


# ANNUAL REPORT 2017

PTT Global Chemical Public Company Limited

ROBECOSAM Sustainability Award Silver Class 2018

Member of Dow Jones Sustainability Indices In Collaboration with RobecoSAM

Global Compact LEAD PARTICIPANT

CDP Disclosure Insight Action

IR Network

## DRIVING INNOVATION

### TOWARDS SUSTAINABLE BETTER LIVING

PTTGC is driving innovation on multiple fronts to respond to technological advancements and changing consumer demands. These innovations support the development of Thailand's Eastern Economic Corridor (EEC), which aims to boost the country's economic growth in bio-fuels and bio-chemicals.

## OPERATING A SUSTAINABLE BUSINESS

### AND CREATING SHARED VALUE

PTTGC is focused on building our business strengths as well as being socially and environmentally responsible to encourage sustainability. We use and integrate knowledge and work with various agencies and communities to support Thai society for a better tomorrow.



# CONTINUOUS DEVELOPMENT

## TO BENEFIT THE COUNTRY

PTTGC develops effective internal administrative and management systems to enhance our capabilities and competitiveness. We drive our business operations aiming for greater efficiency, which will enable us to reach our goal of becoming a global player supporting Thailand's industrial and economic expansion.



ROBECOSAM
Sustainability Award
Silver Class 2018

MEMBER OF
Dow Jones
Sustainability Indices
In Collaboration with RobecoSAM

In 2017, PTTGC was ranked in the Top 10 companies in DJSI under the 'Chemical Sector' for the 5th consecutive year. Throughout 2017, PTTGC was ranked 3rd (scoring the highest and ranked 1st in social dimension) amongst the companies in the Chemical Sector. This outstanding achievement reflects on the accomplishment and importance of all stakeholder groups of PTTGC

**AR Code electronic version installed,** "PTTGC CODE" Application can be downloaded from App Store or Play Store to display AR Code. ANNUAL REPORT 2017 At Cover, Vision (Page 4), Award and Recognitions (Page 8), and Business Structure (Page 18)

CODE

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"Investor may search for more detail of Company information in From 56-1 available at www.sec.or.th or Company website www.pttgcgroup.com"

# VISION

To be a leading chemical company
for better living.

# MISSION

We deliver the best business performance through trustworthiness to create fair and sustainable value for shareholders.

We engage and integrate social and environment to our business with responsibility and care for sustainable development.

We provide superior solutions from innovative products and services to be the best choice for our business partners.

We create a learning organization and a happy workplace to cultivate proficient workforces with profound engagement and commitment to professional excellence.





## OBJECTIVES AND GOALS

PTT Global Chemical Public Company Limited (PTTGC) systematically reviews our corporate vision, mission and direction annually to ensure their alignment with the current context and future business trends. PTTGC aspired to become a leader in the following three aspects in 2017:



### Business Growth

PTTGC is committed to being a petrochemical and chemical manufacturer with integrated production lines, fostering growth and yielding profits in a sustainable and uninterrupted manner.

### Return on Investment:

PTTGC is committed to achieving a return on investment that would place us on the top quartile of industrial players in the Asia Pacific region.

### Sustainability

PTTGC is committed to operating our business under the framework of sustainability with an aim of being continuously accepted and recognized as a leading organization of sustainable development by the DJSI.

# CORPORATE STRATEGIES:

According to our corporate direction and strategies, PTTGC has focused on maintaining our competitiveness and sustainable growth. Meanwhile, we have made various preparations to support future growth. PTTGC has employed this strategic plan as a framework for our operations. We have also regularly monitored its progress to ensure the achievement of short- and long-term goals.

Furthermore, PTTGC has played an important role in propelling Thailand's economy forward with our participation in the working group of public and private entities to realize the government's Eastern Economic Corridor (EEC) Policy. To this end, we have aligned our own strategies and investment plans with the EEC Policy. Our participation in the working group has also given us an opportunity to build a network with the country's many leading organizations, which has led to movements of investment capital into the field and stimulated the use of petrochemical products. Some of the most notable projects included the Map Ta Phut Retrofit project and collaboration projects with Sanyo Chemical and Toyota Tsusho.

Our current operations are based on the following four strategic pillars:

## 1. Sustain Core

To sustain the competitiveness of our production bases amidst the many challenges and ever-changing conditions, PTTGC follows the following two strategies:

- **Business Competitiveness:** We shall maintain and bolster our competitiveness in all aspects through continuous operational improvement and development. We shall increase our competitive advantages through Project MAX, while enhancing operational excellence and marketing excellence, as well as improving the feedstock flexibility of our manufacturing plants' assets and infrastructure (the Map Ta Phut Retrofit). Moreover, we shall also assure the stable supply of our feedstock in the long run.
- **Extend MTP Home Base Competitiveness:** We shall equip our home base with the utilities and infrastructure needed to support future business growth, as well as create future business opportunities based on the Eastern Economic Corridor (EEC) Policy.

## 2. Accelerate Growth Opportunities

PTTGC always seeks opportunities to invest and to operate our existing and new businesses both at home and abroad wherever there is growth and good returns on investment through investing with business partners and enhancing all of our competencies. There are three parallel focus areas:

- We shall expand the production bases of our businesses and products in which we have expertise to countries where there is potential for market growth and where there is feedstock that gives us a competitive advantage.
- We shall diversify our business portfolio by investing in downstream performance chemicals that are consistent with the growth of the target downstream industry and that meet the demand of the market in Thailand, as well as other potential markets in the region, such as CLMV.
- We shall expand our green chemical business to meet the sustainable development demand of the downstream industry.

## 3. Balance Business with Sustainability

PTTGC is committed to becoming a model organization of sustainable growth. Through the balance of the economy, society and the environment, we shall create value-added to our organization.

## 4. Strengthen Enablers

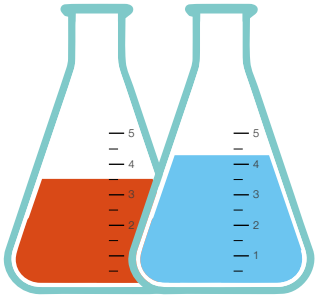
We focus on strengthening internal enablers and ensuring efficiency in the implementation of our strategic plan. We put an emphasis on developing our organizational competencies and fostering all-around business excellence in response to our own organizational direction and the ever-changing business context. These competencies include research, development and innovation; finance and accounting; and production and distribution. Furthermore, PTTGC also has plans in place to ready our business, organization and human resources for our long-term goals.

Furthermore, PTTGC has always believed in the importance of preparing for technological changes, including the fourth industrial revolution or Industry 4.0, in which digital technology is about to play a leading role in the day-to-day business operations. To this end, we have done digitalization planning and execution. The plan is divided into three sub-master plans that are comprised of Business Transformation, Technological Transformation and Organizational Transformation.

# FINANCIAL HIGHLIGHTS

## Sales Revenue

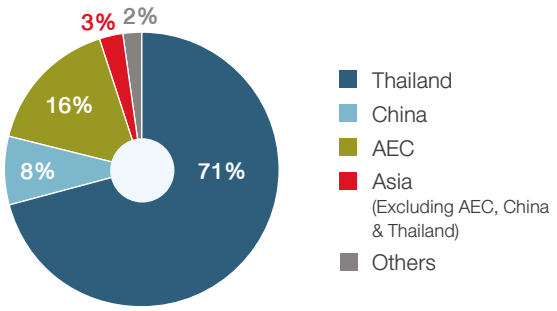
Unit: Million THB



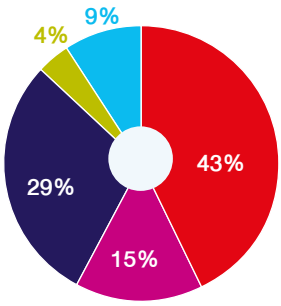
352,185
Year 2016

436,745
Year 2017

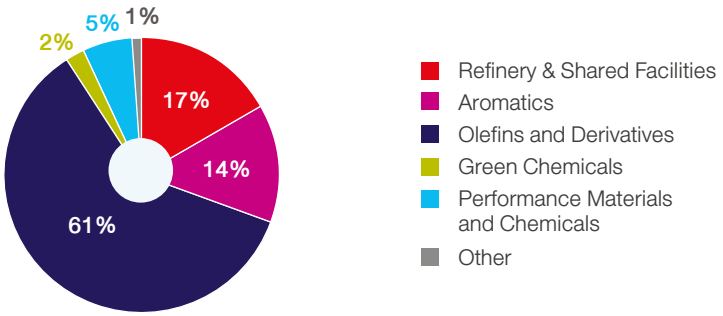
## Sales Revenue of Main Products Breakdown by Geography Year 2017




## Sales Revenue Breakdown by Business Year 2017: 436,745 Million THB

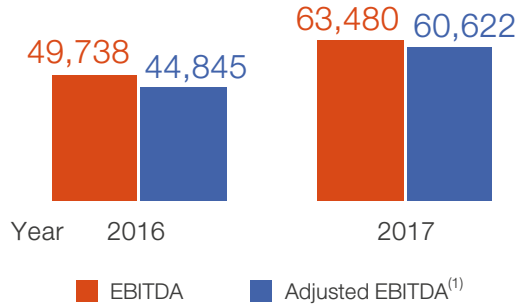



## Adjusted EBITDA[1] Breakdown by Business Year 2017: 60,622 Million THB

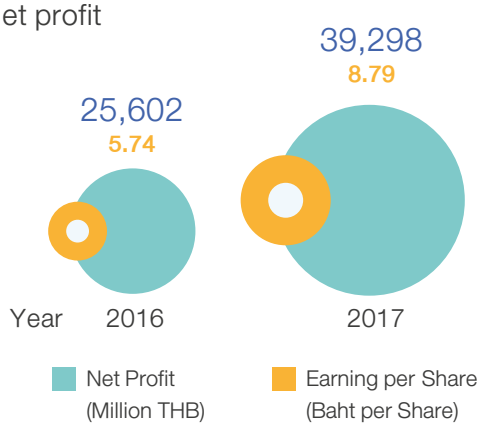



## EBITDA & Adjusted EBITDA[1]

Unit: Million THB




## Net profit



| Statement of Financial Position (Unit: Million THB) | 2015[2] | 2016[2] | 2017 |
|---|---|---|---|
| **Total Assets** | **398,152** | **413,513** | **434,964** |
| Cash and Cash Equivalents + Short-term Investment | 49,594 | 46,889 | 55,050 |
| Current Assets | 70,209 | 82,280 | 85,688 |
| Property, Plant and Equipment | 222,594 | 223,992 | 219,689 |
| Non-current Assets | 55,755 | 60,352 | 74,537 |
| **Total Liabilities** | **145,250** | **146,500** | **154,700** |
| Loan | 107,022 | 97,115 | 97,813 |
| Other Liabilities | 38,228 | 49,385 | 56,887 |
| **Total Equity** | **252,902** | **267,013** | **280,264** |

| Statement of Financial Position | 2016[2] | 2017 |
|---|---|---|
| Current Ratio (times) | 2.37 | 2.33 |
| EBITDA to Tatal Revenues (%) | 14.12 | 14.53 |
| Net Profit on Total Revenues (%) | 7.27 | 9.00 |
| Return on Total Assets (%) | 8.99 | 11.77 |
| Return on Equity (%) | 10.72 | 15.09 |
| Interest Bearing Debt to Equity (times) | 0.36 | 0.35 |
| Net Interest Bearing Debt to Equity (times) | 0.19 | 0.15 |
| Net Interest Bearing Debt to EBITDA (times) | 1.01 | 0.67 |

| Dividend Paid (Baht/Share) | | | | Earning per Share (Baht/Share) | Dividend Payout Ratio (%) |
|---|---|---|---|---|---|
| Year | 1st Half | 2nd Half | Full year | | |
| 2017[3] | 1.75 | 2.50 | 4.25 | 8.79 | 49% |
| 2016 | 1.05 | 1.80 | 2.85 | 5.74 | 50% |
| 2015 | 1.50 | 1.30 | 2.80 | 4.55 | 61% |

**Remarks:**

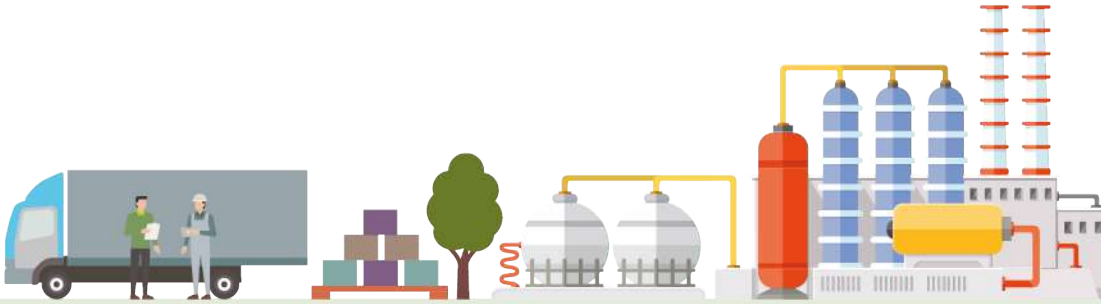
(1) Adjusted EBITDA refers to EBITDA excluding impact of inventory value (excludes Inventory)

(2) Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016

(3) The Board of Directors at its meeting No. 2/2018 held on February 19th, 2018 has approved the proposal to propose at the 2018 Annual General Meeting of Shareholders to consider and approve on the dividend payment for the year 2017 operating performance of 4.25 Baht per share or 49% of net profit, of which 1.75 Baht per share was paid as an interim dividend on September 18th, 2017. The final dividend payment will be 2.50 Baht per share, but the right to receive dividend is subject to the approval of Shareholders at the 2018 Annual General Meeting.

# AWARDS AND RECOGNITIONS

## INTERNATIONAL AWARDS



### UN Global Compact LEAD

PTTGC strives to conduct the business in accordance with the principles of UN Global Compact LEAD, to continuously be the sustainable role model organization as well as to support the achievement of the 17 Sustainable Development Goals.

### Dow Jones Sustainability Indices

PTTGC is ranked as the third place in Dow Jones Sustainability Indices (DJSI) in the Chemicals Sector for the fifth consecutive year.

### FTSE4Good Index

PTTGC's evaluation score from FTSE4Good Index was 75 percent, which demonstrated that PTTGC is operating business with environmental, social responsibility, and good governance, as well as creating trust among international investors.

### CARBON DISCLOSURE PROJECT

PTTGC was recognized at the A List by CDP for both climate and water for the third consecutive year.

### Ecovadis

PTTGC has won gold-level recognition with 72 score for its ESG programs

### Sustainalytics

PTTGC was ranked the fourth from 100 companies in Asia

### ICIS Top 40 Power Players

President & CEO of PTTGC was ranked the 22nd

### ICIS Top 100

PTTGC was ranked at the 35th in the 2017 ICIS Top 100 global chemical companies

### Integrated Sustainability Report

PTTGC is the first company in Thailand to prepared Integrated Sustainability Report

### 7th ASIAN Excellence Award 2017

PTTGC's received three awards, included Asia's Best CEO, Best Investor Relations Professional and Best Investor Relations Company

### IR Magazine Awards & Conference - South East Asia 2017

PTTGC received Best in Sector-Materials and Most Progress in Investor Relation Awards (IR)

### The Asset Awards 2017

PTTGC received Platinum Award for its ESG implementation

A support from all stakeholders is an important influence for PTTGC to constantly make positive change in economic, environment and social. In 2017, PTTGC is proud to be recognized by leading organizations from around the world.



## NATIONAL AWARDS

### THE PRIME MINISTER'S INDUSTRY AWARD

PTTGC branch 2 was awarded with The Prime Minister's Industry Award in Excellence level. This success is a result of our intention to develop business to become the role model in Thai industry. Additionally, TOCGC received an outstanding awards in safety and logistic management, while GGC received an outstanding award in quality management.

### SET SUSTAINABILITY AWARDS

PTTGC received Sustainability Awards of Honor 2017. This award was specially given to listed companies that have been awarded with Best Sustainability Awards for more than three years, consecutively.

### INTEGRITY AWARDS

PTTGC received the complimentary award of NACC Integrity Awards 2017 from the Office of the National Anti-Corruption Commission (NACC). The award reflected that PTTGC has been conducted its business with good corporate governance, and social responsibility.

### GREEN INDUSTRY LEVEL 5 AWARD

PTTGC Group has been certified with Green Industry at the highest level. The awards recognized our intention to cascade 2E1S awareness to our stakeholders.

**Thailand's Private Sector Collective Action Coalition Against Corruption: CAC Certification**
PTTGC received the renewed certification of Thailand's Private Sector Collective Action Coalition Against Corruption

**SET Innovation Awards**
PTTGC's Downgauging for Flexible Packaging Film received an Outstanding Company Innovation Award.

**Sustainability Report Awards**
PTTGC received Sustainability Awards 2017 in Outstanding category

**Thailand Sustainability Investment Awards**
PTTGC was listed in the Thailand Sustainability Investment (THIS)

**Thailand Labor Management Excellence Awards 2017**
PTTGC received Thailand Labor Management Excellence Awards 2017

**CSR-DIW 2017**
14 branches of PTTGC received CSR-DIW Continuous Awards 2017

**Thailand Quality Class 2017**
PTTGC is one of seven Thai good quality organizations that meet the qualifications

**Thailand ICT Excellence Award**
PTTGC received Thailand ICT Excellence Award 2017 in Core Process Improvement Projects category

**Gold Star and Green Star Flag Awards**
11 plants of PTTGC Group received Gold Star Flag Award

**Thailand's Top Corporate Brand Value Award**
PTTGC's brand value ranked the first in the petrochemicals and chemicals business for the fifth consecutive year.

**Thailand Energy Awards**
PTTGC branch 6 and branch 12 received "Thailand Energy Awards" (Control Factory)

# MAJOR EVENTS AND ACTIVITIES IN 2017




## January 23rd, 2017

### Public sector, Private sector and Institute of Research and Development signed an MoU on bioeconomy

The Industry Minister, representing the public sector, and the chairman of PTTGC, representing the private sector, signed a memorandum of understanding (MOU) to kick- start investments in Thailand's bioeconomy. The MOU was made for 23 public and private organizations, including the Institute of Research and Development.

Support Accelerate Growth Opportunities Strategy




## January 25th, 2017

### PTTGC invested in construction of plastic forming plant in Myanmar

Solution Creation Company Limited, PTTGC's subsidiary, signed a joint-venture agreement with S.P. Petpack Company Limited. Under the terms of this 50-million-baht agreement, Solution Creation holds a 25% stake in S.P. PETPACK's subsidiary S.P. PETPACK INTER GROUP (THAI) Company Limited. The joint venture is overseeing the construction of a plastic forming plant and the development of the plastic packaging market in the Republic of the Union of Myanmar.

Support Accelerate Growth Opportunities Strategy

## March 29th, 2017

### Upcycling the Oceans, Thailand Project-Tackles the marine waste problem

PTTGC, the Tourism Authority of Thailand (TAT) and the Ecoalf Foundation launched the Upcycling the Oceans, Thailand Project to promote creative and environmentally friendly waste management at Thailand's marine tourist attractions, as well as in relevant coastal areas and on islands. The project encourages environmental conservation and social responsibility, as well as promotes a good image for Thailand. The launch took place at CentralWorld shopping center, Bangkok.

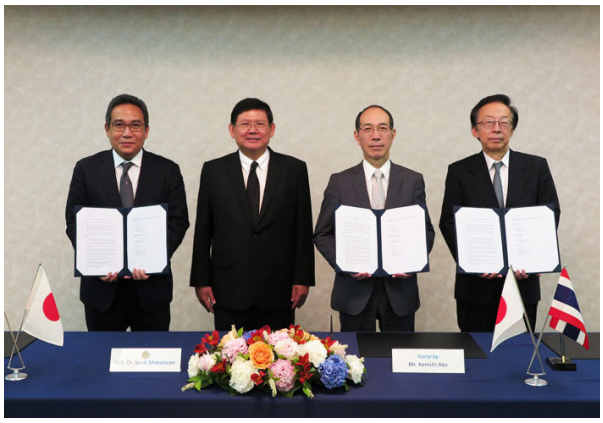
Support Balance Business with Sustainability Strategy

## May 2nd, 2017

### GGC's first day trade in Stock Exchange of Thailand

Executive officers from PTTGC, Global Green Chemical Public Company Limited (GGC) and the Stock Exchange of Thailand (SET) attended the ceremony marking GGC's first day as a publically traded company in the SET. GGC has increased its production capacity with the opening of its second methylester plant and the first phase of the Biocomplex project, which has established the infrastructure needed to manufacture future biochemical and bioplastic products.

Support Accelerate Growth Opportunities Strategy



## June 7th, 2017

### World-leading petrochemical and specialty chemical companies - Kuraray, Sumimoto Corp. and PTT Global Chemical - moved forward with investments in Thailand

PTTGC signed a key terms joint venture agreement on the production and distribution of high heat resistant polyamide-9T super engineering plastic products and hydrogenated styrenic block copolymer (HSBC) thermal plastic products in Thailand with Japan's leading specialty chemical company Kuraray and Japan-based international trading firm Sumimoto Corporation. The signing ceremony was held in Tokyo, Japan.

Support Accelerate Growth Opportunities Strategy




## June 20th, 2017

### PTTGC and Singapore's Nanyang to develop 3-D printed high performance materials for automotive industry

PTTGC signed a memorandum of understanding to jointly develop 3-D printed high performance materials for applications in the automotive industry with Nanyang Technological University (NTU) under the operations of the Singapore Centre for 3D Printing (SC3DP). NTU is a leading university equipped with experts in the field of 3-D printing research and development. There signing ceremony was held at the Energy Complex, Bangkok.

Support Accelerate Growth Opportunities Strategy



## July 3rd, 2017

### Transfer of shares between PTTGC and PTT in Ruam Mitr Project

As part of the Ruam Mitr Project, PTTGC and PTT signed documents transferring shares from PTT's petrochemical businesses, namely propylene, biochemical and related servicing businesses, as well as viability study results to PTTGC. This transfer was approved by shareholders at the Annual General Meeting held on April 5th, 2017. Both parties have carried out the procedures listed in the share trading agreement, as well as other relevant measures. Therefore, PTTGC was able to receive the transfer of all pertinent shares from PTT by July 3rd, 2017.

Support Accelerate Growth Opportunities Strategy




## July 27th, 2017

### PTTGC appointed five banks as underwriters of its Baht 10 billion worth of debentures

PTTGC appointed the following banks as underwriters of the 1/2017 debenture issuance: Bangkok Bank, Krungthai Bank, Ayudhaya Bank, Kasikorn Bank and Siam Commercial Bank. The offered four-year debentures carry an interest rate of 3.05% per annum. Their offering value was up to Baht 10 billion. The purpose of this issuance of debenture was to expand the base of investors by strengthening the foundation of minority shareholders. Subscription to the issuance was first open to the elderly to give them a better investment option in one of the country's top companies.

Support Accelerate Growth Opportunities Strategy

## August 17th, 2017

### PTTGC established joint venture with TPBI and Myanmar Star Group to manufacture plastic in Myanmar

Solution Creation Company Limited, PTTGC's subsidiary, TPBI International Company Limited and Myanmar Star Group Company Limited signed a shareholders' agreement at the Energy Complex, Bangkok, to establish a joint venture in the Republic of the Union of Myanmar that forms plastic products for distribution within the republic. This investment was in line with PTTGC's business direction and strategy, aiming to support its major clients with investments, expand its business portfolio and promote polymer products in the CLMV.

Support Accelerate Growth Opportunities Strategy

## August 17th, 2017

### PTTGC to develop plastic packaging market in Myanmar with A.K. Pack and Machinery Company Limited

PTTGC signed a memorandum of understanding (MOU) to develop the plastic packaging market in the Republic of the Union of Myanmar with A.K. Pack and Machinery Company Limited at the Energy Complex, Bangkok. This endeavor will propel the country's economy forward and expand our business into a neighboring country with great potential. Both parties will jointly develop the business, build a production base and support each other with new formula development techniques and inter-organizational transfers of knowledge and experiences, all of which will foster mutual growth in a sustainable manner.

Support Accelerate Growth Opportunities Strategy




## August 25th, 2017

### PTTGC to establish GC Polyols with Sanyo Chemical and Toyota Tsusho, approved investment in propylene oxide (PO) project

PTTGC approved an investment in GC Polyols, a manufacturer and distributor of polyols, which is the main raw material used in the production of polyurethane. GC Polyols is a PTTGC joint venture founded with the help of Sanyo Chemical and Toyota Tsusho; it has the following shareholding structure: 82.1% by PTTGC, 14.9% by SCI and 3% by TTC. The investment was a business expansion move to meet the increasing demand in the automotive, electric appliances and electronics and construction material industries. Furthermore, PTTGC also founded GC Oxirane Co., Ltd. to invest in a propylene oxide (PO) manufacturing. This wholly owned subsidiary has a production capacity of 200,000 tons per year.

Support Accelerate Growth Opportunities Strategy

## August 25th, 2017

### Founding San Phalang Social Enterprise Co. Ltd.

PTTGC founded a joint venture called San Phalang Social Enterprise Co., Ltd. (SPSE). PTT Public Co., Ltd. (PTT) holds a 20% stake in the joint venture. PTT Exploration and Production Public Co., Ltd. (PTTEP), Thai Oil Public Co., Ltd. (TOP), IRPC Public Co., Ltd. (IRPC) and PTTGC hold a 15% stake each. Meanwhile, Global Power Synergy Public Co., Ltd. (GPSC) and PTT Oil and Retail Business Co., Ltd. (PTTOR) hold a 10% stake each. San Phalang Social Enterprise Co. Ltd. has an initial registered capital of Baht 10 million, Baht 1.5 million of which belongs to PTTGC.

Support Balance Business with Sustainability Strategy




## September 28th, 2017

### PTTGC and Faculty of Medicine Siriraj Hospital, Mahidol University, to research and develop medical equipment innovations

PTTGC signed a memorandum of understanding (MOU) with the Faculty of Medicine Siriraj Hospital, Mahidol University, at the Administration Building, Faculty of Medicine Siriraj Hospital, Mahidol University, to research and develop medical equipment innovations. This agreement marks another milestone in the history of plastic medical equipment development. A team of PTTGC researchers will work with Siriraj Hospital's team of practitioners to study mutual needs and to develop affordable medical products at reasonable costs, giving the public better access to medical services.

Support Accelerate Growth Opportunities Strategy




## October 2nd, 2017

### PTTGC witnessed MOU between PTTGC America and JobsOhio to uplift standards of living for communities in Ohio, USA

PTTGC bore witness to the signing of a memorandum of understanding (MOU) between PTTGC America LLC. and JobsOhio, an agency promoting investments in the State of Ohio. Under the terms of the MOU, both parties are to jointly study, plan and execute a project to develop and uplift the standards of living for communities in project areas, as well as nearby, in the State of Ohio, USA, ensuring mutual benefits. The signing ceremony was held at Four Seasons hotel, Washington, D.C., USA.

Support Accelerate Growth Opportunities Strategy




## November 2nd, 2017

### PTTGC and Thai Union Group to develop packaging, products and raw materials for sustainable businesses

PTTGC and Thai Union Group Public Company Limited signed a memorandum of understanding (MOU) to collaboratively research and develop plastic packaging, products and raw materials used in Thai Union's products, including both petroleum- and bio-based plastics. The goal is to create value-added to Thai Union's seafood business, reduce production costs and create sustainable and environmentally friendly innovations. The signing took place at Centara Grand hotel at Central Plaza Ladprao, Bangkok.

Support Accelerate Growth Opportunities Strategy

## December 19th, 2017

### Founding GC Treasury Center Co., Ltd.

PTTGC founded GC Treasury Center Company Limited, a wholly owned subsidiary with an initial registered capital of Baht 5 million, which will later be increased to Baht 10 million. The subsidiary has already been registered with the Ministry of Commerce. It is in the process of applying for a treasury center license from the Ministry of Finance, after which it will have to obtain approval from the Revenue Department to be set up as an international headquarters (IHQ), following the legally established procedure.

Support Strengthen Enabler Strategy




## December 22nd, 2017

### PTTGC and New Modern Super Pack to jointly develop plastic packaging market in Myanmar

PTTGC signed a memorandum of understanding (MOU) to jointly develop the plastic packaging market in the Republic of the Union of Myanmar with New Modern Super Pack Company Limited at the Energy Complex, Bangkok.

Support Accelerate Growth Opportunities Strategy

## December 26th, 2017

### PTTGC singed MOU with Nippon Shokubai and Mitsui to study the viability of establishing a manufacturer and distributor of surfactant for downstream industries in Thailand

PTTGC has agreed to study the viability of a project to manufacture and distribute secondary alcohol exthoxylates, a surfactant under the trademark SOFTANOL, in Thailand with Nippon Shokubai Co., Ltd. and Mitsui & Co., Ltd. This project will be located in the Hemaraj Eastern Industrial Estate, Rayong.

Support Accelerate Growth Opportunities Strategy



# MESSAGE FROM THE CHAIRMAN

## Dear Shareholders,

**PTT Global Chemical Company Limited operated to the best of its ability throughout 2017, resulting in a performance that outshines that of any other year. Our net profit rose to 39,298 million baht or a year-on-year increase of 53 percent. This is the highest net profit in six years or since the company was founded, marking yet another milestone that we are proud of.**

A number of factors have played a major role in supporting the satisfactory growth of our gross revenue, including the global climb of oil prices due to the OPEC's collective production decrease, the growth of Thailand's exports that exceeded expectations as a result of the simultaneous recovery of the American, European and Japanese economies for the first time in many years and the upward trend of Thailand's tourism sector. Nonetheless, the Board of Directors has remained vigilant and closely monitored the situations to assure that management would be able to move our organization along the established directions in the most efficient manner possible. These directions included strategic plans to bolster our present businesses; to foster growth in new segments, such as the diversification of performance chemicals and the enhancement of our green chemicals; and to balance our business with sustainability.

**Sustainable growth through further investments in Map Ta Phut per the government's EEC policy, as well as continuous investments overseas**

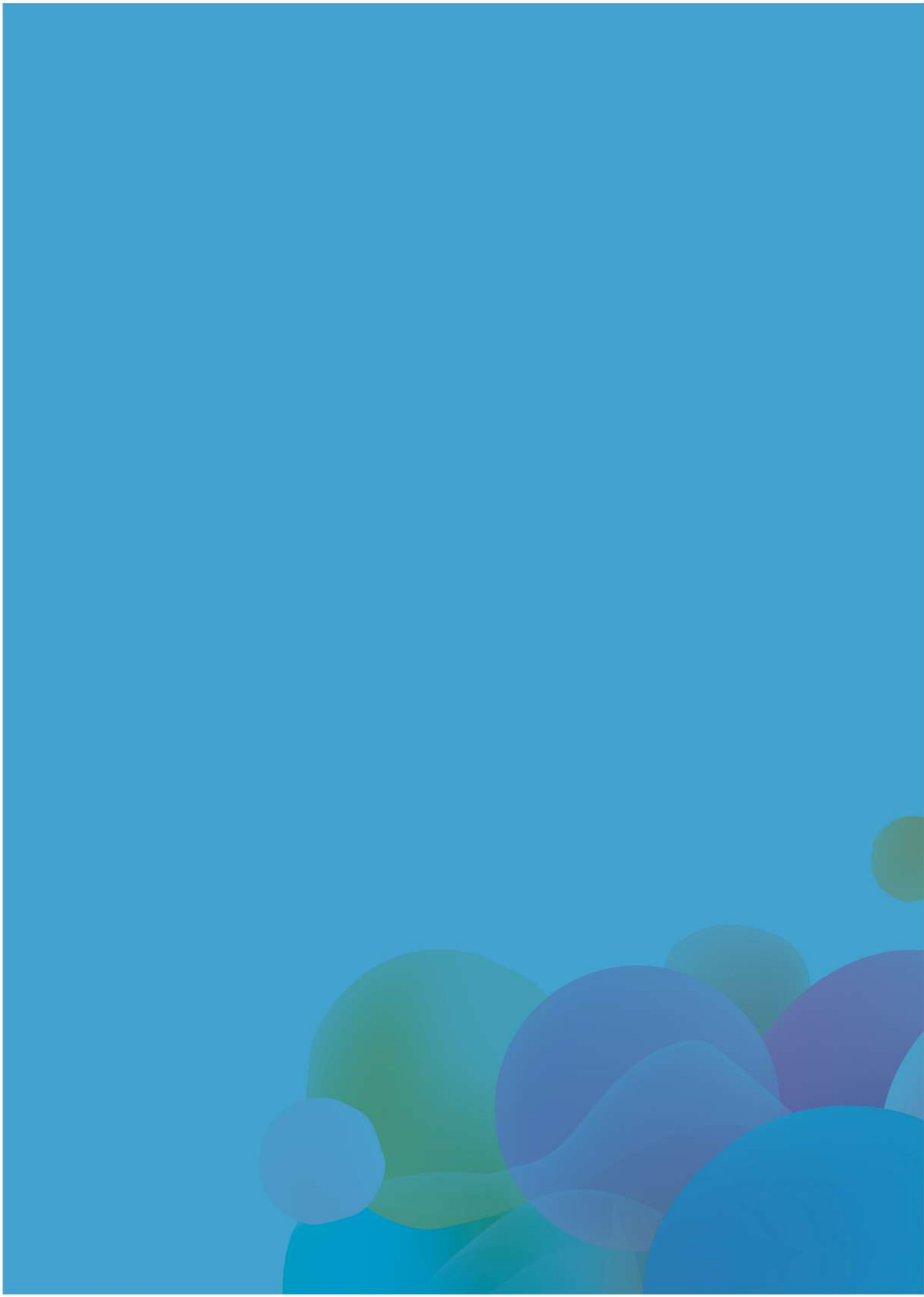
As for our future endeavors, we have further invested in businesses in which we have expertise. Our major investment projects included the Olefins Reconfiguration Project (ORP) to use naphtha as feedstock in downstream businesses; a new specialty chemical plant (PO/Polyols) to create value-added to downstream businesses and to support the government's S-Curve policy and its Eastern Economic Corridor (EEC) development; the switch from shale gas to ethane as feedstock at our US Petrochemical Complex; and other investments in the CLMV and the AEC. Furthermore, we have always put an emphasis on maintaining the economic, environmental and social balance (2Es 1S) through social investments, serving as a role model for other organizations. For instance, we have introduced the concept of a circular economy through Upcycling the Oceans, Thailand, a program that plays a role in dealing with plastic garbage in Thailand's seas by turning it into high-quality fashion items. The program is our direct response to the global Sustainable Development Goals (SDGs).

Due to our strong operation, the quality of our management systems and our attention to detail across all dimensions, we have maintained our leading position and garnered much national and international recognition. We have been ranked third or in the top ten in the petrochemical sector by The Dow Jones Sustainability Indices for five consecutive years. We have also been given the Outstanding Industry Award from The Prime Minister's Industry Awards 2017 and an honorary mention by the National Anti-Corruption Commission for our organization transparency. We strive to become a role model of sustainability to strike a balance between business growth and meeting our stakeholders' expectations.

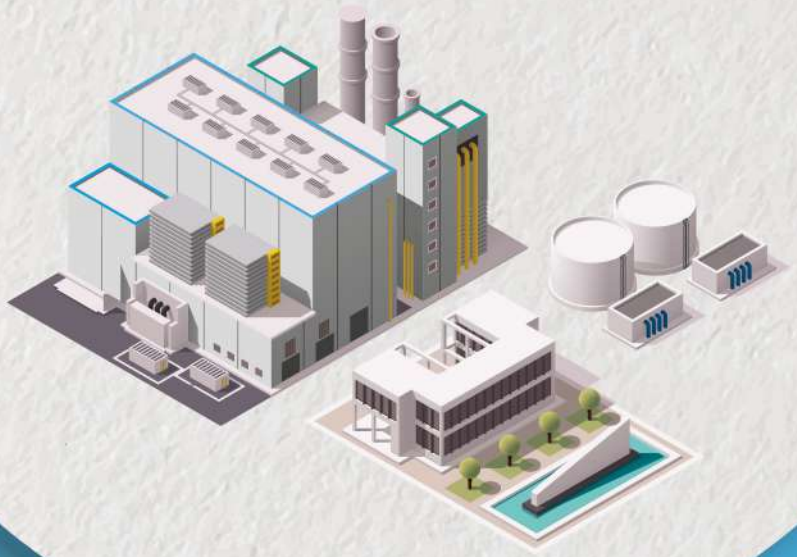
**With our resolution and commitment to business quality through a balance of management achieved by the implementation of innovations, PTTGC has achieved the vision of becoming a petrochemical leader for better living. We have created value-added and stability to Thailand's economy and society in a sustainable manner.**



(Mr. Prasert Bunsumpun)
Chairman



# BUSINESS HIGHLIGHTS



# BUSINESS STRUCTURE

PTT Global Chemical Public Company Limited (PTTGC), as a Chemical Flagship of PTT Group with a combined chemical / petrochemical capacity of **9.72** million tons per year and crude oil / condensate distillation capacity of **280,000** barrels per day. PTTGC consists of 8 business groups.




| | REFINERY & SHARED FACILITIES | AROMATICS | OLEFINS | POLYMERS |
|---|---|---|---|---|
| **MAIN PRODUCTS** | LPG<br>LIGHT NAPHTHA<br>REFORMATE<br>JET A1<br>DIESEL<br>FUEL OIL | BENZENE<br>TOLUENE<br>PARAXYLENE<br>ORTHOXYLENE<br>MIXED XYLENES<br>CYCLOHEXANE | ETHYLENE<br>PROPYLENE<br>BUTADIENE<br>BUTENE-1 | HDPE<br>LDPE<br>LLDPE<br>PS<br>PP |
| **CAPACITY*** | CRUDE OIL DISTILLATION<br>145,000 BARRELS/DAY | CONDENSATE DISTILLATION<br>135,000 BARRELS/DAY<br>AROMATICS<br>2,419 KTA | ETHYLENE/ PROPYLENE<br>2,888 KTA<br>BUTADIENE/ BUTENE-1<br>100 KTA | POLYETHYLENE<br>1,500 KTA<br>POLYSTYRENE<br>90 KTA<br>POLYPROPYLENE<br>336 KTA |
| **OPERATED BY** | PTTGC | PTTGC | PTTGC | PTTGC<br>TSCL<br>HMC |

| SERVICES AND OTHERS | | |
|---|---|---|
| | Jetty and chemical tank farms | Operated by TTT |
| | Utility businesses | Operated by GPSC |
| | Plant maintenance and engineering design services | Operated by PTTME and PTTES |
| | Safety, occupational health, and environmental services | Operated by NPC S&E and NPCSG |
| | Pipeline infrastructural services | Operated by EFT |
| | Information technology services | Operated by PTT DIGITAL |
| | Labor outsourcing service | Operated by BSA |

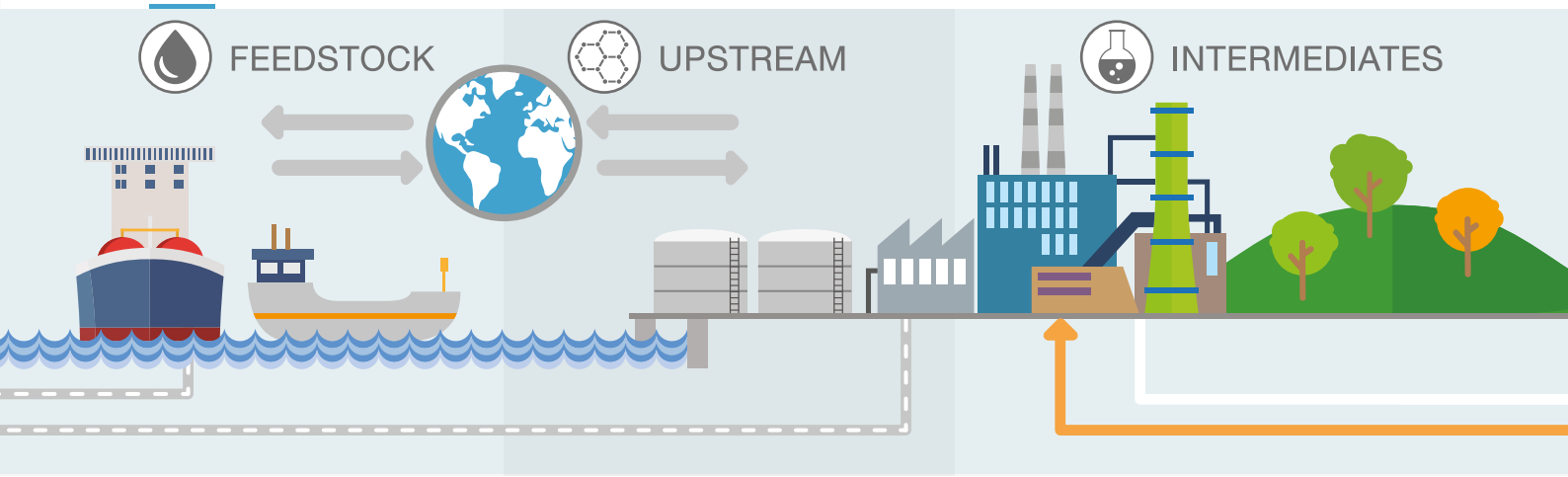



| MAIN PRODUCTS | | | |
|---|---|---|---|
| ETHYLENE GLYCOL<br>ETHANOLAMINE | METHYL ESTER<br>GLYCERIN<br>FATTY ACID<br>FATTY ALCOHOL<br>ETHOXYLATE<br>SPECIALTY OLEOCHEMICALS<br>BIOPLASTIC | PHENOL<br>BISPHENOL A<br>ACETONE | HEXAMETHYLENE DISOCYANATE AND DERIVATIVES<br>ACRYLONITRILE<br>METHYL METHACRYLATE |
| **CAPACITY*** | | | |
| 473 KTA | 756 KTA | 910 KTA | 250 KTA |
| **OPERATED BY** | | | |
| TOCGC | GGC<br>TFA<br>EMERY<br>NATUREWORKS<br>TEX<br>PTTMCC | PPCL | VENCOREX<br>PTTAC |

**Remarks:**
** Only capacity that PTTGC hold equal to or more than 25% share and calculate proportion by percent share.*

- Marketing and sales for health and nutrition products — Operated by Solution Creation
- Polymer sales and marketing services — Operated by PTTPM and ITT (Polymers Business Unit)
- Logistics services — Operated by PTTPL (Polymers Business Unit)
- Social Enterprise — Operated by PRS RAYONG
- PTTGC Group's liquidity management and financing vehicle services — Operated by GC Treasury Center
- Development support on plastic packaging products — Operated by SPSE
- Manufacture, procure, sell products and/or provide services that contributes to society — Operated by SPIG

# BUSINESS VALUE CHAIN

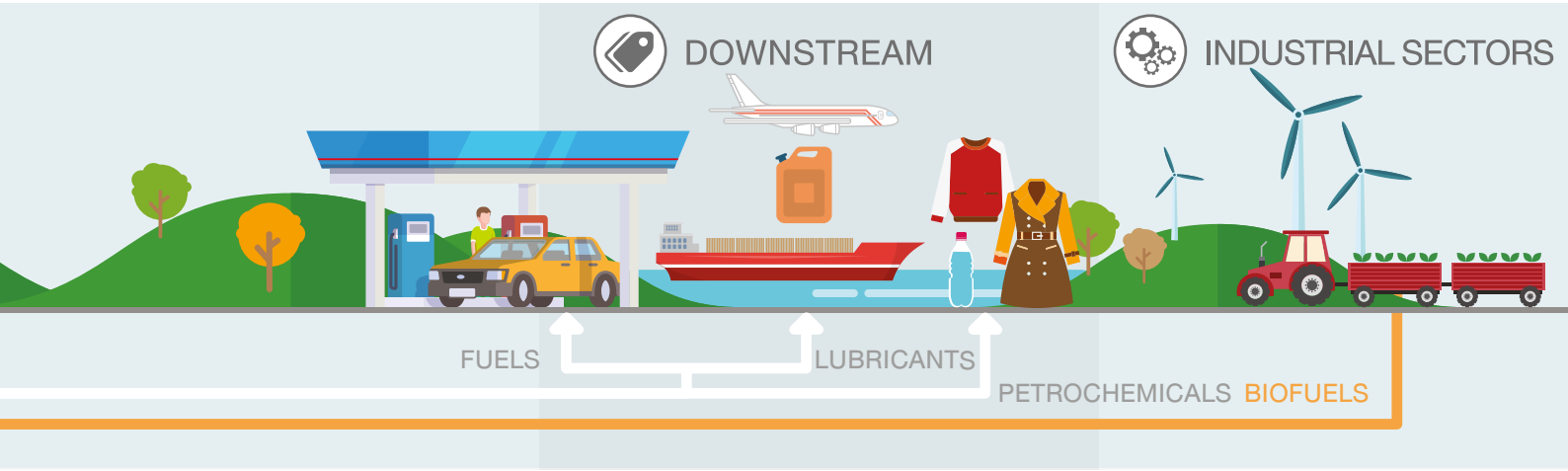



NATURAL GAS
CONDENSATE
CRUDE OIL
CRUDE PALM OIL
TALLOW
AGRICULTURAL PRODUCTS

ETHYLENE
PROPYLENE
MIXED C4s
BENZENE
TOLUENE
PARAXYLENE
ORTHOXYLENE
OLEOCHEMICALS
SPECIALTY OLEOCHEMICAL

EO
VINYL CHLORIDE MONOMER
BUTENE-1
EB / SM
PO
POLYOLS
BUTADIENE
PHENOL
CUMENE
ACETONE
CYCLOHEXANE
HMDA
HDI
TDI
PTA
PA
FATTY ALCOHOL
METHYL ESTER (B100)

Group Performance Center-Refinery & Shared Facilities
Group Performance Center-Olefins
EO-Based Performance Business Unit
Performance Materials and Chemicals Business Unit
Group Performance Center-Aromatics
Polymers Business Unit
Green Chemicals Business Unit
Phenol Business Unit




MEG

BPA

ACRYLONITRILE

MMA

CAPROLACTAM

SYSTEM HOUSE

ADIPIC ACID

HDPE

LDPE

PVC

LLDPE

ETHANOLAMINE

ETHOXYLATE

PS

ABS

PP

SBR

PC

EPOXY RESINS

PMMA

NYLON 6

NYLON 6,6

PU

POLYESTER FIBER

PET

PLASTICIZER

PETROLEUM PRODUCTS

- LPG
- REFORMATE
- LIGHT NAPHTHA
- JET A1
- DIESEL
- FUEL OIL

GLYCERIN

FATTY ACID

BIOPLASTIC

AGRO GREEN SOLUTION

OZONE ACID

PLASTIC ADDITIVE

ECO-FRIENDLY POLYOLS

BIO-LUBRICANTS

Potential Product Opportunities

Packaging



Personal Care



Pharmaceutical



Automotive



Construction



Electronic



Textile



Agriculture



# NATURE OF BUSINESS AND PERFORMANCE



## GROUP PERFORMANCE CENTER – REFINERY AND SHARED FACILITIES

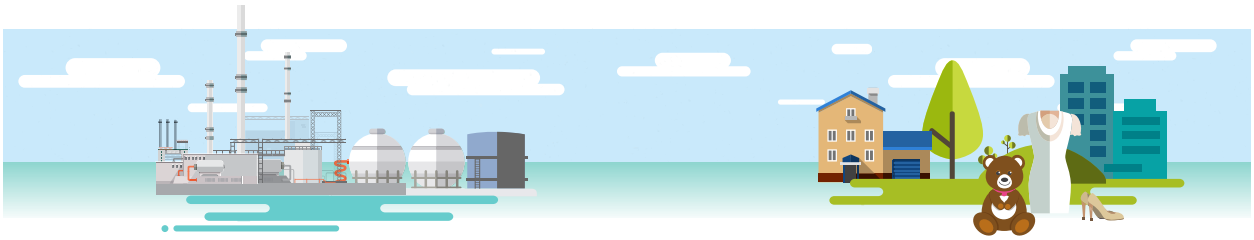
PTTGC is Thailand's leading refinery and distributor of petroleum products. PTTGC owns and operates a modern refinery complex, which is capable of converting low-value fuel oil to more valuable middle distillate products. Our refining capabilities stand strong at 145,000 barrels per day. Additionally, PTTGC refinery is flexible; its production capacity can be adjusted to accommodate customer demand, as well as any volatility in the market. The following is a summary of PTTGC's petroleum production capabilities and their usages:

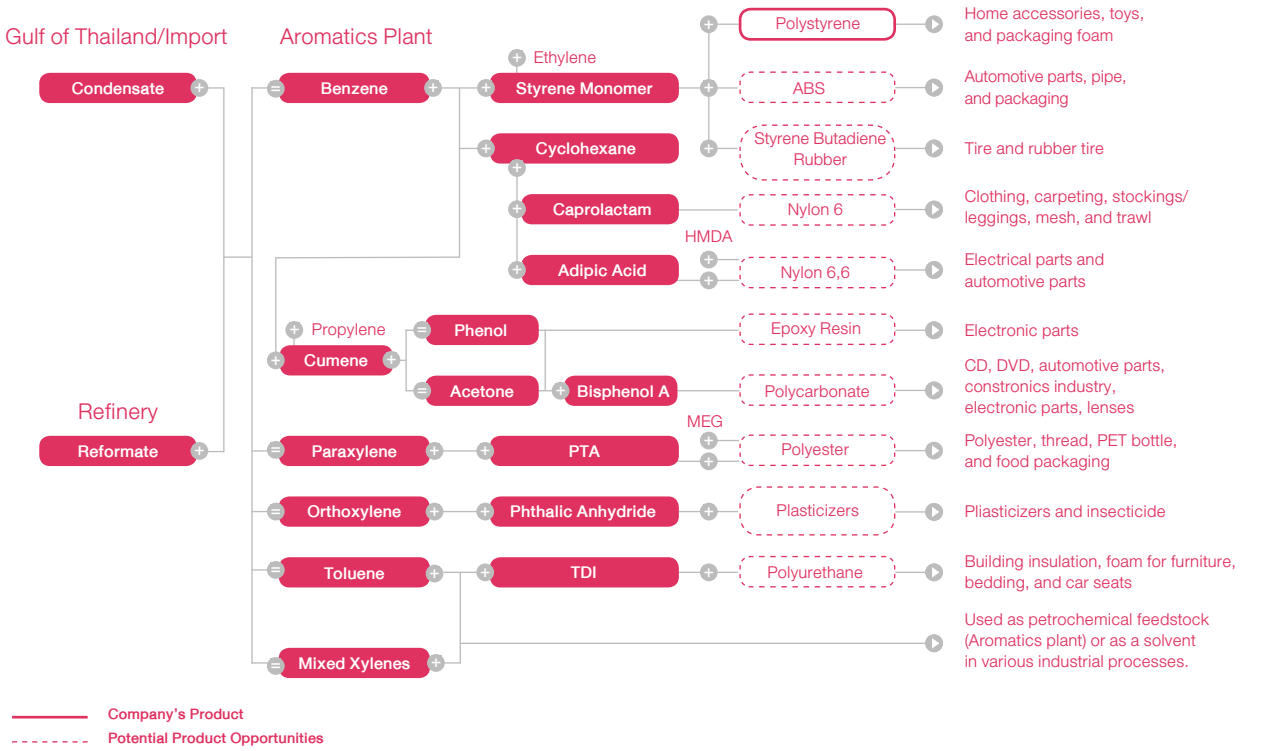
| Petroleum Products | | Usages |
|---|---|---|
| Light Distillates | Liquefied Petroleum Gas or LPG | Fuel<br>Petrochemical feedstock (Olefins plants) |
| | Light Naphtha | Gasoline blending component<br>Petrochemical feedstock (Olefins plants) |
| | Reformate | Gasoline blending component<br>Petrochemical feedstock (Aromatics plants) |
| Middle Distillates | Jet Fuel | Aviation fuel |
| | Diesel | Industry fuel and automotive fuel |
| Heavy Distillates | Fuel Oil | Industry fuel and maritime transportation fuel |

As of 2017, PTTGC has a domestic market share of middle-distillate approximately 20 percent.

## GROUP PERFORMANCE CENTER – AROMATICS

PTTGC produces and distributes aromatic products, namely paraxylene, benzene, orthoxylene, mixed xylenes, toluene, and cyclohexane. These products are used as feedstock in various industrial processes detailed in the chart below:






Aside from the products listed above, PTTGC's aromatics plants also produce multiple by-products, including liquefied petroleum gas (LPG) and light naphtha, which are used as feedstock at PTTGC's olefins plants. Furthermore, heavy aromatics and condensate residue are used as feedstock in our refinery operations to make jet fuel, diesel, and fuel oil.

PTTGC currently operates two aromatics plants with a combined capacity of 2,419 thousand tons per year. The table below shows the production capacity of each product in details:

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| PTTGC | Benzene | 697 |
| | Toluene* | 50 |
| | Paraxylene | 1,310 |
| | Orthoxylene | 86 |
| | Mixed Xylene* | 76 |
| | Cyclohexane | 200 |

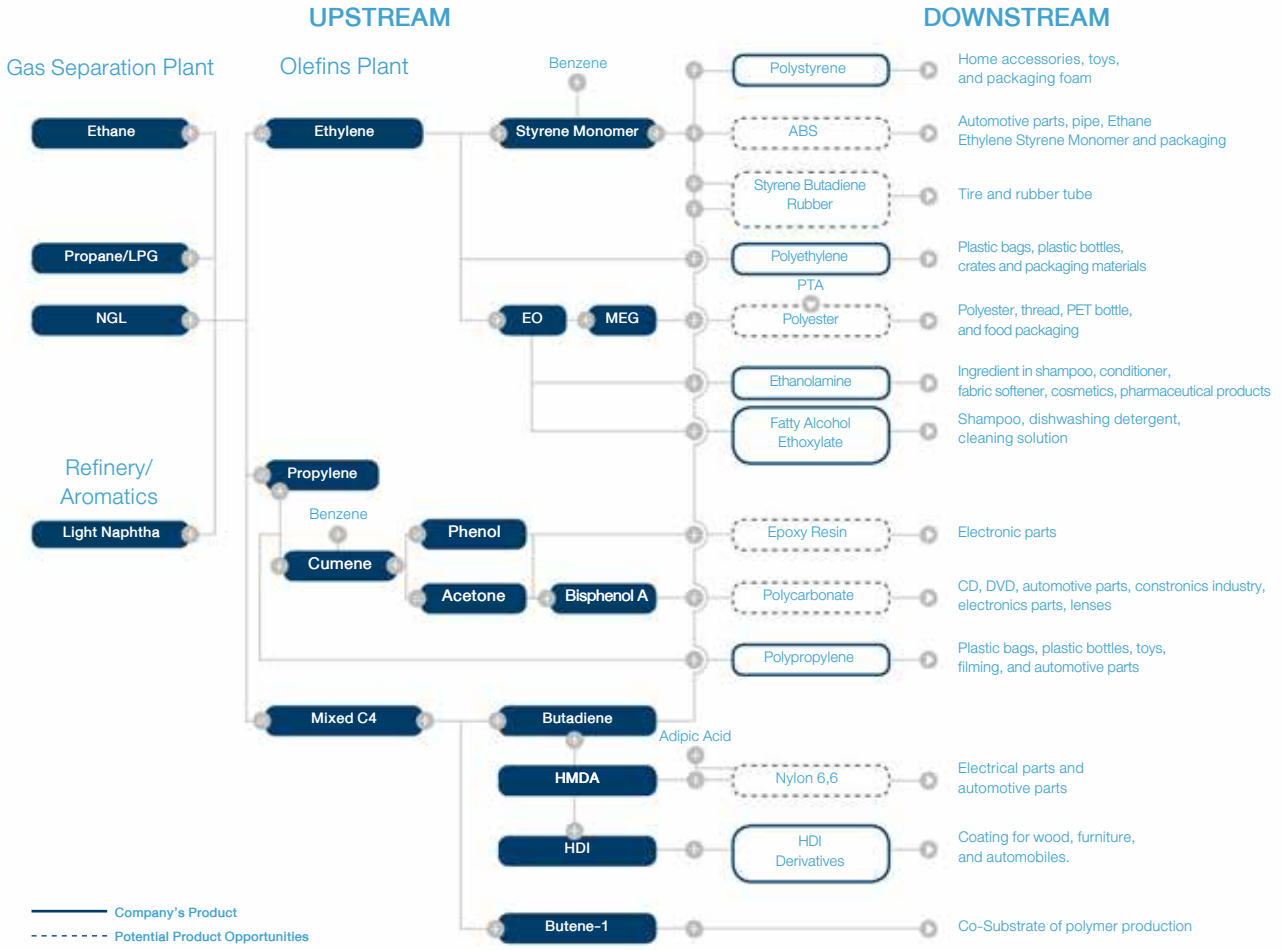
** Toluene and mixed xylene are currently used as feedstock at the aromatics plants.*

As of 2017, PTTGC has a domestic market share of aromatics approximately 66 percent.

## GROUP PERFORMANCE CENTER – OLEFINS

PTTGC's olefins plants are capable of producing olefins, such as ethylene and propylene. The chart below shows the feedstock used in production and their sources, as well as intermediate and downstream products:






PTTGC's olefins plants also yield various by-products, such as pyrolysis gasoline, mixed C4, tail gas, cracker bottom and hydrogen. The Company creates value-added to these by-products through synergy at its refinery and aromatics plants. For example, pyrolysis gasoline is turned into aromatics products; cracker bottom is distilled into petroleum products; hydrogen is used in the refinery as a substitute for hydrogen produced by the Hydrogen Manufacturing Unit (HMU), which has higher production costs, and mixed C4 is turned into butadiene and butene-1 at the by-product value-added plant.

Furthermore, the Company has a complex that produces and distributes important utilities such as electricity, steam and water for industrial use. The latter can be broken down into treated water and demineralized water, which are used at PTTGC's olefins plants and sold to a group of downstream petrochemical manufacturers in concession areas with permission and to other companies in the Map Ta Phut Industrial Estate.

PTTGC has four olefins plants, producing 2,988 thousand tons per year of ethylene, propylene, butadiene and butane-1. The following table shows the breakdown of their capacities:

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| PTTGC | Ethylene | 2,376 |
| | Propylene | 512 |
| | Butadiene | 75 |
| | Butene-1 | 25 |

As of 2017, PTTGC has a domestic market share of ethylene and propylene approximately 38 percent and 29 percent, respectively.

## POLYMERS BUSINESS UNIT

Polymers are downstream petrochemical products primarily used as raw material in manufacturing everyday plastic products. They are commonly used in the molding of plastic containers such as bags, bottles, engine lubricant containers, buckets and crates. They are also used as feedstock in other downstream industries, such as electric appliance production, fishery, agriculture and construction business. The following is a list of important PTTGC's polymer-based products:

- High density polyethylene (HDPE) plastic pellets
- Linear low density polyethylene (LLDPE) plastic pellets
- Low density polyethylene (LDPE) plastic pellets
- Polypropylene (PP) plastic pellets
- Polystyrene (PS) plastic pellets

Polyethylene plastic pellets are produced by PTTGC and sold under the trademark "InnoPlus". Polypropylene plastic pellets are produced by HMC Polymers Co., Ltd. and sold under the trademarks "Moplen", "Purell", "Clyrell" and "Adstif". Meanwhile, polystyrene plastic pellets, available as general-purpose polystyrene (GPPS) and high impact polystyrene (HIPS), are produced by Thai Strynics Co., Ltd. (TSCL), which operates under the supervision of the PTTGC Polymers Business Unit. These polystyrene plastic pellets are sold under the trademark "DIAREX".

The PTTGC Group currently operates eight commercial polymer plants. They are located at the Map Ta Phut Industrial Estate and the Pha Daeng Industrial Estate, Rayong. Their production capacities are summarized in the table below.

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| PTTGC | HDPE | 800 |
| | LLDPE | 400 |
| | LDPE | 300 |
| HMC | PP | 810 |
| TSCL | PS | 90 |

## EO-BASED PERFORMANCE BUSINESS UNIT

PTTGC has expanded its business to cover the production of ethylene-oxide-based (EO-based) performance products and its other downstream products. The expansion creates value-added to our olefin products and meets the rising industrial and consumer demand. These EO-based performance products also fulfill domestic needs normally met by imports. Additionally, their production raises the competitiveness of Thailand's petrochemical industry in the global market. PTTGC's EO-based performance products and their intended uses can be described as follows:

### ETHYLENE OXIDE (EO) / ETHYLENE GLYCOL (EG)

EO is a downstream product of ethylene, which serves as feedstock in the production of EG and other downstream products. EG-based products include mono ethylene glycol (MEG), diethylene glycol (DEG), triethylene glycol (TEG) and polyethylene glycol (PEG). Among these, the key product is MEG; it is mainly used as feedstock, together with purified terephthalic acid (PTA), in the production of polyester, which is used in the textile industry and in the production of PET bottles.

### ETHANOLAMINE (EA)

EA is produced from EO and primarily comes in the forms of monoethanolamine (MEA), diethanolamine (DEA) and triethanolamine (TEA). EA products are used as ingredients in the production of shampoos, conditioners, fabric softeners, cosmetics, pharmaceutical products, cement and others.

In 2017, the EO-Based Performance Business Unit commercially operates two plants, which are located in the Hemaraj Eastern Industrial Estate, Rayong. The breakdown of its production capacity is shown in the table below.

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| TOCGC | MEG | 423 |
| | EA | 50 |

In 2017, PTTGC has a domestic market share of ethylene glycol approximately 76 percent.

## GREEN CHEMICALS BUSINESS UNIT

Green chemicals are products created from natural feedstock such as palm oil, palm kernel oil, vegetable oil, animal fat, corn, sugarcane sugar and cassava. These green chemicals can be made into other downstream products in a variety of industries, such as personal care, pharmaceutical, food and bioplastic industries. PTTGC's green chemical products can be divided into two categories:

### VALUE ADDED OLEOCHEMICALS (VAO)

#### METHYL ESTER

Methyl ester is a basic oleochemical product. Also known as B100, methyl ester can be combined with diesel to make biodiesel that meets the EN14214 European standard for use in diesel engines. Methyl ester helps augment the efficiency of diesel, both in terms of lubrication and combustion. It also increases an engine's lifespan, and more importantly, it minimizes environmental impact.

#### FATTY ALCOHOL

Fatty alcohol is a basic oleochemical product used as a reactant in a number of different processes in the personal care industry. Fatty alcohol is used in the main ingredient or a component of many products, including surfactants, plasticizers, solvents, aroma compounds for perfumes, detergent, foam stabilizers, lubricants, cosmetics, plastic intermediates, shampoos, paints and coating products, and components in leatherwear and ink.

#### FATTY ALCOHOL ETHOXYLATE

Fatty alcohol ethoxylate is a downstream product of EO and fatty alcohol. It is used as feedstock in the production of shampoo and other personal care products, as well as home care products. In addition, it is used in the textile industry as a scouring agent in the preparation process and a softener in the last step of fiber preparation.

### GLYCERIN

Glycerin is a by-product of methyl ester and fatty alcohol. It is used in the pharmaceutical, food, and personal care industries.

### FATTY ACID

Fatty acid is a basic oleochemical product used in the production of personal care products, such as soaps and cosmetics. It is also used as a reactant in downstream production of specialty oleochemicals.

### SPECIALTY OLEOCHEMICALS

Specialty oleochemicals are made from basic oleochemical substances in a downstream process. These specialty products are used in an extensive range of industries, including cleaning products, personal care products, plastic additives, construction and oil drills. Examples of specialty oleochemicals include ozone acid, bio-lubricants, green polymer additives, agro-green solutions, and eco-friendly polyols.

## BIOPLASTICS AND BIOCHEMICALS

Bioplastics and bio-based chemicals are produced from natural feedstock such as sugarcane sugar, cassava and corn. The feedstock is turned into reactants, namely lactic and succinic acids. These reactants are then used in the production of bioplastics such as polylactic acid (PLA) and polyesters such as polybutylene succinate (PBS).

PTTGC produces these value-added oleochemicals (VAO) through Global Green Chemical Public Company Limited (GGC), Thai Fatty Alcohol Company Limited (TFA), which Thailand's only fatty alcohol producer, and Thai Ethoxylate Company Limited (TEX). In addition, PTTGC has joint-ventures with Malaysia's Sime Darby Plantation (M) Sdn. Bhd. called Emery Oleochemicals (M) Sdn. Bhd. (EOM) and Emery Specialty Chemicals Sdn. Bhd. (ESC). Emery is the producer and distributor of oleochemical products with global product positioning. Headquarter in Malaysia, the companies have production plants in key regions around the world such as Malaysia, Germany and the US. Moreover, it has a global network of subsidiaries and distributors for distribution and marketing.

PTTGC operates bioplastic and biochemical businesses through joint ventures and a subsidiary. With US-based Cargill Inc., PTTGC founded NatureWorks LLC. It is the proprietor of a polylactic acid (PLA) production technology with a commercial production capacity of 150,000 tons per year. Via US-based biotechnology-developer Myriant Corporation, PTTGC holds intellectual property rights to succinic acid production with a prototype plant near Lake Providence in Louisiana. In addition, together with Mitsubishi Chemical Corporation (MCC), PTTGC founded PTT MCC Biochem Co., Ltd. (PTTMCC) to produce and distribute polybutylene succinate (PBS), an eco-friendly bioplastic product capable of decomposing without being subjected to extreme temperatures. PTTMCC is the world's only producer of bio-PBS. Its plant is located in Rayong and has a production capacity of 20,000 tons per year. The capacities of commercial production plants in Thailand and overseas of the Green Chemicals Business Unit are shown in the following table.



| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| GGC/TFA | Methyl Ester | 300 |
| | Glycerin | 31 |
| | Fatty Alcohol | 100 |
| TEX | Fatty Alcohol Ethoxylate | 115 |
| EMERY | Basic Oleochemicals in US | 271 |
| | Basic Oleochemicals in Asia | 227 |
| | Specialty Oleochemicals in US | 53 |
| | Specialty Oleochemicals in Asia | 53 |
| | Specialty Oleochemicals in EU | 32 |
| NatureWorks | Polylactic Acid (PLA) | 150 |
| PTTMCC | Polybutylene Succinate (PBS) | 20 |

## PHENOL BUSINESS UNIT

The PTTGC Group's phenols are used as feedstock in the production of other downstream products, such as engineering plastics. These products are in high demand among high-growth industries including automotive, electric appliance, electronics and construction industries. The products of Phenol Business Unit are produced through PTT Phenol Company Limited (PPCL). Its key products are listed below:

### PHENOL

Phenol is an intermediate petrochemical product made from benzene and propylene. It is a key reactant in the production of bisphenol A (BPA), phenolic resin and various derivatives used in the plastic, pharmaceutical and chemical industries.

### ACETONE

The production of phenol also yields acetone, which is a solvent widely used in industries such as the chemical, cosmetics and medical industries. In addition, acetone is a reactant in the production of BPA and methyl methacrylate, which is used in the plastic and coating industries, among others.

### BIS PHENOL A (BPA)

Bisphenol A, an intermediate petrochemical product, serves as feedstock in the production of polycarbonate (PC), which is an engineering plastic that is used in industries, such as the automotive, electric appliance, electronics and construction industries. Additionally, BPA is also the feedstock in the production of epoxy resin, which is used as a composite material, a coating agent and in the paint industry.

In 2017 PPCL operates three commercial plants locates at the Hemaraj Eastern Industrial Estate in Rayong. Their production capacities are detailed in following table.

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| PPCL | Phenol | 470 |
| | Acetone | 290 |
| | Bisphenol A | 150 |

As of 2017, PPCL has a domestic market share of phenol and Bisphenol A approximately 82 percent and 2 percent, respectively.

## PERFORMANCE MATERIALS AND CHEMICALS BUSINESS UNIT

Performance materials and chemicals are major components in high-growth downstream industries, such as the automotive, construction industry and engineering plastic industries. The Performance Materials and Chemicals Business Unit includes the following products:

### HEXAMETHYLENE DIISOCYANATE (HDI) AND HDI DERIVATIVES:

HDI is an intermediate petrochemical product used in the production of PU coating, which plays a prominent role in the construction and automotive industries. PU coating can be applied to wood, plastic, furniture, and vehicles. The coating renders the final product shiny and more scratch resistant. PTTGC produces HDI and HDI derivatives through Vencorex Holding France (Vencorex).

### ACRYLONITRILE (AN):

As an intermediate petrochemical product, AN is mostly a monomer in the production of acrylonitrile polymers, such as acrylic fiber and other synthesized fibers for garments and carpets. AN also serves as a reactant in the production of acrylonitrile-butadiene-styrene (ABS) plastic pellets. ABS plastic is widely used in electric appliances and electronics as an exterior shell because of its strength and resistance to scratches, as well as wear and tear. In addition to good looks, ABS also renders an appliance easier to clean. Its popularity in the automotive industry, particularly for the production of car parts and joints, is due to its superior hardness and toughness. ABS parts are able to maintain their form and withstand impact quite well. ABS also resists friction, heat and chemicals better than other plastics.

### METHYL METHACRYLATE (MMA)

This intermediate petrochemical product is the main feedstock for the production of polymethyl methacrylate (PMMA) plastic pellets and PMMA acrylic sheets. They are components of taillight cases, commercial lighting boxes, eyewear lenses, smartphone screens, TV screens and computer screens.

PTTGC produces AN and MMA through PTT Asahi Chemical Co., Ltd., whose plant is located at the Hemaraj Eastern Industrial Estate (Map Ta Phut), Rayong.

Vencorex's plants are located in industrial estates in France, the US and Thailand, while PTTAC's plant is located at the Hemaraj Eastern Industrial Estate (Map Ta Phut), Rayong. Their production capacities are as shown below.

| Company | Products | Capacity (Thousand Tons per Year) |
|---|---|---|
| Vencorex | HDI and HDI Derivatives | 127 |
| PTTAC | Acrylonitrile (AN) | 200 |
| | Methyl Methacrylate (MMA) | 70 |

## UTILITIES AND INFRASTRUCTURE

Apart from the aforementioned eight business units, PTTGC also focuses on businesses and activities that promote the stability and completeness of its core. These various endeavors are listed below:

1) **Jetty and Chemical Tank Farm** Thai Tank Terminal Limited (TTT) provides jetty and storage tank for liquid chemicals, as a concession, to industrial organizations located within the Map Ta Phut Industrial Estate.

2) **Utility Business** Global Power Synergy Public Company Limited (GPSC) is responsible for the production and sale of industrial electricity, steam and water to the PTT Group's companies and other industrial plants.

3) **Plant Management and Engineering Design Services** PTT Maintenance and Engineering Co., Ltd. (PTTME) offers a variety of services, including plant maintenance, design and engineering, construction, pipe work, procurement, material work, and production administration for petroleum and petrochemical companies in the Map Ta Phut Industrial Estate. Services extend to other organizations located throughout Thailand and in neighboring Asian countries. Additionally, PTTGC, together with other companies in the PTT Group, has invested in PTT Energy Solutions Co., Ltd. (PTTES), a company responsible for providing technical engineering consultations.

4) **Safety, Occupational Health, Environmental and Security Services** NPC Safety and Environmental Services Co., Ltd. (NPC S&E) provides a comprehensive range of services, including safety, occupational health and environmental training; designing and installation of fire protection systems; and consultation on the implementation of international management standards such as quality, safety, occupational health and environmental systems. Its subsidiary, NPC S&E Security Guard Co., Ltd (NPCSG) provides security service and training.

5) **Pipeline Infrastructure Services** Eastern Fluid Transport Co., Ltd. (EFT) provides pipeline infrastructure for petroleum and petrochemical enterprises located within the Map Ta Phut Industrial Estate and nearby areas.

6) **Information Technology Services** PTT DIGITAL Solutions Co., Ltd. (PTT DIGITAL ) offers comprehensive information technology and communications services, including the design, development, and maintenance of an IT system that meets business demands.

7) **Outsourcing Services** Business Services Alliances Co., Ltd. (BSA) supplies manpower and contractors for PTT and the PTT Group.

8) **Marketing and Sales of Methyl Amine Derivatives, Plastic Compound Products, Specialty Products, and Health and Nutrition Products** Solution Creation Co., Ltd. serves as PTTGC's marketing arm in the distribution of PTTGC's products and finds marketing opportunities in niche markets. It also helps with product development to create value-added to products that meet the demand of various industries, such as packaging, household chemicals, electronics, textile, food, and dietary supplements.

9) **Polymer Sales and Marketing Services** PTT Polymer Marketing Co., Ltd. (PTTPM) is responsible for marketing and sales of PTT's polymer-based products. It has a far-reaching network of authorized dealers in Thailand and in all regions of the world. Additionally, our joint-venture PT Indo Thai Trading (ITT) in Jakarta sells polymer-based and petrochemical products in Indonesia in order to increase marketing channels in the future.

10) **Logistics Services** PTT Polymer Logistics Co., Ltd. (PTTPL) offers comprehensive logistics services to producers of polymers within the PTT Group.

11) **PTTGC Group's liquidity management and financing vehicle services** GC Treasury Center Co. Ltd. manages the finances of companies in the PTTGC Group and find them investment capital.

12) **Social Enterprise** Pracharath Rak Samakkee Rayong (Social Enterprise) Co., Ltd. (PRS RAYONG) offers management consultations and advice for local agriculturalists, tradesmen, etc.

13) **Manufacture, procure, sell products and/or provide services that contributes to society** San Palang Social Enterprise (SPSE) conducts business, including the production, purchase and sale of products and/or services in a way that benefits communities, society and the environment.

14) **Development Support on plastic packaging products** S. P. Petpack Inter Group Co., Ltd. (SPIG) provides support for the development of plastic packaging, preparing for future market growth in the Republic of Myanmar.

# INDUSTRY OVERVIEW OF 2017 AND OUTLOOK FOR 2018

## PETROLEUM AND PETROCHEMICAL MARKETS IN 2017

### PETROLEUM

In 2017, the situation of crude oversupply in the crude oil market was relieved since both OPEC and non-OPEC producers agreed toward the end of 2016 to cut crude production output by a combined 1.8 million barrels per day. Although they initially decided on six months, the oil producing countries later extended this period to nine months instead, lasting until March of 2018. Moreover, crude-oil production was slowed down in the United States in the third quarter of 2017 due to the impact of Hurricane Harvey. Meanwhile, civil unrest continued in Middle Eastern nations, including Iraq, Saudi Arabia, and Iran. These uncertainties led to worries about the risk of a tight supply. In addition, the International Energy Agency (IEA) had projected a global crude-oil demand growth of 1.5 million barrels per day, as of December 2017, due to global economic recoveries and the continuous climb of demand in Asia, especially in China and India. Consequently, the Dubai crude-oil price rose, fluctuating between 50–65 US dollars per barrel throughout 2017, averaging at 53.2 US dollars per barrel or a 29 percent surge from 2016.

### AROMATICS

Globally, the market demand for paraxylene soared by 2 million tons to 42.1 million tons in 2017. Most of the demand came out of Asia, where it took a leap of 1.7 million tons in response to the capacities of new purified terephthalic acid (PTA) plants in China and Taiwan. Meanwhile, the collective global output of paraxylene grew to 49.9 million tons per year in 2017, a hike of 2.1 million tons from the previous year. This increase came from new production bases in India and South Korea whose operations began during the first half of the year after they had been postponed in 2016. Due to these factors, the spread between paraxylene and naphtha went down to 358 US dollars per ton, a year-on-year decrease about 37 US dollars per ton.

As for benzene, its global market demand jumped to 46.3 million tons, an upward move of 1.1 million tons. Most of the demand also came from Asia, particularly from China, where new producers of styrene monomer and phenol came into play. In terms of supply, the global output of benzene rose by 1.1 million tons per year to 63.0 million tons per year due to new expansions in Asia and the Middle East, such as China, India and South Korea. As a result, the 2017 average spread between benzene and naphtha rose to 327 US dollars per ton, a year-on year increase about 86 US dollars per ton.

### OLEFINS

The price of ethylene rose in 2017 due to a decrease in supply as a result of the annual turnarounds of large manufacturing plants in Southeast and North Asia. Furthermore, due to the felt impact of Hurricane Harvey in the United States during August and September, 90 percent of the ethylene production was affected. Additionally, methanol-to-olefins (MTO) plants in China shut down temporarily due to the soar in the feedstock price. Other positive factors that led to higher ethylene demand included the demand in styrene products whose price jumped, new styrene monomer plants and the recovery of ethylene glycol products. Thanks to these factors, the average price of ethylene in Southeast Asia throughout 2017 was 1,091 US dollars per ton, a year-on-year increase about 54 US dollars per ton. Meanwhile, the spread between ethylene and naphtha dropped by about 44 US dollars per ton but remained high at 595 US dollars per ton. This was due to the price of oil and naphtha that took a significant hike of 29 percent and 24 percent, respectively, in comparison with 2016.

The propylene market headed in a similar direction in 2017. The price of propylene climbed due to a number of positive factors, namely the scheduled turnarounds of olefins and on-purpose propylene plants across Asia, including Thailand, China, South Korea, Japan, and Taiwan; the shutdown of the MTO plant due to economic unviability of its production costs; and the impact of Hurricane Harvey, which affected 79 percent of the American production capacities. All in all, the price of

propylene in Southeast Asia went up in 2017 from the previous year to an average of about 824 US dollars per ton or by as much as 120 US dollars per ton from 2016. The spread between propylene and naphtha, however, took a small increase about 22 US dollars per ton to 328 US dollars per ton.

## POLYMERS

Overall, the polyethylene (PE) industry continued to grow from 2016. The global PE demand in 2017 rose by 3.3 million tons per year (from 91.9 million tons per year to 95.3 million tons per year) or an annual average of 3.7 percent. Meanwhile, its output surged by 7.2 million tons per year (from 106.4 million tons per year to 113.7 million tons per year) or an annual average of 6.8 percent. Most of this came from the continued increase in the number of shale gas projects in North America and from India's additional capacities, resulting in price of PE in Southeast Asia declining; however, it regained stability after OPEC and non-OPEC oil producers agreed to extend their output curbing period. The average prices of HDPE, LLDPE and LDPE in Southeast Asia in 2017 rose to 1,168, 1,178 and 1,277 US dollars per ton, respectively. In other words, they took a jump of 36, 8, and 95 US dollars per ton, respectively, in comparison with the same period of the previous year. Nontheless, the average spread between polyethylene products and naphtha went down to 711 US dollars per ton in 2017, decline about 52 US dollars per ton from 2016.

The polypropylene market continued to grow in 2017. The annual average price of polypropylene in Southeast Asia was 1,155 US dollars per ton in 2017, a jump of about 109 US dollars per ton from 2016. This rise was rooted in the increase in the feedstock price: The annual average price of propylene in Southeast Asia rose in 2017 from the previous year by about 120 US dollars per ton. In addition, the lack of supply in the latter half of the year in Northeast Asia pushed the price of polypropylene higher. The 2017 average spread between polypropylene in Southeast Asia and naphtha rose to 659 US dollars per ton, an increase of about 11 US dollars per ton from the previous year.

The polystyrene market grew slightly in 2017 with a global demand of 10.6 million tons per year while the global supply grew by 5,000 tons per year (to a combined output of 15.2 million tons per year). Nonetheless, its average price in 2017 went up in comparison with 2016 following the increase in crude oil prices and tight supply of butadiene. As a result, the price of styrene monomer (SM) rose. Overall, the spread between GPPS and SM in 2017 rose slightly to 148 US dollars per ton, or an increase of 18 US dollars per ton since 2016.

## ETHYLENE OXIDES

Since MEG is a commodity product and main raw material for the production of polyester, which is used in downstream productions of textile and clear plastic bottles, its demand goes in the same direction as the polyester industry. The overall market in 2017, the demand for MEG in the polyester industry continued to grow, a number of MEG manufacturers had turnarounds. As a result, the average MEG price in the Asia Spot Price (ASP) in 2017 rose by about 196 US dollars per ton from the previous year to 850 US dollars per ton.

As for ethanolamine (EA), the overall EA demand was rather stable throughout the year; however, due to the rise in its the feedstock price, the 2017 average price of EA products in China also rose from the previous year by about 121 US dollars per ton to 1,079 US dollars per ton.

## GREEN CHEMICALS

The methyl ester market in 2017 improved from the previous year. Although the government enforced the B5 requirement to return the domestic palm oil market to its equilibrium during the beginning of the year, the situation had since then improved, and the government was able to revert back to the B7 requirement on May 8th, 2017. The domestic demand for methyl ester for automotive diesel in 2017 was estimated at 1.24 million tons, an increase of 0.17 million tons or 16 percent. Meanwhile, as the price of crude palm oil decreased, so did the price of methyl ester drop to 28,301 Baht per ton. Moreover, due to the continuously high amount of domestic palm oil in stock, the government had asked biodiesel producers and fuel retailers to increase the amount of methyl ester in stock to prevent the price of domestic palm oil from going too low.

Demand for PLA products has been on the rise due to present and future needs, which are rooted in the environmental awareness of consumers, as well as

outstanding attributes of bioplastics, including the use of natural raw material in their production and their biodegradability. The packaging sector is the target group of bioplastics. The amount of plastic packaging in Thailand is expected to grow at the rate of 5 percent per year. The target market in which bioplastics could serve as substitutes is the market of plastic packaging that uses film extrusion injection and thermoforming technologies.

Although PTTMCC only began its commercial operation in the first quarter of 2017, it had been developing products with major clients worldwide since 2012. To date, it continues to gain recognition among customers. Despite being the world's only bio-PBS manufacturer, it has not enjoyed as much growth as anticipated due to the high costs of its feedstock and the low price of crude oil.

## PHENOL

The phenol market continued to remain rather stagnant from the previous year into the first half of 2017 due to the volatility of phenols' feedstock price, lower downstream output and a new surge of supply from the Petro Rabigh plant in Saudi Arabia. Nonetheless, as a result of Hurricane Harvey during the third quarter, many phenols plants located in Texas were shut down until at least October. There fore, Phrnol product was tight supply. Since US is a major exporter. The combination of these factors led the spread between product and feedstock prices in 2017 to climb up by about 289 US dollars per ton to 316 US dollars per ton.

Meanwhile, the bisphenol A (BPA) business became weaker than the previous year due to the lower demand of BPA in the epoxy resin market as a result of more stringent environmental measures being stipulated in China, which led a number of epoxy resin plants in the country to slow down their production or temporarily shut down. Nonetheless, because the price of phenol feedstock rose due to the effects of Hurricane Harvey and due to the increase in demand from Yantai Wanhua Chem's polycarbonate manufacturing plant and from Grace's epoxy resin manufacturing plant toward the end of the year, the average spread between phenol products and their feedstock rose by 203 US dollars per ton to 238 US dollars per ton.

## PERFORMANCE MATERIALS AND CHEMICALS

The global demand for HDI products continued to grow in 2017, especially in Asia; however, the average price of HDI products in 2017 was dropped of 448 US dollars per ton to 5,638 US dollars per ton. This decrease was the result of fiercer competition in the market, which was rooted in the Asian output increase of Vencorex itself, as well as competitive pricing to augment sales. And only Vencorex is Thailand's first manufacturer of HDI derivatives. Its commercial operation began in June 2017.

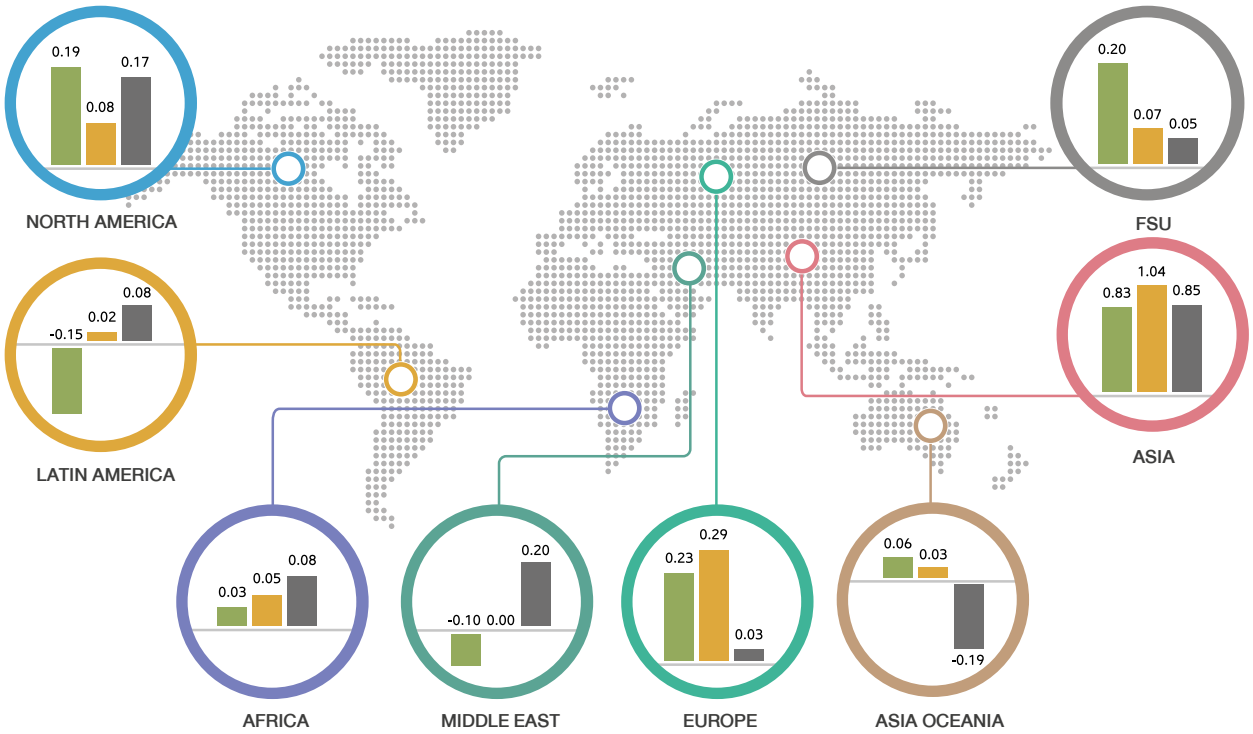
The global AN market has been estimated at 5.9 million tons with an average annual growth rate of 3 percent. At present, Asia is the biggest AN market with an AN consumption of about 3.6 million tons, about 8 percent or 283,000 tons of which come from Southeast Asia. This consumption can be further divided into 39 percent of acrylic fiber, 37 percent of ABS plastic and 19 percent of nitrile rubber.

The global MMA market has been estimated at 3.6 million tons with an average annual growth rate of 2.2 percent. At present, Asia has an MMA consumption of about 2 million metric tons, 19 percent per year of which mainly come from Southeast Asia's production of PMMA acrylic sheets and PMMA molding compounds. This is because Southeast Asia has seen continuous growth of industrial goods and the automotive industry.

The prices of AN and MMA in 2017 were 1,555 and 2,217 US dollars per ton, respectively. They took a hike from their lowest point during the previous year at 1,150 and 1,577 US dollars per ton, respectively. This change was a consequence of the crude oil price, which had been low since the end of 2015. In addition, there were positive factors in 2017 that led to the decrease in global supply, such as the temporary shutdown of AN manufacturers in China due to environmental problems and in the US due to Hurricane Harvey, as well as the simultaneous turnarounds of many MMA manufacturers. Nonetheless, we expect the prices of AN and MMA to return to normal in 2018.

## World Oil Demand Growth 2016/2017/2018

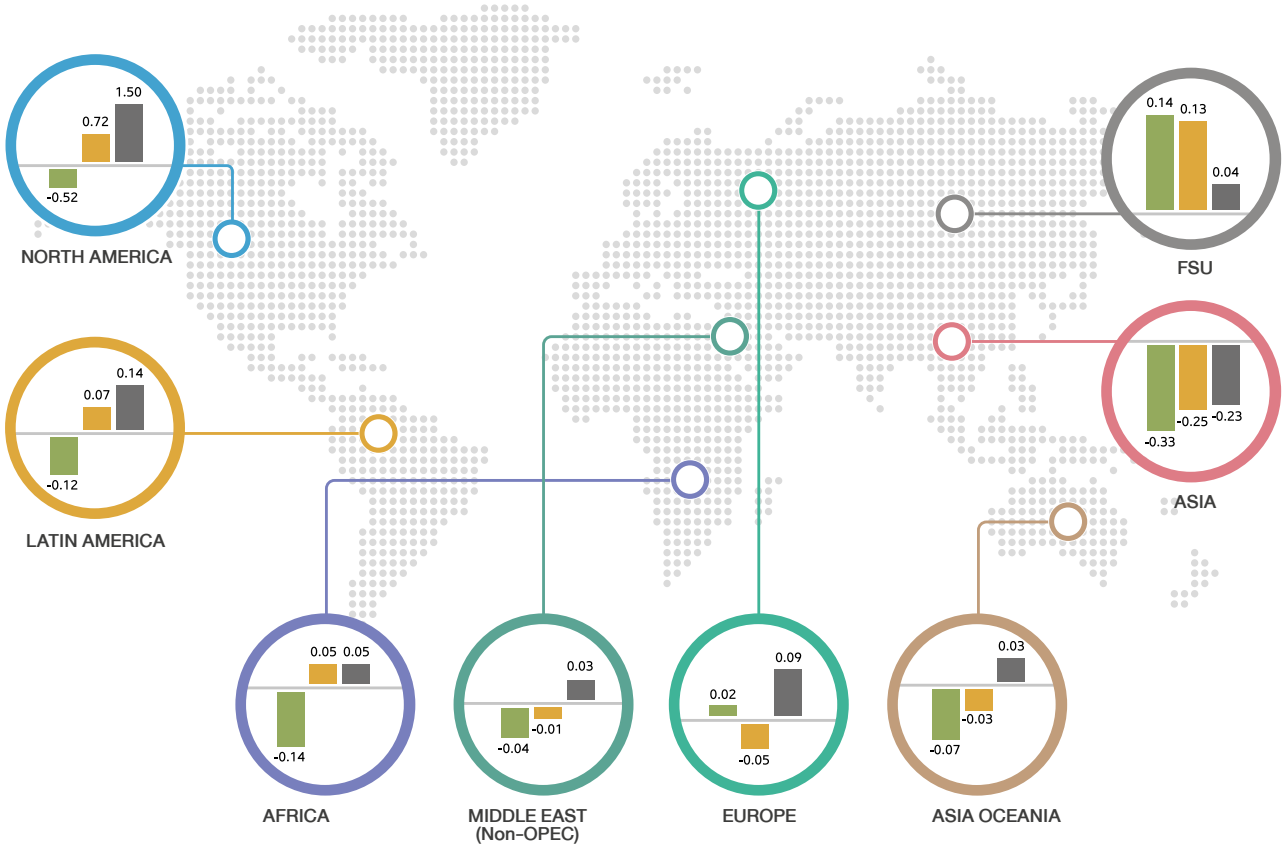
(Million Barrels per Day)




*Source: IEA Monthly Market Outlook Report Jan, 2018*

## World Oil Supply Growth 2016/2017/2018

(Million Barrels per Day)




*Source: IEA Monthly Market Outlook Report Jan, 2018*

## OUTLOOK FOR 2018

In terms of the petroleum business outlook for 2018, the International Monetary Fund (IMF) forecast in October 2017 that the global economy would grow by 3.7 percent in 2018. This has been a slight change from its previous forecast of 3.6 percent back in April due to the growth of many regional economies that had exceeded expectations, as well as Brexit not having affected the European economy as much as anticipated. With these signs of a global economic recovery, the International Energy Agency (IEA) forecast in December of 2017 that the global oil demand would soar up to 99.1 million barrels per day in 2018 or an increase of 1.3 million barrels per day. The IEA believes that Asian countries, especially China and India, will be the main players that drive this demand up. Meanwhile, the demand for oil in developed countries, such as the US and European-Union nations, has been forecast to slow down. Moreover, the agreement among OPEC and non-OPEC countries to cut crude production output by a combined 1.8 million barrels per day has led the price of crude oil to rise above 50 US dollars per barrel. Nonetheless, there is a worry that the US output is climbing too fast as the price of crude oil takes a hike. According to a weekly report by the US Energy Information Administration (EIA), the American crude production capacity has increased from 8.6 million barrels per day in September of 2016 to 9.6 million barrels per day in September of 2017.

As for the outlook for the refinery industry in 2018, the global refinery capacity is expected to increase by about 1.3 million barrels per day, mostly in Asia. Nevertheless, there are risks stemming from postponing machinery commission while the global demand is on the rise due to the global economic recovery. In addition, the continuously dwindling inventory of refined oil products will likely lead to a slight increase in the market GRM from 2017.

For aromatic products, we expect the spread between aromatics (paraxylene and benzene) and naphtha in 2018 to remain within the same neighborhood as the previous year. This stability is supported by industries, such as fiber and filament, PET bottle resin and new producers of derivatives (such as styrene monomer, methylene diphenyl diisocyanate, phenol and cyclohexane) in China, South Korea and Saudi Arabia.

For olefins and derivatives products, we expect 2018 to see the spread between olefins and naphtha in the Asia market will increase a bit because of the positive demand in the first half of 2018 from styrene monomer, ethylene glycol, polyethylene and polypropylene and also tight supply from plant's turnaround in South Korea and Japan. However, the anticipated surge of supply from US which began toward the end of 2017 may expect to impact Asia market. For polyethylene, ethylene glycol, and phenol, the price of these products will be pressured by new capacities from US, and more export from India and China, meanwhile, the rise of global economic will increase demand in 2018.



# MANAGEMENT DISCUSSION AND ANALYSIS

In Fiscal Year 2017, PTT Global Chemical Public Company Limited ("the Company") performances increased significantly, generating sales revenue of Baht 436,745 million, increased by 24% from previous year. Consequently, the report adjusted EBITDA was Baht 60,622 million and net profit was Baht 39,298 million (Baht 8.79 earnings per share), escalated by 35% and 53% respectively from previous year. These mainly contributed from an increase in sales volume as a result of production efficiency improvement, higher products prices, share of profits of investments in petrochemical businesses from Asset Injection project in previous year and benefits from organization's efficiency enhancement from MAX project.

## TABLE: PERFORMANCE SUMMARY

| (Unit: Million Baht) | 2016 (Restate)* | 2017 | YoY % +/(-) |
|---|---|---|---|
| Sales Revenue | 352,185 | 436,745 | 24% |
| EBITDA | 49,738 | 63,480 | 28% |
| EBITDA Margin (%) | 14% | 15% | 1% |
| Share of profit of investments in JV and Associates | 2,592 | 5,574 | 115% |
| Share of profit of investments in JV and Associates (attributable to Owners of the Company)*** | 456 | 3,360 | 637% |
| Net Profit | 25,602 | 39,298 | 53% |
| EPS (Baht/Share) | 5.74 | 8.79 | 53% |
| Adjusted EBITDA** | 44,845 | 60,622 | 35% |
| Adjusted EBITDA Margin (%) | 13% | 14% | 1% |

**Note:**

* *Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

** *Adjusted EBITDA refers to EBITDA excluding impact of oil stock value*

*** *Reported only portion attributable to the Company and actual realization after the Asset injection*

On the aspect of the Company's performance in 2017, it had been improved with the sales revenue of Baht 436,745 and Adjusted EBITDA of Baht 60,622 million, escalated by 24% and 35% respectively from 2016. This resulted from higher utilization rate of Refinery and Olefins units in which the utilization rate of Crude Distillation Unit (CDU) was 103% and Olefins unit was 96% comparing with 2016 at 83% and 90% respectively.

For entire contributions in 2017, the Company had realized the profit from MAX project for Baht 2,919 million which was resulted from the organization's efficiency enhancement that had been implemented since the end of 2016. In addition, there was share of profit from investments in joint ventures and associates (attributable to Owners of the Company) of Baht 3,360 million, deriving from Asset Injection Project which the Company had purchased shares of 6 petrochemical companies under propylene chain, biochemical and related services with PTT Public Company Limited; the transactions are completed on July 3rd, 2017. Furthermore, the Company had gain from foreign exchanges of Baht 2,301 million and realized profit on stock gain for Baht 2,858 million, together with realized loss on commodity hedging, the net gain was Baht 1,383 million. Along with the impairment loss from Myriant Corporation for Baht 2,004 million, the Company's total net profit in 2017 was Baht 39,298 million, surging from 2016 by 53%.

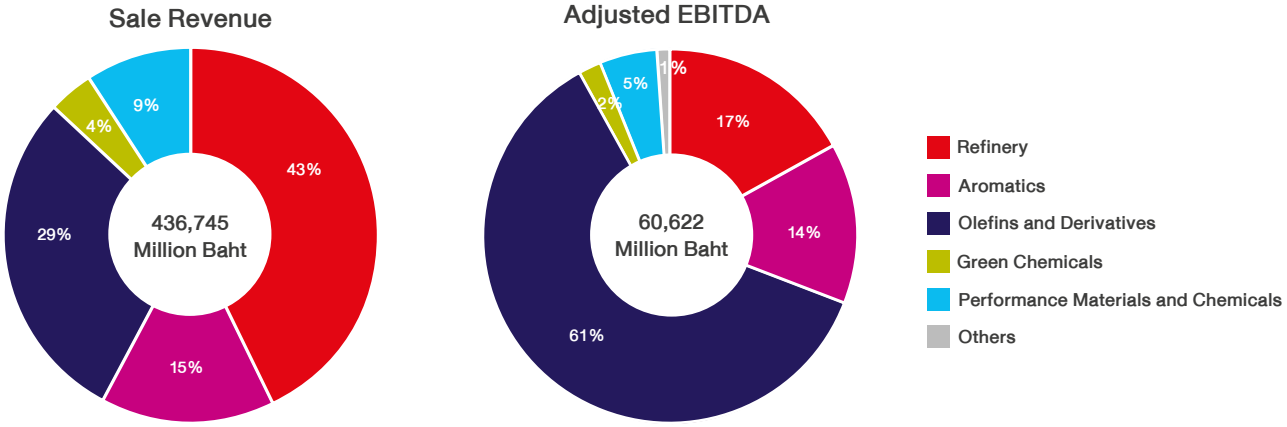
## TABLE: ADJUSTED EBITDA MARGIN

| % Adj. EBITDA Margin | 2016 (Restate)* | 2017 |
|---|---|---|
| Business Unit: | | |
| Refinery | 5 | 6 |
| Aromatics | 11 | 13 |
| Olefins and Derivatives | 25 | 29 |
| Green Chemicals | 7 | 6 |
| Performance Materials and Chemicals (PC)** | 6 | 9 |
| **Average** | **13** | **14** |

**Note:**

** Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

*** HVS business has changed the name to Performance Materials and Chemicals (PC)*




# REFINERY BUSINESS UNIT

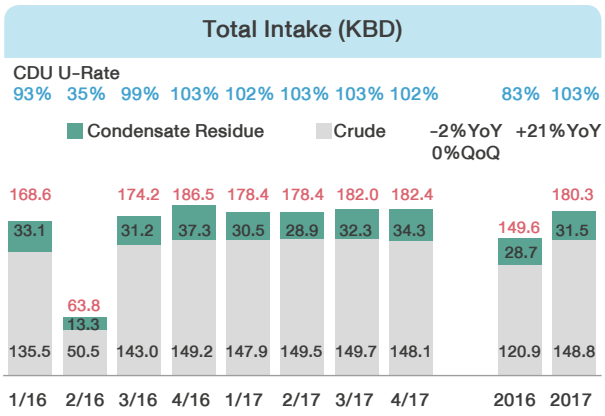
## TABLE: CRUDE PRICE & PETROLEUM PRODUCT SPREADS

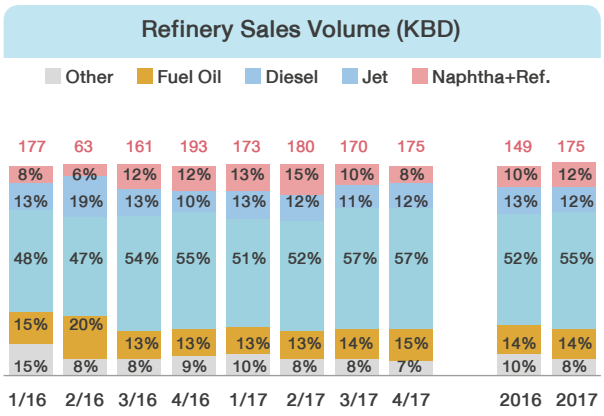
| (Unit: USD per bbl ) | 2016 | 2017 | YoY % +/(-) |
|---|---|---|---|
| Dubai Crude Oil | 41.27 | 53.18 | 29% |
| Gasoline-Dubai | 14.85 | 14.87 | 0% |
| Jet-Dubai | 11.56 | 12.14 | 5% |
| Diesel-Dubai | 10.78 | 12.53 | 16% |
| Fuel Oil-Dubai | -4.97 | -2.36 | 53% |

The crude oil price in 2017 was 53.18 USD per bbl, 29% increased from previous year. This was due to collaboration of the OPEC and Non-OPEC members to control the production, declining production from United States in Q3/2017 which was affected from Hurricane Harvey, and the unrest in Middle East. For the crude oil demand, IEA had forecasted the global growth to increase by 1.5 Mbbl per day in 2017 according to the world's economic recovery and regional demand for crude oil from China and India which arose continuously.

The Petroleum products spread over crude oil price had all been increased from 2016, contributed from the demand outlook which was in relevance with the economic recovery, particularly in Asian region and the cold weather that resumed back to normal. Meanwhile, the supply was affected by the production difficulties of Refinery plants in Middle East, Northeast Asia, and Europe, as well as effect from Hurricane Harvey in United States, along with the limiting export quota from China. These factors led the increases in Petroleum products spread from 2016. Average Gasoline over Dubai crude spread was at 14.87 USD per bbl, increased by 0.02 USD per bbl. Average Jet oil over Dubai crude spread was at 12.14 USD per bbl, increased by 0.58 USD per bbl. Average Diesel over Dubai crude spread was at 12.53 USD per bbl, increased by 1.75 USD per bbl. Average Fuel oil over Dubai crude spread was at -2.36 USD per bbl, increased by 2.61 USD per bbl.

## GRAPH: REFINERY INTAKE AND SALES VOLUME




For 2017, CDU utilization rate had increased by 19% from previous year because there was a maintenance shutdown from May to beginning of July 2016 which couldn't utilize the plant fully. While the Petroleum products sales volume had increased by 20% due to higher utilization rate as there was maintenance shutdown in 2016.

### TABLE: GROSS REFINERY MARGIN

| (Unit: USD per bbl ) | 2016 (Restate)* | 2017 | YoY % +/(-) |
|---|---|---|---|
| Market GRM | 5.32 | 6.74 | 27% |
| CDU GRM | 5.64 | 7.36 | 30% |
| CRS GRM | 3.94 | 3.81 | -3% |
| Hedging Gain/(Loss) | -0.61 | -0.70 | 14% |
| Stock Gain/(Loss) Net NRV | 1.19 | 0.84 | -29% |
| Accounting GRM | 5.89 | 6.88 | 17% |
| **Adjusted EBITDA (MB)** | **6,445** | **10,577** | **64%** |
| **Adjusted EBITDA (%)** | **5%** | **6%** | **1%** |

**Note:**

** Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

Comparing the spread of Petroleum products over crude oil price between 2017 and 2016, the spread of Diesel, Jet oil and Fuel oil were increased at 16%, 5%, and 53% respectively, resulting in Market GRM of 6.74 USD per bbl, 27% increased from 2016 Market GRM of 5.32 USD per bbl. The Adjusted EBITDA of Refinery business was Baht 10,577 million, a 64% increase from 2016. In addition, the Company realized stock gain at 0.84 USD per bbl or Baht 1,873 million, following an increase in average crude oil price by 29%. The Company also recorded net loss from Commodity Hedging of 0.70 USD per bbl, resulting in Accounting GRM of Refinery business at 6.88 USD per bbl, increased from 2016 at 5.89 USD per bbl.

## AROMATICS BUSINESS UNIT

### TABLE: AROMATICS PRODUCT PRICES AND SPREADS OVER CONDENSATE

| (Unit: USD per ton) | 2016 | 2017 | YoY % +/(-) |
|---|---|---|---|
| Condensate | 379 | 467 | 23% |
| Paraxylene (TW) | 794 | 854 | 8% |
| Paraxylene (TW)-Condensate | 415 | 388 | -7% |
| Paraxylene (FECP) | 774 | 847 | 9% |
| Paraxylene (FECP)-Condensate | 395 | 380 | -4% |
| Benzene (Spot Korea) | 640 | 823 | 29% |
| Benzene-Condensate | 262 | 357 | 36% |
| Naphtha-Condensate | 19 | 29 | 52% |

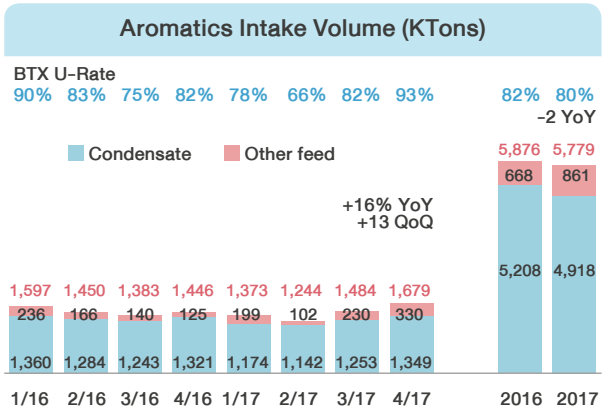
## PARAXYLENE

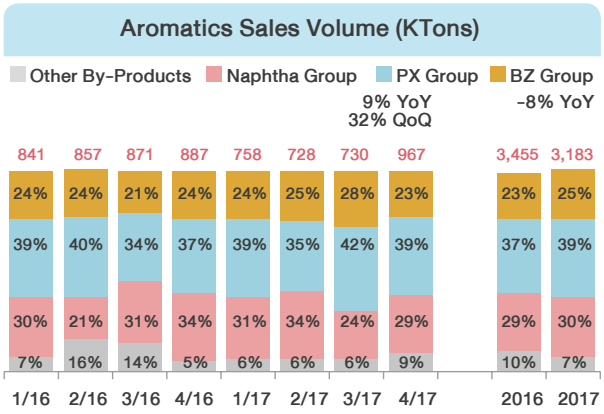
For 2017, Paraxylene (FECP) spread over Condensate price declined from 2016 at 380 USD per ton by 4%. Paraxylene price increased by 9% from 2016, due to higher crude oil price and demand from downstream business relating to economic recovery, especially in China, leading to increasing demand for Paraxylene as a feedstock. However, Condensate price had been increased significantly by 23% in relation to crude oil price, therefore Paraxylene spread over Condensate price declined.

## BENZENE

For 2017, Benzene spread over Condensate price was at 357 USD per ton, surging from 2016 by 36%. These resulted from a significant increase in Benzene price by 29% following higher demand from economic recovery as well as reducing inventory in China. Besides, the expansion in downstream businesses had contributed for the demand for Benzene as a feedstock, supporting the price and spread of Benzene in 2017.

## GRAPH: AROMATICS INTAKE AND SALES VOLUME (BTX)




## TABLE: AROMATICS MARKET P2F

| (Unit: USD per ton) | 2016 (Restate)* | 2017 | YoY % +/(-) |
|---|---|---|---|
| Market P2F | 185 | 226 | 22% |
| NRV | 0.0 | 0.0 | 0% |
| Hedging Gain/(Loss) | 0.1 | 1.3 | 1196% |
| Stock Gain/(Loss) | 33.3 | 14.2 | -57% |
| Accounting P2F | 218 | 241 | 11% |
| **Adjusted EBITDA (MB)** | 6,746 | 8,204 | 22% |
| **Adjusted EBITDA (%)** | 11% | 13% | 2% |

**Note:**

* *Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

For the operation in 2017, BTX utilization was at 80%, slightly declined from 2016 at 82% as the Aromatics II had the maintenance shutdown between June 4th to July 18th, 2017 in order to change the Catalyst and Adsorbent. The maintenance resulted in the efficiency improvement in feedstock intake and ability to increase Paraxylene production. Aromatics business Market P2F per ton of BTX increased from 185 to 226 USD per ton BTX in 2017, due to a significant increase in Aromatics products spread, especially from Benzene and Naphtha byproduct by 36% and 52% respectively. The Company had realized the Stock Gain at 14.2 USD per ton and Hedging Gain at 1.3 USD per ton from Aromatics business, contributing to an Accounting P2F of 241 USD per ton in 2017, increased from 218 USD per ton in 2016.

## OLEFINS AND DERIVATIVES BUSINESS UNIT

### TABLE: PRICES AND SPREADS OF OLEFINS AND DERIVATIVES

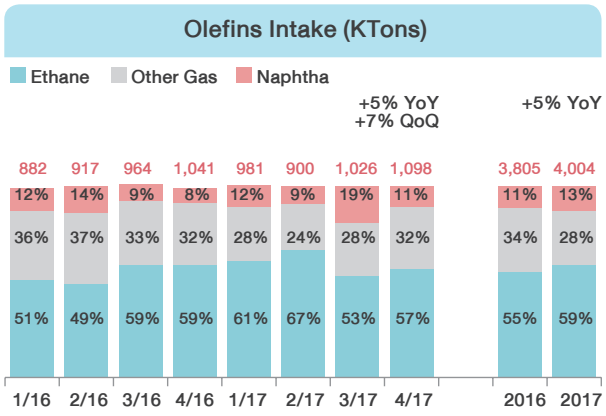
| (Unit: USD per ton) | 2016 | 2017 | YoY % +/(-) |
|---|---|---|---|
| Naphtha (MOPJ) | 398 | 496 | 24% |
| Ethylene (SEA) | 1,037 | 1,091 | 5% |
| Propylene (SEA) | 704 | 824 | 17% |
| HDPE | 1,132 | 1,168 | 3% |
| HDPE-Naphtha | 734 | 672 | -8% |
| LLDPE | 1,170 | 1,178 | 1% |
| LLDPE-Naphtha | 772 | 682 | -12% |
| LDPE | 1,182 | 1,277 | 8% |
| LDPE-Naphtha | 784 | 781 | 0% |
| PP (SEA) | 1,046 | 1,155 | 10% |
| PP-Naphtha | 648 | 659 | 2% |
| MEG (ACP) | 783 | 1,015 | 30% |
| MEG-0.65 Ethylene | 109 | 305 | 180% |

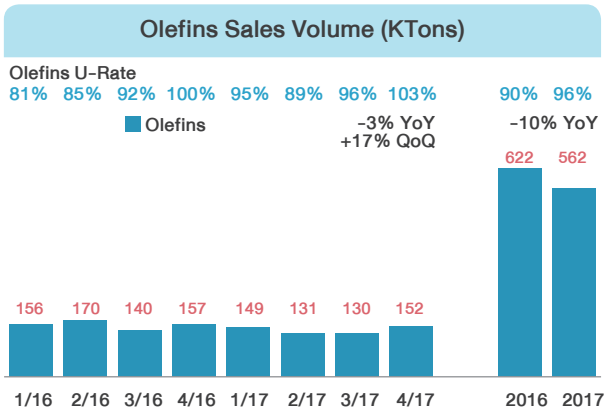
For the situation in 2017, Ethylene price was at 1,091 USD per ton, increased by 5% from 2016 in relation to the crude oil price that was rising during the year end together with an increasing demand from downstream products. On the supply side, the capacities didn't increase as expected: North America's new capacity and production plan had shifted while some existing capacities were affected by hurricane, causing suspension during the year end, and an environmental control measure in China affected some capacity, particularly the plants that use coal as a feedstock.

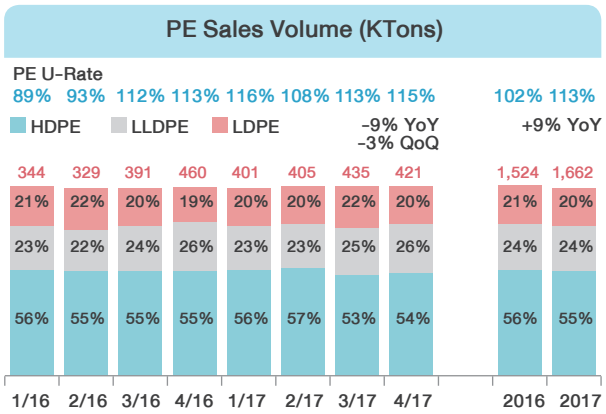
Polyethylene price was at 1,207 USD per ton in 2017, increased by 4% from 2016. The demand had increased from economic recovery, particularly on China's economy which the concerns from the slowdown of business sectors had been alleviated and the confidence was built up. Besides, the capacities didn't increase as the market expected along with the support from higher crude oil price, leading to a better product price during the year end.

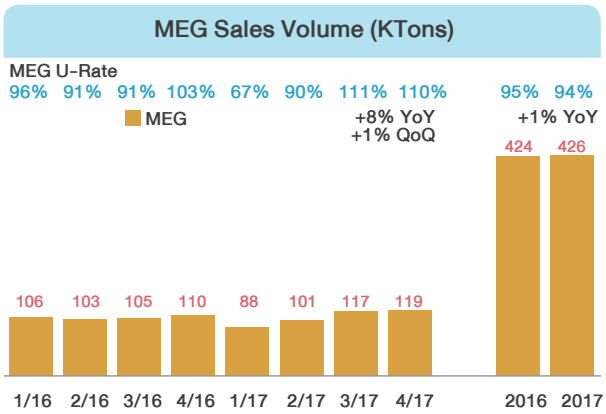
For MEG situation in 2017, the price (refer to ACP) had increased by 30% from 2016, supported by the downstream demand from Polyester that recovered continuously, together with the PET Bottle demand, and a declining inventory in China.

## GRAPH: OLEFINS INTAKE AND OLEFINS AND DERIVATIVES SALES VOLUME




## TABLE: GAS/LIQUID RATIO

| | 2016 | 2017 | YoY % +/(-) |
|---|---|---|---|
| Gas | 89% | 88% | -1% |
| Naphtha | 11% | 12% | 1% |
| Total Intake (KTons) | 3,805 | 4,004 | 5% |

For the situation in 2017, Olefins and Polymers business utilization rate had improved; Olefins and Polymers businesses utilization was increased to 96% and 113% respectively. Olefins intake volume on Natural Gas was 88% and Naphtha was 12%, which was about the same portion as 2016. This was resulted from the maintenance shutdown on Olefins 2/1 in Q2/2017 and on Olefins 3 in Q1/2016.

### TABLE: ADJUSTED EBITDA OF OLEFINS AND DERIVATIVES

| (Unit: Million Baht) | 2016 (Restate)* | 2017 | YoY % +/(-) |
|---|---|---|---|
| Adj. EBITDA | 28,591 | 36,697 | 42% |
| Adj. EBITDA Margin | 25% | 29% | 4% |

**Note:**

** Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

In 2017, average Ethylene price was 1,091 USD per ton, increased by 5% from 2016. While average Polyethylene price was 1,207 USD per ton, increased by 4% and MEG price was 1,015 USD per ton, escalated by 30% from 2016. As a result, Adjusted EBITDA in 2017 increased by 42% from 2016 with Adjusted EBITDA Margin increased by 4%.

## PERFORMANCE SUMMARY BY BU IN 2017

### TABLE: ADJUSTED EBITDA BY BU

| Adjusted EBITDA (Million Baht) | 2016 (Restate)* | 2017 | YoY % +/(-) |
|---|---|---|---|
| Business Unit: | | | |
| Refinery | 6,445 | 10,577 | 64% |
| Aromatics | 6,746 | 8,204 | 22% |
| Olefins and Derivatives | 28,591 | 36,697 | 28% |
| Green Chemicals | 1,217 | 1,001 | -18% |
| Performance Materials and Chemicals (PC)** | 1,643 | 3,356 | 104% |
| Others | 203 | 787 | 288% |
| **Adj. EBITDA (Million Baht)** | **44,845** | **60,622** | **35%** |

**Note:**

** Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

*** HVS business has changed the name to Performance Materials and Chemicals (PC)*



## OPERATING PERFORMANCE

| | (Unit: Million Baht) | 2016 (Restate)* | 2017 | YoY % + /(-) |
|---|---|---|---|---|
| | Sales Revenue | 352,185 | 436,745 | 24% |
| | Feedstock cost | (260,157) | (325,553) | 25% |
| | **Product to Feed Margin** | **92,028** | **111,192** | **21%** |
| 1 | Variable Cost | (24,318) | (25,123) | 3% |
| 2 | Fixed OH | (15,944) | (16,186) | 2% |
| 3 | Stock Gain/(Loss) and NRV | 4,893 | 2,858 | -42% |
| 4 | Gain/(Loss) on Hedging Commodity | (1,203) | (1,475) | -23% |
| 5 | Other Revenue | 5,505 | 4,594 | -17% |
| 6 | SG&A Expenses | (11,223) | (12,380) | 10% |
| | **EBITDA** | **49,738** | **63,480** | **28%** |
| 7 | Depreciation & Amortization | (17,901) | (20,085) | 12% |
| 8 | Loss from Impairment of Asset | (656) | (2,296) | 250% |
| | **EBIT** | **31,181** | **41,099** | **32%** |
| 9 | Net financial expense | (3,442) | (2,991) | -13% |
| 10 | FX Gain(Loss) | 933 | 2,301 | 147% |
| 11 | Share of gain/(loss) from Investments | 2,592 | 5,574 | 115% |
| | Share of gain/(loss) from Investments Attributable to the Company*** | 456 | 3,360 | 637% |
| 12 | Corporate Income Tax | (3,090) | (3,863) | 25% |
| **13** | **Net Profit after Tax** | **28,174** | **42,120** | **49%** |
| | **Profit/(loss) attributable to:** | | | |
| **14** | **Owners of the Company** | **25,602** | **39,298** | **53%** |
| 15 | Non-controlling interests | 2,572 | 2,822 | 10% |
| 16 | Adjusted EBITDA** | 44,845 | 60,622 | 35% |

**Note:**

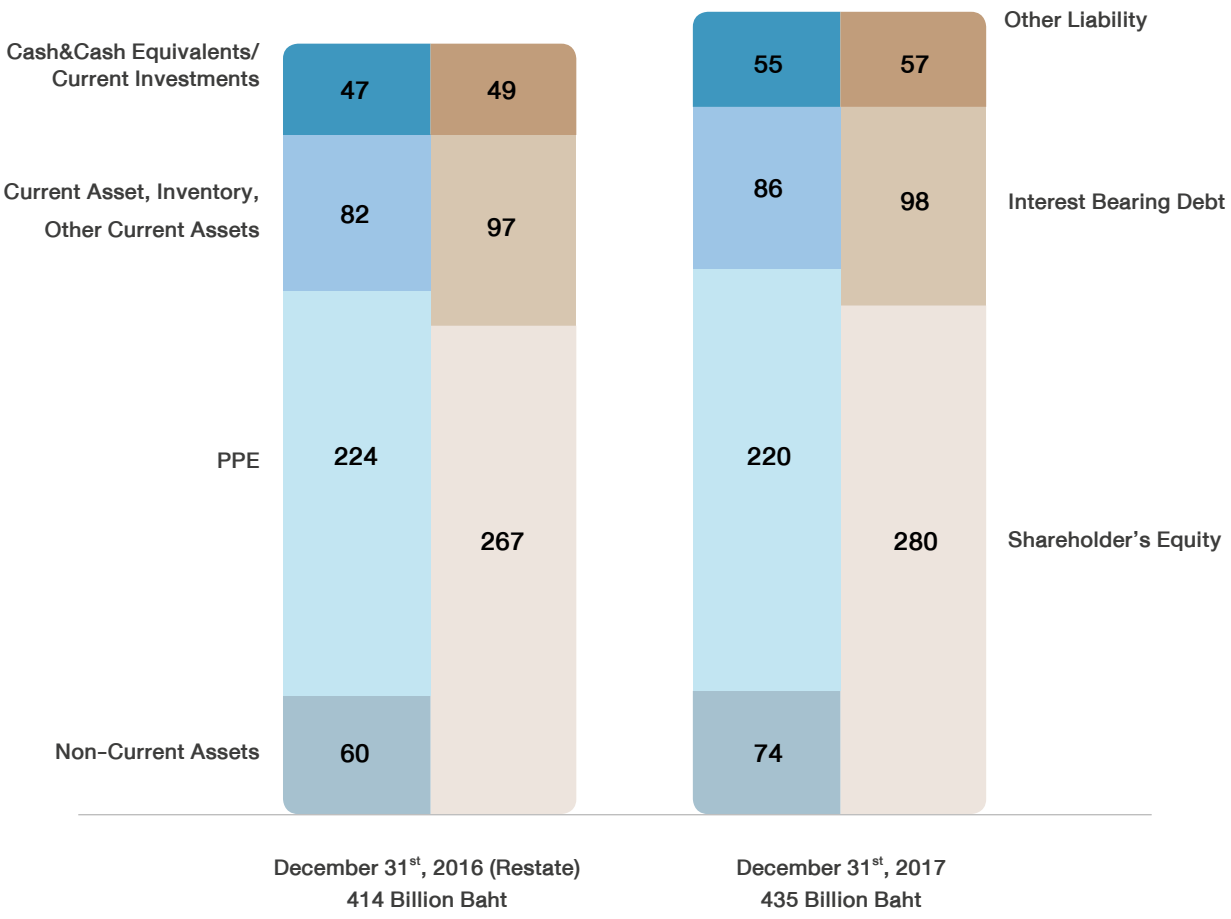
* *Restatement to include Assets injection of 6 companies, retrospect to January 1st, 2016*

** *Adjusted EBITDA refers to EBITDA excluding impact of oil stock value (Stock Gain/Loss and NRV)*

*** *Reported only portion attributable to the Company and actual realization after the Asset injection*

## STATEMENT OF FINANCIAL POSITION

Unit: Billion Baht




### ASSET

As of December 31st, 2017, the Company had total asset of Baht 434,964 million, increased by Baht 21,451 million from December 31st, 2016, generates from current asset by Baht 11,569 million and non-current asset by Baht 9,882 million.

1) Current asset increased by Baht 11,569 million from the followings:

- Cash and cash equivalents and current investments increased by Baht 8,160 million or 17% with cash inflow from operations by Baht 61,955 million, offset by cash outflow from purchasing of assets and investments by Baht 38,929 million, dividend payment by Baht 16,501 million, and securities available for sale by Baht 5,164 million. The Company also has net inflow from new issuance of debentures and loan repayment of Baht 6,990 million.
- Accounts receivable increased by Baht 3,945 million or 10% due to higher receivable from Petroleum products which increased by Baht 998 million, mainly from trade accounts receivable of Petroleum products. Receivable from Aromatics products increased by Baht 1,086 million from an increase in sales volume of 32,000 ton in December 2017 comparing to previous year, especially from Paraxylene and LPG. Receivable from Phenol increased by Baht 1,068 million from higher average selling price, primarily from Phenol and BPA which prices increase by 28% and 18% respectively.
- Inventory decreased by Baht 603 million or 2%, mainly from reduction in inventory of Green Chemicals product by Baht 1,583 million, due to an increase in sales volume in December 2017 comparing to previous year. Inventory from Refining Product decreased by Baht 305 million following the reduction in the purchase of feedstock. Inventory from Ethylene Oxide decreased by Baht 161 million, resulting from the stock

for inventory during the end of 2016 to support for sales volume during the maintenance shutdown in March and April 2017. Alternatively, Aromatics product inventory increased by Baht 1,404 million from higher production volume in December 2017 and higher feedstock price compare with the end of 2016.

- Other current assets increased by Baht 67 million or 1%, primarily due to an increase in receivable from oil fund by Baht 738 million from increasing in compensation rate. However, the Company has received indemnity for Radiant Coil from Dhipaya Insurance for Baht 805 million.

2) Non-current asset increased by Baht 9,882 million from the followings:

- Property, plant and equipment decreased by Baht 4,303 million or 2%, mainly from depreciation of Baht 17,444 million. The adjustment of asset value in foreign countries reduced by Baht 218 million due to the strengthening of Thai Baht value. Additionally, there is disposal of asset by Baht 1,215 million and asset impairment of Baht 1,673 million, mainly due to Succinic Acid plant from Myriant Corporation. Alternatively, there is also an increase in purchase and construction of asset for Baht 16,247 million from the projects that have been completed in 2017 and the projects that are under construction such as LLDPE II, Olefins Reconfiguration, Methyl Ester II, and Propylene Oxide and Polyols as well as disbursements in plant maintenance that can be capitalized.
- Other non-current asset increased by Baht 14,185 million or 24%, mainly from realized profit and dividend from the investment portion in joint ventures and associates companies of approximately Baht 2,268 million. In addition, there was an increase in debt securities available for sales and investment in private fund for Baht 4,386 million. Besides, there was a purchase of Catalyst for EOEG plant and Aromatics II to use for the planned maintenance in March and June 2017 respectively. PTTGC also had long-term loan to related company, PTTAC, for Baht 6,665 million. However, this was offset by the impairment loss in intangible asset from Myriant Corporation for Baht 471 million.

## LIABILITY

As of December 31st, 2017, the Company had total liability of Baht 154,700 million, increased from December 31st, 2016 by Baht 8,200 million or 6%.

- Accounts payable increased by Baht 2,711 million or 10%, mainly from Aromatics which its payable increased by Baht 2,836 million following higher price and purchasing volume of Condensate from ending 2016. Payable from Olefins also increased by Baht 1,394 million due to overdue payment in 2017. However, payable from Petroleum products decreased by Baht 1,766 million, mainly from lower feedstock purchase volume at the end of 2016.
- Current Liabilities increased by Baht 4,357 million or 30% due to increase in excise tax liability by Baht 2,572 million due to the change in regulation for filing and payment for excise tax; formerly the payment was within 10 days from the date the oil was taken out from the Company but the new regulation is within 15th day next to the month that the goods was taken out from the plant. Income tax payable increased by Baht 533 million according to better 2H/2017 performance while payable from Commodity Hedging increased by Baht 496 million and derivatives liability increased by Baht 549 million.
- Interest bearing debt increased by Baht 698 million or 1%, mainly from the Company's new issuance of Baht 10,000 million debentures. Additionally, long-term loans from other parties increased by Baht 5,000 million while long-term loans from related parties increased by Baht 2,583 million. However, there was repayment of debentures for Baht 2,800 million as well as repayment of short and long term loans from other parties around Baht 7,843 million and from related parties for Baht 2,768 million. In addition, the Company's USD loan and USD debenture decreased by Baht 3,381 million from the appreciation of Thai Baht at 3.15 Baht per USD compared to the end of 2016 (reference from BOT averaged selling rate as of December 31st, 2017 at 32.85 Baht per USD and December 31st, 2016 at 36.00 Baht per USD).

## SHAREHOLDER'S EQUITY

As of December 31st, 2017, the Company reported total shareholders' of equity of Baht 280,264 million, increased by Baht 13,251 million or 5% from December 31st, 2016.

Shareholder's Equity increase of Baht 13,251 million are composed of profit attributable to owners of the Company by Baht 39,298 million, surplus on treasury shares by Baht 3,789 million, and difference arising from business combination under common control by Baht 3,348 million. However, there was dividend payment of Baht 15,845

million and a decrease in other components of equity for Baht 1,170 million, resulting from the loss in foreign currency translation differences for foreign operations, loss from change in fair value of cash flow hedge, profit from net change in fair value of available-for-sale investments, and share of other comprehensive income (loss) of investments in joint ventures and associates. Non-Controlling Interest (NCI) had increased by Baht 2,729 million, particularly from registration for capital increase and public offerings of ordinary shares from Global Green Chemicals Public Company Limited (GGC) - this caused PTTGC shareholdings of GGC to decrease from 100% to 72.29%. For 2017, NCI had total profit of Baht 452 million.

## STATEMENT OF CASH FLOWS

For the year ending December 31st, 2017, the Company had net cash flows from operating activities of Baht 61,955 million and net cash flows used in investment activities of Baht 41,545 million. Cash was invested on the purchase of property, plant and equipment, and intangible assets for Baht 16,334 million; on the projects such as LLDPE Expansion, Olefins Reconfiguration, Methyl Ester Plant II, and Propylene Oxide and Polyols. The investment also included the expenses on maintenance shutdown and securities available for sales of Baht 5,164 million. There was cash outflow for investment in subsidiaries and associates for Baht 17,809 million, particularly on the investment in purchase and sale of shares, the acceptance of the transfer of rights and obligations under the shareholders agreements and loan agreements, and the acceptance of the transfer of study results of the projects under the 6 companies: HMC Polymers Company Limited (HMC), PTT Asahi Chemical Company Limited (PTTAC), PTT MCC Biochem Company Limited (PTTMCC), PTT Polymer Marketing Company Limited (PTTPM), PTT Polymer Logistic Company Limited (PTTPL), and PTT Maintenance and Engineering Company Limited (PTTME); these transactions are completed on July 3rd, 2017. Besides, there was payment to increase shareholding of Vencorex Holding and the purchase of catalyst for the total of Baht 2,626 million. Net long-term loans to related parties increased by Baht 7,334 million. On the inflow, there was decrease in current investments for Baht 3,489 million along with the increase in interest and dividend received for Baht 799 million and 3,436 million respectively. The Company had net cash used in financing activities for Baht 9,511 million. These composed of the outflow from the repayment of short-term and long-term loans for Baht 10,800 million, payments of finance costs and finance lease for Baht 3,987 million, and dividend payments of Baht 16,501 million. As for the inflow, there were proceeds from short-term and long-term loans for Baht 7,611 million, proceeds from debenture for Baht 9,985 million, proceeds from sale of treasury shares for Baht 3,789 million, and proceeds from changes in non-controlling interest from GGC's registration for capital increase and public offerings of ordinary shares on December 31st, 2017. The Company had cash and cash equivalent ending 2017 for Baht 43,429 million, together with current investments of Baht 11,620 million and other long-term investments managed by private fund and the Company for Baht 9,334 million; totally, the Company had cash and cash equivalent, including current and other long-term investments of Baht 64,383 million.



## KEY FINANCIAL RATIOS

| (Unit: Million Baht) | | 2016 | 2017 |
|---|---|---|---|
| **Liquidity Ratio:** | | | |
| Current Ratio | (Times) | 2.37 | 2.33 |
| Quick Ratio | (Times) | 1.55 | 1.60 |
| Acid Test Ratio | (Times) | 0.97 | 1.08 |
| Account Receivables Turnover | (Times) | 10.05 | 10.98 |
| Account Receivable Days | (Days) | 36.41 | 33.34 |
| Inventory Turnover | (Times) | 9.42 | 10.20 |
| Days Sales in Inventory | (Days) | 38.84 | 35.90 |
| Account Payables Turnover | (Times) | 13.39 | 13.03 |
| Account Payables Days | (Days) | 27.27 | 28.02 |
| Cash Conversion Cycle | (Days) | 47.98 | 41.22 |
| **Profitability Ratio:** | | | |
| Gross Margin Ratio | (%) | 8.64% | 11.16% |
| EBIT/Sales Revenue | (%) | 10.09% | 11.43% |
| Cashflow from Operation/EBIT | (%) | 131.02% | 124.11% |
| Net Profits to Sales Revenue | (%) | 7.27% | 9.00% |
| Return on Equity | (%) | 10.72% | 15.09% |
| **Efficiency Ratios:** | | | |
| Return on Total Assets | (%) | 8.99% | 11.77% |
| (Profit+Depre)/Asset | (%) | 19.59% | 26.77% |
| Total Asset Turnover | (Times) | 0.89 | 1.03 |
| **Solvency Ratios:** | | | |
| Interest Bearing Debt to Equity | (Times) | 0.36 | 0.35 |
| Interest Coverage Ratio | (Times) | 11.34 | 16.67 |
| Dividend Payout Ratio | (%) | 50% | 49% |

## PROJECT PROGRESS IN 2017

### MAX PROJECT

MAX Project is an efficiency enhancement project in the organization which mainly target to improve performance by increase production effectiveness, uplift profit, improve work processes, and reduce expenses. Currently, the Company already deployed this project and continuously developed as planned and realized the profit of Baht 2,919 million in FY2017.

### GGC IPO

One of PTTGC's strategic directions is the growth toward green chemical business in which Global Green Chemicals Public Company Limited (GGC) is the designated flagship of the Company's green business. The Company has raised fund for GGC through IPO in the Stock Exchange of Thailand and first traded the securities on May 2nd, 2017.

### ASSET INJECTION: PURCHASE AND SALE OF SHARES, THE ACCEPTANCE OF THE TRANSFER OF RIGHTS AND OBLIGATIONS UNDER THE SHAREHOLDERS AGREEMENTS AND LOAN AGREEMENTS, AND THE ACCEPTANCE OF THE TRANSFER OF STUDY RESULTS OF THE PROJECTS

Asset Injection Project is shareholding restructure of Petrochemical businesses under propylene chain, biochemical and related services with PTT Public Company Limited in order to enhance management efficiency and business value chain to create value added for the Company. The Company has completed the purchase and sale of shares and the transfer of study results of the projects on July 3rd, 2017.

### PROPYLENE OXIDE (PO) AND POLYOLS & PU SYSTEM PROJECT

The purpose of PO/Polyols Project is to expand toward downstream business of Polyurethane; a high value product which is having an increasing demand from the industries such as automobile, furniture, bedding, construction, electronics and electrical industries. The Company has set up a wholly-owned, GC Oxirane Company Limited, to produce PO with the capacity of 200,000 ton per year and is expected to start commercial operation in 2020. The Company also collaborates with Sanyo Chemical (SCI) and Toyota Tsusho (TTC) to set up GC Polyols Company Limited, with shareholdings of PTTGC 82.1%, SCI 14.9%, and TTC 3% to produce Polyols with the capacity of 130,000 ton per year and PU System products with the capacity of 20,000 ton per year.

### mLLDPE PROJECT

mLLDPE project consists of LLDPE plant with capacity of 400,000 ton per year and Co-monomer plant with Hexene-1 capacity of 34,000 ton per year (Hexene-1 has been used in LLDPE production). This project will create value added to the Company's ethylene chain by expanding the value chain. Currently, the plant's construction is completed and is expected to start commercial operation in Q1/2018.

## MARKET AND BUSINESS OUTLOOK IN 2018

The crude oil price in 2018 had a potential for growth according to a steadily good compliance rate from both OPEC and Non-OPEC petroleum producers and uncertainty from the unrest in Middle East countries. These may affect the crude oil production volume in the region and the market expectation on the possibility that the OPEC and Non-OPEC will continue to restrain petroleum production. However, in 2018, there will be effect from the increasing production volume of Shale oil in United States which could put pressure on the crude oil price. As for the crude oil demand, there is a robust signal from the economic recovery in United States and China, which in turn will support the global demand.

For Petroleum product, the Company anticipates that the Diesel spread over crude oil price will rise from the average in 2017 while the Fuel oil and Gasoline spread will decline. The Diesel spread over Dubai crude price is expected to be around 13.8 USD per bbl, supporting by the economic recovery with potential GDP growth of 3.1% in 2018 which the economic movement may increase. The Fuel oil spread is expected to decline toward -3.7 USD per bbl and the Gasoline spread may decline toward 14.1 USD per bbl. As a result, the Company's expected GRM in 2018 will be averaged around 6.6 USD per bbl. As for the utilization rate for Refinery, it will be operated at 100% and without any plan for maintenance shutdown in 2018.

For Aromatics product, Paraxylene spread over Condensate price in 2018 has a potential to slightly decline from average price in 2017; it is expected around 365 USD per ton as the new supply, such as from Saudi Arabia and Vietnam, has shifted the operation from 2017. However,

the demand will be supported by the expanding textile industry, polyester, PET bottle resin, and downstream product on Purified Teraphthalic Acid (PTA) which have a robust outlook. Particularly on the demand from China which contributes to new PTA capacity and lower cost per unit will alleviate the effect on Paraxylene price. For Benzene spread over Condensate price, it is expected to maintain around 310 USD per ton, supported by higher new demand than additional supply in Korea, Saudi Arabia, and mainly in China which has an increasing demand in Styrene Monomer, Phenol, and Cyclohexane. For Aromatics plant utilization rate in 2018, the Company expects better utilization rate at 91%, resulting from production efficiency improvement in Aromatics II in 2017 and without any plan for maintenance shutdown in 2018.

The outlook for Olefins and Derivatives product has a better potential; Ethylene price is expected around 1,192 USD per ton and average Polyethylene price will be around 1,243 USD per ton. It is expected that the additional capacities from United States and Asia, excluding Middle East, will be approximately 5.7 million ton. The demand growth for Polyethylene together with the termination of recycled grade polyethylene in China and positive outlook on global economy have contributed toward the total demand around 5.5 - 6.0 million ton. Therefore, this is expected to stabilize the market. For MEG outlook, there is good potential following the increasing demand in polyester, particularly in China, and MEG inventory in China is touching the lowest level in 5 years time. The Company expects the average MEG price around 952 USD per ton. In 2018, Olefins and Derivatives plants utilization rate will be around 99%; this has included the effect of maintenance shutdown in Olefins I in Q3/2018.



# RISK MANAGEMENT AND RISK FACTORS

## RISK MANAGEMENT

The way in which we conduct businesses today is becoming more complicated. Business formats have already undergone a transformation. A major factor is advances in technology, which have disrupted the conventional way of life and consumer behavior. This disruption has already affected many sectors, such as banking, media and retail. And although nothing has clearly indicated that technological advancements are about to impact our current business, there are always potential opportunities and risk factors that may significantly leave their marks on our operation.

Our company, PTT Global Chemical Public Company Limited (PTTGC), has always emphasized an organization-wide system of risk management. With continuous development, our risk management assures that PTTGC is able to handle uncertainties effectively. It is based on internationally acclaimed guidelines, such as the COSO Framework of the Committee of Sponsoring Organizations of the Treadway Commission and ISO 31000 of the International Organization for Standardization, as well as the Corporate Governance Code for listed company 2017 (CG Code 2017) and anti-corruption principles. In 2017, PTTGC was ranked in the top 10 global chemical companies by the Dow Jones Sustainability Indices (DJSI) for the fifth consecutive year. This achievement proves that the company's standards of Risk and Crisis Management is on par with international standards. The following are our risk management guidelines:

### RISK MANAGEMENT STRUCTURE

We divide risk management into three levels, namely corporate, business unit and operation levels. At the corporate level, risk are managed by the Risk Management Committee (RMC), which was inaugurated by the Board of Directors. The RMC is tasked with establishing risk management policies and frameworks, as well as monitoring and providing suggestions and advice on the subject matter. Furthermore, we have formed the Enterprise Risk Management Committee (ERMC), whose members are comprised of Executive Officers from the many business units, to closely monitor our risk management performance every month.

For the product price risk and foreign exchange risk that are highly volatile, PTTGC has closely managed on a weekly basis by the Value Chain Management Committee (VCM). This has been implemented under the risk management framework approved by the RMC.

At the business unit level and at plant operations or the subsidiaries level, the corporate risk management has been applied and has made the entire system aligned as one process.

### RISK MANAGEMENT TOOLS

We have implemented various tools to analyze and assess risk, including a risk map, mitigation plans and key risk indictors (KRIs). We have also taken advantage of the Monte Carlo simulation to identify potential impacts on our operating results in the form of value at risk (VaR). Furthermore, we have monitored changes in significant external factors through an early warning system (EWS) to proactively prepare mitigation plans for emerging risk.

### RISK MANAGEMENT CULTURE

We have focused on promoting a risk management culture throughout our organization to bring about stable and sustainable growth. To this end, we have adhered to our risk management policy and guidelines, as well as continuously monitored our risk management progress at both management and operational levels. Moreover, we have continuously communicated and promoted an understanding of risk management through channels such as the e-learning platform, the quarterly newsletter and training sessions.

## RISK FACTORS

We have analyzed our business environment, including internal and external factors, as well as economic, social, political, technological, industrial, competitor and sundry other trends of relevance, to define the corporate risks. These risks are categorized as follows:

### RISK FACTORS PERTINENT TO OUR CURRENT BUSINESS

Our current business depends on the continuity of our production, as well as its utmost safety; therefore, we have always put an emphasis on our management of

**Operation and Safety Risk** To manage these risks, we have put in place the Operational Excellence Management System (OEMS) and Process Safety Management (PSM), as well as strictly adhered to our Safety, Security, Health and Environment (SSHE) Policy. In 2017, we enhanced every plant's Asset Reliability and Integrity Management measures by having an internal expert conduct an Asset Integrity Assessment (AIA) and forming the Reliability Improvement Team (RIT). The team has been tasked with analyzing our machinery's reliability and establishing reliability improvement plans that encompass all factors that may lead to an incident. As a result, the rate of our unplanned shutdowns has been at the lowest point in the last five years. In addition to our production reliability management, we have also placed much importance on sourcing feedstock. Currently, we are constructing the Map Taphut Retrofit Project, which will diversify our resources upon completion. We will be able to use our self-produced naphtha from the refinery and the aromatics plants as feedstock. This project will mitigate our **Long-Term Feedstock Risk.**

**Sales and Market Risk** is another significant factor that may affect PTTGC's gross revenue, especially in the currently volatile market where there is an imbalance between the supply and demand of products. As a result, we have closely monitored market conditions and made necessary adjustments to our marketing plan whenever appropriate. Additionally, we also attempt to diversify and expand our market. All of this has been done to ensure that we are able to achieve our sales target while maintaining appropriate prices.

The operations of PTTGC today rely on the use of information technology system to connect and analyst the data including the plant automated system. Our production also relies on automated control. There are possible external and internal loopholes in the security that may result in system failure or leak of information. Such failure and leakage are considered as **Cybersecurity Risk,** which poses a threat to the revenue and reputation of PTTGC.

## RISK FACTORS PERTINENT TO OUR FUTURE BUSINESS

The successful execution of established strategies leads to the achievement of long-term goals, but such execution maybe affected by the volatility and rapid changes in the business environment, whether they present themselves as business opportunities or **Strategy Execution Risk.** Due to our business growth directions, we have further considered investments in several projects, both domestic and overseas. Because some of these projects require a large amount of investment capital, we have laid down a stringent consideration process to minimize our **Investment Risk** and to ensure the achievement of our investment goals. Furthermore, expanding our business downstream may require restructuration, as well as recruiting and developing a sufficient number of employees with the required knowledge and expertise for such an expansion, to reduce our **People and Organization Capability Risk.** Meanwhile, the actualization of our research for commercial production is yet another key to our future growth. We, therefore, require to manage our **Innovation Risk** to assure that we will be able to develop new products or enhance existing products serve with the market expectations.

One of the ways to mitigate investment, people, and innovation risk is to find an joint venture partner with an expertise in the investment business target. Nonetheless, we may also face a **Joint-Venture Partnership Management Risk** should we fail to accomplish what we have set out to do.

Additionally, PTTGC has continued to monitor other major risk factors that may affect our future operations in terms of business opportunities and obstacles. Doing so has enabled us to manage or change our strategic direction in a timely manner. These risk factors include **Policy and Regulatory Changes Risk,** such as changes in the policy or regulations of the government or laws and regulations related to our operations. While some of these changes are business opportunities, some are obstacles, such as the Oil Fund Act, New Petroleum Concession Policy, Public Private Partnership Law (PPP), Investment Promotion Act (BOI), Land and Building Tax Act, Eastern Economic Corridor Act (EEC) and the reduction of greenhouse gas ($CO_2$) emissions.

Because **Disruptive Technology Risk** may bring about either opportunities or risk, PTTGC has kept a close eye on the development of innovations, such as digital technology, vehicles of the future, 3-D printing and renewable energy. Moreover, we have also regarded **Climate Change Risk** with concern since the world has put a greater emphasis on climate change. The agreement made at the 21$^{st}$ session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change may affect our business: The government may issue regulations that require our participation and compliance with the said agreement. This may lead to an increase in our production costs or physical events, such as floods and droughts, that may impact our production. The agreement may also affect consumer

behavior, leading to more demand in eco-friendly products and technology. It may also be used as a trade barrier.

PTTGC's risk mitigation measures can be summarized as follows:

## MITIGATION MEASURES

### 1. OPERATION AND SAFETY RISK

- Together with experts within the PTT Group, we conduct a Pre-Maturity Assessment on our operational excellence management system (OEMS) to ensure the efficiency and effectiveness of the OEMS.
- Focus on enhancing process safety management (PSM) as well as asset reliability and integrity management by accredited international experts perform a benchmarking with peers and improve our PSM level.
- Further develop operation and safety employees to enhance their knowledge and awareness of safety, reliability, and integrity management together with learning from lesson learnt through incident-based learning system. Furthermore, we plan to implement technical authority system throughout the organization.
- Conduct pilot tests for applying new technologies and innovations in big data management, such as Equipment Foresight, Smart Plant Monitoring and Dynamic Risk Analysis. These technologies can help us analyze and assess possibility of an abnormal operating conditions and provide preventive advice that reduces the number of emergency shutdowns. Information collected can be used for improving assets enhancing production capability, and minimizing business opportunities losses.
- For less-likely but potentially severe scenarios that could result in an interruption of our business, we have implemented a business continuity management system (BCMS). The system enables us to mitigate the consequences of such an interruption, curtail its duration and/or reduce any subsequent damage. PTTGC has carried out annually test runs of the Business Continuity Plan covering all plants.
- PTTGC and its subsidiaries have taken out the required insurance policies to mitigate loss that could occur from doing business.

### 2. LONG-TERM FEEDSTOCK RISK

- Conduct a study to improve flexibility of our production process to use alternative feedstocks.
- Conduct a study on using and importing alternative feedstock from other economical sources.

### 3. SALES & MARKET RISK

#### Short-Term Mitigation Measures

- Monitor and forecast prices on a weekly basis as well as analyze customer portfolios and the supply and demand in each region to adjust sale method and mitigate short-term impacts from the market price decline.
- Monitor domestic sale volume and re-analyze current customers whenever our sale revenue misses the target to ensure that we can maintain the domestic market.
- Apply customer relationship management (CRM) to sustain current customer satisfaction.

#### Medium and Long-Term Mitigation Measures

- Expand market to diversify the risk.
- Expand into an emerging CLMV market, which may be developed into a main market in the future to replace markets in which we may soon our competitive edge.
- Make long-term contracts with major customers to buy a major portion of our products at a suitable price to reduce both our risk and theirs.
- Entry to an end-use market and acquire new customers who are interested in developing functions and performance of product with technology and innovation to serve a better quality of life for the end-user consumer. We have established a Customer Solution Center to foster development collaboration between PTTGC and our partners to develop and deliver value to customers. This will result to gain loyalty and continual purchases from customers. We refer such products as of the high-value products.
- Develop market to new product lines in downstream businesses to diversify our product portfolio.
- Growth alongside with strategic partners who are brand owners to increase market opportunity by pushing our product as a part of the partners' products to sustain demand, for instance, packing in fast-moving consumer goods (FMGC).

### 4. CYBER SECURITY RISK

- Install a preventive system and monitor the cyber threats both in the office and plant areas. Moreover, conduct the monthly meeting to follow up and monitor the new cyber threats as well as report the attack and resolve result to improve further preventive measures. Conduct penetration test and vulnerability assessment at least once a year to ensure the effectiveness of the current system. Implement an information security management system (ISMS)

according to the ISO/IEC27001 (Information Security) standard. In 2018 we will implement additional ISO/IEC 27032:2012 (Guidelines for Cybersecurity) standard which relate to cyber asset security.

- Promote awareness of cybersecurity to employees at all levels continually including potential threats, prevention, and any relevant IT laws through all internal communication channels. We have also conducted training through our e-learning system, which allows our employees to access any time, at any place and evaluation for the further training program improvement.
- Test the Cybersecurity Drill and rehearsal the disaster recovery testing annually to assure that can handle the situation promptly reduce damage to the IT system and assure our business continuity.

## 5. STRATEGY EXECUTION RISK

- Drive PTTGC on the Transformation Pathway towards being an international Performance Chemical Business in the future accordance with the appropriate business structure proportion as per the Optimized Portfolio Structure by utilizing developments/findings from our research, development, and innovation.
- Capture opportunity continuously as we are a part of the working groups of the Public - Private Committee to support the initiatives of the government in driving economic and social development of the country in long run. Committees in which PTTGC participated are New S-Curve and Eastern Economic Corridor (EEC) which provided ideal opportunities to exchange knowledge and information, as well as establishing an academic network with leading corporate agencies of the country. This has led to success in the following investment projects in 2017, for example, PO/POLYOLS project and engineering plastic development project.
- Monitor and analyze emerging risk and prepare the back up plans in the case that critical strategic plan be unattainable through the following systems:
  (1) Develop a system to track and stimulate the undertakings of each Initiative of the strategic plan, to ensure that they achieve their objectives.
  (2) Develop an Early Warning System (EWS) to track and analyze the internal and external factors that may have an impact on driving the strategic plan of PTTGC, both opportunities and risk, so adequate measures can be prepared in time.

## 6. INVESTMENT RISK

- Implement a Stage Gate Process to prudently and concisely cover and govern from opportunity seeking until investment approval. In each stage, responsible executives, and experts scrutinize investment projects in all aspects. For the high capital investment projects, the Risk Management Committee (RMC) is also involved in the consideration of the adequacy of risk assessment and mitigation measures which will be used as part of the approval criteria.
- For the high capital investment projects, PTTGC has also established a Steering Committee. Also, project's progress and risk management are closely monitor through the Major Project Management meeting (MPM) to ensure that the major investment projects have been executed as planned.
- Develop a Look Back process to monitor and evaluate the completed projects. This would continuously improve investment process and increase the success of future investment projects.

## 7. PEOPLE AND ORGANIZATION CAPABILITY RISK

- Strengthen our organizational culture by pushing GC SPIRIT core value through the four core behaviors. This aims to shift mindset and the working methods for our people to be able to handle with the uncertainty, volatility, and complexity.
- Restructure the organization to be able to best respond to the future business and the strategic direction also including manpower for the project development to ensure suitable and sufficient human resources in a timely manner.
- Define a people portfolio to support the PTTGC growth direction and to strengthen the people in the portfolio.
- Revise people's capabilities previously not covered in the people portfolio and prepare to enhance capabilities for the future requirement.
- Strengthen specific competencies in professional areas such as engineers, researchers, and marketers.
- Develop a human-resource recruitment and management plan covering both quality and quantity aspects, in accordance with our future growth business
- Develop continuously our executive as leadership plan.
- Initiate a succession plan for high important position to facilitate a smooth job handover.

## 8. INNOVATION RISK

- Focus on the development of human resources to provide support for both upstream and downstream businesses innovation through the collaboration with our network in the educational and industrial sectors, including external experts and licensor.
- Align direction and investment pattern for innovation with our strategic plan and business operation to seeking new technologies efficiently through the open innovation and Corporate Venture Capital (CVC) channels.
- Established a dedicated team focusing on clearly outlining the scope and goal of innovation, as well as suitably developing the skills, knowledge and expertise of researchers and partners.
- Apply digital program and tools in our research and development such as program for searching and analyzing big data and program for predicting behavior or property of product etc. These technologies enhance efficiency of our R&D process.
- Implement a procedure to evaluate and prevent abuse and violations of intellectual property for which the international standard IP Code of Practice was adopted as a guideline of practice.

## 9. JOINT VENTURE PARTNERSHIP MANAGEMENT RISK

- Restructured for joint venture management by establishing new department to collaborate with our partners at all levels and to ensure an alignment of JV process as agreed target.
- Exchange management perspectives, collaborate and prevent any conflicts that may arise.
- Initiate synergy projects with partners such as workshop, progress monitoring through monthly meetings to expand business opportunity together.
- Conduct roadshows between PTTGC and JV companies to ensure the management and governance comply with the PTTGC Way of Conduct
- Develop and strengthen our employees to be ready to work with the Joint venture partner.

## 10. POLICY & REGULATORY CHANGE RISK

- Provide observations and suggestions that benefit the nation and industries to the related governmental organizations as basic information needed in the preparation of draft laws, regulations, policies, and other benefits.
- PTTGC closely monitors for important news and information related to the government's policies, law and regulations affecting PTTGC's business and notifies the related departments within PTTGC and requests for their consideration, comments, and feedback on the draft policies, laws, and regulations, etc., and sends them to the related governmental agencies or ministries for consideration before adoption, and after they are adopted, PTTGC shall inform all related departments and advise them on the proper practice and adhering to those policies, laws, and regulations.
- Study and consider the changes in the government's laws and regulations and includes them in the evaluation of the economic value of investment projects decision making process.
- Declare our intention to fight against corruption and, in 2014, was certified as member of the Collective Action Coalition (CAC) - which is Thailand's Private Sector movement against corruption and re-certified in 2017. Our process complies with the Prevention and Suppression of Corruption Act. Also, we internally assessed the corruption risk for the process that contacts with governmental agencies. We also review our compliance with our anti-corruption policy and measures, the report of which is submitted to the Audit Committee, the Corporate Governance Committee, and the Board of Directors to verify our practices and operations regularly. Furthermore, Internal Control monitors our operations to prevent misuse or unauthorized use of assets, whether belonging to PTTGC or one of our subsidiaries, by directors, executive officers, or employees. Anti-corruption efforts are, additionally, an integral part of our Risk Management Policy.

## 11. DISRUPTIVE TECHNOLOGY RISK

- Realize the importance of changing the way we do the business, seeking opportunity from digital technology by setup the Digital Transformation Function to study digitalization management in a sustainable manner.
- Study disruptive technologies that are pertinent to our business, such as digital technology, vehicles of the future, 3-D printing, renewable energy, and green energy, serves as guidelines to produce products that respond to these technologies.

## 12. CLIMATE CHANGE RISK

- Applied international standard, ISO 14064-1: 2006 standards, for measure, reporting and reduction of greenhouse gas emissions.
- Optimize energy consumption efficiency to reduce our greenhouse gas emission from our business operation.
- Join the pilot project of the Thailand Voluntary Emission Trading Scheme to increase capability to deduct of greenhouse gas emission, also prepare for the changing of law and regulation.
- Applied circular economy concept which bring the waste from production process to reuse in industry such as the Upcycling the Oceans, Thailand project with associated among PTTGC, the Tourism Authority of Thailand and the Ecoalf foundation to recycle plastic waste from the ocean.
- PTTGC has a concrete system of water management in place. We have continuously improved our processes to reduce water consumption. We have established a seawater reverse osmosis (SWRO) plant as a reserve of water, force water management projects, and develop water source development projects with governance agencies through the Sustainable Water Management Working Team.
- Incorporate eco-friendly technology factor as part of investment criteria to align with the overall greenhouse gas emission management and link to the strategy execution risk, the investment risk and the policy and regulatory change risk.

**PTTGC believes that by following the aforementioned mitigation measures, we will be able to minimize risk and allow us to achieve our business goals according to our direction and strategies.**



# INTERNAL CONTROL

PTT Global Chemical Public Company Limited values the importance of the Internal Control System which has been designed in accordance with the international standard of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) to achieve the objectives relating to operations, reporting, and compliance.

During the Board of Directors' Meeting No. 2/2018 held on February 19th, 2018, PTTGC's Internal Control System was evaluated based on the internal control assessment report prepared by the Management which follows the guidelines of the Securities and Exchange Commission (SEC), together with the result of the Audit Committee's internal control review. The Board viewed that PTTGC's Internal Control System has been functioning properly in an adequate and effective manner. The operation has been efficiently managed with sufficient number of qualified and competent personnel. In addition, PTTGC has implemented a monitoring system to ensure safeguarding of PTTGC Group's assets against misuse or unauthorized use by the Board or the Management.

PTTGC's Internal Control System can be summarized as follows;

## CONTROL ENVIRONMENT

The Board and the Management strive to promote a corporate culture that focuses on integrity and ethics. They also provide supervision of PTTGC's operations to ensure compliance with the organizational vision and missions and to ensure that PTTGC's control environment is appropriate for the implementation of the Internal Control System, as detailed below;

- The Board and the Management have established the Corporate Governance Policy, Business Code of Conduct, Corporate Compliance Policy, Internal Control System Policy and Anti-Corruption Guidelines which provide preferred practices for all Directors, the Management and Employees. All employees are accountable for their internal control activities and for maintaining an effective internal control system. These policies have regularly been communicated and promoted to all employees through training courses and activities. In 2017, the Management further supported good corporate governance culture by communicating ethics and business code of conduct to employees through the key meetings on a monthly basis (CG Talk).
- The Board is independent from the Management and is responsible for supervising the overall operations of PTTGC as well as expressing views on the directions and strategy of PTTGC which will be used as guidelines to formulate business and operating plans. Furthermore, the Board regularly monitors the performance of PTTGC and its Sub-committees to ensure achievement of PTTGC's objectives and goals.
- PTTGC's corporate structure has been grouped into business units and functions in a way to best support its business operations in an efficient manner and with good governance. This structure comes with a system of checks and balances which delegates duties and responsibilities appropriately. Furthermore, all employees acknowledge their roles, authorities, responsibilities and accountabilities.
- PTTGC has specified qualifications for all positions. These qualifications form the basis for recruitment and personnel development. PTTGC has also put in place succession plans for important management positions to ensure business continuity. Furthermore, it has established a performance management and fair rewarding system as incentives to motivate efficiency by employees. In 2017, PTTGC initiated the "Cultural Fit Assessment" in order to ensure that potential candidates fit the Company's core values.
- PTTGC has continuously organized exhibitions to raise awareness of Fraud risks and impact and also provided related governance guidance to the Management and Employees. In 2017, PTTGC conducted the "CG Role Model: Focus on Action" seminar for the Management in different levels to raise awareness of the importance of business code of conduct in connection with being a role model and encouraging employees to stay alert against these issues.

## RISK ASSESSMENT

The Board and Management recognize the significance of Risk Management as an enabler for PTTGC in order to achieve its short-term and long-term goals. The Risk Management Committee and Enterprise Risk

Management Committee are collectively responsible PTTGC's Risk Management and ensuring that they are managed in an appropriate, effective and efficient manner;

- PTTGC's Risk Management Framework has been set up in accordance with the international standards of ISO 31000 - Risk Management and COSO Enterprise Risk Management. Furthermore, the Risk Management Policy has been drawn up and will act as a guideline for managing risks that might have an impact on business operations or PTTGC's strategic direction.
- PTTGC's Risk Management has been applied entity-wide and includes:
  (1) Enterprise Risk Management which develops risk profiles at corporate level, business unit level and department level
  (2) Investment Risk Management
  (3) Business process level Risk Management
  PTTGC takes into consideration the changes within internal and external factors and the potential of fraud and corruption, in assessing risks against the achievement of objectives. Mitigation Plans are drawn up to manage those risks. Risks and mitigation plans are reviewed and monitored on a monthly basis. All departments are responsible for managing risks to maintain an acceptable level.
- PTTGC has developed Key Risk Indicators (KRI) to monitor changes in risk factors so that those risks are managed efficiently and in a timely manner.
- In 2017, PTTGC improved the "Early Warning System" to monitor important events and news which may impact the Company's target and prepare efficient mitigation plans.

## CONTROL ACTIVITIES

PTTGC has developed efficient and effective control activities that contribute to the mitigation of risks against the achievement of objectives, to acceptable levels. They include;

- PTTGC has designed its control activities in accordance with internal control principles. These include the segregation of duties, policies and good practices for conflicts of interest transactions. In addition, business is operated in a transparent, fair and auditable manner. There is a transparent transaction approval process which takes into account the utmost benefit of the organization.
- PTTGC has in place rules, regulations, policies, and procedures in which clear boundaries of authorization have been drawn up to limit the power and authority of the Chief Executive Officer, the Management, as well as all levels of Employees. Furthermore, operations are reviewed regularly to ensure their compliance with those rules, regulations, policies, and procedures.
- PTTGC has implemented the automated control of crucial processes. For example, SAP GRC - Access Control System has been in place to ensure that access rights in SAP operating system is in accordance with good practices in segregation of duties. PTTGC also has the "Continuous Control Monitoring System (CCMS)" to notify responsible persons for correcting exceptional transactions in a timely manner.
- PTTGC has in place an Information Technology Security Policy in accordance with the ISO 27001 - Information Security Management standard, and the Control Objectives for Information and Related Technologies (COBIT) to ensure efficiency and effectiveness of PTTGC's information technology security. Furthermore, Cyber Threat Prevention news and trainings are provided to all employees on a regular basis.
- PTTGC has guidelines to govern and manage companies invested in by PTTGC. This is to ensure that these companies align with PTTGC in terms of operating direction as well as comply with PTTGC's policies, procedures and strategic direction. Operations of these companies are monitored regularly and continuously.

## INFORMATION & COMMUNICATION

PTTGC recognizes the criticality of the quality of Information & Communication that supports the effectiveness of PTTGC's Internal Control System, as detailed below;

- PTTGC has set up information classification, instructions for filing important documents and controlled documents. This includes information from both internal and external sources. This process is intended to ensure that important information concerning PTTGC and its business operations are accurate, complete, adequate and timely.
- PTTGC implemented SAPECC 6.0 to process the key business transactions of the Company. This reduces duplication of small legacy systems and enhances efficiency of management reporting.
- PTTGC has in place the database to effectively maintain the key external factors information for strategic plans preparation purpose. In addition, the system has also been established to systematically maintain strategic

plan of each business unit which are in line with the Company's strategies.

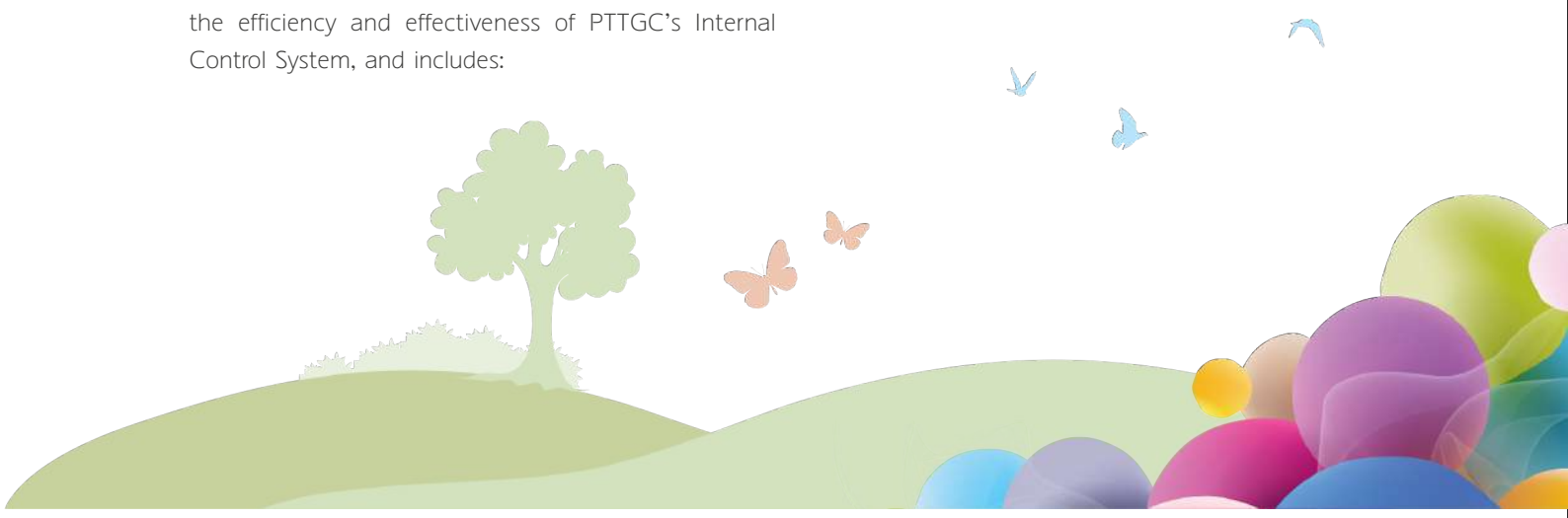
- PTTGC has appropriately communicated the relevant information to the Board, the Management, Employees and Stakeholders. Crucial information relevant to PTTGC's performance will be delivered to Directors prior to the Board of Directors meetings in order that they will have sufficient time to study, review and make decisions. When necessary, the Board may request additional information from relevant specific departments or personnel.
- PTTGC has set up several internal communication channels, for example, Town Hall activities for facilitating communication from Senior Managements to Employees, the organization's intranet, e-mail, etc. In addition, new employees receive important information through orientation. Employees can access useful information through Knowledge Based System and E-Learning System. In 2017, PTTGC developed "WE GC mobile phone application" that enabled all employees to access the Company's news via mobile phone.
- PTTGC has set up external communication channels to communicate with external stakeholders, such as PTTGC website, e-mail, Facebook and Twitter. In addition, assigned departments are responsible for the disclosure of important information to all stakeholders regularly.
- PTTGC has established an open communication channel managed by Whistleblower System. This allows employees and external individuals to be confident that the complaints will be handled with transparency, fairness and confidentiality in timely manner.

## MONITORING ACTIVITIES

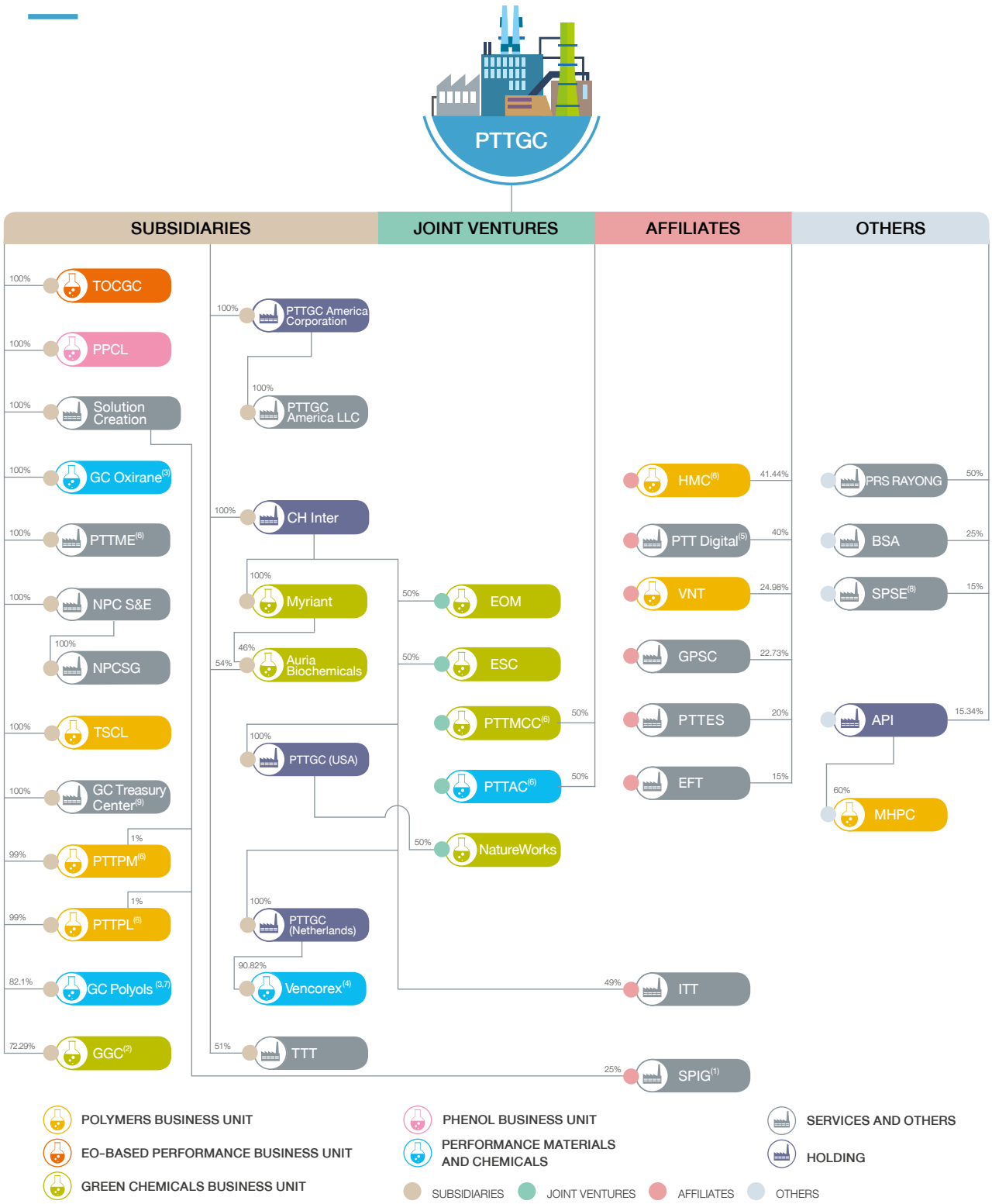
PTTGC continuously monitors and evaluates the adequacy of its internal control system. Development and improvement processes have also been in place to ensure the efficiency and effectiveness of PTTGC's Internal Control System, and includes:

- PTTGC evaluates the adequacy of the corporate internal control system on an annual basis. In addition, PTTGC has implemented Control Self-Assessment (CSA) for process owners to evaluate internal control mechanisms at the process level. The adequacy and appropriateness of CSA results will be verified by the Internal Control System Division, which also provides recommendations for improvement on internal control deficiencies, if any. A reporting and monitoring process is also in place to report deficiencies to the Management and track remediation progress on a timely basis.
- The Internal Audit function, which is an independent unit reporting directly to the Audit Committee, examines and evaluates the effectiveness and operations of internal control activities according to the audit plan approved by the Audit Committee. Deficiencies and recommendations are communicated to parties responsible for implementation. The audit reports and findings are presented to the Audit Committee on a quarterly basis. Internal control for financial reporting is reviewed by external auditors and reported to the Audit Committee on a quarterly and yearly basis.

In 2017, the Audit Report did not find any significant issues related to conflicts of interest, fraudulent activities, or any other significant deficiencies in the Internal Control System materially in affect PTTGC's objectives. Furthermore, no violations of SEC and SET rules and regulations or other laws related to PTTGC were found.



# SHAREHOLDING STRUCTURE IN SUBSIDIARIES AND AFFILIATES




**Remarks : Changes in the shareholding structure in subsidiaries and affiliates in 2017**

1. February 15th, 2017: Solution Creation became a shareholder in SPIG. As a result, Solution Creation now holds 25% of SPIG shares.
2. May 2nd, 2017: GGC was listed on the Stock Exchange of Thailand and opened for the 1st trade securities in the Stock Exchange of Thailand and June 2nd, 2017: After the capital increase by GGC and the return of shares by the Over-allotment Agent to PTTGC, PTTGC now holds 72.29% of GGC shares.
3. June 2nd, 2017: GC Oxirane and GC Polyols were established.
4. June 21st, 2017: PTTGC (Netherlands) made share payment to Perstorp Holding AB. As a result, PTTGC (Netherlands) shareholding in Vencorex changed from 85% to 90.82%.
5. June 22nd, 2017: PTT ICT registered a change of company name as PTT Digital Solutions Company Limited or PTT Digital.
6. July 3rd, 2017: The transactions of purchase of the shares, the acceptance of the transfer of rights and obligations under the shareholders agreements and loan agreements, and the acceptance of the transfer of study results from PTT are finished. As a result, PTTGC now holds 50% of PTTAC shares, 41.44% of HMC shares, 50% of PTTMCC shares, 100% of PTTPL shares, 100% of PTTPM shares, and 100% of PTTME shares.
7. August 25th, 2017: Sanyo Chemical Industries, Ltd. and Toyota Tsusho Corporation became shareholders in GC Polyols. As a result, PTTGC now holds 82.1% of GC Polyols shares.
8. September 8th, 2017: PTTGC became a shareholder in SPSE. As a result, PTTGC now holds 15% of SPSE shares.
9. December 19th, 2017: GC Treasury Center was established.

## SUBSIDIARIES

| | |
|---|---|
| Auria Biochemicals | Auria BioChemicals Company Limited |
| CH Inter | PTT Chemical International Private Limited |
| GC Oxirane | GC Oxirane Company Limited |
| GC Polyols | GC Polyols Company Limited |
| GC Treasury Center | GC Treasury Center Company Limited |
| GGC | Global Green Chemicals Public Company Limited |
| Myriant | Myriant Corporation |
| NPC S&E | NPC Safety and Environmental Service Company Limited |
| NPCSG | NPC S&E Security Guard Company Limited |
| PPCL | PTT Phenol Company Limited |
| PTTGC America Corporation | PTTGC America Corporation |
| PTTGC America LLC | PTTGC America LLC |
| PTTGC (Netherlands) | PTTGC International (Netherlands) B.V. |
| PTTGC (USA) | PTTGC International (USA) Inc. |
| PTTME | PTT Maintenance and Engineering Company Limited |
| PTTPL | PTT Polymer Logistics Company Limited |
| PTTPM | PTT Polymer Marketing Company Limited |
| Solution Creation | Solution Creation Company Limited |
| TOCGC | TOC Glycol Company Limited |
| TSCL | Thai Styrenics Company Limited |
| TTT | Thai Tank Terminal Limited |
| Vencorex | Vencorex Holding |

## JOINT VENTURES

| | |
|---|---|
| EOM | Emery Oleochemicals (M) Sdn. Bhd. |
| ESC | Emery Specialty Chemicals Sdn. Bhd. |
| NatureWorks | NatureWorks LLC |
| PTTAC | PTT Asahi Chemical Company Limited |
| PTTMCC | PTT MCC Biochem Company Limited |

## AFFILIATES

| | |
|---|---|
| EFT | Eastern Fluid Transport Company Limited |
| GPSC | Global Power Synergy Public Company Limited |
| HMC | HMC Polymers Company Limited |
| ITT | PT Indo Thai Trading |
| PTT Digital | PTT Digital Solutions Company Limited |
| PTTES | PTT Energy Solutions Company Limited |
| SPIG | S.P. Petpack Inter Group Company Limited |
| VNT | Vinythai Public Company Limited |

## OTHERS

| | |
|---|---|
| API | Alliance Petrochemical Investment (Singapore) Pte. Ltd. |
| BSA | Business Services Alliance Company Limited |
| MHPC | Mehr Petrochemical Company |
| PRS RAYONG | Pracharath Rak Samakkee Rayong (Social Enterprise) Company Limited |
| SPSE | Sarn Palung Social Enterprise Company Limited |

# REVENUE STRUCTURE

| Business Unit | 2015* | | 2016* | | 2017 | |
|---|---|---|---|---|---|---|
| | Revenue (Million THB) | % | Revenue (Million THB) | % | Revenue (Million THB) | % |
| **Refinery and Shared Facilities** | | | | | | |
| Sales revenue from Light Naphtha | 8,829 | 2.1 | 2,819 | 0.8 | 3,442 | 0.8 |
| Sales revenue from Reformate | 16,163 | 3.9 | 8,302 | 2.3 | 13,438 | 3.1 |
| Sales revenue from Jet Fuel | 24,133 | 5.9 | 17,673 | 5.0 | 25,991 | 5.9 |
| Sales revenue from Diesel | 109,049 | 26.5 | 84,360 | 23.7 | 120,900 | 27.5 |
| Sales revenue from Fuel Oil | 19,719 | 4.8 | 13,569 | 3.8 | 20,236 | 4.6 |
| Others | 3,262 | 0.8 | 3,054 | 0.9 | 3,417 | 0.8 |
| **Total** | **181,155** | **44.0** | **129,777** | **36.5** | **187,424** | **42.7** |
| **Aromatics** | | | | | | |
| Sales revenue from Benzene | 5,977 | 1.5 | 5,847 | 1.6 | 4,978 | 1.1 |
| Sales revenue from Paraxylene | 27,982 | 6.8 | 32,522 | 9.1 | 32,537 | 7.4 |
| Sales revenue from Cyclohexane | 4,183 | 1.0 | 4,091 | 1.2 | 5,441 | 1.2 |
| Sales revenue from Light and Heavy Naphtha | 13,759 | 3.3 | 14,392 | 4.0 | 15,910 | 3.6 |
| Sales revenue from Condensate Residue | - | - | 2,107 | 0.6 | - | - |
| Others | 7,733 | 1.9 | 4,259 | 1.2 | 6,329 | 1.4 |
| **Total** | **59,634** | **14.5** | **63,218** | **17.7** | **65,195** | **14.7** |
| **Olefins** | | | | | | |
| Sales revenue from Ethylene | 16,690 | 4.1 | 13,054 | 3.7 | 13,278 | 3.0 |
| Sales revenue from Propylene | 7,963 | 1.9 | 6,242 | 1.8 | 5,934 | 1.3 |
| Sales revenue from Derivatives | 5,348 | 1.3 | 5,574 | 1.6 | 6,914 | 1.6 |
| Others | 5,330 | 1.3 | 4,554 | 1.2 | 4,926 | 1.1 |
| **Total** | **35,331** | **8.6** | **29,424** | **8.3** | **31,052** | **7.0** |
| **Polymers** | | | | | | |
| Sales revenue from Polyethylene | 66,680 | 16.2 | 63,606 | 17.9 | 68,573 | 15.6 |
| Sales revenue from Polystyrene | 2,129 | 0.5 | 2,214 | 0.6 | 2,858 | 0.6 |
| Others | 7,611 | 1.9 | 6,703 | 1.9 | 9,488 | 2.2 |
| **Total** | **76,420** | **18.6** | **72,523** | **20.4** | **80,919** | **18.4** |

| Business Unit | 2015* | | 2016* | | 2017 | |
|---|---|---|---|---|---|---|
| | Revenue (Million THB) | % | Revenue (Million THB) | % | Revenue (Million THB) | % |
| **EO-Based Performance** | | | | | | |
| Sales revenue from EO/EG | 12,913 | 3.1 | 11,949 | 3.4 | 14,536 | 3.3 |
| Sales revenue from EO Derivatives | 1,551 | 0.4 | 1,204 | 0.3 | 1,367 | 0.3 |
| **Total** | **14,464** | **3.5** | **13,153** | **3.7** | **15,903** | **3.6** |
| **Green Chemicals** | | | | | | |
| Sales revenue from ME/FA | 13,775 | 3.4 | 16,252 | 4.6 | 18,195 | 4.1 |
| Others | 35 | - | 37 | - | - | - |
| **Total** | **13,810** | **3.4** | **16,289** | **4.6** | **18,195** | **4.1** |
| **Performance Materials and Chemicals** | | | | | | |
| Sales revenue from Phenol | 3,912 | 1.0 | 7,333 | 2.1 | 11,244 | 2.6 |
| Sales revenue from Acetone and Derivatives | 2,458 | 0.6 | 4,280 | 1.2 | 6,858 | 1.6 |
| Sales revenue from Bis Phenol A | 6,120 | 1.5 | 5,870 | 1.7 | 7,012 | 1.6 |
| Sales revenue from HDI / TDI | 14,510 | 3.5 | 10,796 | 3.0 | 13,387 | 3.0 |
| Others | 1,044 | 0.3 | 739 | 0.2 | 697 | 0.2 |
| **Total** | **28,044** | **6.9** | **29,018** | **8.2** | **39,198** | **9.0** |
| **Services & Others** | | | | | | |
| Services & Others | 2,128 | 0.5 | 2,122 | 0.6 | 2,035 | 0.5 |
| **Total** | **2,128** | **0.5** | **2,122** | **0.6** | **2,035** | **0.5** |
| **Net Total after deduction from connected transaction** | **410,986** | **100** | **355,524** | **100** | **439,921** | **100** |

**Remark:**

** Restated from the purchase of the shares in 6 companies from PTT Public Company Limited.*



# CONNECTED TRANSACTION

## CONNECTED TRANSACTION BETWEEN RELATED COMPANIES

For the 2017 accounting period, PTTGC conducted significant business transactions with its subsidiaries and related companies with common shareholders and/or Directors. Connected transactions with other entities which may result in conflicts of interest are based on market or contractual prices (the prices agreed in previous contracts) - if there are no reference market prices. Details of the relationships with these companies are as follows:

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 1. PTT Public Company Limited (PTT) | • Major shareholder holding 48.89% of the shares in PTTGC<br>• Common Director: Mr. Don Wasantapruek<br>• Directors who are PTT Executives:<br>1. Mr. Sarun Rungkasiri *(Retired as of 30th Sep 2017)*<br>2. Mr. Auttapol Rerkpiboon<br>3. Mrs. Boobpha Amornkiatkajorn<br>4. Mr. Supattanapong Punmeechaow<br>• Common Management:<br>1. Mr. Supattanapong Punmeechaow<br>2. Miss Duangkamol Settanung<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 124,389 | 115,162 | 148,614 |
| | | Purchases of goods or receiving of services | 235,823 | 191,566 | 244,807 |
| | | Other incomes | 97 | 85 | 40 |
| | | Other expenses | 153 | 102 | 88 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 6,119 | 12,169 | 12,625 |
| | | Other accounts receivable - related parties | 448 | 411 | 210 |
| | | Trade accounts payable - related parties | 13,363 | 20,610 | 23,189 |
| | | Other accounts payable - related parties | 53 | 976 | 36 |
| | | Payables to contractor - related parties | 7 | 1 | - |
| 2. Global Power Synergy Public Company Limited (GPSC) | • Associate company (PTTGC holds 22.73% of the shares)<br>• Major shareholder (PTT) holds 22.58% of the shares<br>• Common Director : Mr. Supattanapong Punmeechaow<br>• Executive who is Director of GPSC: Mr. Kongkrapan Intarajang<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 55 | 49 | 42 |
| | | Purchases of goods or services | 7,688 | 8,263 | 8,290 |
| | | Other incomes | 22 | 17 | 24 |
| | | Other expenses | - | 3 | 3 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 11 | 10 | 9 |
| | | Other accounts receivable - related parties | 85 | 20 | 65 |
| | | Trade accounts payable - related parties | 844 | 752 | 1,634 |
| | | Other accounts payable - related parties | 5 | 5 | 11 |
| | | Payables to contractors - related parties | - | 18 | 17 |

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 3. PTT Energy Solutions Company Limited (PTTES) | • Associate company (PTTGC holds 20% of the shares)<br>• Major shareholder (PTT) holds 40% of the shares<br>• Executive who is Director of PTTES : Mr. Varit Namwong<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 8 | - | - |
| | | Purchases of goods or services | 133 | 138 | 127 |
| | | Other incomes | 1 | - | 3 |
| | | Other expenses | - | - | 3 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 2 | - | - |
| | | Other accounts receivable - related parties | 26 | 1 | 1 |
| | | Other accounts payable - related parties | 27 | 42 | 15 |
| 4. PTT Digital Solutions Company Limited (PTT DIGITAL)<br><br>(Former : PTT ICT Solutions Co., Ltd. (PTTICT) | • Associate company (PTTGC holds 40% of the shares)<br>• Major shareholder (PTT) holds 20% of the shares<br>• Executive who is Director of PTT DIGITAL : Mr.Siridech Kumvongdee<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Purchases of goods or services | 15 | - | 3 |
| | | Other incomes | 43 | 42 | 57 |
| | | Other expenses | 414 | 394 | 451 |
| | | **Statements of Financial Position Balances** | | | |
| | | Other accounts receivable - related parties | 20 | 18 | 27 |
| | | Other accounts payable - related parties | 70 | 65 | 115 |
| | | Payables to contractors – related parties | 39 | 54 | 50 |
| 5. Trans Thai-Malaysia (Thailand) Co., Ltd. (TTMT) | • Major shareholder (PTT) holds 50% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | - | - | 2 |
| 6. TOP Solvent Company Limited (TS) | • Subsidiary of TOP<br>• Sales/Purchase transaction of products | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 108 | 162 | 242 |
| | | Purchases of goods or services | 65 | 102 | 127 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 9 | 12 | 11 |
| | | Trade accounts payable - related parties | 9 | 7 | 5 |
| | | Other accounts payable - related parties | 2 | - | 10 |
| 7. Thai Petroleum Pipeline Company Limited (THAPPLINE) | • Major shareholder (PTT) holds 40.4% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 1 | - | - |

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 8. Dhipaya Insurance Public Company Limited (DHIPAYA) | • Major shareholder (PTT) holds13.33% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Purchases of goods or services | 1,121 | 1,017 | 761 |
| | | Other incomes | 702 | 1,169 | 206 |
| | | Other expenses | 20 | 20 | 15 |
| | | **Statements of Financial Position Balances** | | | |
| | | Other accounts receivable - related parties | 1,278 | 1,429 | 595 |
| | | Other accounts payable - related parties | 40 | 20 | 16 |
| | | Payables to contractor – related parties | 2 | - | - |
| 9. Thai Paraxylene Company Limited (TPX) | • Subsidiary of TOP<br>• Sales/Purchase transaction of products | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 543 | - | - |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 140 | - | - |
| 10. Thai Oil Public Company Limited (TOP) | • Major shareholder (PTT) holds 49.10% of the shares<br>• Common Director : Mr. Sarun Rungkasiri *(Resigned as of 1st Jan, 2018)*<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 1,366 | 1,000 | 1,107 |
| | | Purchases of goods or services | 574 | 1 | - |
| | | Other incomes | 2 | 2 | 3 |
| | | Other expenses | - | 4 | - |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 47 | 50 | 68 |
| | | Other accounts payable - related parties | 1 | 1 | - |
| 11. Business Services Alliance Company Limited (BSA) | • Affiliate company (PTTGC holds 25% of the preference shares)<br>• Major shareholder (PTT) holds 100% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Purchases of goods or services | 262 | 230 | 205 |
| | | Other expenses | 138 | 104 | 101 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts payable - related parties | 41 | 54 | 52 |
| | | Other accounts payable - related parties | 62 | 68 | 103 |
| | | Payables to contractor - related parties | 15 | 4 | 8 |
| 12. PTT Global Management Company Limited (PTTGM) | • Major shareholder (PTT) holds 100% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Other expenses | - | - | 11 |

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 13. PTTEP Siam Limited (PTTEPS) | • Subsidiary of PTTEP<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 69 | 68 | 46 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 5 | 6 | - |
| 14. PTTEP International Limited (PTTEPI) | • Subsidiary of PTTEP<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 1 | - | 1 |
| 15. PTT Exploration and Production Public Company Limited (PTTEP) | • Major shareholder (PTT) holds 65.29% of the shares<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 20 | 19 | 21 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 2 | 2 | 3 |
| 16. PTT Tank Terminal Company Limited (PTT TANK) | • Major shareholder (PTT) holds 100% of the shares<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 60 | 51 | 47 |
| | | Purchases of goods or services | - | 16 | - |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 56 | 50 | 22 |
| 17. PTT International Trading Private Limited (PTTT) | • Major shareholder (PTT) holds 100% of the shares<br>• Sales/Purchase transaction of products | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 30,553 | 13,162 | 21,352 |
| | | Purchases of goods or services | 223 | 93 | 859 |
| | | Other incomes | - | - | 3 |
| | | Other expenses | 15 | 20 | 6 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 2,408 | 1,055 | 2,446 |
| | | Other accounts receivable - related parties | - | 47 | 24 |
| | | Trade accounts payable - related parties | - | - | 203 |
| | | Other accounts payable - related parties | 10 | 118 | 661 |
| 18. PTT LNG Company Limited (PTTLNG) | • Major shareholder (PTT) holds 100% of the shares<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 9 | 3 | 27 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 2 | 1 | 22 |

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 19. PTTEP Services Limited (PTTEP Services) | • Subsidiary of PTTEP<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Other expenses | 1 | 3 | 1 |
| 20. Labix Company Limited (LABIX) | • Subsidiary of TOP<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | - | 22 | 20 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | - | 2 | 2 |
| 21. Sakchaisit Co., Ltd. (SAKC) | • Subsidiary of TOP<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | - | 1,581 | 1,844 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | - | 150 | 177 |
| 22. Amata Natural Gas Distribution Company Limited (Amata NGD) | • Subsidiary of PTT Natural Gas Distribution Company Limited (PTTNGD)<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 5 | - | - |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 5 | - | - |
| 23. UBE Chemicals (Asia) Public Co., Ltd. (UCHA) | • Associate of IRPC<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | - | - | 23 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | - | - | 2 |
| 24. Energy Complex Company Limited (ENCO) | • Major shareholder (PTT) holds 50% of the shares<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | - | 30 | 44 |
| | | Other expenses | 194 | 197 | 196 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | - | 11 | 13 |
| | | Other accounts receivable-related parties | - | - | 44 |
| | | Other accounts payable-related parties | 8 | 4 | 13 |
| 25. IRPC Polyol Company Limited (IRPCP) | • Subsidiary of IRPC<br>• Sales/Purchase transaction of products | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 32 | 33 | 37 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 6 | 10 | 10 |

Baht (Million)

| Company | Relationship As of December 31st, 2017 | Connected Transaction | 2015 (Restated) | 2016 (Restated) | 2017 |
|---|---|---|---|---|---|
| 26. IRPC Public Company Limited (IRPC) | • Major shareholder (PTT) holds 38.51% of the shares<br>• Sales/Purchase transaction of products and services | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 20,968 | 14,239 | 20,162 |
| | | Purchases of goods or services | 14,464 | 9,971 | 14,106 |
| | | Other incomes | 74 | 9 | 16 |
| | | Other expenses | 1 | - | 7 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 1,724 | 1,571 | 1,969 |
| | | Other accounts receivable-related parties | 6 | 5 | 6 |
| | | Trade accounts payable - related parties | 1,036 | 1,435 | 1,311 |
| | | Other accounts payable - related parties | 1 | 1 | 2 |
| 27. PTTEP SP Limited (PTTEP SP) | • Subsidiary of PTTEP<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 1 | - | - |
| 28. PTT International Trading DMCC | • Subsidiary of PTTT<br>• Services transaction | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 1,029 | 321 | 863 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | - | 322 | - |
| 29. TOP Solvent (Vietnam) LLC. (TSV) | • Subsidiary of TOP<br>• Sales/Purchase transaction of products | **Statements of Income Transactions** | | | |
| | | Sales of goods or rendering of services | 27 | 108 | 215 |
| | | **Statements of Financial Position Balances** | | | |
| | | Trade accounts receivable - related parties | 4 | 15 | 23 |

## MEASURE AND PROCEDURE FOR APPROVAL OF CONNECTED TRANSACTION

The Company's Articles of Association stated that a Director can acquire or dispose of PTTGC assets or perform any business transaction involving PTTGC either by himself or herself or on behalf of others only with the approval from the Board of Director. Any Director who personally gains from any acquisition or disposal of PTTGC asset or any transaction of PTTGC is not allowed to vote on that matter. After receiving approval from the Board of Directors, PTTGC can perform any business transaction or acquire or dispose of major assets in line with the announcement of the Stock Exchange of Thailand (SET). This also applies to PTTGC's subsidiaries in the SET announcement concerning connected transaction of listed companies as well as the buying and selling of registered company assets.

## NEED AND JUSTIFICATION OF CONNECTED TRANSACTION

The sales of products by PTTGC to connected companies have been carried out mainly so that they may process its products into their own products for sale at prices corresponding to long-term off-take agreements or spot prices. Prices must prove mutually beneficial and based on market prices without any undue transfer of interests or extraordinary items to both parties. When providing services to connected companies, transactions must cover transportation or storage costs of products. The charges for services are both market-based and benefit-based without any undue transfer of interests or extraordinary items.

For the product and feedstock supply and/or services as well as the volume of products, feedstock or services given by connected companies must meet the needs and business operation of PTTGC. Prices of products trading or services are as agreed by PTTGC and connected companies without any undue transfer of interests or extraordinary items. In addition, PTTGC is required to purchase feedstock from connected companies because the capacity and quality of such feedstock meet its needs. PTTGC also saves on transportation expenses since the feedstock can be transferred safely by PTTGC's pipeline systems from their plants in Map Ta Phut Industrial Estate, Rayong.

## OPINION OF INDEPENDENT DIRECTORS

The Independent Directors agreed with the Board of Directors.

## POLICY AND TREND ON FUTURE CONNECTED TRANSACTION

Future connected transactions between PTTGC and connected companies will be conducted as part of the normal course of business with no special favors and no transfer of benefits. For the pricing policy between PTTGC and connected companies, the price of products or feedstock purchased will be set in agreement and or linked to market prices. In addition, service charges paid to connected companies will also be at arm's length. The price of product sold or purchased between PTTGC and connected companies will, as a rule, be linked to market prices. Disclosure of the Company's connected transaction is to comply with the rules and regulations of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET). The audit standards for connected parties will be as specified by the Federation of Accounting Professions under The Royal Patronage of His Majesty The King.



# SHAREHOLDING STRUCTURE

- List of Top 10 Major Shareholders (registered book closing date on January 30th, 2018)

| No. | Shareholders | Shares | % |
|---|---|---|---|
| 1. | PTT Public Company Limited | 2,204,318,915 | 48.89% |
| 2. | Thai NVDR Company Limited(1) | 603,940,769 | 13.39% |
| 3. | STATE STREET EUROPE LIMITED | 151,961,443 | 3.37% |
| 4. | HMC Polymers Company Limited(2) | 83,427,636 | 1.85% |
| 5. | CHASE NOMINEES LIMITED | 67,235,699 | 1.49% |
| 6. | NORTRUST NOMINEES LTD-CL AC | 58,525,094 | 1.30% |
| 7. | NORTRUST NOMINEES LIMITED-NT0 SEC LENDING THAILAND CL AC | 49,616,777 | 1.10% |
| 8. | Social Security Office | 48,260,951 | 1.07% |
| 9. | Bangkok Synthetics Company Limited | 43,420,625 | 0.96% |
| 10. | SE ASIA (TYPE B) NOMINEES LLC | 42,941,162 | 0.95% |

**Remarks:**

(1) *Shareholders of Thai NDVR Company Limited holding Non-Voting Depository Receipt: NVDR, are ineligible for voting at shareholders' meeting except when exercising their voting on delisting the shares from SET.*

(2) *PTTGC holds 41.44% of HMC Polymers Company Limited*

- In practice the major shareholders with significant influence on the establishment of PTTGC's policy and strategy is PTT Group Shareholders, which in total holds 48.89% in PTTGC.
- Foreign Shareholders As of December 29th, 2017; there are 21 foreign shareholders, holding a combined of 910,936,899 shares (20.43% of paid-up capital).

PTTGC has foreign shareholding limitation as specified in Article 8 of the Article of Association that "PTTGC's shares can be transferred without any restriction, except in the case where the said transfer would result in more than thirty-seven (37) percent of the Company's total paid-up shares being held by foreigners".

# DIVIDEND PAYMENT POLICY

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED

The Board of Directors Meeting No. 1/2011, held on October 19th, 2011, resolved that the dividend payment policy of the Company is to pay dividend at a rate of no less than 30% of net profit after tax and allocation to all reserve funds of the Company. Such dividend payment however is subject to the investment plan, other necessary and appropriate considerations in the future.

## SUBSIDIARIES' DIVIDEND PAYMENT POLICY

The dividend payment policy for PTTGC's subsidiaries shall be considered and proposed by the Board of Directors of each subsidiary for approval at the Annual General Meeting of each subsidiary. The dividend payment of subsidiaries shall be calculated based on the investment plans and other requirements and considerations, such as the adequacy of cash flow of each subsidiary after deducting reserve funds in accordance with the law.

# ORGANIZATION STRUCTURE



# PTTGC BOARD OF DIRECTORS



## Mr. Prasert Bunsumpun

Chairman / Chairman
of Independent Directors
Age 65

**Appointed :**
October 19th, 2011
April 8th, 2014 (1st re-elected)
April 5th, 2017 (2nd re-elected)

### Education / Training

- Honorary Doctoral of Arts (Innovation and Management) Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University
- Honorary Doctoral of Management, Mahasarakham University
- Honorary Doctoral in Management Science, Phetchaburi Rajabhat University
- Honorary Doctoral in Management, National Institute of Development Administration (NIDA)
- Honorary Doctoral in Engineering, Chulalongkorn University
- M.B.A., Utah State University, U.S.A.
- B.Eng. (Civil Engineering), Chulalongkorn University
- Business Revolution and Innovation Network (BRAIN) Class 1, The Federation of Thai Industries (F.T.I.)
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 3, Thailand Energy Academy
- Capital Market Academy Leadership Program, Class 3, Capital Market Academy
- Advanced Certificate Course in Politics and Governance in Democratic System for Executives, Class 6, King Prajadhipok's Institute
- Certificate in Advance Management Program (Class 155), Harvard Business School, U.S.A.
- Diploma, National Defence Course for the Joint State-Private Sector, Class 10, The National Defence College

### Director Training

- Role of the Chairman Program (RCP) Class 28/2012 and Director Accreditation Program (DAP) Class 26/2004, Thai Institute of Directors Association (IOD)

### Board member / Management in Listed Company – The Stock Exchange of Thailand : 5

- Chairman and Chairman of Independent Directors, PTT Global Chemical Public Company Limited
- Chairman, SVI Public Company Limited
- Chairman and Chairman of the Executive Board of Directors, Thoresen Thai Agencies Public Company Limited
- Independent Director / Chairman of the Nomination and Governance Committee / Member of the Leadership Development and Compensation Committee / Member of the Strategic and Organizational Review Committee, Intouch Holdings Public Company Limited
- Independent Director and Chairman of the Executive Committee, Thaicom Public Company Limited

### Board member / Management in Non-Listed Company – The Stock Exchange of Thailand : 1

- Chairman and Non-Executive Chairman, Mermaid Maritime Public Company Limited

### Position in Other Organizations / Institutions : 6

- Member of the National Legislative Assembly of Thailand
- Chairman, Thailand Business Council for Sustainable Development (TBCSD)
- Chairman, Small and Micro Community Enterprise
- Distinguished Member of Chulalongkorn University Council
- Distinguished Member of the Suranaree University of Technology Council Office
- Council President, Dhurakij Pundit University

### Work Experiences (5-years Past Experiences)

- 2013 - 2017 Independent Director / Chairman of the Remuneration Committee and Member of the Enterprise Risk Management Committee, PTT Public Company Limited
- 2003 - 2011 President and Chief Executive Officer / Director and Secretary to the Board of Directors, PTT Public Company Limited
- 2011 - 2015 Independent Director, Krung Thai Bank Public Company Limited
- 2014 - 2015 Chairman of the Board of Executive Directors, Krung Thai Bank Public Company Limited
- 2010 - 2013 Chairman and Chairman of the Executive Board of Directors, IRPC Public Company Limited

**Shareholding :** Spouse 271,142 shares (0.006014%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Somchai Kuvijitsuwan

Independent Director
Chairman of the Audit Committee
Age 66



**Appointed :**
October 19th, 2011
April 2nd, 2012 (1st re-elected)
April 1st, 2015 (2nd re-elected)

**Education / Training**
- LL.B., Ramkhamhaeng University Class 1
- Barrister at Law, Class 27, Institute of Thai Bar Association
- Master of Political Science, National Institute of Development Administration
- PTT Group AC Forum 2016 "Audit Committee : Yesterday Today and Tomorrow" by PTT Public Company Limited
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 2, Thailand Energy Academy
- Capital Market Academy Leadership Program, Class 9, Capital Market Academy
- Provincial Public Prosecutor Program, Class 9/1987

**Director Training**
- Audit Committee Seminar - AC Hot Update, Federation of Accounting Professions under the Royal Patronage of his Majesty the King
- Role of the Chairman Program (RCP) Class 28/2012
  Understanding the Fundamental of Financial Statement (UFS) Class 3/2006
  Director Certification Program (DCP) Class 76/2006 and Director Accreditation Program (DAP) Class 56/2006,
  Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 5
- Independent Director and Chairman of the Audit Committee, PTT Global Chemical Public Company Limited
- Independent Director and Chairman, AQ Estate Public Company Limited
- Independent Director, WP Energy Public Company Limited
- Independent Director and Chairman of the Audit Committee, Thonburi Healthcare Group Public Company Limited
- Independent Director and Director to the Audit Committee, Prima Marine Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 2
- Independent Director and Chairman of the Audit Committee, Eastern Power Group Public Company Limited
- Vice Chairman / Independent Director and Chairman of the Audit Committee, Apple Wealth Holdings Public Company Limited

**Position in Other Organizations / Institutions :** None

**Work Experiences (5-years Past Experiences)**
- 2009 - 2016 Commissioner in the Customs Appeal Committee
- 2009 - 2016 Commissioner / Chairman of the Audit Committee and Chairman of the Board of Appeals Office of the Securities and Exchange Commission, Thailand
- 2013 - 2015 Director-General, Department of Economic Crime Litigation
- 2011 - 2014 Director / Chairman of Corporate Governance and Social Responsibility Committee and Chairman of Risk Management and Internal Control Committee, Provincial Electricity Authority
- 2011 - 2013 Director-General, Department of Public Prosecutor Commission, Office of the Attorney General
- 2001 - 2013 Chairman, Krungthai Laws Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Vasin Teeravechyan

Independent Director
Chairman of the Nomination and Remuneration Committee
Age 69



**Appointed :**
October 19th, 2011
April 2nd, 2012 (1st re-elected)
April 1st, 2015 (2nd re-elected)

**Education / Training**
- M.A. (Law), Chulalongkorn University
- B.A. (Law), Chulalongkorn University
- Barrister at Law, Thailand, 1972
- The National Defence College of Thailand, Class 40

**Director Training**
- Seminar on Directors' Compensation Survey 2016 and "Non-Executive Directors' Compensation - Global Practices and Trends"
  Role of the Nomination and Governance Committee (RNG) Class 5/2013
  Director Certification Program (DCP) Class 155/2012 and Director Accreditation Program (DAP) Class 94/2012,
  Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Independent Director and Chairman of the Nomination and Remuneration Committee, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 8
- Advisor, Ministry of Foreign Affairs
- Chairman (Thailand), Thai - Malaysia Land Boundary Committee
- Member of the Special Committee for the Consideration of Treaties, Ministry of Foreign Affairs
- Vice - Chairman (Thailand), Thai - Laos Land Boundary Committee
- Vice - Chairman (Thailand), Thai - Myanmar Joint Committee on Demarcation for Land Boundary
- Vice - Chairman, Thai - Korean Friendship Association
- Member of the Sub-Committee for Appeal Consideration, Bank for Agriculture and Agricultural Co-Operatives
- Advisor, Mitr Phol Sugar Corp. Ltd.

**Work Experiences (5-years Past Experiences)**
- 2009 - 2016 Special Lecturer on Public and Private International Law, School of Law, Mae Fah Luang University, Chiang Rai
- 2009 - 2014 Vice-Chairman (Thailand), Thai - Cambodia Joint Technical Committee (Delimitation of Sea Boundary)
- 2008 - 2014 Chairman (Thailand), Thai - Myanmar Joint Committee on Demarcation for Land Boundary
  Chairman (Thailand), Senior Officials' Meeting of the Thai-Laos Land Boundary Committee

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Professor Surapon Nitikraipot

Independent Director / Chairman of the Corporate Governance Committee and Director to the Nomination and Remuneration Committee
Age 57



**Appointed :**
September 22nd, 2014
April 1st, 2015 (re-elected)

**Education / Training**
- Honorary Doctoral, Soka University, Japan
- Doctorat en droit (mention très honorable), l'Universitè Robert Schuman de Strasbourg, France
- Diplôme d'ètudes approfondies (D.E.A.) de droit Public, Strasbourg III, France
- Bachelor of Laws (Second Class Honors), Thammasat University
- Barrister at Law, Class of 35th, Institute of Thai Bar Association of Thailand
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 7, Thailand Energy Academy
- Diploma, National Defence Course for the Joint State-Private Sector, Class 23, The National Defence College, 2010
- Capital Market Academy Leadership Program, Class 4, Capital Market Academy
- Certificat, La Dècentralisation et l' Administration Locale, Institut International d' Administration Publique (IIAP), Paris, France

**Director Training**
- Role of the Chairman Program (RCP) Class 25/2011 and Director Certification Program (DCP) Class 102/2008, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Independent Director / Chairman of the Corporate Governance Committee and Director to the Nomination and Remuneration Committee, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 7
- Professor of Public Law, Faculty of Law, Thammasat University
- Member of the Commission on Public Organization Promoting
- Chairman of the Executive Committee, Thammasat University Hospital
- Member of the 8th Committee of Council of State, Office of the Council of State
- Chairman of the Navamindradhiraj University Council
- Vice President, Vidyasirimedhi Institute of Science and Technology (VISTEC)
- Chairman of Kamnoetvidya Science Academy School (KVIS) Council

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - 2014 - 2016 | Chairman, The Krungthep Thanakom Company Limited |
| - 2010 - 2014 | Member of Executive Committee and Chairman of the Audit Committee, Mahidol Wittayanusorn School |
| - 2010 - 2012 | Independent Director and Chairman of the Corporate Governance Committee, PTT Public Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Anon Sirisaengtaksin

Director / Chairman of the Risk Management Committee
Age 65



**Appointed :**
September 22nd, 2014
April 5th, 2016 (re-elected)

**Education / Training**
- Honorary Doctor of Public Administration, Bangkok Thonburi University
- M.B.A., Thammasat University
- B.Sc. (Geology), Chulalongkorn University
- Capital Market Academy Leadership Program, Class 1, Capital Market Academy
- Certificate in Project Investment Appraisal and Management and Certificate in Global Leadership, Harvard University, U.S.A.

**Director Training**
- Director Certification Program (DCP) Class 73/2006 and Director Accreditation Program (DAP) Class 52/2006, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Director and Chairman of the Risk Management Committee, PTT Global Chemical Public Company Limited
- Director and Member of the Corporate Governance and Nomination Committee, Banpu Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 8
- Chairman, PTT Chemical International Private Limited
- Chairman, NatureWorks LLC.
- Chairman, Vencorex Holding
- Chairman, Myriant Corporation
- Chairman, Emery Oleochemicals (M) Sdn. Bhd.
- Chairman, Emery Specialty Chemicals Sdn. Bhd.
- Director / President, PTTGC International (USA) Inc.
- Director, PTTGC International (Netherlands) B.V.

**Position in Other Organizations / Institutions :** 2
- Chairman of Bioeconomy, New S-Curve Committee under the Pracharat PPP Collaboration Project
- Council Committee, King Mongkut's Institute of Technology Ladkrabang Council

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - 2009 - 2017 | Independent Director / Chairman of the Audit Committee and Chairman of the Nomination and Remuneration Committee, Bangkok Commercial Asset Management Public Company Limited |
| - Oct 2014 - Sep 2015 | Member of the National Reform Council |
| - 1st Oct 2013 - 21st Sep 2014 | Advisor, PTT Global Chemical Public Company Limited |
| - 2012 - 2013 | Director and Chief Executive Officer, PTT Global Chemical Public Company Limited |
| - 2008 - 2013 | Senior Executive Vice President - Corporate Strategy and Development, PTT Public Company Limited |
| - 2008 - 2012 | President and Chief Executive Officer, PTT Exploration and Production Public Company Limited |

**Shareholding :** 86,027 shares; Spouse 6,705 shares (0.002057%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Amnuay Preemonwong

Independent Director
Director to the Audit Committee
and Director to the Risk Management
Age 59



**Appointed :**
October 19th, 2011
April 8th, 2014 (1st re-elected)
April 5th, 2017 (2nd re-elected)

**Education / Training**
- M.P.A., National Institute of Development Administration
- L.L.B., Sukhothai Thammathirat Open University
- B.A. in Economics, Ramkhamhaeng University
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 8, Thailand Energy Academy
- The National Defence College of Thailand, Class 51
- Advanced Executive Program, Kellogg School of Management, Northwestern University, U.S.A.

**Director Training**
- Anti-Corruption for Executive Program (ACEP) Class 13/2014
  Audit Committee Program (ACP) Class 38/2012
  Financial Statement for Directors (FSD) Class 11/2011
  Director Certification Program (DCP) Class 80/2006,
  Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Independent Director / Director to the Audit Committee and Director to the Risk Management,
  PTT Global Chemical Public Company Limited
- Chairman, TCJ Asia Public Company

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1
- Director, Bangkok Commercial Asset Management Public Company Limited

**Position in Other Organizations / Institutions :** 2
- Deputy Permanent Secretary of Ministry of Finance
- Director, The State Railway of Thailand

**Work Experiences (5-years Past Experiences)**
- 2014 - 2017 Vice Chairman, Thailand Tobacco Monopoly, Ministry of Finance
- 2015 - 2016 Director, Bangkok Commercial Asset Management Public Company Limited
- 2011 - 2016 Independent Director, Nusasiri Public Company Limited
- 2014 - 2015 Director, Don Muang Tollway Public Company Limited
- 2012 - 2014 Director, Tourism Authority of Thailand
- 2012 - 2014 Committee Member, Government Savings Bank
- 2009 - 2013 Inspector General, Ministry of Finance
- 2012 Chairman, Thailand Tobacco Monopoly
- 2011 - 2012 Chairman, CAT Telecom Public Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders:** None

## Mr. Prasan Chuaphanich

Independent Director
Director to the Audit Committee
Age 65



**Appointed :**
April 5th, 2016

**Education / Training**
- Bachelor of Accounting (Second Class Honor), Chulalongkorn University
- Diploma in Auditing Chulalongkorn Business School, Chulalongkorn University
- Certified Public Accountant (Thailand), Federation of Accounting Professions under the Royal Patronage of His Majesty the King
- Audit Committee Seminar - AC Hot Update, Federation of Accounting Professions under the Royal Patronage of his Majesty the King
- Leading Professional Services Firms, Harvard Business School, Boston, U.S.A.
- Executive Management Program, Ivey School of Business, University of Western Ontario, Canada

**Director Training**
- National Director Conference "Steering Governance in a Changing World" / IOD International Trip 2017 - Attend Singapore IOD Flagship Conference "The Sustainability Imperative" and Visit Awards Winning Companies / Audit Committee Forum "The Audit Committee's Role in Compliance and Ethical Culture Oversight" and Collective Action Against Corruption Conference "Bright Spots : Lighting the way to a corruption free society" Board Matters and Trends (BMT) Class 2/2017, Financial Institution Governance Program (FGP) Class 6 / 2013 and Director Certification Program (DCP) Class 119 / 2009, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 4
- Independent Director and Director to the Audit Committee, PTT Global Chemical Public Company Limited
- Independent Director and Chairman of the Audit Committee, The Siam Commercial Bank Public Company Limited
- Independent Director / Director to the Audit Committee and Chairman of the Nomination and Remuneration Committee, Thai Solar Energy Public Company Limited
- Independent Director / Member of Audit Committee and Member of Sustainable Development Committee, Advanced Info Service Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 9
- Chairman, Thai Institute of Directors Association (IOD)
- Audit Committee Member, Mahidol University Council
- Expert Member of the General Insurance Fund under the Ministry of Finance
- Commission Member (Accounting) and Chairman of the Audit Committee of the Office of Insurance Commission, Thailand
- Commission Member, OIC Advanced Insurance Institute
- Expert Member (Accounting) of the Committee on Dumping and Subsidy, Thailand
- CAC Committee Member, The Private Sector Collective Action Coalition Against Corruption (CAC)
- Member of the Finance and Property Committee, King Mongkut's University of Technology Thonburi
- Commission Member, Public Sectors Audit and Evaluation Commission (PAEC)

**Work Experiences (5-years Past Experiences)**
- 2014 - 2017 President of the Federation of Accounting Professions under the Royal Patronage of His Majesty the King
- 2008 - 2012 Executive Chairman, PricewaterhouseCoopers (Thailand)
- 2008 - 2012 Co- Executive Chairman, PricewaterhouseCoopers Southeast Asia Peninsula Region

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Sarun Rungkasiri

Director
Director to the Nomination and Remuneration Committee
Director to the Risk Management Committee
Age 60



**Appointed :**
October 18th, 2013
April 8th, 2014 (1st re-elected)
April 5th, 2017 (2nd re-elected)
Resigned effective February 1st, 2018

**Education / Training**
- Master of Science in Management, Polytechnic Institute of New York, U.S.A.
- Bachelor of Engineering in Industrial Engineering, Chulalongkorn University
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 5, Thailand Energy Academy
- Top Executive in Industrial Development and Investment, Class 1, Institute of Business and Industrial Development (IBID)
- The Joint State - Private Sector Course, National Defence College, (Class of 23rd)
- NIDA-Wharton Executive Leadership Program 2009, The Wharton School of the University of Pennsylvania, U.S.A.
- Thirty Fourth Oxford Energy Seminar, St. Catherine's College, Oxford University, U.K.

**Director Training**
- Seminar "Briefing on International Anti-Corruption International cases and practices" Finance for Non-Finance Director (FND) Class 19/2005 Director Certification Program (DCP) Class 61/2005 and Company Secretary Program (CSP) Class 8/2004, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Director / Director to the Nomination and Remuneration Committee and Director to the Risk Management Committee, PTT Global Chemical Public Company Limited
- Director / Chairman of the Risk Management Committee and Director to the Nomination and Remuneration Committee, Thai Oil Public Company Limited (Resigned January 1st, 2018)

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 2
- Advisor, PTT Public Company Limited
- President, Chulalongkorn Engineering Alumni

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - 1 Oct 2013 - 2017 | Chief Operating Officer, Downstream Petroleum Business, PTT Public Company Limited |
| - 2016 - 2017 | Chairman, PTT Asahi Chemical Company Limited |
| - 2016 | Club President, PTT Rayong Football Club |
| - 15th Oct 2013 - 1st Apr 2016 | Director / Chairman of the Risk Management Committee and Director to the Nomination and Remuneration Committee, IRPC Public Company Limited |
| - 2014 - 2015 | Chairman, PTT Polymer Marketing Company Limited |
| - 2011 - 2013 | Senior Executive Vice President, Oil Business Unit, PTT Public Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mrs. Watanan Petersik

Independent Director
Age 56



**Appointed :**
September 22nd, 2014
April 5th, 2016 (re-elected)

**Education / Training**
- AB Bryn Mawr College, Pennsylvania, U.S.A.

**Director Training**
- Director Accreditation Program (DAP) English Program Class 83/2010 Thai Institute of Directors Association (IOD)
- Bursatra Sdn. Bhd. : Mandatory Accreditation Programme (MAP) for Directors of Public Listed Companies (March 2010)
- Certificate: Role of Director, Singapore Institute of Directors Course

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Independent Director, PTT Global Chemical Public Company Limited
- Independent Director and Chairperson of Nomination and Remuneration and Corporate Governance Committee, CIMB Thai Bank Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 3
- Independent Director and Non-Executive Director, CIMB Holdings Berhad, Malaysia
- Independent Director and Non-Executive Director, CIMB Group Sdn. Bhd.
- Director, Asia Capital Advisory Pte Ltd.

**Position in Other Organizations / Institutions :** 1
- Director, Lien Centre for Social Innovation Singapore Management University

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - Jan 2016 - Nov 2017 | Director, TPG Star SF Pte Ltd. |
| - Jan 2016 - Nov 2017 | Director, TPG Growth SF Pte Ltd. |
| - Jan 2016 - Nov 2017 | Director, TPG Growth III Asia Internet Holdings Pte Ltd. |
| - Feb 2015 – Nov 2017 | Director, TE Asia Healthcare Advisory Pte Ltd. |
| - Sep 2014 – Nov 2017 | Director, TE Asia Healthcare Partners Pte Ltd. |
| - 2007 - Nov 2017 | Senior Advisor and Consultant, TPG Capital Asia |
| - 2010 - 2016 | Member of Audit Committee, CIMB Thai Bank Public Company Limited. |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Don Wasantapruek

Independent Director
Director to the Corporate Governance Committee
Age 59

**Appointed :**
November 1st, 2015
April 5th, 2016 (re-elected)



**Education / Training**
- Master of Industrial Engineering, University of New South Wales, Sydney, Australia
- Bachelor of Industrial Engineering, University of New South Wales, Sydney, Australia
- Seminar "Incorporation of State Investment Corporation" (July 13th, 2015)
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 6, Thailand Energy Academy
- Thailand's 5th National Conference on Collective Action Against Corruption Tackling Corruption through Public - Private Collaboration (October 16th, 2014)

**Director Training**
- Briefing on International Anti-Corruption... International Cases and Practices / Seminar "Anti-Corruption : Leadership Role of the Board in Driven the Organization toward the Draft of the Development of Corporate Governance and Enterprise Management Act .... And Good Corporate Governance, Director Accreditation Program (DAP) Class 117/2015 / and Role of the Nomination and Governance Committee (RNG) Class 7/2015, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Independent Director and Member of the Corporate Governance Committee, PTT Public Company Limited
- Independent Director and Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** None

**Work Experiences (5-years Past Experiences)**
- 2009 – Present Self-employed

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Colonel Nithi Chungcharoen

Independent Director
Director to the Corporate Governance Committee
Age 46

**Appointed :**
September 22nd, 2014
April 1st, 2015 (re-elected)



**Education / Training**
- Master of Engineering (Mechanical), Stevens Institute of Technology, New Jersey, U.S.A.
- Bachelor of Science, Chulachomklao Royal Military Academy
- Peace Mediation Course
- Peace Keeping Operation Course
- Command and General Staff College, Class 80

**Director Training**
- IOD Talk 2/2017 "Cyber security: Risks, Liabilities, and Best Practices" Driving Company Success with IT Governance (ITG) Class 5/2017 Role of the Nomination and Governance Committee Class 8/2016 and Director Certification Program (DCP) Class 200/2015, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Independent Director and Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 1
- Deputy Defence Attaché, Canberra, Australia

**Work Experiences (5-years Past Experiences)**
- 2014 - 2015 Attached to Directorate of Intelligence
- 2013 - 2014 Deputy Chief of Staff, 11th Army Circle
- 2012 - 2013 Staff Officer Commanding General Office
- 2010 - 2012 Battalion Commander, 3rd Battalion 21st Regiment Queen Guard

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Auttapol Rerkpiboon

Director / Director to the Corporate Governance Committee and Director to the Risk Management Committee
Age 52



**Appointed :**
October 1st, 2015
April 5th, 2017 (re-elected)

**Education / Training**
- Master of Economics Program, National Institute of Development Administration (NIDA)
- Bachelor of Engineering (Civil Engineering), Chulalongkorn University
- The National Defence Course (Class 58), National Defence College
- Executive Development Program (EDP), The Stock Exchange of Thailand
- PTT Executive Leadership, General Electric, GE, New York, U.S.A.
- NIDA-Wharton Executive Leadership Program 2009, The Wharton School of the University of Pennsylvania, U.S.A.
- Capital Market Academy Leadership Program, Class 20, Capital Market Academy
- Advanced Certificate Course in Politics and Governance in Democratic System for Executives, Class 14, King Prajadhipok's Institute
- Diploma of Petroleum Management, College of Petroleum Studies, Oxford, England

**Director Training**
- Director Certification Program (DCP) Class 173/2013, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Chief Operating Officer, Downstream Petroleum Business Group and Acting Senior Executive Vice President, Downstream Business Group Alignment, PTT Public Company Limited
- Director / Director to the Corporate Governance Committee and Director to the Risk Management Committee, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1
- Chairman, PTT Oil and Retail Business Company Limited

**Position in Other Organizations / Institutions :** 1
- Director, Sustainable Energy Foundation

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - Oct 2015 - Sep 2017 | Senior Executive Vice President - Oil Business Unit, PTT Public Company Limited |
| - Nov 2015 - Sep 2017 | Chairman, PTT Retail Business Company Limited |
| - Oct 2014 - Sep 2015 | Senior Executive Vice President, Sustainability Management and Project Engineering, PTT Public Company Limited |
| - Jun 2015 - Oct 2015 | Director, IRPC Public Company Limited |
| - Feb 2015 - May 2015 | Director, Bangchak Petroleum Public Company Limited |
| - Dec 2014 - Nov 2015 | Director, Energy Complex Company Limited |
| - Oct 2013 - Oct 2014 | Director, PTT Retail Management Company Limited |
| - Nov 2001 - Sep 2014 | Executive Vice President, Retail Marketing, PTT Public Company Limited |
| - Aug 2012 - Oct 2014 | Chairman, PTT (Cambodia) Limited |
| - May 2012 - Oct 2014 | Chairman, Subic Bay Energy Company Limited (Philippines) |
| - Jun 2012 - Oct 2013 | Chairman, PTT (LAO) Company Limited |
| - May 2011 - Oct 2013 | Executive Vice President, Commercial & International Marketing, PTT Public Company Limited |

**Shareholding :** Spouse 990 shares (0.000022%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mrs. Boobpha Amornkiatkajorn

Director
Age 59



**Appointed :**
October 1st, 2014
April 1st, 2015 (re-elected)

**Education / Training**
- Master of Business Administration (M.B.A.) Finance (Honor), NIDA
- Bachelor of Science Program in Economics (Honor), Kasetsart University
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 10, Thailand Energy Academy
- Capital Market Academy Leadership Program, Class 21, Capital Market Academy, 2015
- Breakthrough Program for Senior Executives (BPSE) Class 2012, IMD Institute in Switzerland
- Leadership Development Program Class 2009, Institute Center for Creative Leadership, U.S.A.
- Army War College Class 2008, Institute of Army Academics
- Senior Executive Program Class 2003, Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Director Training**
- Director Certification Program (DCP) Class 152/2011, Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 2
- Senior Executive Vice President, International Trading Business Unit, PTT Public Company Limited
- Director, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1
- Director, Tiger Energy Trading Pte. Ltd.

**Position in Other Organizations / Institutions :** 1
- Vice Chairperson Executive Committee, The Institute of Industrial Energy, The Federation of Thai Industries

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - Jun 2011 – Jul 2017 | Director, PTT Polymer Marketing Company Limited |
| - 2014 | Executive Vice President, Trading Operation – International Trading Business Unit, PTT Public Company Limited |
| - 2010 - 2014 | Executive Vice President – Downstream Business Group Alignment, PTT Public Company Limited |
| - 2010 - 2013 | Director, Thaioil Marine Company Limited |

**Shareholding :** 57,700 shares (0.001280%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Praphon Wongtharua

Director
Age 56



**Appointed :**
August 24th, 2015
April 5th, 2017 (re-elected)

**Education / Training**
- Master of Engineering (Mechanical Engineering), Chulalongkorn University
- Bachelor of Engineering (Mechanical Engineering), King Mongkut's University of Technology North Bangkok
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 8, Thailand Energy Academy
- Change Management Leadership Program (The Leadership Grid)
- Senior Executive Program on Visionary Leadership (Class 55), Office of the Civil Service Commission (OCSC)
- Joint Staff College, Class 45
- The National Defence College of Thailand, Class 56

**Director Training**
- Boards that Make a Difference (BMD) Class 4/2017
  Financial Statements for Director (FSD) Class 31/2016
  and Director Certification Program (DCP) Class 218/2016,
  Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Director, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Position in Other Organizations / Institutions :** 1
- Director General, The Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - 2015 - 2016 | Deputy Permanent Secretary, Ministry of Energy |
| - 1st Oct 2014 - 20th Jul 2015 | Inspector - General, Ministry of Energy |
| - Feb 2014 - Sep 2014 | Deputy Director-General, Energy Policy and Planning Office |
| - 2008 - 2014 | Director, Bureau of Biofuel Development, Department of Alternative Energy Development and Efficiency |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Supattanapong Punmeechaow

Director and Secretary to the Board of Directors and Director to the Risk Management Committee
Age 58



**Appointed :**
September 25th, 2014
April 5th, 2016 (re-elected)

**Education / Training**
- M.B.A., Chulalongkorn University
- B. Eng. (Chemical Engineering), Chulalongkorn University
- Capital Market Academy Leadership Program, Class 23, Capital Market Academy
- The Rule of Law and Democracy Course (Class 3), 2015, College Constitution
- Corporate Governance Program for Directors and Executives of State Enterprises and Public Organizations (Class 12), 2014, King Prajadhipok's Institute-State Enterprise Policy Office and Office of the Public Sector Development Commission
- Certificate in Top Executives in the Energy Education Program, Thailand Energy Academy (Class 4)
- Oxford Energy Seminar 2013, United Kingdom
- The National Defence Course (Class 50) and The Joint State-Private Sector Course (Class 20), National Defence College
- Advance Management Program, INSEAD University, France

**Director Training**
- Role of the Chairman Program (RCP) Class 30/2013
  and Director Certification Program (DCP) Class 131/2010,
  Thai Institute of Directors Association (IOD)

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 4
- Senior Executive Vice President, PTT Public Company Limited
- Director and Secretary to the Board of Directors / Director to the Risk Management Committee and President & Chief Executive Officer, PTT Global Chemical Public Company Limited
- Director and Member of the Risk Management Committee, Global Power Synergy Public Company Limited
- Chairman, Global Green Chemicals Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1
- Director, PTT Chemical International Private Limited

**Position in Other Organizations / Institutions :** 9
- Director, Thai Institute of Directors Association (IOD)
- President, Chulalongkorn Engineering Alumni (Feb 2018)
- Member, Council of Trustees, Petroleum Institute of Thailand
- Committee Member, The Federation of Thai Industries
- Committee Member, Thai Listed Companies Association
- Vice President, Thailand Swimming Association
- Honorary Member of Vidyasirimedhi Institute Council
- Member of Kamnoetvidya Science Academy
- Vice President, The Power of Leading Foundation

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - 27th Nov 2014 - 19th Jul 2017 | Vice Chairman, Vinythai Public Company Limited |
| - May 2015 - May 2017 | Chairman of the Community Partnership |
| - 2016 | Director of the Center of Excellence on Environmental Health and Toxicology (EHT), Mahidol University |
| - 10th Aug 2015 - 20th Jan 2016 | Chairman, Thai Fatty Alcohol Company Limited |
| - 2014 - 19th Nov 2015 | Chairman, Sport Services Alliance Limited |
| - 1th Aug 2014 - 31th Dec 2014 | Director, Islamic Bank of Thailand |
| - 1th Apr 2012 - 30st Sep 2014 | Senior Executive Vice President, Corporate Strategy, PTT Public Company Limited |
| - 30th Oct 2013 - 25th Sep 2014 | Director and Director of the Nomination and Remuneration Committee, Bangchak Petroleum Public Company Limited |
| - 27th May 2011 - 19th Sep 2014 | Director, Sakari Resources Limited |

**Shareholding :** 60,000 shares (0.001331%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

# PTTGC EXECUTIVES




1 **Mr. Supattanapong Punmeechaow**
President & Chief Executive Officer

2 **Mr. Narongsak Jivakanun**
Executive Vice President - Corporate Strategy

3 **Mr. Toasaporn Boonyapipat**
Executive Vice President - International Business Operations

4 **Mr. Siridech Kumvongdee**
Executive Vice President - Organizational Effectiveness

5 **Mr. Saroj Putthammawong**
Senior Vice President - Marketing, Commercial and Supply

6 **Miss Duangkamol Settanung**
Executive Vice President - Finance & Accounting

7 **Mr. Chaya Chandavasu**
Senior Vice President - Science and Innovation

8 **Mrs. Warawan Tippawanich**
Senior Vice President – Corporate Affairs

9 **Mr. Amorn Putiphrawan**
Senior Vice President - Internal Audit

10 **Mr. Kongkrapan Intarajang**
Chief Operating Officer - Upstream Petrochemical Business

11 **Mr. Anutin Chuaypen**
Senior Vice President - Group Performance Center - Refinery and Shared Facilities

12 **Mr. Pukpong Wungrattanasopon**
Senior Vice President - Group Performance Center - Aromatics

13 **Mr. Boonchai Chunhawiksit**
Senior Vice President - Group Performance Center - Olefins

14 **Mr. Pirun Krimwongrut**
Senior Vice President - Group Performance Center – Utilities




15 **Mr. Patiparn Sukorndhaman**
Chief Operating Officer -
Downstream Petrochemical Business

16 **Mr. Wiboon Chuchepchunkamon**
Senior Vice President -
Polymers Business Unit

17 **Mr. Pornsak Mongkoltrirat**
Senior Vice President -
EO-Based Performance
Business Unit

18 **Mr. Jirawat Nooritanon**
Senior Vice President -
Green Chemicals Business Unit

19 **Mr. Kumpol Chaikitkosi**
Senior Vice President -
Phenol Business Unit

20 **Mrs. Chananchida Wiboonkanarak**
Acting Senior Vice President -
Downstream Strategy
and Business Development

21 **Mr. Varit Namwong**
Chief Operating Officer -
Center of Excellence /
Acting Executive Vice President -
External Affairs

22 **Mr. Wirat Boonbumrungchai**
Senior Vice President -
Quality, Safety, Occupational Health
and Environment

23 **Mrs. Chatsuda Kanjanarat**
Senior Vice President -
Transformation Excellence

24 **Mr. Khomson Piyawattanaviroj**
Senior Vice President -
CAPEX Excellence

25 **Mrs. Jeeranee Pimthanothai**
Senior Vice President -
Technical, Engineering and Maintenance

# PTTGC EXECUTIVES

## Mr. Supattanapong Punmeechaow

President & Chief Executive Officer

Age 58

**Appointed :** October 1st, 2014

**Education / Training**

- M.B.A., Chulalongkorn University
- B. Eng. (Chemical Engineering), Chulalongkorn University
- Capital Market Academy Leadership Program, Class 23, Capital Market Academy
- The Rule of Law and Democracy Course (Class 3), 2015, College Constitution
- Corporate Governance Program for Directors and Executives of State Enterprises and Public Organizations (Class 12), 2014, King Prajadhipok's Institute-State Enterprise Policy Office and Office of the Public Sector Development Commission
- Certificate in Top Executives in the Energy Education Program, Thailand Energy Academy (Class 4)
- Oxford Energy Seminar 2013, United Kingdom
- Role of the Chairman Program (RCP) Class 30/2013 and Director Certification Program (DCP) Class 131/2010, Thai Institute of Directors Association (IOD)
- The National Defence Course (Class 50) and The Joint State-Private Sector Course (Class 20), National Defence College
- Advance Management Program, INSEAD University, France

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 4

- Senior Executive Vice President, PTT Public Company Limited
- Director and Secretary to the Board of Directors / Director to the Risk Management Committee and President & Chief Executive Officer, PTT Global Chemical Public Company Limited
- Director and Member of the Risk Management Committee, Global Power Synergy Public Company Limited
- Chairman, Global Green Chemicals Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director, PTT Chemical International Private Limited

**Position in Other Organizations / Institutions:** 9

- Director, Thai Institute of Directors Association (IOD)
- President, Chulalongkorn Engineering Alumni (Feb 2018)
- Member, Council of Trustees, Petroleum Institute of Thailand
- Committee Member, The Federation of Thai Industries
- Committee Member, Thai Listed Companies Association
- Vice President, Thailand Swimming Association
- Honorary Member of Vidyasirimedhi Institute Council
- Member of Kamnoetvidya Science Academy
- Vice President, The Power of Leading Foundation

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 27th Nov 2014 - 19th Jul 2017 | Vice Chairman, Vinythai Public Company Limited |
| - May 2015 - May 2017 | Chairman of the Community Partnership |
| - 2016 | Director of the Center of Excellence on Environmental Health and Toxicology (EHT), Mahidol University |
| - 10th Aug 2015 - 20th Jan 2016 | Chairman, Thai Fatty Alcohol Company Limited |
| - 2014 - 19th Nov 2015 | Chairman, Sport Services Alliance Limited |
| - 1st Aug. 2014 - 31st Dec 2014 | Director, Islamic Bank of Thailand |
| - 1st Apr. 2012 - 30th Sep 2014 | Senior Executive Vice President, Corporate Strategy, PTT Public Company Limited |
| - 30th Oct 2013 - 25th Sep 2014 | Director and Director of the Nomination and Remuneration Committee, Bangchak Petroleum Public Company Limited |
| - 27th May 2011 - 19th Sep 2014 | Director, Sakari Resources Limited |

**Shareholding :** 60,000 shares (0.001331%) as of December 31st, 2017

**Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Kongkrapan Intarajang

Chief Operating Officer – Upstream Petrochemical Business

Age 50

**Appointed :** April 1st, 2017

**Education / Training**

- Ph.D. Chemical Engineering, University of Houston, U.S.A.
- Bachelor of Engineering (Chemical Engineering) (2nd Class Honor), Chulalongkorn University
- Director Certification Program (DCP) Class 119/2009 and Role of the Chairman Program (RCP) Class 21/2009, Thai Institute of Directors Association (IOD)
- Breakthrough Program for Senior Executives, IMD Business School

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 2

- Chief Operation Officer – Upstream Petrochemical Business, PTT Global Chemical Public Company Limited
- Director, Global Power Synergy Public Company Limited

**Board Member / Management Non Listed Company – The Stock Exchange of Thailand :** 11

- Director, Thai Tank Terminal Ltd.
- Director, PTT Chemical International Private Limited
- Director, Emery Oleochemicals (M) Sdn. Bhd.
- Director, Emery Specialty Chemicals Sdn. Bhd.
- Director / Vice President, PTTGC International (USA) Inc.
- Director, NatureWorks LLC.
- Director, Vencorex Holding
- Director, PTTGC International (Netherlands) B.V.
- Director/ President & CEO, PTTGC America Corporation
- Chairman, PTTGC America LLC.
- Director, Myriant Corporation

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 1st Oct 2014 – 31st Mar 2017 | Executive Vice President – International Business Operations, PTT Global Chemical Public Company Limited |
| - 2012 - 2014 | Executive Vice President reporting to Chief Executive Officer, PTT Global Chemical Public Company Limited – appointed as Chief Executive Officer of Emery Oleochemicals (M) Sdn. Bhd. |
| - 2011 - 2012 | Senior Vice President, PTT Global Chemical Public Company Limited – appointed as Chief Executive Officer of Emery Oleochemicals (M) Sdn. Bhd. |

**Shareholding :** None

**Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Patiparn Sukorndhaman

Chief Operating Officer – Downstream Petrochemical Business

Age 56

**Appointed :** January 1st, 2016

**Education / Training**

- M.B.A. (Finance), The American University, U.S.A.
- B.A. Political Science (Public Administration - Public Finance), 2nd Class Honors, Chulalongkorn University
- Diploma, The National Defence Course (Class 59), Thailand National Defence College
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 7, Thailand Energy Academy, 2015
- Certification Program for "Leadership Development Program III (LDP III)", PTT Leadership and Learning Institute, 2014
- Certification Program for "Breakthrough Program for Senior Executives", IMD Executive Development Services, Switzerland, 2014
- Certificate Program for GE : PTT Executive Program, GE U.S.A., 2012
- Certification Program for Senior Management 5 (Ex - PSM 5), Fiscal Policy Research Institute Foundation
- Director Certification Program (DCP) Class 73/2006, Thai Institute of Directors Association (IOD)
- Graduate Diploma in Public Law and Management (PLM 8), King Prajadhipok's Institute

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 2

- Chief Operating Officer - Downstream Petrochemical Business, PTT Global Chemical Public Company Limited
- Director and Member of Nomination and Remuneration Committee, Global Green Chemicals Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 9

- Chairman, TOC Glycol Company Limited
- Chairman, Thai Styrenics Company Limited
- Chairman, Solution Creation Company Limited
- Chairman, GC Oxirane Company Limited
- Chairman, GC Polyols Company Limited
- Chairman, PTT Polymer Marketing Company Limited
- Vice Chairman, HMC Polymers Company Limited
- Director, PTT Phenol Company Limited
- Director, PTT Asahi Chemical Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2015 - 2017 | Director and Member of Nomination and Remuneration Committee, Global Power Synergy Public Limited |
| - Sep 2012 - 2015 | Director, PTT Chemical International Private Limited |
| - Oct 2009 - 20th Jan 2016 | Director, Thai Fatty Alcohol Company Limited |
| - 19th Oct 2011 - 31st Dec 2015 | Executive Vice President – Finance & Accounting, PTT Global Chemical Public Company Limited |
| - 2011 - 31st Jan 2015 | Director, PTT ICT Solutions Company Limited |
| - 2009 - 2014 | Director, Bio Creation Company Limited |
| - 2009 - 2012 | Director, PTT Polyethylene Company Limited |
| - 2009 - 2012 | Director, Thai Ethanolamines Company Limited |

**Shareholding :** None

**Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Varit Namwong

Chief Operating Officer – Center of Excellence

Age 54

**Appointed :** October 1st, 2016

**Education / Training**

- Master of Business Administration, Business Administration (International Program), Ramkhamhaeng University
- Bachelor of Business Administration, Marketing, Assumption Business Administration College
- Certificate of Advanced Human Resource Executive Program, The Stephen M. Ross School of Business, University of Michigan, 2014
- Certificate of Leadership Development Program III (LDPIII), PTT Leadership and Learning Institute, 2014
- Director Certification Program (DCP) Class 160/2012 and Director Accreditation Program (DAP) Class 91/2011, Thai Institute of Directors Association (IOD)
- Certificate of Senior Executive Program (SEP), Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Board member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Chief Operating Officer - Center of Excellence, PTT Global Chemical Public Company Limited

**Board member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 7

- Chairman, NPC Safety and Environmental Service Company Limited
- Chairman, PTT Maintenance and Engineering Company Limited
- Director, HMC Polymers Company Limited
- Director, PTT Energy Solutions Company Limited
- Director, Sport Services Alliance Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC.

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 19th Oct 2011- 30th Aug 2016 | Executive Vice President – Organizational Effectiveness, PTT Global Chemical Public Company Limited |
| - 2014 - 2016 | Director, Vencorex Holding |
| - 2011 - 2016 | Director, Eastern Fluid Transport Company Limited |
| - 2011 - 2016 | Director, PTT ICT Solutions Company Limited |
| - 2011 - 2016 | Director, Solution Creation Company Limited |
| - 2016 | Director, TOC Glycol Company Limited |
| - 2014 | Director, Myriant Corporation |
| - 2011 - 2014 | Director, Thai Styrenics Company Limited |

**Shareholding :** 108,939 shares (0.002416%) as of December 31st, 2017

**Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Miss Duangkamol Settanung

Executive Vice President – Finance and Accounting

Age 58

**Appointed :** November 1st, 2015

**Education / Training**

- Master of Business Administration, Thammasat University
- Bachelor of Science in Statistics (1st Class Honors), Kasetsart University
- Capital Market Academy, Class 26
- Director Certification Program (DCP) Class 155/2012, Thai Institute of Directors Association (IOD)
- PTT Leadership Development Program III
- PTT Executive Program, GE Crontonville, U.S.A.

**Board member / Management in Listed Company-The Stock Exchange of Thailand :** 3

- Executive Vice President, PTT Public Company Limited
- Executive Vice President, Finance and Accounting, PTT Global Chemical Public Company Limited
- Director, Vinythai Public Company Limited

**Board member / Management in Non-Listed Company-The Stock Exchange of Thailand :** 9

- Director, PTT Phenol Company Limited
- Director, GC Oxirane Company Limited
- Director, GC Polyols Company Limited
- Director, GC Treasury Center Company Limited
- Director, PTT Chemical International Private Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC.
- Director, Emery Oleochemicals (M) Sdn. Bhd.
- Director, Emery Specialty Chemicals Sdn. Bhd.

**Work Experiences (5-years Past Experiences)**

| | |
|---|---|
| - Oct 2011 – Nov 2015 | Senior Executive Vice President, Corporate Accounting & Finance, IRPC Public Company Limited |
| - Nov 2014 – Jun 2015 | Director, PTT Polymer Marketing Company Limited |
| - Jun 2013 – Nov 2015 | Director, IRPC Clean Power Company Limited |
| - Feb 2015 – Nov 2015 | Director, IRPC-PCC Company Limited |
| - Dec 2012 – Dec 2015 | Director, UBE Chemical (ASIA) Public Company Limited |
| - Feb 2012 – Nov 2015 | Director, IRPC Energy Company Limited |
| - Dec 2011 – Nov 2015 | Director, IRPC A&L Company Limited |
| - Nov 2011 – Nov 2015 | Director, Thai ABS Company Limited |
| - Nov 2011 – Nov 2015 | Director, IRPC Oil Company Limited |
| - Nov 2011 – Nov 2015 | Director, IRPC Polyol Company Limited |

**Shareholding:** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Narongsak Jivakanun

Executive Vice President – Corporate Strategy

Age 48

**Appointed :** January 1st, 2017

**Education / Training**

- Master of Science (Chemical Engineering), Oregon State University, Oregon, U.S.A.
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- Certificate, Executive Program on Energy Literacy for a Sustainable Future (TEA), Class 8, Thailand Energy Academy
- TLCA Leadership Development Program (LDP), Class 1, 2013, Thai Listed Companies Association (TLCA) and International Institute for Management Development (IMD)
- Director Certification Program (DCP) Class 165/2012, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 3

- Executive Vice President - Corporate Strategy, PTT Global Chemical Public Company Limited
- Vice Chairman and Director to the Nomination and Remuneration Committee, Vinythai Public Company Limited
- Director and Member of the Risk Management Committee, Global Green Chemicals Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 5

- Director, PTT Phenol Company Limited
- Director, GC Polyols Company Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC.
- Director, Soem Kit Textile Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2017 - 2018 | Chairman, PTT MCC Biochem Company Limited |
| - 25th Nov 2016 – 26th Jul 2017 | Director, PTT Digital Solutions Company Limited |
| - 1st Feb 2016 – 31st Dec 2016 | Senior Vice President – Corporate Strategy, PTT Global Chemical Public Company Limited |
| - 1st Feb 2016 – 28th Feb 2017 | Director, PTT Chemical International Private Limited |
| - 1st Feb 2016 – 28th Feb 2017 | Director, PTT Chemical International (Asia Pacific ROH) Company Limited |
| - 2nd Apr 2015 – 16th Nov 2016 | Director, Emery Oleochemicals (M) Sdn. Bhd.<br>Director, Emery Specialty Chemicals Sdn. Bhd. |
| - 1st Oct 2014 – 31st Jan 2016 | Senior Vice President – International Strategy and Business Development reporting to Executive Vice President – International Business Operations, PTT Global Chemical Public Company Limited |
| - 22nd May 2012 – 26th Jan 2015 | Director, Vencorex Holding SAS |
| - 15th Dec 2011 – 30th Jan 2015 | Director, PTTGC International (Netherlands) B.V. |
| - 3rd Mar 2011 – 23rd Oct 2014 | Director, Bio Creation Company Limited |
| - 13rd Jan 2011 – 14th Jul 2017 | Director and Director to the Nomination and Remuneration Committee, Myriant Corporation |
| 10th Nov 2010-11th Apr 2016 | Director, Bio Spectrum Company Limited |
| - 1st Jan 2010 – 31st Jan 2016 | Chief Executive Officer – PTT Chemical International Private Limited<br>Chief Executive Officer – PTT Chemical International (Asia Pacific ROH) Company Limited |

**Shareholding:** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Toasaporn Boonyapipat

Executive Vice President – International Business Operations
Age 52

**Appointed :** April 1st, 2017

**Education / Training**

- Master of Business Administration, Burapha University
- Bachelor of Mechanical Engineering (2nd Class Honors), Chiang Mai University
- Director Certification Program (DCP) Class 197/2014, Thai Institute of Directors Association (IOD)
- ASEAN Executive Program (AEP), GE Crotonville, U.S.A.

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Executive Vice President - International Business Operations, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 7

- Director and Chief Executive Officer, PTT Chemical International Private Limited
- Director and Chief Executive Officer, PTT America LLC.
- Director, PTTGC International (Netherlands) B.V.
- Director, Vencorex Holding
- Director, Emery Oleochemicals (M) Sdn. Bhd
- Director, Emery Specialty Chemicals Sdn. Bhd.
- Director, PTTGC America Corporation

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2014 - 2017 | Senior Vice President reporting to Executive Vice President - International Business Operations, Secondment to PTTGC America LLC., PTT Global Chemical Public Company Limited |
| - 2013 - 2014 | Senior Vice President – High-Volume Specialties Business Unit, PTT Global Chemical Public Company Limited |
| - 2011 - 2012 | Vice President – Growth Project Management PTT Global Chemical Public Company Limited |

**Shareholding:** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Siridech Kumvongdee

Executive Vice President – Organizational Effectiveness
Age 52

**Appointed :** January 1st, 2017

**Education / Training**

- Master of Science (Chemical Engineering), Washington University, U.S.A.
- Bachelor of Science (Chemistry), Ramkamhaeng University
- Board Matters and Trends (BMT) Class 2/2017 and Director Certification Program (DCP) Class 209/2015, Thai Institute of Directors Association (IOD)
- Leadership Development Program (LDP III) for Senior Executive Vice President Pool of PTT Group, PTT Leadership and Learning Institute
- Certificate of Senior Executive Program (SEP), SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Executive Vice President - Organizational Effectiveness, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 4

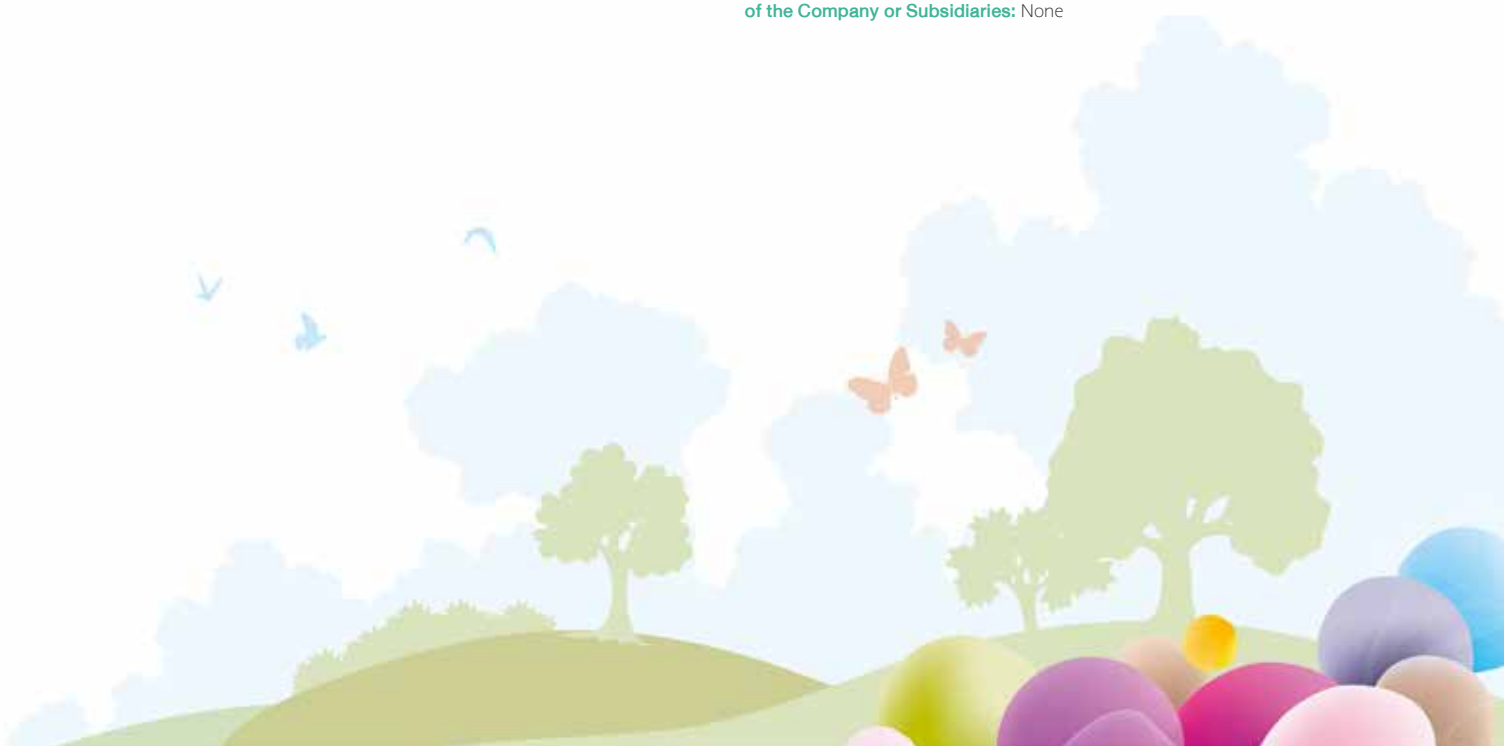
- Director, Vencorex Holding
- Director, PTT Digital Solution Company Limited
- Director, Thai Styrenics Company Limited
- Director, Solution Creation Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2016 | Senior Vice President – Human Resources, PTT Global Chemical Public Company Limited |
| - 2015 | Senior Vice President – Acting Head of Science and Innovation, PTT Global Chemical Public Company Limited |
| - 2013 - 2014 | Executive Vice President, PTT Phenol Company Limited |
| - 2011 - 2012 | Senior Vice President – Supply Chain Management, PTT Global Chemical Public Company Limited |

**Shareholding:** 91 shares; Spouse 11,515 shares (0.000257%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None



## Mr. Wiboon Chuchepchunkamon

Senior Vice President – Polymers Business Unit

Age 55

**Appointed :** January 1st, 2018

**Education / Training**

- Master of Management, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Master of Science, Petroleum and Petrochemical, The Petroleum and Petrochemical College, Chulalongkorn University
- Bachelor of Engineering, Electrical Engineering, Chulalongkorn University
- Director Certification Program (DCP) Class 219/ 2016, Thai Institute of Directors Association (IOD)
- PTT HBS Leadership Management Development Program II
- Stanford - NUS Executive Program in International Management, the Republic of Singapore

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President – Polymers Business Unit, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 3

- Chairman, PTT Polymer Logistics Company Limited
- Director, PTT Polymer Marketing Company Limited
- Director, Thai Stryrenics Company Limited

**Working Experiences (5-years Past Experience)**

| | |
|---|---|
| - 16th Jul – 31st Dec 2017 | Senior Vice President - Downstream Petrochemical Business, PTT Global Chemical Public Company Limited |
| - 22nd Jan 2016 – 15th Jul 2017 | Director/ Managing Director, TOC Glycol Company Limited<br>Senior Vice President - EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited) |
| - 2013 – 2015 | Vice President - Production - Olefins 1, PTT Global Chemical Public Company Limited |
| - 2011 - 2013 | Vice President - Production - LLDPE I<br>Project Director, LLDPE Plastic Pallet Plant<br>PTT Global Chemical Public Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Anutin Chuaypen

Senior Vice President – Group Performance Center – Refinery and Shared Facilities

Age 51

**Appointed :** January 1st, 2014

**Education / Training**

- Master of Science in Computer & Engineering Management, Assumption University
- Bachelor of Science in Chemical Engineering, Chulalongkorn University
- PTT HBS Leadership Management Development Program II
- Director Certification Program (DCP) Class 200/2015, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Group Performance Center – Refinery and Shared Facilities, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 3

- Director, PTT Maintenance and Engineering Company Limited
- Director, Thai Tank Terminal Limited
- Director, Eastern Fluid Transport Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2011 - 2013 | Vice President - Refinery and Shared Facilities & Aromatics Maintenance, PTT Global Chemical Public Company Limited |

**Shareholding :** 36,591 shares (0.000812%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Pukpong Wungrattanasopon

Senior Vice President – Group Performance Center - Aromatics

Age : 47

**Appointed :** August 1st, 2016

**Education / Training**

- Master of Science (Petrochemical Technology), The Petroleum and Petrochemical College, Chulalongkorn University
- Bachelor of Science, Chemical Technology, Chulalongkorn University
- Director Certification Program (DCP) Class 236/2017, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Group Performance Center – Aromatics, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director, PTT Phenol Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 19th Oct 2011 – 31st Jul 2016 | Vice President, Technology, PTT Global Chemical Public Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Boonchai Chunhawiksit

Senior Vice President – Group Performance Center – Olefins

Age 57

**Appointed :** January 1st, 2017

**Education / Training**

- Master of Business Administration, Thammasat University
- Bachelor's Degree in Electrical Engineering, King Mongkut's Institute of Technology (North Bangkok)
- Director Certification Program (DCP) Class 244/2017, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Group Performance Center - Olefins, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 3

- Director, TOC Glycol Company Limited
- Director, Thai Tank Terminal Limited
- Director, HMC Polymers Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2016 | Vice President - Group Performance Center Olefins, PTT Global Chemical Public Company Limited |
| - 1st Oct 2015 - 30th Sep 2016 | Vice President - Olefins Plant II, PTT Global Chemical Public Company Limited |
| - 2015 | Vice President - GPC Strategy & Business Development PTT Global Chemical Public Company Limited |
| - 2013 - 2014 | Vice President - Project Manager, PTT Global Chemical Public Company Limited |
| - 2011 - 2012 | Vice President, Growth Project Management, PTT Global Chemical Public Company Limited |

**Shareholding :** 38,000 shares (0.000843 %) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Pornsak Mongkoltrirat

Senior Vice President – EO-Based Performance Business Unit

Age 51

**Appointed :** January 1st, 2018

**Education / Training**

- Master Degree, Faculty of Business Administration, Kasetsart University
- Bachelor Degree, Faculty of Mechanical Engineering, Kasetsart University

**Board Member/ Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President – EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited

**Board Member/ Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director & Managing Director, TOC Glycol Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - Jul. – Dec. 2017 | Acting Senior Vice President - EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited |
| - Nov 2014 – Jun 2017 | Acting Vice President - Strategy and Business Development, Polymer Business Unit, PTT Global Chemical Public Company Limited |
| - Jan – Jun 2014 | Acting Division Manager – Plant Asset LDPE Plant I, PTT Global Chemical Public Company Limited |
| - Jun – Jul 2013 | Vice President - LLDPE Plant I, Polymer Business Unit, PTT Chemical Public Company Limited |
| - Feb 2013 – Jun 2017 | Vice President - LDPE Plant I, Polymer Business Unit, PTT Global Chemical Public Company Limited |
| - Jul 2011 – Feb 2013 | Division Manager, Plant Operation LDPE Plant I, Polymer Business Unit, PTT Chemical Public Company Limited |

**Shareholding :** 6,258 shares (0.000138%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Jirawat Nooritanon

Senior Vice President – Green Chemicals Business Unit

Age 50

**Appointed :** October 1st, 2015

**Education / Training**

- Master of Engineering Program in Energy Technology, The Asian Institute of Technology (AIT)
- Master of Business Administration (MBA), Thammasat University
- Bachelor of Engineering in Chemical Engineering, Chulalongkorn University
- Director Accreditation Program (DAP) Class 124/2016 and Director Certification Program (DCP) Class 221/2016, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 2

- Senior Vice President - Green Chemicals Business Unit, PTT Global Chemical Public Company Limited
- Director/ Member of Risk Committee / Managing Director and Secretary to the Board of Directors, Global Green Chemicals Public Company Limited

**Board Member/ Management in Non-Listed Company – The Stock Exchange of Thailand :** 3

- Chairman, PTT MCC Biochem Company Limited
- Chairman, Thai Fatty Alcohols Company Limited
- Director, Thai Ethoxylate Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 2012 - 2016 | Director / Managing Director, Thai Fatty Alcohols Company Limited |
| - 2012 - 2016 | Director, Thai Oleochemicals CompanyLimited |
| - 2012 - 2015 | Vice President, Sales & Marketing - Oleochemicals, PTT Global Chemical Public Company Limited |
| - 2012 - 2015 | Managing Director, Thai Oleochemicals Company Limited |
| - 2010 – 2015 | Vice President , Marketing Commercial and Planning, Thai Oleochemicals Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries:** None

## Mr. Kumpol Chaikitkosi

Senior Vice President - Phenol Business Unit

Age 57

**Appointed :** October 1st, 2015

**Education / Training**

- B.Eng. (Chemical Engineering), Chulalongkorn University
- Director Certification Program (DCP) Class 219/2016, Thai Institute of Directors Association (IOD)
- Executive Development Program, TLCA
- Program for Executive Development, IMD, Switzerland

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Phenol Business Unit, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director / Managing Director, PTT Phenol Company Limited

**Work Experience (5-years Past Experience)**

- 2006 - 2015 Executive Vice President – Operation, PTT Phenol Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mrs. Warawan Tippawanich

Senior Vice President - Corporate Affairs and Corporate Secretary

Age 54

**Appointed :** January 1st, 2015

**Education / Training**

- Master of Business Administration, Chulalongkorn University
- B.Sc. In Chemical Engineering, Chulalongkorn University
- Board Matters and Trends (BMT) Class 2/2017
  Director Certification Program (DCP) Class 190/2014
  Company Secretary Program (CSP) Class 57/2014
  Board Reporting Program (BRP) Class 15/2014
  Company Reporting Program (CRP) 10/2014,
  Thai Institute of Directors Association (IOD)
- PTT HBS Leadership Management Development Program II

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President – Corporate Affairs and Corporate Secretary, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 2

- Director, TOC Glycol Company Limited
- Director, Sarn Palung Social Enterprise Company Limited

**Work Experience (5-years Past Experience)**

- Jan – Dec 2014 Vice President – Corporate Governance and Corporate Secretary, PTT Global Chemical Public Company Limited
- Oct 2011 – Dec 2013 Vice President – Strategy and Planning, PTT Global Chemical Public Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Chaya Chandavasu

Senior Vice President - Science and Innovation

Age 44

**Appointed :** November 1st, 2015

**Education / Training**

- Ph.D. in Chemical Engineering, New Jersey Institute of Technology, U.S.A.
- M.S. in Chemical Engineering, New Jersey Institute of Technology, U.S.A.
- B.Sc. in Chemistry (First Class Honors), Mahidol University
- Director Certification Program (DCP) Class 152/2011, Thai Institute of Directors Association (IOD)
- Advanced Senior Executive Program, Sasin & Kellogg School of Management, 2008

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Science and Innovation, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 3

- Chairman, Auria Bio Chemicals Company Limited
- Director, Solution Creation Company Limited
- Director, Myriant Corporation

**Work Experience (5-years Past Experience)**

- 2014 - 2015 Vice President – Innovation Strategy & Management PTT Global Chemical Public Company Limited
- 2013 - 2014 Vice President – Strategy Initiatives – International Business PTT Chemical International (Asia Pacific ROH) Limited
- 2011 - 2013 Vice President – Innovation & Technology, PTT Global Chemical Public Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Saroj Putthammawong

Senior Vice President - Marketing, Commercial and Supply
Age 49

**Appointed :** October 1st, 2015

**Education / Training**
- Master of Business Administration, Thammasat University
- Bachelor of Engineering in Chemical Engineering, Chulalongkorn University
- Director Certification Program (DCP) Class 220/2016, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Senior Vice President - Marketing, Commercial and Supply PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 5
- Director, TOC Glycol Company Limited
- Director, Solution Creation Limited
- Director, Thai Tank Terminal Limited
- Director, GC Oxirane Company Limited
- Director, PTT Polymer Logistics Company Limited

**Work Experience (5-years Past Experience)**
- 1st Jul - 30th Sep 2015 Vice President – Marketing Strategy, PTT Global Chemical Public Company Limited
- 1st Feb 2013 - 30th Jun 2015 Vice President – Supply Sourcing, PTT Global Chemical Public Company Limited
- 19th Oct 2011 - 31st Jan 2013 Vice President – Commercial, PTT Global Chemical Public Company Limited

**Shareholding :** None

**elation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Wirat Boonbumrungchai

Senior Vice President - Quality, Safety, Occupational Health and Environment
Age 56

**Appointed :** January 1st, 2017

**Education / Training**
- Master of Engineering, Chulalongkorn University
- Bachelor of Engineering, Chulalongkorn University
- Director Certification Program (DCP) Class 177/2013, Thai Institute of Directors Association (IOD)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Senior Vice President – Quality, Safety, Occupational Health and Environment, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1
- Director, NPC Safety and Environmental Service Company Limited

**Work Experience (5-years Past Experience)**
- 2013 - 2016 Senior Vice President, PTT Global Chemical Public Company Limited Secondment as Managing Director, PTT Maintenance and Engineering Company Limited
- 2011 - 2013 Expert, PTT Global Chemical Public Company Limited Secondment as Senior Vice President, PTT Maintenance and Engineering Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mrs. Jeeranee Pimthanothai

Senior Vice President - Technical Engineering and Maintenance
Age 53

**Appointed :** September 1st, 2015

**Education / Training**
- Master of Engineering in Petrochemical Technology, Chulalongkorn University
- Bachelor of Science in Chemical Engineering, Chulalongkorn University
- Director Certification Program (DCP) Class 249/2017, Thai Institute of Directors Association (IOD)
- Certificate of Corporate Governance : The Role of Manager in Supporting Directors, Thai Institute of Directors Association (IOD)
- PTT Group Leadership Development Program
- Leadership Innovation and Strategy , GE Crotonville
- Certificate of NIDA-Wharton Executive Leadership Program, U.S.A
- Certificate of the Columbia Senior Executive Program, U.S.A

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1
- Senior Vice President - Technical Engineering and Maintenance, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 2
- Director, PTT Maintenance and Engineering Company Limited
- Director, PTT Asahi Chemical Company Limited

**Work Experience (5-years Past Experience)**
- Jan – Aug 2015 Vice President – Petrochemicals Subsidiary Planning & Management Department, PTT Public Company Limited
- 2014 Vice President – Refining Subsidiary Planning & Management Department and Acting in Vice President – Petrochemicals Subsidiary Planning & Management Department and Project Director of PTT Group Operational Excellence Management System Transformation Project, PTT Public Company Limited
- Mar 2012 - Dec 2013 Vice President – Refining Subsidiary Planning & Management Department and Project Director of PTT Group Operational Excellence Management System Transformation Project, PTT Public CompanyLimited
- Mar 2011 - Feb 2012 Vice President – Refining Subsidiary Planning & Management Department, PTT Public Company Limited

**Shareholding :** 15,543 shares (0.000344%) as of December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Khomson Piyawattanaviroj

Senior Vice President – CAPEX Excellence

Age 55

**Appointed :** January 1st, 2018

**Education / Training**

- Bachelor of Engineering, Chulalongkorn University

**Board Member/ Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President – CAPEX Excellence, PTT Global Chemical Public Company Limited

**Board Member/ Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director, NPC Safety and Environmental Service Company Limited

**Work Experience (5-years Past Experience)**

- Jan 2017 – Dec 2017 Vice President – Center of Excellence, PTT Global Chemical Public Company Limited
- Jul 2013 – Dec 2016 Project Director, PTT Phenol Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Pirun Krimwongrut

Senior Vice President – Group Performance Center – Utilities

Age 49

**Appointed :** April 1st, 2018

**Education / Training**

- Master of Engineering Science in Electrical Engineer, University of New South Wales, Australia
- Bachelor of Engineering (Electrical Engineering) (2nd Class Honors) Khon Kaen University
- PTT HBS Leadership Management Development Program II

**Board Member/ Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President Group Performance Center – Utilities, PTT Global Chemical Public Company Limited

**Board Member/ Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Work Experience (5-years Past Experience)**

- 2015 - 2017 Vice President - GPC Strategy & Business Development, Upstream Petrochemical Business, PTT Global Chemical Public Company Limited
- 2014 - 2015 Vice President - Technical Standard and Policy, PTT Global Chemical Public Company Limited

**Shareholding :** 19,033 shares (0.000422%) as December 31st, 2017

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mrs. Chatsuda Kanjanarat

Senior Vice President – Transformation Excellence

Age 49

**Appointed :** July 1st, 2017

**Education / Training**

- Bachelor of Engineering (Electrical-Electronics) (2nd Class Honors) , King Mongkut's Institute of Technology Ladkrabang
- Director Certificate Program (DCP) Class 249/2017, Thai Institute of Directors Association (IOD)
- PTT HBS Leadership Management Development Program II

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :**1

- Senior Vice President - Transformation Excellence, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director, PTT Digital Solutions Company Limited

**Work Experience (5-years Past Experience)**

- 13th Jun 2016 – 30th Jun 2017 Vice President - PTTGC Business Performance Improvement - Project MAX, PTT Global Chemical Public Company Limited
- 1st Jan 2014 – 12th Jun 2016 Vice President - Strategy and Planning, PTT Global Chemical Public Company Limited
- 1st Mar 2013 – 31st Dec 2013 Vice President - Corporate Risk Management and Internal Control System, PTT Global Chemical Public Company Limited
- 23th Nov 2011 – 28th Feb 2013 Division Manager - Corporate Planning / Strategy and Planning, PTT Global Chemical Public Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## Mr. Amorn Putiphrawan

Senior Vice President – Internal Audit

Age 54

**Appointed :** January 1st, 2018

**Education / Training**

- Master of Engineering in Chemical Engineering, Chulalongkorn University
- Bachelor of Science in Fuel Technology, Chulalongkorn University
- PTT Group Leadership Development Program
- Leadership Development Program II (LDP2)
- Leadership Development Program (LDP)

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Senior Vice President - Internal Audit, PTT Global Chemical Public Company Limited

**Board Member/ Management in Non-Listed Company – The Stock Exchange of Thailand :** None

**Work Experience (5-years Past Experience)**

- 1st Oct 2017 – 31st Dec 2017 Vice President reporting to Chief Executive Officer, PTT Global Chemical Public Company Limited
- 16th Jun 2014 - 31st Sep 2017 Vice President – Corporate Risk Management and Internal Control System, PTTGlobal Chemical Public Company Limited
- 1st Jan 2013 - 15th Jun 2014 Vice President – Project Management Office, PTT Global Chemical Public Company Limited

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

### Mrs. Chananchida Wiboonkanarak

Acting Senior Vice President – Downstream Strategy and Business Development

Age 44

**Appointed :** October 1st, 2017

**Education / Training**

- M.Sc. in Chemical Engineering, Chulalongkorn University
- B.Sc. in Chemical Engineering, Chulalongkorn University
- Certificate of Leadership Development Program 2 Module 2: Business Leader, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Certificate of Leadership Development Program LDP2 Module 1 – Inspiring Leader, GE Crotonville
- PTT HBS Leadership Management Development Program II

**Board Member / Management in Listed Company – The Stock Exchange of Thailand :** 1

- Acting Senior Vice President - Downstream Strategy and Business Development, PTT Global Chemical Public Company Limited

**Board Member / Management in Non-Listed Company – The Stock Exchange of Thailand :** 1

- Director, Thai Fatty Alcohols Company Limited

**Work Experience (5-years Past Experience)**

| | |
|---|---|
| - 1st Apr 2014 - 30th Sep 2017 | Vice President - Strategy and Business Development, High-Volume Specialties Business Unit, PTT Global Chemical Public Company Limited |
| - 1st Jan 2013 - 31st Mar 2014 | Acting Vice President - Strategy and Business Development, High-Volume Specialties Business Unit, PTT Global Chemical Public Company Limited |
| - 1st Jan 2012 - 28th Feb 2013 | Specialist, Strategy and Business Development Green Chemicals Business Unit, PTT Global Chemical Public Company Limited |

**Shareholding :** None

**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries :** None

## SENIOR VICE PRESIDENT APPOINTED AS EXECUTIVES OF PTTGC'S SUBSIDIARIES

### Mr. Sekxon Arttamangkura

Senior Vice President, reporting to Chief Operating Officer – Center of Excellence, Secondment as Managing Director; NPC Safety and Environmental Service Company Limited

### Mr. Pairush Soovan

Senior Vice President, reporting to Chief Operating Officer – Center of Excellence, Secondment as Managing Director; PTT Maintenance and Engineering Company Limited

### Mr. Vitaya Pinmuangngarm

Senior Vice President, reporting to Chief Operating Officer – Upstream Petrochemical Business, Secondment as Managing Director; PTT Asahi Chemical Company Limited

### Mr. Narongchai Pisutpunya

Senior Vice President, reporting to Chief Operating Officer – Downstream Petrochemical Business, Secondment as Managing Director; PTT Polymer Marketing Company Limited

### Mrs. Wilawan Songjaroen

Senior Vice President, reporting to Chief Operating Officer – Downstream Petrochemical Business, Secondment as Managing Director; PTT Polymer Logistics Company Limited

### Mr. Somnuk Suwanpradit

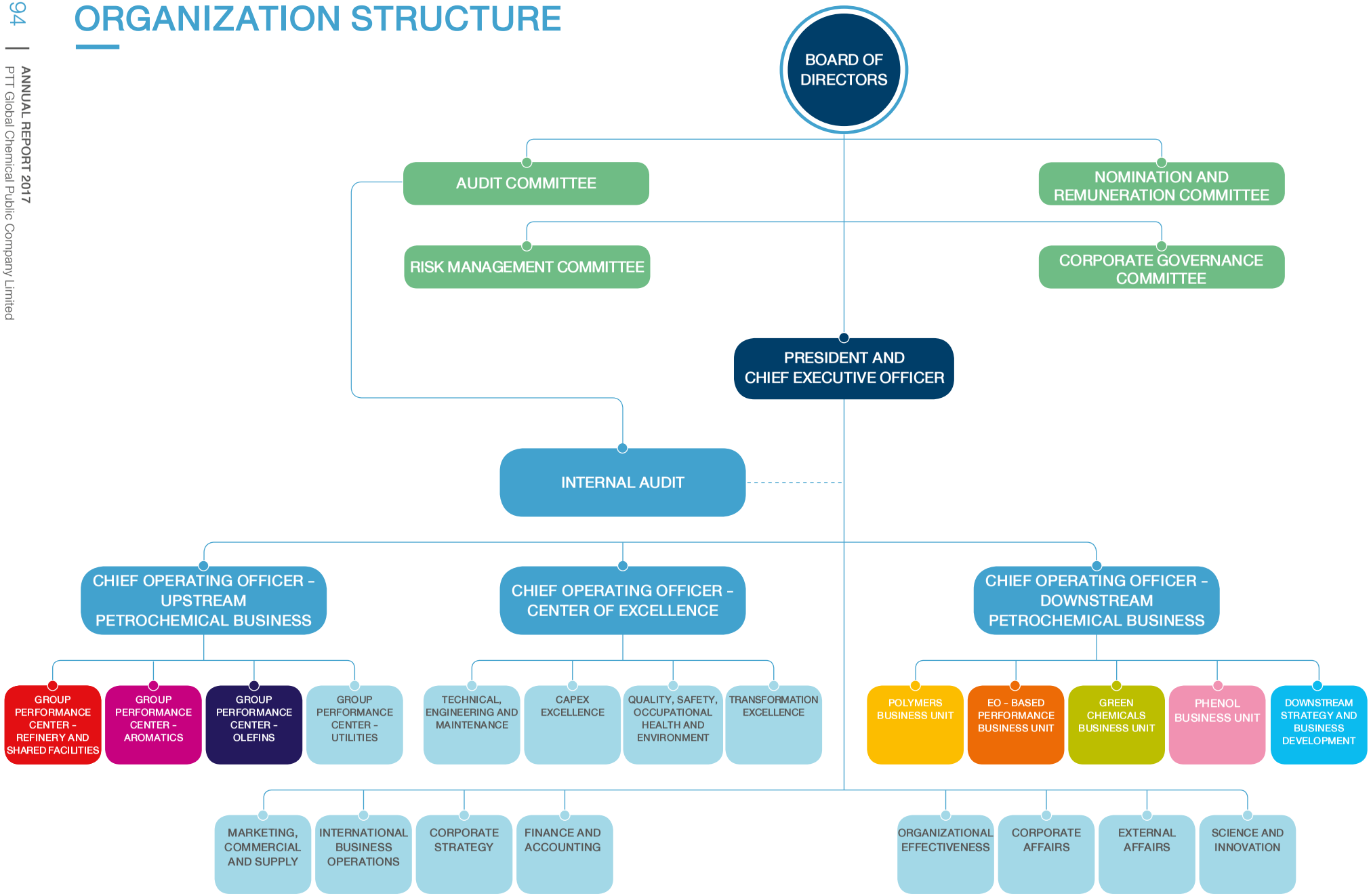
Senior Vice President, reporting to Chief Operating Officer – Downstream Petrochemical Business, Secondment as Managing Director; GC Oxirane Company Limited

### Mr. Theerapol Muenpakdee

Senior Vice President, reporting to Chief Operating Officer – Upstream Petrochemical Business, Secondment as Managing Director; Thai Tank Terminal Limited



# ORGANIZATION STRUCTURE



# MANAGEMENT STRUCTURE

## THE BOARD OF DIRECTORS

### THE BOARD OF DIRECTORS AS OF DECEMBER 31st, 2017, COMPRISES THE FOLLOWING MEMBERS:

| Name - Last Name | Position | Date of Appointment |
|---|---|---|
| 1. Mr. Prasert Bunsumpun | Chairman / Chairman of the Independent Directors | October 19th, 2011 |
| 2. Mr. Somchai Kuvijitsuwan | Independent Director / Chairman of the Audit Committee | October 19th, 2011 |
| 3. Mr. Vasin Teeravechyan | Independent Director / Chairman of the Nomination and Remuneration Committee | October 19th, 2011 |
| 4. Professor Surapon Nitikraipot | Independent Director / Chairman of the Corporate Governance Committee / Director to the Nomination and Remuneration Committee | September 22nd, 2014 |
| 5. Mr. Anon Sirisaengtaksin | Director / Chairman of the Risk Management Committee | September 22nd, 2014 |
| 6. Mr. Amnuay Preemonwong | Independent Director / Director to the Audit Committee / Director to the Risk Management Committee | October 19th, 2011 |
| 7. Mr. Prasan Chuaphanich | Independent Director / Director to the Audit Committee | April 5th, 2016 |
| 8. Mr. Sarun Rungkasiri* | Director / Director to the Nomination and Remuneration Committee / Director to the Risk Management Committee | October 18th, 2013 |
| 9. Mrs. Watanan Petersik | Independent Director | September 22nd, 2014 |
| 10. Mr. Don Wasantapruek | Independent Director / Director to the Corporate Governance Committee | November 1st, 2015 |
| 11. Colonel Nithi Chungcharoen | Independent Director / Director to the Corporate Governance Committee | September 22nd, 2014 |
| 12. Mr. Auttapol Rerkpiboon | Director / Director to the Corporate Governance Committee / Director to the Risk Management Committee | October 1st, 2015 |
| 13. Mrs. Boobpha Amornkiatkajorn | Director | October 1st, 2014 |
| 14. Mr. Praphon Wongtharua | Director | August 24th, 2015 |
| 15. Mr. Supattanapong Punmeechaow | Director / Secretary to the Board of Directors / Director to the Risk Management Committee | September 25th, 2014 |

**Remark:**

* *Mr. Sarun Rungkasiri resigned from Director as of February 1st, 2018 and the Company's Board of Directors at the meething No. 2/2018 held on February 19th, 2018 made the resolution to appoint Mr. Wittawat Svasti-xuto, a Director in replacement of Mr. Sarun Rungkasiri*

### DIRECTORS AUTHORIZED TO SIGN ON BEHALF OF THE COMPANY

According to PTTGC's Articles of Association and Certification of Incorporation from the Department of Business Development of the Ministry of Commerce, as of February 6th, 2018, the names of authorized signatory Directors are as follows: (1) Mr. Supattanapong Punmeechaow, Chief Executive Officer can sign and affix the Company's seal or (2) Mr. Anon Sirisaengtaksin and Mrs. Boobpha Amornkiatkajorn can jointly sign and affix the Company's seal.

### THE COMPOSITION OF THE BOARD OF DIRECTORS

PTTGC's Articles of Association mandates that the Board of Directors shall consist of no fewer than five but no more than 15 Directors. Each Director is to serve a three-year term. At least one-third and no fewer than three Directors on the entire Board must be Independent Directors. Additionally, PTTGC's corporate governance principles prescribe that more than half of the Board of Directors shall be comprised of Independent Directors. These Directors must be residents of the Kingdom

of Thailand. Each of them must be qualified and must not possess any attributes prohibited by law, and they must not be over the age of 70 years old in accordance with the PTTGC's good corporate governance principles.

The composition and qualifications of the Board of Directors comply with PTTGC's Articles of Association, good corporate governance principles and legal regulations without any gender discrimination. The Board of Directors is comprised of individuals from diverse fields of knowledge and expertise, whose experience is beneficial to PTTGC's business operations. In addition, each mandated Director may hold a directorship at no more than five companies listed with the Stock Exchange of Thailand and no more than three state enterprises or juristic persons whose shares are held by state enterprises according to a resolution mandated by the Thai cabinet. PTTGC's Board of Directors comprises a total of 15 Directors, which is the number appropriate for our business size and type. These Directors are divided into the following categories:

(1) Fourteen Non-Executive Directors
(2) One Executive Director, namely the President and Chief Executive Officer
(3) Nine Independent Directors (more than half of the Board)
(4) Two female Directors

## AUTHORITIES AND RESPONSIBILITIES OF THE BOARD OF DIRECTORS

The task of the Board of Directors is to govern PTTGC's operations and to ensure strict compliance with applicable laws, objectives, regulations, shareholder resolutions, principles of good corporate governance and best practices for Directors of listed companies set forth by the Stock Exchange of Thailand. All Directors possess the knowledge and capabilities needed to perform their duty for the benefit of PTTGC and our shareholders. Notable authorities and responsibilities of the Board are summarized below:

(1) The Board dedicates its time and attention to establish PTTGC's vision, mission, directions and strategies. Board members can freely express their opinions and actively seek out information that could be useful to determine the direction of the organization.
(2) The Board reviews and approves strategies, important policies, objectives, financial goals, budgets, investments, projects, important agreements with financial obligations beyond the authority of the President and Chief Executive Officer and the Corporate plans. The Board reviews and revises PTTGC's directions and strategic plans at least once a year; this was done on July 29th, 2017. The Board of Directors supervises and monitors management's implementation of PTTGC strategic plans and directions, making sure that they are able to achieve PTTGC's vision, directions and strategies.
(3) The Board of Directors oversees the Corporate Governance Policy and Business Code of Conduct, which suitably outline principles and guidelines for the Board itself, management and staff members. In addition to instilling responsibility awareness, it is the Board's duty to promote an understanding of the Corporate Governance Policy and Business Code of Conduct among all employees. The Board also encourages employees to strictly adhere to these principles and guidelines, in addition to PTTGC's rules and regulations, to assure all stakeholders of fairness.
(4) The Board ensures that the accounting system, financial reporting and auditing are credible. Moreover, the Board supervises the assessment of internal control's adequacy and makes certain that internal audits are performed efficiently and effectively.
(5) The Board considers all relevant risk factors and devises comprehensive risk management plans. In extension, the Board ensures that PTTGC Executives are equipped with an efficient system or process to mitigate risks, as well as to explore possible business opportunities that may arise from these risks.
(6) The Board monitors and manages all conflicts of interest, as well as all related transactions, that may arise. The Board places great importance on key transactions with an aim to maximize benefits for shareholders and stakeholders.
(7) The Board provides appropriate channels of communication for shareholders. It is also tasked with making certain that any disclosure of information be accurate, transparent, credible and of the highest standards.
(8) The Board regularly conducts assessments and reviews of its performance and of the President and Chief Executive Officer's performance.
(9) The Board provides a system or mechanism that determines appropriate remunerations for PTTGC's Executives, relative to the profitability of PTTGC's operations, to afford them short-term and long-term incentives.
(10) The Board acts as leaders and role models in accordance with PTTGC's Corporate Governance Policy.
(11) The Board assesses PTTGC's adherence to the Corporate Governance Policy and Business Code of Conduct at least once a year.
(12) The Board provides an appropriate, transparent and fair nomination system for all important managerial positions. PTTGC's high-ranking Executives, from Executive Vice President to the President and Chief Executive Officer, are appointed by the Board's majority votes.
(13) The Board reports to PTTGC any conflicts of interest that its members or their affiliates may have towards the management of PTTGC or its subsidiaries.
(14) Each Director must attend every Board meeting, as well as every shareholder meeting. If, under any circumstance, attendance cannot be fulfilled, the Chairman of the Board must be notified in writing.

(15) The Board places value on corporate social and environmental responsibility, as well as on sustainably improving the quality of life in Thai society. All of this starts with improving the living standards of communities around PTTGC's plants, fostering an environment where our plants and these communities co-exist in a sustainable manner.

(16) The Board provides support to all forms of anti-fraud and anti-corruption schemes for the sake of progress and sustainable growth.

Moreover, the Board of Directors must obtain permission from shareholders in a shareholder meeting before acting on the following issues:

- An acquisition or sale of an important asset or any related transaction as prescribed by law and the Capital Market Supervisory Board
- A sale or transfer of PTTGC's entire enterprise or its important components to other entities
- A purchase or acquisition of an enterprise on behalf of PTTGC
- Initiation, modification or termination of all or some important lease contracts of PTTGC, including assignment of lease contracts to other individuals or entry into a partnership with another entity to share profits or losses
- Making addendums or amendments to PTTGC's Memorandum or Articles of Association
- Increasing or decreasing the registered capital
- Issuance of debentures for sales to the public
- Dissolution of PTTGC or merging it with another company
- Announcing annual dividends
- Various other activities as mandated by law or PTTGC's Articles of Association to seek approval from shareholders at a shareholder meeting

## APPOINTMENT TO AND TERMINATION FROM THE BOARD OF DIRECTORS

PTTGC's Articles of Association provide the following guidelines in relation to the appointment to and termination from the Board of Directors:

### APPOINTMENT

- Shareholders at a shareholder meeting shall vote to appoint Director(s) according to the following guidelines:

(1) A shareholder has one vote per share.

(2) In the event that the number of nominees does not exceed the number of vacant positions during the election, shareholders shall vote on those eligible nominees. Shareholders must allocate all of their votes to one nominee per (1) without dividing their votes.

(3) In the event that the number of nominees exceeds the number of vacant positions, shareholders shall still allocate all of their votes to one nominee per (1), without dividing their votes. Nominees receiving the majority of the votes shall be appointed to the Board until there are no vacancies left. Additionally, in the event that the number of nominees with equal votes exceeds the number of available positions, the Chairman of the meeting shall castthe deciding vote.

- The Board of Directors shall nominate one Director as Chairman of the Board of Directors. Decisions made during a Board meeting is based on majority votes, with the Chairman voting only when a deciding vote is needed. In the event that a Director's position becomes vacant for any reason other than retirement by rotation, the Board may appoint a new Director who is qualified and does not possess any attributes prohibited by law to attend the next Board meeting, unless the remaining term is less than two (2) months. The new Director shall only serve the remaining term of his or her predecessor. This decision must be made with the agreement of at least three-quarters (3/4) of the remaining Directors.
- In the event that vacancies cause the number of Directors to fall below the quorum, the only authority the remaining Directors shall have is to call for a shareholder meeting, in which shareholders shall vote to appoint new Directors to fill only these vacancies. This process must be completed within one (1) month from the date on which the number of Directors no longer constitutes the quorum. New Directors shall serve the remaining terms of their predecessors.

### TERMINATION

- In each Annual General Meeting, one-third (1/3) of the serving Directors shall step down as their terms end. In the event that the number of serving Directors is not equally divisible by three (3), the number of Directors stepping down shall be as close to the aforementioned ratio of 1: 3 as possible. Directors to step down in the first and second years after Company registration shall be randomly selected; however, for later years, Directors serving the longest terms shall step down. Directors whose term has ended may be re-elected to the Board.
- In addition to retirement by rotation, other causes for directorship termination include death, resignation or disqualification or prohibition by law. Additionally, Directors can be terminated by a shareholder meeting resolution or by a court order.
- Resigning Directors must submit their resignation notice to PTTGC. Resignation is effective the day PTTGC receives the said notice. In addition, Directors may also submit their resignation notice through the registrar.
- At a shareholder meeting, shareholders may pass a resolution to force the termination of a Director before his or her term ends with three-fourths (3/4) of the attending and eligible shareholders' votes. Additionally, these majority votes must constitute at least half (1/2) of the shares held by attending and eligible shareholders.

## INDEPENDENT DIRECTORS

According to PTTGC's Corporate Governance Principles, Independent Directors must constitute more than half of the Board of Directors. Each Director may serve up to three consecutive terms or up to nine years. The term begins from the date of the 2014 Annual General Meeting of Shareholders onwards, regardless of their previous terms. These Independent Directors must be experienced and fully qualified per the Capital Market Supervisory Board's requirements. Additionally, they must hold no more than 0.5% of PTTGC shares (a stricter regulation than the SEC's limit of 1%). The definition of Independent Directors is disclosed in the Corporate Governance Handbook and on PTTGC's website.

Independent Directors must attend meetings regularly. They are allowed to freely express their opinions during these meetings. To do so, they are entitled to adequate access to financial and business information. They are also tasked with protecting stakeholders' interests and preventing conflicts of interest among PTTGC, its Executives, Board of Directors and Majority Shareholders.

Currently, PTTGC has a total of nine Independent Directors, constituting more than one-third of the Board and exceeding the legal requirement. In addition, this number is in line with PTTGC's Corporate Governance, which stipulates that more than half of the Board should be comprised of Independent Directors. Moreover, the Charter of Independent Directors clearly outlines their duties and ensures their tangible performance. Duties and responsibilities of Independent Directors to the Board of Directors according to the recently amended Charter of Independent Directors are as follows:

- Independent Directors advise the Board of Directors on important issues that PTTGC should act upon or issues that could be beneficial to PTTGC, its shareholders and other relevant stakeholders.
- Independent Directors ensure that PTTGC thoroughly comply with anti-corruption policies and measures.
- Independent Directors prioritize corporate social and environmental responsibility.
- Independent Directors may seek consultation from an outside, independent consultant when necessary. PTTGC will absorb the expenses incurred.
- Independent Directors ensure that PTTGC operates according to all independent directors-related rules and regulations stipulated by agencies that supervise listed companies. They also review the definition of an Independent Director to make sure that it is appropriate and complete according to legal requirements.
- Independent Directors review the adequacy of the Charter annually and propose recommended amendments to the Board of Directors for approval.
- Independent Directors may perform other duties assigned by the Board of Directors as long as these duties do not interfere with the independent nature required of Independent Directors.

## SUB-COMMITTEES

In accordance with good corporate governance principles, the Board of Directors established four different Sub-Committees during Meeting No. 1/2011, held on October 19th, 2011, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. Each Director on these Sub-Committees is to serve a three-year term. They are to focus on their specific tasks with diligence and efficiency. All of the Sub-Committees are to present their reports to the Board of Directors. The names and tasks of each Sub-Committee as of December 31st, 2017, are listed below.

### AUDIT COMMITTEE

| Name - Last Name | Position | Date of Appointment |
|---|---|---|
| 1. Mr. Somchai Kuvijitsuwan | Chairman of the Audit Committee (Independent Director) | October 19th, 2011 |
| 2. Mr. Amnuay Preemonwong | Director to the Audit Committee (Independent Director) | October 19th, 2011 |
| 3. Mr. Prasan Chuaphanich* | Director to the Audit Committee (Independent Director) | April 25th, 2016 |

Mr. Amorn Putiphrawan, *Senior Vice President of Internal Audit, has served as Secretary to the Audit Committee after Mr. Adisorn Vichaikatka retired since January 1st, 2018.*

**Remark:**

* Mr. Prasan Chuaphanich, *who graduated with Bachelor's Degree in Accounting, possess sufficient knowledge and work experience in accounting and finance for the benefit of ensuring the credibility of PTTGC's financial and auditing reports.*

The Audit Committee shall be comprised of Directors serving on the Board, at least three (3) of whom shall be Independent Directors. Each Director shall serve a three-year term unless their term of directorship on the Board ends, or they resign or are removed from position. Directors to the Audit Committee whose term ends may be re-appointed by the Board. Each Director's qualifications, duties and responsibilities shall be in line with the criteria set forth by the Securities and Exchange Commission. Their scope of work shall be defined by the Capital Market Commission.

The Board of Directors has given its approval to the Charter of the Audit Committee, which identifies the composition, qualifications, term in office and scope of duties according to good corporate governance. Details of the charter are disclosed in PTTGC's Corporate Governance Handbook and on our website.

PTTGC's Audit Committee is comprised of all Independent Directors. The Board believes that these respectable Directors possess sufficient knowledge, expertise and experience in finance and accounting. They have continuously undergone training to enhance their expertise for the benefit of ensuring the credibility of PTTGC's financial and auditing reports, including their adherence to accounting standards, applicable laws and other related practices. Furthermore, the Audit Committee makes certain of sufficient and efficient internal control and risk management systems while overseeing internal processes regarding whistleblowers and receipt of complaints. It nominates independent auditors and submits dismissal recommendations to the Board in the event that an independent auditor cannot or neglect or wrongfully perform their duties. It probes the suitability and efficacy of PTTGC's internal audit system and oversees the functions of Internal Audit to ensure compliance with internal auditing standards. The Audit Committee also reviews cases of connected transactions and conflicts of interest to make certain of their compliance with applicable laws and the provisions of the Stock Exchange of Thailand (SET) and the Securities and Exchange Commission (SEC), affording PTTGC reasonableness, the utmost benefit and full disclosure.

In 2017, the Audit Committee held a total of eleven (11) meetings and one (1) additional meeting with company auditors, carrying out its role within the scope of duties and responsibilities mandated by the Charter of the Audit Committee and as assigned to them by the Board of Directors. The Audit Committee also reported its monitoring results to the Board on a quarterly basis before further presenting a summary to shareholders in the annual report.

## NOMINATION AND REMUNERATION COMMITTEE

| Name - Last Name | Position | Date of Appointment |
|---|---|---|
| 1. Mr. Vasin Teeravechyan | Chairman of the the Nomination and Remuneration Committee (Independent Director) | October 19th, 2011 |
| 2. Professor Surapon Nitikraipot | Director to the Nomination and Remuneration Committee (Independent Director) | September 22nd, 2014 |
| 3. Mr. Sarun Rungkasiri* | Director to the Nomination and Remuneration Committee | September 22nd, 2014 |

Mrs. Warawan Tippawanich, *Senior Vice President of Corporate Affairs, serves as Secretary to the Nomination and Remuneration Committee.*

**Remark:**

* Mr. Sarun Rungkasiri *resigned from Director as of February 1st, 2018*

The Nomination and Remuneration Committee shall be comprised of at least three (3) Directors serving on the Board and more than half of its Directors shall be Independent Directors. The Chairman of the Nomination and Remuneration Committee shall also be an Independent Director. Each Director shall serve a three-year term unless their term of directorship on the Board ends, or they resign or are removed from position.

The responsibilities of the Nomination and Remuneration Committee include the nomination of individuals to be considered for a directorship on the Board or Sub-Committee, as well as the nomination of Chief Executive Officer (CEO). The nomination and remuneration consideration processes shall be transparent and aligned with established guidelines. Criteria include experience, profession, diversity in fields of expertise and niche qualifications needed for PTTGC's businesses per the Board Skills Matrix. These criteria aim to strike a balance among all business fields and to yield the utmost benefit to PTTGC. In addition, the Nomination and Remuneration Committee may consider candidates from the Director Pool of trusted organizations and present nominees to the Board and/or at the shareholder meeting for appointment.

The Board of Directors has given its approval to the Charter of the Nomination and Remuneration Committee, which identifies the composition, qualifications, term in office and scope of duties according to good corporate governance principles. Details of the Charter are disclosed in PTTGC's Corporate Governance Handbook and on our website.

In 2017, the Nomination and Remuneration Committee held a total of four (4) meetings, carrying out its role within the scope of duties and responsibilities mandated by the Charter of the Nomination and Remuneration Committee and as assigned to them by the Board of Directors. The Nomination and Remuneration Committee also reported its performance to the Board before further presenting a summary to shareholders in the annual report.

## CORPORATE GOVERNANCE COMMITTEE

| Name - Last Name | Position | Date of Appointment |
|---|---|---|
| 1. Professor Surapon Nitikraipot | Chairman of the Corporate Governance Committee (Independent Director) | September 22nd, 2014 |
| 2. Mr. Don Wasantapruek | Director to the Corporate Governance Committee (Independent Director) | November 1st , 2015 |
| 3. Colonel Nithi Chungcharoen | Director to the Corporate Governance Committee (Independent Director) | September 22nd, 2014 |
| 4. Mr. Auttapol Rerkpiboon | Director to the Corporate Governance Committee | November 1st , 2015 |

Mrs. Warawan Tippawanich, *Senior Vice President of Corporate Affairs, serves as Secretary to the to the Corporate Governance Committee*

The Corporate Governance Committee shall be comprised of at least three (3) Directors serving on the Board and more than half of its Directors shall be Independent Directors. The Chairman of the Corporate Governance Committee shall also be an Independent Director. Each Director shall serve a three-year term unless their directorship on the Board ends, or they resign or are removed from position.

The responsibilities of the Corporate Governance Committee include determining guidelines and policies related to business code of conduct and ethics, as well as anti-corruption measures and policies, in compliance with good corporate governance principles. These guidelines and policies are presented to the Board of Directors to be approved as company regulations. The Corporate Governance Committee also presents guidelines and policies on corporate social and environmental responsibility. Moreover, the Corporate Governance Committee supervises and provides guidance for PTTGC's sustainable development, as well as monitors its progress and assesses the effectiveness of PTTGC's sustainable-development performance. All of this standardizes our practices throughout the organization.

In 2017, the Corporate Governance Committee held a total of five (5) meetings, carrying out its role within the scope of duties and responsibilities mandated by the Charter of the Corporate Governance Committee and as assigned to them by the Board of Directors. The Corporate Governance Committee also reported its monitoring results to the Board on a quarterly basis before further presenting a summary to shareholders in the annual report.

## RISK MANAGEMENT COMMITTEE

| Name - Last Name | Position | Date of Appointment |
|---|---|---|
| 1. Mr. Anon Sirisaengtaksin | Chairman of the Risk Management Committee | September 22nd, 2014 |
| 2. Mr. Amnuay Preemonwong | Director to the Risk Management Committee (Independent Director) | April 25 th, 2016 |
| 3. Mr. Sarun Rungkasiri* | Director to the Risk Management Committee | November 1st, 2015 |
| 4. Mr. Auttapol Rerkpiboon | Director to the Risk Management Committee | December 26th, 2016 |
| 5. Mr. Supattanapong Punmeechaow | Director to the Risk Management Committee | September 25th, 2014 |

Mr. Chusak Wittayakajohnsad, *Acting Vice President of Corporate Risk Management and Internal Control System, has served as Secretary to the Risk Management Committee in lieu of Mr. Amorn Putiphrawan since November 1st, 2017.*

**Remark:**

* Mr. Sarun Rungkasiri *resigned from Director as of February 1st, 2018*

The Risk Management Committee shall be comprised of at least three (3) Directors serving on the Board and at least one (1) of whom shall be an Independent Director. Each Director shall serve a three-year term unless their directorship on the Board ends, or they resign or are removed from position.

The Risk Management Committee's role is to understand significant risks that PTTGC faces and approves its risk appetite and tolerance. The Risk Management Committee considers and approves a risk management policy that focuses on early warning signs and that

is in line with PTTGC's objectives, goals, strategies and risk appetite. This policy serves as a framework in which risk-management processes of every person within our organization are carried out. The policy shall be reviewed annually. In addition, the Risk Management Committee oversees the risk management process to ensure that both external and internal factors, which may impede the achievement of PTTGC objectives, are considered during risk identification. The Risk Management Committee also oversees that the impact and likelihood of these risks are properly assessed, that these risks are properly prioritized and that appropriate risk mitigation methods are identified. The Risk Management Committee reviews and presents all of this to the Board of Directors. The Risk Management Committee monitors and assesses the effectiveness of PTTGC's risk management regularly, and makes certain that our business complies with relevant laws and standards, whether at national or international levels. Furthermore, in the event that PTTGC establishes a subsidiary or invests significantly in an enterprise, it is recommended that the Risk Management Committee consider the results of the said entity's risk-management performance assessment. The Risk Management Committee reviews its charter on an annual basis and carries out duties and responsibilities mandated by the Charter of the Risk Management Committee and assigned by the Board of Directors.

In 2017, the Risk Management Committee held a total of five (5) meetings, carrying out its role within the scope of duties and responsibilities mandated by the Charter of the Risk Management Committee and as assigned to them by the Board of Directors. The Risk Management Committee also reported its performance to the Board on a quarterly basis before further presenting a summary to shareholders in the annual report.

## DIRECTORS' MEETINGS

In 2017, the Board of Directors, Independent Director, Non - Executive Directors and Sub-Comittees held meetings as illustrated in the table below. These meetings were scheduled in advance. Directors who could not attend these meetings due to important, urgent matters submitted a written notice to the Chairman of the Board of Directors detailing their reasons. The Chairman informed the meeting of missing Director(s) prior to commencing every meeting.

| Name - Last Name | Meetings in, 2017 | | | | | | | 2017 Annual General Meeting of Share holders |
|---|---|---|---|---|---|---|---|---|
| | Board of Directors | Independent Directors | Non-Executive Directors | Audit Committee | Nomination and Remuneration Committee | Corporate Governance Committee | Risk Management Committee | |
| | 15 times | 1 time | 1 time | 11 times | 4 times | 5 times | 5 times | 1 time |
| 1. Mr. Prasert Bunsumpun | 15/15 | 1/1 | 1/1 | - | - | - | - | 1/1 |
| 2. Mr. Somchai Kuvijitsuwan | 15/15 | 1/1 | 1/1 | 11/11 | - | - | - | 1/1 |
| 3. Mr. Vasin Teeravechyan | 15/15 | 1/1 | 1/1 | - | 4/4 | - | - | 1/1 |
| 4. Professor Surapon Nitikraipot | 14/15 | 1/1 | 1/1 | - | 3/4 | 5/5 | - | 1/1 |
| 5. Mr. Anon Sirisaengtaksin | 15/15 | - | 0/1 | - | - | - | 5/5 | 1/1 |
| 6. Mr. Amnuay Preemonwong | 14/15 | 1/1 | 1/1 | 11/11 | - | - | 5/5 | 1/1 |
| 7. Mr. Prasan Chuaphanich | 15/15 | 1/1 | 1/1 | 11/11 | - | - | - | 1/1 |
| 8. Mr. Sarun Rungkasiri | 15/15 | - | 1/1 | - | 4/4 | - | 5/5 | 1/1 |
| 9. Mrs. Watanan Petersik | 11/15 | 1/1 | 0/1 | - | - | - | - | 0/1 |
| 10. Mr. Don Wasantapruek | 14/15 | 1/1 | 1/1 | - | - | 5/5 | - | 1/1 |
| 11. Colonel Nithi Chungcharoen | 14/15 | 1/1 | 1/1 | - | - | 4/5 | - | 1/1 |
| 12. Mr. Auttapol Rerkpiboon | 15/15 | - | 1/1 | - | - | 5/5 | 4/5 | 1/1 |
| 13. Mrs. Boobpha Amornkiatkajorn | 14/15 | - | 1/1 | - | - | - | - | 1/1 |
| 14. Mr. Praphon Wongtharua | 15/15 | - | 1/1 | - | - | - | - | 1/1 |
| 15. Mr. Supattanapong Punmeechaow | 15/15 | - | - | - | - | - | 4/5 | 1/1 |

## PTTGC EXECUTIVES

To ensure efficient organizational management and operations that follow the policies and directions established by the Board of Directors, the President and Chief Executive Officer, exercising the power vested in him by the Articles of Association, formed the Management Committee (MC) and the Group Management Committee (GMC). Both committees are comprised of high level Executives from Senior Vice President to Executive Vice President, under direct supervision of the President and Chief Executive Officer who, at the highest position of PTTGC's hierarchy, has the authority and duty to ensure that PTTGC operates according to the policies, plans and budgets approved by the Board.

The Management Committee (MC) is responsible for devising and aligning operational directions and guidelines with the Board's established policies. To do this, the MC analyzes and gives advice on PTTGC's policies and operational guidelines that effect crucial changes to our operations, Group Performance Centers and Business Units. The MC also analyzes and gives advice on Board meeting agenda prior to presenting them to the Board at the meeting. In extension, the MC also oversees PTTGC's compliance with laws, as well as PTTGC's rules and regulations. It makes sure that tasks are carried out according to the resolutions, suggestions and opinions given at Board meetings. It also oversees diverse aspects of PTTGC's progress as a whole and as an international business.

The Group Management Committee (GMC) is tasked with analyzing and giving advice on the consistency between PTTGC's policies and our Group Performance Centers and Business Units in relations to operational guidelines. Moreover, the GMC monitors PTTGC's progress on innovation and technology, as well as any projects that contribute to the efficiency of the operations of Group Performance Centers and Business Units.

The Management Committee holds at least three (3) meetings monthly, while the Group Management Committee holds at least one (1) meeting a month. In 2017 the MC held a total of thirty-four (34) meetings and GMC held a total of eleven (11) meetings. The Senior Vice President of Corporate Affairs serves as Secretary to both committees.

### EXECUTIVES UNDER ORGANIZATION STRUCTURE AS OF APRIL 1st, 2018

| Name - Last Name | Position |
|---|---|
| 1. Mr. Supattanapong Punmeechaow | President & Chief Executive Officer |
| 2. Mr. Kongkrapan Intarajang | Chief Operating Officer - Upstream Petrochemical Business |
| 3. Mr. Patiparn Sukorndhaman | Chief Operating Officer - Downstream Petrochemical Business |
| 4. Mr. Varit Namwong | Chief Operating Officer - Center of Excellence / Acting Executive Vice President - External Affairs |
| 5. Miss Duangkamol Settanung | Executive Vice President - Finance & Accounting |
| 6. Mr. Siridech Kumvongdee | Executive Vice President - Organizational Effectiveness |
| 7. Mr. Narongsak Jivakanun | Executive Vice President - Corporate Strategy |
| 8. Mr. Toasaporn Boonyapipat | Executive Vice President - International Business Operations |
| 9. Mr. Anutin Chuaypen | Senior Vice President - Group Performance Center - Refinery and Shared Facilities |
| 10. Mr. Pukpong Wungrattanasopon | Senior Vice President - Group Performance Center - Aromatics |
| 11. Mr. Boonchai Chunhawiksit | Senior Vice President - Group Performance Center - Olefins |
| 12. Mr. Wiboon Chuchepchunkamon | Senior Vice President - Polymers Business Unit |
| 13. Mr. Pornsak Mongkoltrirat | Senior Vice President - EO-Based Performance Business Unit |
| 14. Mr. Jirawat Nooritanon | Senior Vice President - Green Chemicals Business Unit |
| 15. Mr. Kumpol Chaikitkosi | Senior Vice President - Phenol Business Unit |

## EXECUTIVES UNDER ORGANIZATION STRUCTURE AS OF APRIL 1st, 2018 (CONTINUED)

| Name - Last Name | Position |
|---|---|
| 16. Mrs. Warawan Tippawanich | Senior Vice President - Corporate Affairs |
| 17. Mr. Chaya Chandavasu | Senior Vice President - Science and Innovation |
| 18. Mr. Saroj Putthammawon | Senior Vice President - Marketing, Commercial and Supply |
| 19. Mr. Wirat Boonbumrungchai | Senior Vice President - Quality, Safety, Occupational Health and Environment |
| 20. Mrs. Jeeranee Pimthanothai | Senior Vice President - Technical, Engineering and Maintenance |
| 21. Mr. Khomson Piyawattanaviroj | Senior Vice President - CAPEX Excellence |
| 22. Mrs. Chatsuda Kanjanarat | Senior Vice President - Transformation Excellence |
| 23. Mr. Pirun Krimwongrut | Senior Vice President - Group Performance Center - Utilities |
| 24. Mrs. Chananchida Wiboonkanarak | Acting Senior Vice President - Downstream Strategy and Business Development |
| 25. Mr. Amorn Putiphrawan | Senior Vice President - Internal Audit |

**Remark:**
*Executives numbered 1 through 8 are executives per SEC definition.*

## CHANGES IN EXECUTIVES DURING JANUARY 1st, 2017 TO APRIL 1st, 2018

**1) Mr. Adisorn Vichaikatka,** Senior Vice President - Internal Audit, retired on December 31st, 2017.

**2) Mr. Wiboon Chuchepchunkamon,** former Senior Vice President - EO-Based Performance Business Unit, was appointed Senior Vice President and Chief Operating Officer - Downstream Petrochemical Business on July 1st, 2017, and was appointed Senior Vice President - Polymers Business Unit on January 1st, 2018.

**3) Mr. Pornsak Mongkoltrirat,** Vice President of LDPE Plant I, Polymers Business Unit, was appointed Acting Senior Vice President - EO-Based Performance Business Unit on July 1st, 2017, and was appointed Senior Vice President - EO-Based Performance Business Unit it on January 1st, 2018.

**4) Mrs. Chatsuda Kanjanarat,** former Chief Transformation Officer under the President and Chief Executive Officer, was appointed Senior Vice President - Transformation Excellence on July 1st, 2017.

**5) Mr. Khomson Piyawattanaviroj,** former Vice President under the Chief Operating Officer - Center of Excellence, was appointed Senior Vice President - CAPEX Excellence on January 1st, 2018.

**6) Mr. Pirun Krimwongrut,** former Vice President - Strategy and Business Development - Upstream Petrochemical Business under the Chief Operating Officer - Upstream Petrochemical Business, was appointed Senior Vice President - Group Performance Center - Utilities on April 1st, 2018.

**7) Mrs. Chananchida Wiboonkanarak,** former Vice President - High-Volume Specialties Strategy and Business Development, was appointed Acting Senior Vice President - Downstream Strategy and Business Development on October 1st, 2017.

**8) Mr. Amorn Putiphrawan,** former Vice President - Corporate Risk Management and Internal Control - Corporate Strategy, was appointed Senior Vice President - Internal Audit on January 1st, 2018.

**9) Mr. Somnuk Suwanpradit,** former Vice President - Polymer Maintenance - Polymers Business Unit, was appointed Senior Vice President on Secondment to GC Oxirane Co., Ltd., on October 1st, 2017.

## COMPANY SECRETARY

In compliance with the Securities and Exchange Commission Act, Sections 89/15 and 89/16, the Board of Directors appointed Mrs. Warawan Tippawanich, Senior Vice President - Corporate Affairs, as Company Secretary. By law, the responsibilities of this position include the preparation, storage and safeguarding of important company documents, including the roster of directors, meeting notices, board and shareholder meeting minutes, annual reports and reports of connected transactions of Directors and Executives. The Company Secretary is in charge of organizing board and shareholder meetings, in addition to informing the Board and Executives of rules and regulations they should familiarize themselves with. The Company Secretary also organizes training and orientation for existing and new Directors, as well as provides them with the information central to their performance as Directors. Moreover, the Company Secretary oversees compliance with laws, regulations and resolutions passed in board and shareholder meetings, as well as collaborates with relevant agencies in regard to compliance. PTTGC's Company Secretary has undergone training courses necessary for her to duly perform her role.

## REMUNERATIONS FOR THE BOARD OF DIRECTORS AND EXECUTIVES

### BOARD OF DIRECTORS' REMUNERATIONS

The Board of Directors has set up a fair and reasonable remuneration policy for PTTGC's Directors in accordance with good corporate governance principles. The Nomination and Remuneration Committee determines Directors' remunerations based on suitability and PTTGC's financial standing by means of comparison with other SET listed companies in the same industry and of similar sizes. The Nomination and Remuneration Committee also takes into account each Director's responsibilities. Any Directors appointed to be on a Sub-Committee are entitled to additional remuneration due to their added responsibilities.

Directors' remunerations must be approved at a shareholders meeting. At the 2017 General Meeting of Shareholders, held on April 5th, 2017, shareholders resolved to award Directors and Directors to Sub-Committees for the year, 2017 and to approve the Director's bonus for the year 2016 as follows:

**(1) Remunerations for the Board of Directors and Sub-Committees**

| Type of Remuneration | Rate |
|---|---|
| 1. Board of Directors | Monthly Remuneration<br>• Chairman 60,000 THB / Month<br>• Director 50,000 THB / Month / Director<br><br>Remuneration for Meeting Attendance<br>• Chairman 40,000 THB / Times<br>• Director 30,000 THB / Times / Director |
| 2. Sub-Committees<br>• Audit Committee<br>• Nomination and Remuneration Committee<br>• Corporate Governance Committee<br>• Risk Management Committee | Remuneration for Meeting Attendance<br>Chairman 50,000 THB / Times<br>Director 40,000 THB / Times / Director |
| 3. Others | -None- |

**(2) Directors' bonus for their 2016 performance** was considered and given based on PTTGC's earnings in 2016. Effective from the date of the 2013 Annual General Meeting of Shareholders until the AGM passes a new resolution, the Board of Directors shall receive a bonus only when dividend is paid to shareholders within the same year. The amount of Directors' bonus shall be 0.30% of PTTGC's net profit that year, but not exceeding 50 million baht. It shall be calculated based on the time served in the previous year. The Chairman shall receive a bonus of 25% higher than other Directors. In 2017, the Board of Directors collectively received a bonus of 50 million baht.

## DIRECTORS' REMUNERATIONS IN 2017

| Name - Last Name | Monthly Remuneration for PTTGC Directors (THB) | Remuneration for Meeting Attendance (THB) | Remuneration for Sub-Committee Meeting Attendance (THB) | | | | 2016 Bonus paid in 2017 (THB)* | Total (THB) |
|---|---|---|---|---|---|---|---|---|
| | | | Audit Committee | Nomination and Remuneration Committee | Corporate Governance Committee | Risk Management Committee | | |
| 1. Mr. Prasert Bunsumpun | 720,000.00 | 640,000.00 | - | - | - | - | 4,097,626.51 | 5,457,626.51 |
| 2. Mr. Somchai Kuvijitsuwan | 600,000.00 | 480,000.00 | 550,000.00 | - | - | - | 3,278,101.21 | 4,908,101.21 |
| 3. Mr. Vasin Teeravechyan | 600,000.00 | 480,000.00 | - | 250,000.00 | - | - | 3,278,101.21 | 4,608,101.21 |
| 4. Mr. Anon Sirisaengtaksin | 600,000.00 | 450,000.00 | - | - | - | 250,000.00 | 3,278,101.21 | 4,578,101.21 |
| 5. Professor Surapon Nitikraipot | 600,000.00 | 450,000.00 | - | 160,000.00 | 300,000.00 | - | 3,278,101.21 | 4,788,101.21 |
| 6. Mr. Sarun Rungkasiri | 600,000.00 | 480,000.00 | - | 200,000.00 | - | 200,000.00 | 3,278,101.21 | 4,758,101.21 |
| 7. Mr. Amnuay Preemonwong | 600,000.00 | 450,000.00 | 440,000.00 | - | - | 200,000.00 | 3,278,101.21 | 4,968,101.21 |
| 8. Mr. Prasan Chuaphanich | 600,000.00 | 480,000.00 | 440,000.00 | - | - | - | 2,427,227.94 | 3,947,227.94 |
| 9. Mrs. Boobpha Amornkiatkajorn | 600,000.00 | 480,000.00 | - | - | - | - | 3,278,101.21 | 4,358,101.21 |
| 10. Mrs. Watanan Petersik | 600,000.00 | 360,000.00 | - | - | - | - | 3,278,101.21 | 4,238,101.21 |
| 11. Colonel Nithi Chungcharoen | 600,000.00 | 450,000.00 | - | - | 200,000.00 | - | 3,278,101.21 | 4,528,101.21 |
| 12. Mr. Praphon Wongtharua | 600,000.00 | 480,000.00 | - | - | - | - | 3,278,101.21 | 4,358,101.21 |
| 13. Mr. Auttapol Rerkpiboon | 600,000.00 | 480,000.00 | - | - | 240,000.00 | 160,000.00 | 3,278,101.21 | 4,758,101.21 |
| 14. Mr. Don Wasantapruek | 600,000.00 | 450,000.00 | - | - | 240,000.00 | - | 3,278,101.21 | 4,568,101.21 |
| 15. Mr. Supattanapong Punmeechaow ** | 600,000.00 | 480,000.00 | - | - | - | 160,000.00 | 3,278,101.21 | 4,518,101.21 |
| **Director who resigned her term during 2016 (received bonus in 2017 from performance in 2016)*** ** | | | | | | | | |
| 1. Miss Ruenvadee Suwanmongkol | - | - | - | - | - | - | 859,829.82 | 859,829.82 |
| Grand Total | 9,120,000.00 | 7,090,000.00 | 1,430,000.00 | 610,000.00 | 980,000.00 | 970,000.00 | 50,000,000.00 | 70,200,000.00 |

**Remarks:**

*PTTGC provides a corporate vehicle for the Chairman throughout the duration of his term for corporate-related activities only.*

* *Bonus for 2016 performance paid in 2017 per time served in 2016 in an amount not exceeding 50 million baht.*

** *Remuneration for directorship only; executive remuneration not included.*

*** *Director who completed his/her in 2016, Miss Ruenvadee Suwanmongkol term ended on april 5 th, 2016*

## DIRECTORS' REMUNERATIONS FOR DIRECTORSHIPS AT MAJOR SUBSIDIARIES

PTTGC's Directors hold a directorship at subsidiaries to ensure that their businesses are operated in accordance with the PTTGC Group's policies.

| Name - Last Name | Position | Total Remuneration |
|---|---|---|
| **PTT Chemical International Private Limited ( CH Inter) (Wholly Owned Subsidiary)** | | |
| 1. Mr. Anon Sirisaengtaksin | Chairman | 15,000 Singapore Dollars |
| 2. Mr. Supattanapong Punmeechaow | Director | 12,000 Singapore Dollars |
| **Global Green Chemical Public Company Limited (72.29% Shareholding)** | | |
| 1. Mr. Supattanapong Punmeechaow | Chairman | 429,435.48 Baht |

## SHARES HELD BY THE BOARD OF DIRECTORS, THEIR SPOUSES & THEIR MINORS AS OF DECEMBER 31st, 2017

| Name - Last Name | Shares | | |
|---|---|---|---|
| | As of January 1st, 2017 | As of December 31st, 2017 | Increase / (Decrease) of Shares during the Year (Share) |
| 1. Mr. Prasert Bunsumpun | -None- | -None- | -No Change- |
| Spouse | 271,142 | 271,142 | -No Change- |
| 2. Mr. Somchai Kuvijitsuwan | -None- | -None- | -No Change- |
| 3. Mr. Vasin Teeravechyan | -None- | -None- | -No Change- |
| 4. Professor Surapon Nitikraipot | -None- | -None- | -No Change- |
| 5. Mr. Anon Sirisaengtaksin | 86,027 | 86,027 | -No Change- |
| Spouse | 6,705 | 6,705 | -No Change- |
| 6. Mr. Amnuay Preemonwong | -None- | -None- | -No Change- |
| 7. Mr. Prasan Chuaphanich | -None- | -None- | -No Change- |
| 8. Mr. Sarun Rungkasiri | -None- | -None- | -No Change- |
| 9. Mrs. Watanan Petersik | -None- | -None- | -No Change- |
| 10. Mr. Don Wasantapruek | -None- | -None- | -No Change- |
| 11. Colonel Nithi Chungcharoen | -None- | -None- | -No Change- |
| 12. Mr. Auttapol Rerkpiboon | -None- | -None- | -No Change- |
| Spouse | 990 | 990 | -No Change- |
| 13. Mrs. Boobpha Amornkiatkajorn | 57,700 | 57,700 | -No Change- |
| 14. Mr. Praphon Wongtharua | -None- | -None- | -No Change- |
| 15. Mr. Supattanapong Punmeechaow | 60,000 | 60,000 | -No Change- |

## SHARES HELD BY EXECUTIVES PER SEC'S DEFINITION, THEIR SPOUSES & THEIR MINORS AS OF DECEMBER 31st, 2017

| | Name - Last Name | Shares | | |
|---|---|---|---|---|
| | | As of January 1st, 2017 | As of December 31st, 2017 | Increase / (Decrease) of Shares during the Year (Share) |
| 1. | Mr. Supattanapong Punmeechaow | 60,000 | 60,000 | -No Change- |
| 2. | Mr. Kongkrapan Intarajang | -None- | -None- | -No Change- |
| 3. | Mr. Patiparn Sukorndhaman | -None- | -None- | -No Change- |
| 4. | Mr. Varit Namwong | 108,939 | 108,939 | -No Change- |
| 5. | Miss Duangkamol Settanung | -None- | -None- | -No Change- |
| 6. | Mr. Siridech Kumvongdee | 91 | 91 | -No Change- |
| | Spouse | 11,515 | 11,515 | -No Change- |
| 7. | Mr. Narongsak Jivakanun | -None- | -None- | -No Change- |
| 8. | Mr. Toasaporn Boonyapipat | -None- | -None- | -No Change- |
| 9. | Mr. Pairote Utaisup* | -None- | -None- | -No Change- |
| 10. | Mr. Athavuth Vikitsretht | -None- | -None- | -No Change- |

**Remarks:**
** Retired on December 31st, 2017.*

## REMUNERATIONS FOR THE EXECUTIVES

PTTGC evaluates the performance of its Executives annually using Key Performance Indicators (KPIs). These include financial performance, implementation of long-term strategic goals, personal performance, PTTGC performance and guidelines from SET listed companies in the same industry and of similar sizes. The evaluation also takes into account their responsibilities, management development and overall economic conditions.

Remuneration for the President and Chief Executive Officer is appropriately determined using transparent, fair and reasonable criteria. The position's duties and responsibilities are also taken into account, in conjunction with personal performance. The Nomination and Remuneration Committee gives consideration and reviews it prior to submission to the Board of Directors for approval. It should be noted that, at the highest level of PTTGC's management hierarchy, the President and Chief Executive Officer is awarded compensation and other benefits in addition to those received as a Director on the Board of Directors.

## EXECUTIVES PER SEC'S DEFINITION, WHO SERVED IN 2017, INCLUDING THOSE WHO RETIRED IN 2017, WERE AWARDED THE FOLLOWING FIGURES IN 2017:

| Type of Remuneration | Number of Executives | Total (Million Baht) |
|---|---|---|
| Total Combined Salaries | 10 | 64 |
| Total Combined Special Bonuses | 9 | 34 |
| Provident Fund Contributions | 8 | 6 |
| **Total** | | **104** |

## EMPLOYEES

As of December 31st, 2017, PTTGC has a total of 6,334 employees according to our business structure, including subsidiaries, which can be divided into the following functions:

| | Function | Number of Employees |
|---|---|---|
| 1. | Under the President and Chief Executive Officer | 6 |
| 2. | Under the Chief Operating Officer - Upstream Petrochemical Business | 25 |
| 3. | Under the Chief Operating Officer - Downstream Petrochemical Busines | 91 |
| 4. | Under Chief Operating Officer - Center of Excellence | 98 |
| 5. | Internal Audit | 21 |
| 6. | Marketing, Commercial and Supply | 99 |
| 7. | International Business Operations | 688 |
| 8. | Corporate Strategy | 59 |
| 9. | Finance & Accounting | 217 |
| 10. | Organizational Effectiveness | 263 |
| 11. | Corporate Affairs | 104 |
| 12. | External Affairs | 15 |
| 13. | Science and Innovation | 51 |
| 14. | Technical, Engineering and Maintenance | 472 |
| 15. | CAPEX Excellence | 184 |
| 16. | Quality, Safety, Occupational Health and Environment | 170 |
| 17. | Transformation Excellence | 9 |
| 18. | Downstream Strategy and Business Development | 37 |
| 19. | Group Performance Center - Utilities | 443 |
| 20. | Group Performance Center - Aromatics | 320 |
| 21. | Group Performance Center - Olefins | 603 |
| 22. | Group Performance Center - Refinery and Shared Facilities | 99 |
| 23. | Polymers Business Unit | 456 |
| 24. | EO-Based Performance Business Unit | 184 |
| 25. | Green Chemicals Business Unit | 169 |
| 26. | Phenol Business Unit | 211 |
| 27. | Others | 1,240 |
| | **Total** | **6,334** |

### TOTAL REMUNERATIONS PAID TO EMPLOYEES IN 2017

| Type of Remuneration | Total (Million Baht) |
|---|---|
| Total Combined Salaries | 12,732 |
| Provident Fund Contributions | 529 |
| Long Term Employee Benefits | 272 |
| Other Long Term Employee Benefits | 211 |

## BOARD OF DIRECTORS APPOINTED AS DIRECTORS OF SUBSIDIARIES / AFFILIATES / ASSOCIATED AND RELATED COMPANIES (AS OF FEBRUARY 1st, 2018)

| No. | Name | Subsidiaries | | | | | | | | | | Affiliates / Associated and Related Companies | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PTTGC | GGC | CH Inter | PTTGC (Netherlands) | PTTGC (USA) | Myriant | Vencorex | NatureWorks | EOM | ESC | PTT | GPSC |
| 1 | Mr. Prasert Bunsumpun | ● | | | | | | | | | | | |
| 2 | Mr. Somchai Kuvijitsuwan | ● | | | | | | | | | | | |
| 3 | Mr. Vasin Teeravechyan | ● | | | | | | | | | | | |
| 4 | Professor Surapon Nitikraipot | ● | | | | | | | | | | | |
| 5 | Mr. Anon Sirisaengtaksin | ● | | ● | ● | ● ● | ● | ● | ● | ● | ● | | |
| 6 | Mr. Amnuay Preemonwong | ● | | | | | | | | | | | |
| 7 | Mr. Prasan Chuaphanich | ● | | | | | | | | | | | |
| 8 | Mr. Sarun Rungkasiri | ● | | | | | | | | | | | |
| 9 | Mrs. Watanan Petersik | ● | | | | | | | | | | | |
| 10 | Mr. Don Wasantapruek | ● | | | | | | | | | | ● | |
| 11 | Colonel Nithi Chungcharoen | ● | | | | | | | | | | | |
| 12 | Mr. Auttapol Rerkpiboon | ● | | | | | | | | | | ● | |
| 13 | Mrs. Boobpha Amornkiatkajorn | ● | | | | | | | | | | ● | |
| 14 | Mr. Praphon Wongtharua | ● | | | | | | | | | | | |
| 15 | Mr. Supattanapong Punmeechaow | ● ● | ● | ● | | | | | | | | ● | ● |

**Remarks:** ● Chairman ● Director ● Executive

## EXECUTIVES APPOINTED AS DIRECTORS OF SUBSIDIARIES / AFFILIATES / ASSOCIATED AND RELATED COMPANIES (AS OF FEBRUARY 1st, 2018)

| No. | Name | Subsidiaries | | | | | | | | | | | | | | | | | | | | | Affiliates / Associated and Related Companies | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PTTGC | TOCGC | PPCL | GGC | TSCL | SUN | GCTC | GCO | GCP | PTTPM | TTT | NPC S&E | PTTME | CH Inter | PTTGC (Netherlands) | PTTGC (USA) | PTTGC America Corporation | PTTGC America LLC | Myriant | Vencorex | NatureWorks | EOM | ESC | PTT | PTT Digital | GPSC | VNT | PTTES | PTTAC | HMC | PTTMCC |
| 1 | Mr. Supattanapong Punmeechaow | ● ● | | | ● | | | | | | | | | | ● | | | | | | | | | | ● | | ● | | | | | |
| 2 | Mr. Kongkrapan Intarajang | ● | | | | | | | | | | ● | | | ● | ● | ● ● | ● ● | ● | ● | ● | ● | ● | ● | | | ● | | | | | |
| 3 | Mr. Patiparn Sukorndhaman | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | | | | | | | ● | ● | |
| 4 | Mr. Varit Namwong | ● | | | | | | | | | | | ● | ● | | | | ● | ● | | | | | | | | | | ● | | ● | |
| 5 | Miss Duangkamol Settanung | ● | | ● | | | | ● | ● | ● | | | | | ● | | | ● | ● | | | | | ● | ● | | | | ● | | | |
| 6 | Mr. Siridech Kumvongdee | ● | | | | ● | ● | | | | | | | | | | | | | | ● | | | | | ● | | | | | | |
| 7 | Mr. Narongsak Jivakanun | ● | | ● | ● | | | | | ● | | | | | | | | ● | ● | | | | | | | | | ● | | | | ● |
| 8 | Mr. Toasaporn Boonyapipat | ● | | | | | | | | | | | | | ● ● | | ● | ● | ● ● | | ● | | | ● | ● | | | | | | | |

**Remarks:** ● Chairman ● Director ● Executive

### SUBSIDIARIES

| | | |
|---|---|---|
| TOCGC | = | TOC Glycol Company Limited |
| PPCL | = | PTT Phenol Company Limited |
| GGC | = | Global Green Chemicals Public Company Limited |
| TSCL | = | Thai Styrenics Company Limited |
| SUN | = | Solution Creation Company Limited |
| NPC S&E | = | NPC Safety and Environmental Service Company Limited |
| TTT | = | Thai Tank Terminal Limited |
| GCTC | = | GC Treasury Center Company Limited |
| GCO | = | GC Oxirane Company Limited |
| GCP | = | GC Polyols Company Limited |
| PTTME | = | PTT Maintenance and Engineering Company Limited |
| PTTPM | = | PTT Polymer Marketing Company Limited |
| CH Inter | = | PTT Chemical International Private Limited |
| PTTGC (Netherlands) | = | PTTGC International (Netherlands) B.V. |
| PTTGC (USA) | = | PTTGC International (USA) Inc. |
| PTTGC America Corporation | = | PTTGC America Corporation |
| PTTGC America LLC | = | PTTGC America LLC |
| Myriant | = | Myriant Corporation |
| Vencorex | = | Vencorex Holding |
| NatureWorks* | = | NatureWorks LLC |
| EOM* | = | Emery Oleochemicals (M) Sdn. Bhd. |
| ESC* | = | Emery Specialty Chemicals Sdn. Bhd. |

### AFFILIATES

| | | |
|---|---|---|
| PTT Digital | = | PTT Digital Solutions Company Limited |
| GPSC | = | Global Power Synergy Public Company Limited |
| VNT | = | Vinythai Public Company Limited |
| PTTES | = | PTT Energy Solutions Company Limited |
| PTTAC | = | PTT Asahi Chemical Company Limited |
| HMC | = | HMC Polymers Company Limited |
| PTTMCC | = | PTT MCC Biochem Company Limited |

### ASSOCIATED AND RELATED COMPANIES

| | | |
|---|---|---|
| PTT | = | PTT Public Company Limited |

*Jointly Controlled Entities*

## DIRECTORS OF PTTGC'S SUBSIDIARIES – WHOLLY OWNED BY PTTGC (AS OF FEBRUARY 1st, 2018)

**TOC Glycol Company Limited**

| Name | Position |
|---|---|
| 1. Mr. Patiparn Sukorndhaman | Chairman |
| 2. Mr. Saroj Putthammawong | Director |
| 3. Mrs. Warawan Tippawanich | Director |
| 4. Mr. Boonchai Chunhawiksit | Director |
| 5. Mr. Pornsak Mongkoltrirat | Director / Managing Director |

**Solution Creation Company Limited**

| Name | Position |
|---|---|
| 1. Mr. Patiparn Sukorndhaman | Chairman |
| 2. Mr. Chaya Chandavasu | Director |
| 3. Mr. Saroj Putthammawong | Director |
| 4. Mr. Siridech Kumvongdee | Director |
| 5. Mr. Kittiphong Limsuwannarot | Director / Managing Director |

**PTT Phenol Company Limited**

| Name | Position |
|---|---|
| 1. Mr. Bowon Vongsinudom | Chairman |
| 2. Mr. Patiparn Sukorndhaman | Director |
| 3. Miss Duangkamol Settanung | Director |
| 4. Mr. Narongsak Jivakanun | Director |
| 5. Mr. Pukpong Wungrattanasopon | Director |
| 6. Mr. Pramin Phantawesak | Director |
| 7. Mr. Kumpol Chaikitkosi | Director / Managing Director |

**NPC Safety and Environmental Service Company Limited**

| Name | Position |
|---|---|
| 1. Mr. Varit Namwong | Chairman |
| 2. Mr. Wirat Boonbumrungchai | Director |
| 3. Mr. Khomson Piyawattanaviroj | Director |
| 4. Mr. Sekxon Arttamangkura | Director / Managing Director |

**Thai Styrenics Company Limited**

| Name | Position |
|---|---|
| 1. Mr. Patiparn Sukorndhaman | Chairman |
| 2. Mr. Siridech Kumvongdee | Director |
| 3. Mr. Wiboon Chuchepchunkamon | Director |
| 4. Mr. Anupong Phitukpong | Director / Managing Director |

**PTT Chemical International Private Limited**

| Name | Position |
|---|---|
| 1. Mr. Anon Sirisaengtaksin | Chairman |
| 2. Mr. Supattanapong Punmeechaow | Director |
| 3. Miss Duangkamol Settanung | Director |
| 4. Mr. Kongkrapan Intarajang | Director |
| 5. Mr. Patel Cyrus Jonathan | Director |
| 6. Mr. Toasaporn Boonyapipat | Director / CEO |

| PTTGC America Corporation | |
|---|---|
| **Name** | **Position** |
| 1. Miss Duangkamol Settanung | Director |
| 2. Mr. Varit Namwong | Director |
| 3. Mr. Narongsak Jivakanun | Director |
| 4. Mr. Toasaporn Boonyapipat | Director |
| 5. Mr. Kongkrapan Intarajang | President & CEO |

| PTT Maintenace and Engineering Company Limited | |
|---|---|
| **Name** | **Position** |
| 1. Mr. Varit Namwong | Chairman |
| 2. Mr. Anutin Chuaypen | Director |
| 3. Mrs. Jeeranee Pimthanothai | Director |
| 4. Mr. Pairush Soovan | Director / Managing Director |

| PTT Polymer Marketing Company Limited | |
|---|---|
| **Name** | **Position** |
| 1. Mr. Patiparn Sukorndhaman | Chairman |
| 2. Mr. Wiboon Chuchepchunkamon | Director |
| 3. Mrs. Wilawan Songjaroen | Director |
| 4. Mr. Narongchai Pisutpunya | Director / Managing Director |

| GC Oxirane Company Limited | |
|---|---|
| **Name** | **Position** |
| 1. Mr. Patiparn Sukorndhaman | Chairman |
| 2. Miss Duangkamol Settanung | Director |
| 3. Mr. Saroj Putthammawong | Director |
| 4. Mr. Somnuk Suwanpradit | Director / Managing Director |

| PTT Polymer Logistics Company Limited | |
|---|---|
| **Name** | **Position** |
| 1. Mr. Wiboon Chuchepchunkamon | Chairman |
| 2. Mr. Narongchai Pisutpunya | Director |
| 3. Mr. Saroj Putthammawong | Director |
| 4. Mrs. Wilawan Songjaroen | Director / Managing Director |

| GC Treasury Center Company Limited | |
|---|---|
| **Name** | **Position** |
| 1. Miss Duangkamol Settanung | Director |
| 2. Mr. Sansern Sujitjorn | Director |
| 3. Mr. Chusak Wittayakajohnsad | Director |
| 4. Mrs. Natchalee Phadungsidh | Director |



# CORPORATE GOVERNANCE



# CORPORATE GOVERNANCE

The Board of Directors of PTT Global Chemical Public Company Limited (PTTGC) adheres to good corporate governance and business code of conduct, entrenching transparency and efficiency in our operations. Such a commitment brings about trust and confidence in our organization from investors. In 2017, the Board adapted the Corporate Governance Code (CG Code) for listed companies 2017 to our business context. As a leading body, the Board fully understood its responsibility to ensure good governance of the organization, which would lead to the creation of sustainable values, such as competitiveness, long-term profitability; ethical business practices; respect for and responsibility toward shareholders, investors and all groups of stakeholders; creation of benefits to society; reduction of environmental impact; and adaptability under changing conditions. Therefore, the Board of Directors oversees that PTTGC strictly adheres to the Good Governance Policy.

## CORPORATE GOVERNANCE POLICY

The Board of Directors has been committed to maintaining PTTGC's corporate governance standards in conformity with universally accepted practices ever since the inception of our operations in 2011. The Corporate Governance Policy has been formulated as part of the Business Operations Policy. The Corporate Governance Committee has been tasked with overseeing matters of corporate governance, making certain that the implementation of the Corporate Governance Policy meets international standards and ensuring that the policy complements our business strategies and directions, as well as conforms to regulatory and legal requirements and other international guidelines. In addition, the Corporate Governance Committee monitors and assesses the implementation of PTTGC's Corporate Governance Policy through meetings of each Sub-Committee. The results are reported to the board regularly and are disclosed to shareholders in the annual report.

## CORPORATE GOVERNANCE AND BUSINESS CODE OF CONDUCT

PTTGC, with approval of the Board of Directors, has issued the Corporate Governance and Business Code of Conduct Handbook. It defines a structure of corporate governance and provides guidelines that correspond with the Corporate Governance Policy. The handbook is distributed to all levels of employees, Executive Officers and Directors. By appending their signature to the handbook, they acknowledge that they have safely received the handbook and agree to employ the principles therein as a benchmark in their day-to-day operations in a concrete manner.

Our Business Code of Conduct is comprised of principles and best practices for an ethical business, such as respect for the law, compliance with regulations, taking an anti-corruption stance, responsibility toward relevant stakeholders, respect for human rights and consumer rights and lawful use of labor. Our Board of Directors and Executives act as role models to promote a culture of good corporate governance. They also provide a system to oversee, monitor, assess and review employees' compliance with the Business Code of Conduct. The Corporate Governance and Business Code of Conduct Handbook is also distributed to joint venture companies, relevant authorities, stakeholders and business allies. Additionally, shareholders, investors and the public may conveniently access the handbook on our website, www.pttgcgroup.com, under "Corporate Governance".

## CORPORATE COMPLIANCE

PTTGC places a great deal of emphasis not only on the growth of our business but also on our full compliance with relevant regulatory and legal requirements both at home and overseas because PTTGC realizes that complying with the law or even more stringent standards is another way to foster sustainable development.

In 2017, PTTGC emphasized every unit to understand our corporate compliance with the establishment of the three lines of defense (source: The Institute of Internal Auditors). Under this framework, the first line of defense must understand their role in compliance risks management and ensure full compliance of their functions. The Corporate Compliance Division, meanwhile, serves as the second line of defense with three main tasks: 1. support other units in matters of compliance risk assessment; 2. offer advice and educate other units about compliance rules and regulations to ensure preventive activities; and 3. monitor, review and report to ensure corrections and improvements.

Furthermore, supervisory bodies such as the Corporate Governance Division, the Corporate Risk Management Division and the Corporate Compliance Division, who are the second line of defense, have collectively taken the Governance, Risk Management and Compliance (GRC) Approach to integrate management in terms of policy, execution and information exchange. In doing so, we have avoided repetitiveness among all three divisions.

In terms of knowledge dissemination, PTTGC has conducted training for our Directors and Executives, and its subsidiaries including topics such as "Corporate Governance and Compliance for Director and Executive" and "Compliance Mandatory for Manager". The aim of these training sessions has been to enable management to properly oversee matters of compliance. As for employees, several training courses with up-to-date and needed information have been offered, including 1. New Thai Competition Act; 2. Human Rights; 3. Understanding and Compliance to Law, Rule & Regulation Related to Subsidiary; and 4. Comply with Corporate Compliance Policy and Code of Conduct.

As for compliance monitoring and reporting, PTTGC and our subsidiaries, both in Thailand and overseas, continued with the plan made in 2016, which ensured compliance in all areas. We verified that all areas made a compliance checklist to monitor their implementation of the Compliance Policy. Together with the Corporate Risk Management Division, we took into account the results of corporate risk assessment from every company within the PTTGC Group when we assessed, analyzed and monitored their compliance. We also made compliance risk assessment and control-self assessment (CSA), which includes Compliance Health Check that focuses on monitoring the awareness and understanding of middle management toward compliance transfer, stimulation, promotion and coaching of employees under their supervision. In addition, we also worked with Internal Control to align our compliance and compliance risk monitoring criteria. In doing so, we have set up an integrated system of supervision and control.

Management is in charge of compliance oversight organization-wide. They report the conduct of our corporate compliance to the Board of Directors and ensure that our corporate compliance management is effective and aligned with universally accepted practices.

### DISSEMINATION OF GOOD CORPORATE GOVERNANCE PRINCIPLES

PTTGC has established CREATE, which stands for Creation of long-term value, Responsibility, Equitable treatment, Accountability, Transparency and Ethics. We ensure that every employee is aware of CREATE on their first day at PTTGC and continue to instill its value in our employees' mind through continual seminars and activities. We regularly conduct assessments on our Board's performance and on our employees' awareness and implementation of good corporate governance principles, in addition to being assessed by authorities such as the Securities and Exchange Commission (SEC), the Stock Exchange of Thailand (SET), the Thai Institute of Directors (IOD) and the Thai Investors Association. All of this gauges our compliance with good corporate governance principles and elevates our corporate governance toward international standards. Furthermore, our Executives and Management include the CG Talk in their base agenda to encourage every employee to behave ethically and to adhere to our Corporate Governance principles.

## COMPLIANCE WITH INTERNATIONAL STANDARDS OF GOOD CORPORATE GOVERNANCE

PTTGC continues to adhere to international standards of good corporate governance, including those established by the Stock Exchange of Thailand, the ASEAN CG Scorecard and the Dow Jones Sustainability Indices (DJSI). In 2017, PTTGC complied with the following five aspects of good corporate governance:

### SHAREHOLDER RIGHTS

Placing a great deal of emphasis on the protection of shareholder rights, the Board of Directors included shareholder rights protection mechanisms in the Corporate Governance Handbook. It also oversaw PTTGC's thorough compliance with the established principles.

#### 1. The provision of important and pertinent information to shareholders

We afforded shareholders clear and up-to-date information of importance and of pertinence to our business operations. Regardless of legal requirements, we always disclosed the information that we deemed necessary. This information was provided on our website and via the Stock Exchange of Thailand's portal.

## 2. THE 2017 ANNUAL GENERAL MEETING OF SHAREHOLDERS

PTTGC held the 2017 Annual General Meeting of Shareholders (AGM) on April 5th, 2017, at the Bangkok Convention Center on the 5th floor of Central Plaza Ladprao, located at 1695 Phahon Yothin Rd., Chatuchak, Chatuchak, Bangkok. The meeting commenced at 2 p.m. We afforded participating shareholders the following conveniences:

### PRIOR TO THE MEETING

- We provided opportunities for minority shareholders, defined as any single shareholder or a group of shareholders holding at least 0.1% of all shares with eligible voting rights, to propose agenda items and nominate qualified candidates to be elected as Directors prior to the meeting during September 19th to December 31st, 2016, via the Stock Exchange of Thailand's portal and on the company website.
- Proposed agenda items and candidates are considered against established criteria. The Nomination and Remuneration Committee is tasked with considering whether the proposed candidates possess desired qualifications. Meanwhile, the Corporate Governance Committee is in charge of reviewing and selecting proposed agenda items based on their benefits and appropriacy. The selected agenda items are submitted to the Board of Directors for its final approval. The Board then informs the shareholders of its decision regarding these agenda items and its reasons at the meeting. However, no agenda items were proposed, and no nominations were made in 2017.
- We instantly notified the Stock Exchange of Thailand after the Board of Directors Meeting on February 20th, 2017, that the 2017 Annual General Meeting (AGM) of Shareholders would be held on April 5th, 2017, so that the news would be disseminated to our shareholders. We also informed them of the record date on March 6th, 2017 to encourage shareholders to attend the AGM and to promote their rights to receive their dividend payment. This information was also made available on our company website.
- We published the invitation to the 2017 Annual General Meeting of Shareholders on our website for more than 30 days prior to the date of the meeting. Enclosed with the invitation were meeting agenda with the Board's opinions about each agenda item and meeting documents. All of this was made available in both Thai and English.
- In the event that a shareholder would like to assign a proxy to attend and vote at the AGM on their behalf or that a shareholder would be unable to attend the AGM personally, we provided them with a proxy statement that allowed each shareholder to specify their "for", "against" or "abstain" vote for each agenda item. We also provided Independent Directors' names and biography for shareholders to consider as their proxy. Details of the proxy assignment process and documents required for the procedure were enclosed with the meeting invitation. All of this was available in both Thai and English.
- The invitation was mailed to shareholders 21 days prior to the meeting. A map of the meeting location and a telephone number for inquiries were also included.

### ON THE DAY OF THE MEETING

- We held the AGM in a large conference hall that could accommodate a sizeable number of shareholders. We afforded shareholders an opportunity to ask questions and express their opinions, ensuring smooth and efficient meeting organization. We organized an exhibition, with commentators, in front of the conference hall to educate participants about the various aspects of our business and performance. We also provided sufficient food and drink for participants.
- We adopted barcode scanning in our registration process for convenience and efficiency. We also provided staff to help verify shareholders' documents. Registration was opened for more than two hours before the meeting started.
- Out of 15 Directors, 14 attended the 2017 Annual General Meeting of Shareholders. Mrs. Watanan Petersik was unable to attend due to an urgent task. Also in attendance were high-ranking Executive Officers, Auditors, Legal Advisors, Shareholder rights protection volunteer, Lawyers and Shareholder who volunteered as vote counting witness.
- Before the meeting commenced, the Company Secretary explained voting and vote counting procedures for each agenda item. Voting cards were provided for each agenda item. Shareholders and proxies could vote "for", "against" or "abstain".
- The Chairman of the meeting proceeded with all the agenda items in order and afforded all shareholders equal rights to express their opinions. Sub-Committee Chairpersons, the President and Chief Executive Officer and related high-ranking Executive Officers were tasked with answering shareholders' questions. All opinions expressed and questions asked were fully recorded in the meeting's minutes.

### AFTER THE MEETING

- We disclosed the resolutions passed in the 2017 Annual General Meeting of Shareholders through the Stock Exchange of Thailand's portal once the meeting had ended within the same day. The disclosed resolutions included a complete set of the "for", "against" and "abstain" votes of each agenda item. We also put together meeting minutes, specifying the names of Directors and Executives in attendance, as well as other relevant attendees, important explanations, a list of questions and answers and a summary of opinions expressed. The minutes were made in both Thai and English and submitted to the Stock Exchange of Thailand and other related agencies within 14 days following the meeting. They were also made available on company website, www.pttgcgroup.com, for shareholders' consideration.

From the quality assessment of our organization of the 2017 Annual General Meeting of Shareholders conducted by the Thai Investors Association (TIA), PTTGC received a perfect score of 100, or outstanding level, for the sixth consecutive years (2012–2017).

## EQUITABLE TREATMENT OF SHAREHOLDERS

The Board of Directors oversees equitable treatment of every shareholder, whether majority or minority, Thai or foreign. PTTGC's equitable treatment of shareholders can be summarized as follows:

1. PTTGC values all shareholders. We have measures in place to fairly and equitably protect the rights of every shareholder. These measures also bring about investors' trust and confidence in PTTGC and ensure continuous suitable returns.
2. PTTGC affords minority shareholders a chance to express their opinions, provide suggestions and submit complaints to the Board of Directors via a contact form on the company website (http://www.pttgcgroup.com/en/corporate-governance/contact-the-board-of-directors) and to the Chairman of the Corporate Governance Committee (an Independent Director) and the Company Secretary via email at cg@pttgcgroup.com. The Corporate Governance Committee reviews these submissions and takes appropriate action. Institutional investors may request information or express their opinions via email at ir@pttgcgroup.com, which falls under the jurisdiction of Investor Relations.
3. PTTGC fosters good relations with our shareholders through an activity that also benefits society and the environment, namely Company Visit 2017, which took place in Rayong. The activity gave 500 majority and minority shareholders equal opportunity to participate. There were two groups of 250 people. The first group visited plants of the PTTGC Group and took part in a social outreach activity on November 8th, 2017. Meanwhile, the second group visited Kamnoetvidya Science AcademySchool and Vidyasirimedhi Institute of Science and Technology, as well as carried out an environmental conservation activity at the Wang Chan Forest on November 15th, 2017.

## STAKEHOLDERS' ROLES

Placing much importance on the rights of every group of stakeholders, PTTGC has collected and published practices for stakeholder rights protection and impact mitigation, especially on our website. We have also provided channels by which stakeholders can submit their opinions and complaints



The 2017 Annual General Meeting of Shareholders (AGM)

to PTTGC. Our stakeholder-related policies and guidelines, as well as their actualization in 2017 are summarized below:

## SHAREHOLDERS

PTTGC respects the fundamental rights of shareholders and treats every shareholder equitably, which brings about their utmost satisfaction. These rights include the right to participate in the annual general meeting, the right to vote, the right to propose meeting agenda items and the right to nominate candidates for a directorship. PTTGC organizes activities for shareholders, including Company Visits, listens to their opinions and suggestions and provides them with contact channels, via the www.pttgcgroup.com website and via email at ir@pttgcgroup.com and cg@pttgcgroup.com, as previously disclosed under Shareholder Rights and Equitable Treatment of Shareholders.

Moreover, under the Giving Back to Society campaign initiated at the 2017 Annual General Meeting of Shareholders, PTTGC donated 100 baht per shareholder who registered to attend the meeting (whether in person or through a proxy) in lieu of giving souvenirs to shareholders (refraining from distributing souvenirs per the SEC's directive). A total of 477,000 baht was donated for the purchase of medical equipment for Khao Chamao Chalermphrakiat 80 Years Hospital in Rayong.



Giving Back to Society Campaign: Donation of Medical Equipment for Khao Chamao Chalermphrakiat 80 Years Hospital in Rayong

## CUSTOMERS

PTTGC is committed to bringing about customer satisfaction and confidence through the development of good products and services. By providing unprejudiced, appropriate, transparent and accountable management, we ensure that our services and products are of good quality and are reasonably priced. We also make certain that our standards continue to improve. We maintain a good and sustainable relationship with our customers through a diverse range of activities. For instance, we conduct a monthly review of our customer-related operations. We also check our products quality, develop new ones and try to the best of our abilities to meet customer demand. We even implement a customer relationship management (CRM) system and a whistleblower form on our company website to facilitate submission of complaints about our products and services.

Furthermore, we have established several standards by which our operations can be improved. They also serve as tools with which we manage and assess the efficiency of our operations. These standards include standard contracts for product sales and purchase, control self-assessment, the Marketing and Commercial Operations Policy, which has been devised in conformity to the Corporate Governance and Business Code of Conduct Handbook, and the Corporate Compliance Policy. These standards serve as guidelines to which every employee in the division must strictly adhere.

## SUPPLIERS

PTTGC operates with fairness and lawfulness to foster mutual growth between us and our suppliers by ensuring that our operation is transparent, accountable and ethical. Our supplier-oriented achievements include the adoption of an e-procurement system that has rendered our procurement processes more transparent, less costly and more simplified, as well as the improvements made to the Approved Vendor List (AVL). Furthermore, we have formulated the Supplier Code of Conduct and the Procurement Code of Conduct, basing their principles on the Corporate Governance and Business Code of Conduct Handbook. We have also implemented a system of annual supplier audit and assessment.

Additionally, we have conducted supplier relationship management (SRM) activities year after year, namely the Suppliers Conference, where we meet with our suppliers to

Supplier Conference 2017: SMART TOGETHER




socialize, exchange ideas and communicate our policies to them. There have also been partnerships between PTTGC and our suppliers, in which we have been able to lower the costs of procurement and enhance our suppliers' competitiveness.

## BUSINESS COMPETITORS

It is PTTGC's policy to align our treatment toward our competitors with international practices under the framework of competition laws. We adhere to principles of fair and transparent competition. We neither seek competitors' trade secrets through inappropriate or dishonest means nor do we defame them by malicious accusation.

## CREDITORS

PTTGC treats our creditors with fairness and responsibility. We strictly conform to best practices in accordance with terms and conditions set forth in the contracts, terms of guarantee, capital management and debt repayment, due dates and financial encumbrances. We do not conceal information or facts that may cause damage to creditors. In the event that PTTGC foresees that we may not be able to perform any of our contractual obligations, we promptly notify our creditors and work with them to find a solution. Furthermore, PTTGC holds banker feedback sessions to heed our financial institutions' opinions toward our organization's processes, which also enhances their confidence in our processes and our compliance with their regulations. PTTGC has no lawsuits over debt default with any of our creditors.

As for debenture holders, PTTGC diligently complies with laws and announcements of the Securities and Exchange Commission of Thailand, as well as policies, objectives and resolutions passed at any of the shareholder meetings. We regularly organize activities to foster good relationships with our debenture holders, including the recent Chao Phraya River sightseeing by Angsana Cruise on November 22nd, 2017. A total of 120 debenture holders and their companions (1:1) participated in the event.

## PUBLIC SECTOR

PTTGC believes that the public sector, one of our stakeholders, plays a key role in the success of our business. We have put in place a policy on our conduct toward the public sector in all countries where we invest to avoid any inappropriate action and transactions. This policy is disclosed in the Corporate Governance and Business Code of Conduct Handbook. PTTGC is committed to our corporate compliance with the local law and governmental regulations. To obtain permits, benefits and concessions, we comply with all of the rules, regulations and laws, as well as established procedures and processes. Our contact with the public sector, including local authorities and state enterprises, is transparent. We also offer full disclosure per governmental requirements.

## EMPLOYEES

Understanding that employees are a vital key to progress, PTTGC focuses on developing our employees' competence with an aim of becoming a learning organization. In addition, we afford our employees fair compensation, a safe work environment and the ability to offer opinions and suggestions regardless of their position in the corporate hierarchy.

Our human resource management plan is aligned with our operations to support our business units and our foreign endeavors. We also strive to prepare our employees for our business expansion abroad.

Moreover, it is PTTGC's policy to welcome individuals living with disabilities into our organization with open arms and to make the necessary provisions to better the quality of their life. Our remuneration policy is aligned with our short- and long-term performance. Our talent and succession management system serves as a framework in which our human resources are managed and developed according to their own potential, capabilities and performance. Further details of our human-resource management are disclosed in the People Management and Development Policy.

### SOCIETY, COMMUNITIES AND THE ENVIRONMENT

Integral to our operations is our responsibility toward society, communities and the environment. We take into account issues such as safety, quality of life, conservation of natural resources, the promotion of efficient energy consumption and the quality of life of people living around our plants and across Thailand as a whole. To bring about the sustainability of our corporate social responsibility (CSR) management, we have developed the three levels of our CSR programs portfolio, namely immediate vicinities, provincial and national. The goal of our CSR programs is to care for society while working to achieve our vision as a leading chemical Company for better living. We also strive to balance its environmental, economic and social aspects. Our CSR programs are mainly driven by the Employee Volunteer Program.

PTTGC Fish Aggregating Device Project: A Social Outreach Activity under "Company Visit 2017"





Environmental Conservation Activity at the Wang Chan Forest, in Rayong

To strengthen society in a sustainable manner, we have formulated the community support process approach. As a manual of sustainability, we have applied this approach to our CSR programs to truly meet their needs and ensure the sustainability of such programs. In addition to our financial reports, we have also made the integrated sustainability report (ISR), which is a world-class sustainability framework that covers economic, social and environmental topics, as well as any other issues that may significantly affect PTTGC. More details on the topic may be found in the 2017 Integrated Sustainability Report.

Furthermore, PTTGC has demonstrated resilient dedication to the development of economic and social innovations. Our latest endeavor has been a project called Upcycling the Oceans, Thailand, in which plastic waste recovered from the ocean is transformed into clothes. The project has created value-added economically and also contributed to environmental protection. The project has received much praise from the Stock Exchange of Thailand. We hope that it can concretely become part of the circular economy in the future.

## DISCLOSURE AND TRANSPARENCY

PTTGC is committed to the transparent and timely disclosure of accurate and complete information (both financial and non-financial) to stakeholders in conformity with the relevant rules of law and regulations. We disclose such information through the SET Community Portal of the Stock Exchange of Thailand and on our www.pttgcgroup.com website. Investors Relation (IR), Corporate Governance and Company Secretary are in charge of providing such information and responding to inquiries.

(1) Disclosure of Important Information in the Annual Report and in Form 56-1

- **Financial Information:** PTTGC's financial statements are audited by a professional auditor for the accuracy of essential information, following financial auditing standards. Each financial statement is also approved by the Audit Committee and the Board of Directors prior to the disclosure to shareholders and the public. The Board of Directors' statement on the accountability of our financial reports is disclosed alongside the auditor's report in this annual report. It includes connected transactions, management's analysis and risk management.

- **Non-Financial Information:** PTTGC also discloses non-financial information, including the operational structure of the PTTGC Group, the majority shareholder's shareholding structure, the number of shares held, the ratio of shares held by institutional investors and the ratio of free-float shares. Upon taking office and every instance the information is changed, any persons tasked with the management of PTTGC and its subsidiaries must report their and their affiliates' conflicts of interest. They must also report their securities holding every month and at the end of the year.

(2) Channels that PTTGC uses to disclose essential information, which is available in Thai and English, include the following:

- We disclose essential information via the SET Community Portal of the Stock Exchange of Thailand;
- We disclose essential information on our website, www.pttgcgroup.com, which is regularly updated. Channels that may be used to contact the Board and other divisions are also fully and clearly displayed;
- We disclose information and news to our stakeholders via email, exhibitions, newspaper articles, press releases and sundry other activities.

## INSIDER INFORMATION

PTTGC takes the issue of insider information seriously. It is our policy to prohibit the use of insider information, which is defined as essential information that has not yet been made public, for personal gain or for the benefit of any individual. Such usage includes trading PTTGC's stock. This policy appears in the Corporate Governance and Business Code of Conduct Handbook, which is retrievable on the PTTGC website, for shareholders to acknowledge and for our Directors, Executive Officers and other personnel to abide by. The following is a summary of this policy.

(1) Directors and Executive Officers per the SEC's definition, from Senior Vice President to the top of the hierarchy, must report as any changes in their holding of PTTGC's stock within three (3) business days following the change per the SEC's specifications. Moreover, our policy requires Directors and Executive Officers to notify the Company Secretary of their intention to trade PTTGC's stock at least one (1) business day before the transaction.

(2) The Board of Directors monitors the implementation of our Business Code of Conduct on the subject of insider information. It mandates that any person whose duty is to report stock holding and changes to stock holding must submit a copy of the report to the Company Secretary. The Company Secretary must then report these changes to the Board at every meeting or when the changes occur. Information of stock holding at the beginning and the end of each fiscal year is disclosed in the annual report.

(3) PTTGC notifies Directors and Executive Officers in writing that they are prohibited from trading stock 30 days prior to the disclosure of the quarterly and annual financial statements or other information that may affect the price of PTTGC's stock. They are also prohibited from trading PTTGC's securities within 24 hours from the disclosure.

(4) According to the Confidentiality of Information Policy, which is part of our Corporate Compliance Policy, every Executive Officer and staff member are required to treat PTTGC's information with confidentiality and to safeguard our information, our business partners' information and the personal information of related parties. They are also required to adhere to our guidelines on confidential information or information that is yet to be in public domain.

(5) PTTGC regularly keeps our Directors, Executive Officers and employees up to date on regulations and policies regarding insider information. On top of ensuring their acknowledgement and compliance, we also clearly outline punitive disciplinary action for cases of violation. No reports of violation were made in 2017.

## INFORMATION TECHNOLOGY

PTTGC has established an organizational framework of governance and management for information technology, which is designed to meet our business needs. In addition, we have taken advantage of information technology to augment business opportunities, bolster our risk management and enable us to achieve our objectives and goals. The following guidelines have been put in place to regulate the use of information technology:

(1) PTTGC shall ensure compliance with relevant laws, regulations and standards on the use of information technology through supervision and monitoring.

(2) By means of cybersecurity, PTTGC shall maintain the confidentiality, integrity and availability of data, as well as protect data against unlawful use or unauthorized modification.

(3) PTTGC shall regularly review all information-technology risks that may affect our business and prepare action plans to mitigate and manage such risks, including

business continuity management, asset management and incident management. These plans are disclosed under Risk Management and Risk Factors.

(4) PTTGC shall manage information-technology resources and shall establish criteria for the prioritization of information technology plans. These criteria may include alignment with the strategic plan, effects on operations, urgency, information technology budget and human resources and suitability for our business model.

## INVESTOR RELATIONS

Investor Relations is the center of communication, where essential information is disclosed to shareholders, institutional and retail investors, analysts and relevant authorities. Investor Relations also oversees the quality of financial reporting processes and essential information that may affect the price of PTTGC's stock, such as financial statements, earnings reports and quarterly and annual Management's Discussion and Analysis (MD&A). These are all indicators of PTTGC's financial standing, performance and future trend. Investor Relations also manages the disclosure of information via the SET Community Portal of the Stock Exchange of Thailand to foreign and domestic investors. Furthermore, Investor Relations put in place "Investor Relations Code of Conduct" that outlines the role and best practices that apply to investor relations officers to treat all shareholders equally.

In the year 2017, our Executive Officers regularly met with shareholders, financial analysts, investors and employees through a number of activities and events to present them with our performance. These include analyst meetings, domestic and overseas roadshows and retail-investor events.

| Investor Meetings | |
|---|---|
| Investor Meetings Abroad | 7 times |
| Domestic Investor Meetings | 10 times |
| SET Opportunity Day | 4 times |
| Meetings with Financial Analysts | 4 times |
| Meetings at the Company | 69 times |
| Teleconferences | 18 times |

| Information Disclosure | |
|---|---|
| Disclosure via SET Community Portal and Company Website | 86 times |

| Activities | |
|---|---|
| Bondholders Site Visits | 1 time |
| Analysts/Fund Site Visits | 1 time |
| Shareholders Site Visits | 2 times |
| Relationship-Fostering Activities with Analysts | 3 times |
| Basic Training with Analysts | 4 times |

Investors or any interested persons may contact PTTGC via the following 5 channels for more information:

(1) Mail: Investor Relations, PTT Global Chemical Public Company Limited
555/1 Energy Complex, Building A,
14th–18th Floor, Vibhavadi Rangsit Road,
Chatuchak, Chatuchak, Bangkok 10900
(2) Phone: 66(0) 2 265 8400 ext. 8172, 8364, 8361, 8213 or 66(0) 2 140 8714
(3) Email: ir@pttgcgroup.com
(4) Fax: 66(0) 2265-8500
(5) Website: www.pttgcgroup.com

In addition, PTTGC offers swift and convenient correspondence via email. The email address is published on our company website under Corporate Governance. Shareholders and the public may reach out to the Board of Directors or Chairman of the Corporate Governance Committee directly. They may also contact the Company Secretary for company information at cg@pttgcgroup.com.

## RESPONSIBILITIES OF THE BOARD OF DIRECTORS

The Board of Directors has effectuated the following policy regarding their composition and the scope of their responsibilities and duties:

### 1. The Establishment of Business Strategies, Policies and Directions

The Board considers and establishes PTTGC's policies, strategies and sustainable development goals under the framework of universal sustainable business practices with an aim to balance the economy, the environment and society. At least once a year, the Board reviews and sets corporate vision and goals in accordance with the current economic condition. In addition, the Board approves key

performance indicators (KPIs), which must encompass the following four aspects, namely finance, stakeholder, internal process, and human resources and leadership. The Board also formulates various other corporate goals and plans, as well as periodically monitors their progress. Furthermore, the Board also supervises the performance of the management team through the President and Chief Executive Officer to assure the achievement of PTTGC's goals and plans.

### 2. Corporate Governance and Business Code of Conduct

The Board provides the PTTGC Group with the Corporate Governance Policy and Business Code of Conduct, by which Directors, Executive Officers and employees must abide to bring about efficient, standardized, ethical, transparent and accountable operations. The Board also ensures that all stakeholders justly receive the benefits guaranteed to them by their fundamental rights, bolstering confidence and fostering recognition among the public. The Corporate Governance Committee, inaugurated by the Board, is tasked with assuring PTTGC's diligent compliance with the Corporate Governance Policy, Business Code of Conduct, Corporate Compliance Policy, as well as all applicable laws, objectives, regulations and shareholder resolutions. The Corporate Governance Committee also oversees the equitable treatment of all shareholders, whether it be shareholder benefits and rights, and instills an understanding of good corporate governance in the mind of our employees.

### 3. Internal Control and Internal Audit

The Board requires that PTTGC and its subsidiaries have an effective internal control system; that this internal control system be as adequate as any universally accepted standards; that it correspond to our risk appetite; and that it take into account the appropriate internal control environment. The Audit Committee and Internal Audit are tasked with performing reviews and monitoring internal audit on a regular basis. They must ensure efficient internal control activities, adequate and accountable information and internal and external communication, and regular monitoring and assessment. Their efforts bring about the achievement of operational, reporting and compliance objectives. They also foster confidence among Executive Officers, investors and other stakeholders of PTTGC. Further information may be found under Internal Control.

### 4. Risk Management

The Board oversees PTTGC's management system of risks that may derail our strategic objectives. The Board tasks the Risk Management Committee with devising policies and frameworks of risk management, as well as ensuring risk management efficiency. By reviewing risks that may negatively impact our objectives and considering substantial risks at project and organization levels, the Risk Management Committee provides PTTGC with an execution plan, as well as consistently monitors, assesses and makes adjustments to the said plan to make certain that these risks remain within our risk tolerance level. Furthermore, the Risk Management Committee provides risk management reports to the Board on both regular and ad-hoc bases, as disclosed under Risk Management and Risk Factors.

### 5. Conflicts of Interest

The Board of Directors has laid down a policy and guidelines for the possibility of a conflict of interest in the Corporate Governance and Business Code of Conduct Handbook, to which all Directors, Executive Officers and employees must conform. They must also carefully follow the guidelines for transactions or connected transactions to refrain from violating the regulations of the Securities and Exchange Commission and the Stock Exchange of Thailand. Directors and Executive Officers from Executive Vice President to the top of the corporate hierarchy, as well as other finance-related positions per the SET's requirements, must report their interests and those of their related persons to PTTGC. Employees are required to report all possible conflicts of interest annually. In addition, in the event that a conflict of interest has arisen, all persons involved are required to report it to PTTGC immediately.

PTTGC has put further measures in place to prevent conflicts of interest. Directors, Executive Officers, employees and all related persons shall refrain from partaking in a financial transaction and/or a relation with an external entity that may result in a conflict of interest with PTTGC or may hinder the efficiency of our operations. In the event that a conflict of interest has arisen in procurement, bidding, decision making or transaction approval, they are required to report the conflict of interest to their immediate supervisor or the party involved, using our Conflict of Interest Form, and withdraw from such a process.

## ANTI-CORRUPTION EFFORTS

PTTGC's transparent and accountable operation is founded upon good corporate governance. We have a control and monitoring mechanism in place to prevent internal fraud and all forms of corruption, whether they be direct or indirect.

In the year 2017, PTTGC has expressed our dedication to the fight against fraud and corruption in the following manners:

### CAC

PTTGC first became a certified member of the Private Sector Collective Action Coalition against Corruption (CAC) on July 4th, 2014. Our membership was recertified on May 25th, 2017 (Each certification only lasts three years). The recertification process required PTTGC to self-assess our organization, the result of which was audited and signed by the Chairman of the Audit Committee, to prove that PTTGC had anti-corruption policies, guidelines and measures in place, as well as operated according to good corporate governance principles per the CAC's requirements.







PTTGC renews membership of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC-Recertification)

## ORGANIZATION OF TRANSPARENCY

PTTGC firmly adheres to ethical and transparent business practices because we realize that corruption is a major obstacle to Thailand's development and poses a significant threat to the country on several fronts, including the economy, society, politics, social values, virtues and morality. To support the government's anti-corruption efforts via the promotion of awareness, social values, virtues and morality, as well as to propel Thailand's transparency toward an accepted standard and to promote a culture of business management based on good corporate governance, PTTGC has participated in the annual NACC Integrity Awards held by the Office of the National Anti-Corruption Commission (NACC) year after year.

In 2017 we received an honorable mention in the NACC Integrity Awards. Furthermore, we partook in several activities to express our commitment and efforts in the fight against all forms of corruption, including the National Anti-Corruption Day 2017 organized by the Anti-Corruption Organization of Thailand and the International Anti-Corruption Day (Thailand) organized by the Royal Thai Government in conjunction with the Office of the NACC, the Office of the Public Sector Anti-Corruption Commission (PACC), the Anti-Corruption Organization of Thailand and Thailand's anti-corruption network.

## FRAUD RISK ASSESSMENT

PTTGC uses a fraud risk assessment tool to analyze and evaluate fraud risks in several internal processes, as well as their possible effects. This past year we conducted the "CG Role Model: Focus on Action" training, in which we invited a risk-assessment expert trainer from an external agency to train our management team. This Anti-Corruption Society certified expert coached us on fraud risk assessment techniques and held a workshop to raise our Executive Officers' awareness of the importance of ethical operations. The workshop has equipped them with the ability to assess risks and anti-corruption processes, to strengthen our organization by being a role model and to encourage employees to be vigilant of fraudulent activities.

## NO GIFT POLICY

Giving or receiving gifts, treating someone or being treated to a meal, and giving or receiving any other forms of benefit need to be addressed because these actions are all possible causes of corruption. Therefore, PTTGC has issued the No Gift Policy in compliance with our Anti-Corruption



PTTGC partook in the International Anti-Corruption Day 2017




PTTGC received an Honorable Mention in the NACC Integrity Awards



"CG Role Model: Focus on Action" Training

Policy. Stringently enforced across our organization, the No Gift Policy mandates that any person employed by the PTTGC Group may not ask for or receive gifts, samples, meals or any forms of favor from a business partner of the PTTGC Group that may be considered inappropriate. In doing so, we refrain from an act that may influence our decision or lead to selective treatment or result in a conflict of interest. We have communicated this policy to all external parties involved in our business operations for their acknowledgement. Compliance with the No Gift Policy ensures that our business maintains its integrity, transparency, honesty and lawfulness.

## WHISTLEBLOWER SYSTEM

PTTGC recognizes the important role that all stakeholders play in our corporate governance. Whenever they witness any violations of the Business Code of Conduct, any forms of fraud or corruption or any other inappropriate cases, they may submit a complaint directly to the Chairman of the Corporate Governance Committee or the Board of Directors or Executive Officers of PTTGC or any other channels that they trust.

Mail: The Chairman of the Corporate Governance Committee / The Board of Directors / Executive Officers or Company Secretary, PTT Global Chemical Public Company Limited 555/1 Energy Complex, Building A, 18th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900

Email: whistleblower@pttgcgroup.com

Website: www.pttgcgroup.com

Or other available channels

### WHISTLEBLOWER POLICY PROCEDURE

PTTGC has formulated and effectuated the following Whistleblower Policy Procedure:

(1) Review: The responsible department reviews essential information provided in all anonymous submission according to policy and procedure. The submissions are considered given that they provide clear reasoning and evidence. The review result is then reported back to the whistleblower.

(2) Investigation: Head of Internal Audit presents a report of facts, as well as his/her opinion and suggestions,

to the President and Chief Executive Officer for his consideration and further action.

(3) Executive Action: The President and Chief Executive Officer will form an investigation committee to oversee action to be taken in accordance with the Company Work Regulations. The investigation committee ensures that every party involved is treated fairly.

(4) Report: The whistleblower will be notified of the solution if contact information was provided. The Corporate Governance Committee and the Audit Committee will also be notified of the solution.

### WHISTLEBLOWER AND WITNESS PROTECTION

Whistleblowers and any witnesses who collaborate in the investigation will be afforded the following protection according to the Whistleblower Policy:

(1) A whistleblower, a stakeholder or any person who truthfully collaborates in the investigation will be protected and treated with non-retaliation.

(2) Information of the whistleblower, as well as any persons involved, will be treated with confidentiality according to our regulations on information classification and security of confidential documents.

(3) PTTGC will provide suitable mitigation measures for the whistleblower or the affected party.

### COMPLAINT STATISTICS

In 2017 PTTGC received a total of 77 complaints. Eight of these complaints were about our business code of conduct, five of which we have investigated and taken action, while the other three are currently under investigation according to procedure. We also received one safety, occupational health and environment complaint, which was about a non-hazardous odor during the turnaround of PTTGC Plant (Branch 3). The issue has since then been rectified. Meanwhile, we received 68 voice of customer complaints, most of which were about tearing of our polymer packaging. These complaints have been addressed, and appropriate prevention measures have been put in place.

## BOARD OF DIRECTORS AND SUB-COMMITTEES

### BOARD OF DIRECTORS

The Board of Directors comprises 15 members, of which nine are Independent Directors. All Directors on the Board are experts from various fields with coveted knowledge, skills and experiences. The combination of their skills, qualifications and experiences bring about advantages to PTTGC. The Board dedicates their time to perform their duties for the utmost benefit to PTTGC and our shareholders. They are nominated and appointed according to proper criteria. Their duties and responsibilities are based on applicable laws, as well as PTTGC's regulations and Articles of Association, shareholder resolutions and good corporate governance. Directors' duties and responsibilities are effectuated in ways that steer them from conflicts of interest with PTTGC, instilling trust and confidence in our shareholders and investors. The structure of the Board of Directors as appears in Management Structure allows Board members to perform their duties efficiently. The number of Directors is suitable for the size and type of our business and is approved by shareholders.

### SUB-COMMITTEES

The Board of Directors has established four Sub-Committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. Directors selected to be on these Sub-Committees possess the expertise and knowledge required to oversee specific issues that each Sub-Committee is tasked with, according to the Articles of Association. Each Sub-Committee has established its own charter, which prescribes its Directors' desired qualifications, term in office and scope of duties and responsibilities. The names of Directors on these Sub-Committees, their responsibilities, the number of their meetings and attendance in these meetings are found under Management Structure.

Furthermore, every Sub-Committee is required to regularly report its performance to the Board at a Board meeting. The four Sub-Committees also reveal their performance of the previous year to our shareholders using Form 56-1 and in the annual report.

## NOMINATION AND APPOINTMENT OF DIRECTORS, INDEPENDENT DIRECTORS AND PRESIDENT AND CHIEF EXECUTIVE OFFICER

The Board of Directors, through the Nomination and Remuneration Committee, considers and nominates candidates with the knowledge, skills, expertise, experience and niche qualifications that are in agreement with PTTGC's business strategy or could benefit our operations when a Director position becomes vacant or when a Director's term limit is due. In the nomination process, we consider

candidates from the Director Pool of the Thai Institute of Directors and encourage shareholders to nominate qualified individuals, ensuring that the composition of the Board is wholesome and will yield the utmost benefit to PTTGC. In the event that a former Director is re-nominated, we will also consider his or her past year's performance, dedication and participation in the various activities and events.

Concerning the nomination and appointment of Independent Directors, PTTGC strives to ensure our compliance with the SEC's specifications regarding the suitable number of Independent Directors on the Board. As of December 31st, 2017, PTTGC's Board of Directors is comprised of 15 members, of which nine are Independent Directors, exceeding the number mandated by the SEC. The definition and qualifications of an Independent Director may be found in the Corporate Governance Handbook and on our website.

As for the nomination of a candidate to the office of the President and Chief Executive Officer, in the event that this position becomes vacant, the Nomination and Remuneration Committee will consider and nominate one of the Directors on the Board. The nominee must possess the skills, professional experience and niche qualifications that are needed and that will bring about the utmost benefit to PTTGC. This nominee must have the knowledge, expertise and experience in the petrochemical, petroleum or energy sector. He or she must also demonstrate a great deal of leadership, have led an organization and be held in high esteem by relevant businesses and organizations. The possibility of a conflict of interest must also be taken into account. The nominee shall be appointed by the Board itself.

## ROLES OF THE CHAIRMAN AND OF THE PRESIDENT AND CHIEF EXECUTIVE OFFICER

The Chairman of the Board of Directors and the President and Chief Executive Officer are not the same person. Their duties and responsibilities are distinct, as outlined below:

**The Chairman of the Board of Directors** is an Independent Director, whose main role is to oversee the Board of Directors' efficiency, its compliance with good corporate governance principles and the Business Code of Conduct and its independence from management. In addition, the Chairman works in tandem with the President and Chief Executive Officer to determine meeting agenda but refrains from partaking in the day-to-day business management. The Chairman presides over both board and shareholder meetings. He is prohibited from serving on any Sub-Committees. This prohibition is unequivocally outlined in the scope of responsibilities of the Board of Directors and of Sub-Committees. With a firm and suitable establishment of his scope of duties and functions, the Chairman is able to independently exercise his discretion.

**The President and Chief Executive Officer** sits at the pinnacle of our corporate hierarchy and is appointed from one of the Directors in conformity with the Articles of Association. He is tasked with managing PTTGC according to established policies, plans and budgets under the authority granted by the Board of Directors and set forth in the Articles of Association and per PTTGC regulations. The President and Chief Executive Officer also serves as secretary to the Board of Directors. The roles and duties of this position are disclosed on our website in both Thai and English. Furthermore, the Articles of Association also mandate that the President and Chief Executive Officer receive compensation and benefits for his role as the highest-ranking officer in addition to what he earns as a Director.

## BOARD MEETINGS

The Board of Directors schedules the exact date and time of Board meetings for the entire year in advance on the fourth Monday of every month and also clearly outlines the agenda of each meeting. The Board may also call for special meetings whenever the need arises. Directors receive a Board meeting invitation, draft minutes of the previous meeting and information accompanying the meeting agenda at least seven days prior to the meeting. In 2017 there were a total of 15 Board meetings.

The Chairman presides over these Board meetings and affords every Director a chance to participate and express his or her opinion freely. At least two-thirds of all Directors on the Board must be present to constitute a quorum, which must be maintained until voting is complete. Each Director has one vote, and a resolution is passed based on majority votes. The Chairman shall cast his vote, which is the deciding vote, only in the event of a tie.

The Board believes in the importance of prudent, impartial and transparent management of conflicts of interest. All information regarding conflicts of interest is fully disclosed. Should any Director have an interest in an agenda item, he or she must refrain from partaking in the decision-making process of that particular agenda item.

After every meeting, the Company Secretary is responsible for completing the minutes, which will be presented for the Board's approval as the first agenda item of the next

meeting. Once the Chairman places his signature on the minutes, they are approved and are systematically kept as a confidential document with an electronical copy, together with other agenda-accompanying documents, for ease of retrieval and reference purposes.

Moreover, the Board of Directors mandates that Non-Executive Directors hold their own meetings, in the spirit of good corporate governance, to offer their opinions and guidelines for PTTGC's management and operations. The Board also mandates that Independent Directors hold similar meetings to exchange ideas and review their role and performance every year. In 2017, Non-Executive Directors held one meeting on July 24th, 2017, while Independent Directors also held one meeting on November 20th, 2017. Summaries of these meetings were presented to the Board for their acknowledgement. The details of Board meetings and Sub-Committee meetings are disclosed in Directors' Meetings under Management Structure.

To easily and swiftly dispatch information and meeting documents, as well as to reduce the use of paper, PTTGC has implemented an e-Meeting system. Information is sent to Directors' iPads, which are equipped with data encryption. LINE, a messaging application, is also used for internal communication between Directors and the Company Secretary regarding meeting-related issues and other important matters.

## DIRECTORS' PERFORMANCE ASSESSMENT

### BOARD OF DIRECTORS

The performance of the Board of Directors is assessed every year to help Directors review their performance and revisit problems and obstacles of the past year. There are three types of assessment: group assessment, self-assessment and cross-assessment (assessing another Director). The score is divided into five levels. The overall assessment is summarized and presented to the Board and is disclosed in that year's annual report.

In 2017 the assessment questions and criteria underwent another revision to align them with best practices and guidelines on directors' assessment, including the new CG Code issued by the SEC. The assessment result was taken into account during the Board's annual remuneration consideration, in addition to PTTGC's operating performance. The suggestions provided in the assessment were used to devise guidelines that would help concretely improve the efficiency of the Board as a whole.

1. **The Group Assessment** comprised six categories of questions, namely Board policy, Board performance, Board structure, Board style, Board meeting and Board development. The group assessment was conducted in December of 2017, during which 15 Directors were in office.

   The Group Assessment of the Board yielded **an average score of 96.8%.**

2. **The Self-Assessment** comprised three categories of questions, namely responsibility toward duties, independence, and self-development and teamwork.

   The Self-Assessment of the Board yielded **an average score of 96.3%.**

3. **The Cross-Assessment** comprised three categories of questions, namely expertise, independence and time dedication and meeting attendance.

   The Cross-Assessment of the Board yielded **an average score of 98.3%.**

The Nomination and Remuneration Committee has used the Board assessment results as part of the 2017 remuneration criteria, in addition to PTTGC's operating performance and other factors.

### SUB-COMMITTEES

PTTGC's Sub-Committees are comprised of the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. They also undergo the annual performance assessment, both at committee (group) and individual levels. In 2017 every Sub-Committee reviewed and improved the assessment questions and criteria to include compliance with good corporate governance.

1. **The Audit Committee** was assessed on the topics of its charter; composition; meetings; training and resources; responsibilities; relationship with Senior Vice President of Internal Audit, auditors and management; reporting duty to the Board and shareholders; and the maintenance of their performance quality. The results are summarized below:
   - Group Assessment: **average of 92.9%**
   - Individual Assessment: **average of 96.3%**

2. **The Nomination and Remuneration Committee** was assessed on the topics of composition and qualifications, scope of duties, meetings, reporting duty and performance evaluation. The results are summarized below:
   - Group Assessment: **average of 98.1%**
   - Individual Assessment: **average of 98.1%**

3. **The Corporate Governance Committee** was assessed on the topics of composition and qualifications, scope of duties, meetings, reporting duty and performance evaluation. The results are summarized below:
   - Group Assessment **average of 99.7%**
   - Individual Assessment: **average of 96.9%**

4. **The Risk Management Committee** was assessed on the topics of composition and qualifications, scope of duties, meetings, reporting duty and performance evaluation. The results are summarized below:
   - Group Assessment: **average of 98.4%**
   - Individual Assessment: **average of 97.6%**

## DEVELOPMENT OF DIRECTORS AND EXECUTIVE OFFICERS

To enhance Directors' knowledge and competence, which bolsters the performance of the Board of Directors as a whole, as well as to ready our Executive Officers for internal position rotations and to prepare for the succession to the office of the President and Chief Executive Officer and other high-ranking offices, the Board of Directors encourages the participation in pertinent training courses and sees value in the assessment of potential high-ranking Executives to ensure their preparedness for future roles. Below is a summary of key developmental efforts:

### ORIENTATION FOR NEW DIRECTORS

The orientation includes a presentation on PTTGC's business, data, practices, related rules and regulations, corporate governance, code of conduct and other useful information for the assumed position. Directors also receive handbooks and other documents needed to perform their role, namely the strategic plan, the Articles of Association, Company Memoranda, the annual report, related regulations, the Corporate Governance and Business Code of Conduct Handbook and the Compliance Policy Handbook.

### TRAINING FOR DIRECTORS

PTTGC has always encouraged our Directors to pursue further learning and training opportunities to enhance their competence for the job, which includes the following:

- We encourage our Directors to partake in activities and events aimed at the promotion and standardization of good corporate governance, as well as to visit operational sites of the PTTGC Group and of our joint ventures both in Thailand and overseas to enrich their understanding of our business and optimize their knowledge and experiences for the benefit of PTTGC.
- We encourage our Directors to enroll in relevant and beneficial training programs, as well as refresher programs, at the Thai Institute of Directors Association (IOD). In 2017 our Directors participated the following programs:

| Directors | IOD'S Program |
|---|---|
| 1. Mr. Vasin Teeravechyan | • Nomination Committee Best Practice Guidelines Seminar |
| 2. Mr. Prasan Chuaphanich | • Board Matters and Trends Class 2/2017<br>• National Director Conference "Steering Governance in a Changing World"<br>• IOD International Trip 2017 - Attend Singapore IOD Flagship Conference "The Sustainability Imperative"<br>• Audit Committee Forum "The Audit Committee's Role in Compliance and Ethical Culture Oversight"<br>• Collective Action Against Corruption Conference "Bright Spots : Lighting the way to a corruption free society |
| 3. Colonel Nithi Chungcharoen | • Driving Company Success with IT Governance, Class 5/2017 (ITG)<br>• IOD Talk 2/2017 "Cybersecurity : Risk, Liabilities, and Best Practice" |
| 4. Mr. Praphon Wongtharua | • Boards that Make a Difference (BMD) Class 4/2017 |

| Directors | Program/Institute |
|---|---|
| 1. Mrs. Boobpha Amornkiatkajorn | Energy Science for Executive Officers, Class 10/2017, Thailand Energy Academy |

- We held a lecture for our Board of Directors entitled "Corporate Governance & Compliance for Directors and Executive Management 2017" by Miss Peangpanor Boonklum, Executive Vice President, Office of Corporate Legal at PTT Public Company Limited. The topics included the new Stock Exchange Act and directors' responsibilities according to the new law, as well as the Rolls-Royce case study.

### TRAINING FOR THE COMPANY SECRETARY

The Board of Directors encourages the Company Secretary to receive continuous training that will benefit her role in assisting the Board of Directors. In 2017 the Company Secretary participated in the Board Matters and Trends (BMT), Class 2/2017, at the Thai Institute of Directors Association (IOD). She also attended the "Corporate Governance & Compliance for Directors and Executive Management 2017" lecture by Miss Peangpanor Boonklum, Executive Vice President, Office of Corporate Legal at PTT Public Company Limited.

### TALENT MANAGEMENT AND SUCCESSION PLAN

PTTGC has a developed systematic talent management and succession plan. Using 360-degree executive evaluation and an assessment center that gauges leadership competency, organizational management and experience, we are able to formulate effective individual development plans. Moreover, to support business expansion and organizational structure changes, as well as to ensure management continuity by finding replacements for positions to be vacant due to retirement, which will effectively contribute to the achievement of strategic goals, we have laid down succession plans. These plans help PTTGC manage positions to be left vacant by those entering retirement or those being rotated or new positions that emerge from restructuration or expansion in Thailand and overseas. Potential successors are part of a systematic development scheme that readies them for succession in a timely manner.

## GOVERNANCE OF PTTGC AND OUR SUBSIDIARIES

In addition to our main operation, PTTGC also conducts business through other companies in the PTTGC Group. These are subsidiaries, affiliates and joint ventures. The details of our shareholding in these entities appear under Shareholding Structure. The Board of Directors has endorsed the following governance guidelines for the operations and management of these companies in conformity with the PTTGC Business Principles as summarized below:

- The President and Chief Executive Officer shall have the authority to formulate policies, guidelines, conditions and methods needed to appoint an employee or an individual to serve as a Director at one of the PTTGC Group companies as part of the PTTGC's human resource management regulations. In doing so, the President and Chief Executive Officer shall aim to bring about the utmost benefit to the Company through such an appointment.
- Major policies of PTTGC's subsidiaries shall comply with the regulations of the Securities and Exchange Commission and of the Stock Exchange of Thailand, as well as applicable laws. These major policies include management policy; governance policy; compliance policy; financial policy; safety, occupational health and environment policy; corporate social responsibility policy; human resource management policy; and sundry others.
- The "PTTGC Way of Conduct" that is established as the guidelines for governance of policies and investments of companies whose shares are held by PTTGC, shall serve as guiding principles for a PTTGC representative in a company under the PTTGC Group. Abiding by these guidelines, the representative shall be able to ensure that the company's management, governance and internal control are suitable and aligned with those of PTTGC's, fostering efficiency and bringing about the achievement of goals.

## COMPLIANCE WITH OTHER PRINCIPLES OF GOOD CORPORATE GOVERNANCE

PTTGC has always thoroughly complied with principles of good corporate governance. In 2017, we made the following efforts:

1) The Board of Directors understands the organizational leadership role it plays as a governing body of PTTGC. More than half of its members have studied the 2017 CG Code or participated in lectures on the subject matter. With a profound understanding of good corporate governance and how its principles can be applied in a sustainable manner to our organization, the Board has adapted the 2017 CG Code to our business. For any principles that could not yet be adapted or have yet to be, the Board has noted the reasons as part of their resolutions. They have also assessed compliance with each principle of the CG Code to ensure the suitability of the outcomes and business development plans.

   Furthermore, all of the Sub-Committees have given consideration to the CG Code and reviewed and revised the scope of their duties accordingly.

2) The Board of Directors has established its key performance indicators (Board KPIs) for its 2018 performance measure according to each guideline of the 2017 CG Code and the DJSI.

3) The charters of all four Sub-Committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee, as well as the Charter of Independent Directors, have been revised according to the 2017 CG Code.

4) The Board also updated its skills matrix per the DJSI. Focusing on board development, the update was aimed at equipping our Directors with qualifications needed for the current nature of PTTGC's business and its direction. The updated skills matrix will also contribute to the director nomination process.

## HEADS OF INTERNAL AUDIT AND CORPORATE COMPLIANCE

The Charter of the Audit Committee mandates that the appointment, termination and rotation of the Senior Vice President of Internal Audit must be approved by the Audit Committee. The Audit Committee in the meeting No.8/2017, held on September 18th, 2017, appointed **Mr. Amorn Putiphrawan as Senior Vice President of Internal Audit,** replacing Mr. Adisorn Vichaikatka, who retired, effective on January 1st, 2018. Mr. Putiphrawan has extensive knowledge, skills, experience and qualifications required for the role. He also underwent all training courses required for internal audit, internal control and risk management of PTTGC.

Furthermore, PTTGC has established the Corporate Compliance Division under the supervision of the Corporate Governance and Corporate Secretary Department. Its role is to monitor and oversee thorough compliance with the law by every unit of PTTGC. **Mrs. Rattana Nakasiri,** Vice President of Corporate Governance and Corporate Secretary Department, **has been appointed to oversee Corporate Compliance.** Her role and responsibility are to encourage and support compliance activities among Executive Officers and employees of PTTGC and PTTGC Group companies, including joint ventures.



# PEOPLE MANAGEMENT AND DEVELOPMENT POLICY

## PEOPLE AND ORGANIZATIONAL MANAGEMENT STRATEGY

Effective and robust Human Resource management system is a key mechanism to create competitive advantage for a corporation. To strengthen its operational excellence and exceptional business performance while supporting key business future state in innovating chemical specialty and environmental-friendly products that emphasis our corporate social responsibility in being good corporate citizen as well as supporting oversea business expansion, Human Resource management system are delicately designed with strategic linkage to international business expansion and diversity of business portfolio in the future.

To foster employees' productive work environment and quality of living, PTTGC provides full scheme of employee benefits and welfare not only based on legal requirement but also support the establishment of Welfare Committee. The committee has a role to leverage employee's insights, address their concerns and further work with executive and management team to enable effective employee relation system in the corporation. A fair-based performance management system is thoroughly executed, to ensure effective employee development through assignment. Employees and managers are encouraged to create agreement of work goals (KPI) in the beginning of the year, and conduct mid-year progress review together with year-end performance evaluation. To promote transparency and alignment, the process of bi-annual performance discussion has been kicked-off and encouraged. Performance alignment is introduced in each business unit to ensure a standard set assessment criterion of Top Performer, this is to recognize strong contribution of high-performer which lead to outstanding results of reward and recognition. In 2017, Division Manager and above level are extensively educated to understand philosophy of performance management system, and able to identify and retain top-performers who can strategically add value to the organization. Furthermore, GC SPIRIT, the corporate value has been embedded into performance evaluation system as behavioral assessment criterion, with the intension of translating value into corporate practice. Employee assessment and career progression plan has been integrated through Own Wish Program, which emphasis the employee to express individual career aspiration and goal in each job family with 1-3 years plan, this information is used to support job rotation, people development, career plan and internal job recruiting.

### TALENT PIPELINE

A co-effort between HR and Business Owner is a critical contributor to the success of manpower planning in term of competency and people supply in talent pipeline. Our effective talent pool shows full-range of resources to supply in project and assignment. In 2017, we incorporate social media as another talent acquisition channel by using Facebook and Line (under group name "PTT Global Chemical Recruitment") for communication and program promotion to external targeted audiences. Another leading-edge of sourcing tool is G-Lens, which is our internal database system that stored candidate applications and data. The system enable ease in sourcing and filtering relevant candidate profile. Additionally, to echo our Digital Mindset in term of leveraging technology in HR management system, we also utilize other on-line interview system such as Skype and VDO call - VIDYO to interview potential candidates who locate oversea.

Other programs that support talent pipeline feeding are Employee Referral Program, that encourage our employee to pre-screen and refer right candidates to place in high-caliber positions. Our Chemical Engineering Practice School Program (ChEPS) is providing scholarship to the students from King Mongkut's University of Technology Thonburi, and once the students graduate they will be shortlisted as first-tier to interview and place in Chemical Engineering and Innovation fields. These programs integrated the talents sourcing strategy into one to continuously feeding talents and high potential candidates to work with PTTGC.

### CAREER MANAGEMENT

PTTGC's career management is a live system that encourages our people to design their own future growth according to their career aspiration. Our career track is drawn for both talents who prefer to grow in their technical fields – Specialist Track, and those who are oriented to leadership role – Management Track. Center of Excellence is a track that cater talents who are capable in in-depth knowledge and skills in a certain area follows its own Career Track and Job Expectation. For managerial track, people move around the designed career

paths to increase their exposure in multiple areas to prepare their readiness for assuming a higher managerial position. Our career management framework help employees understand their own career growth and being ready to path themselves for future assignment that consistent to corporate's long-term direction. Additionally, the framework also supports cross high-potential employees to grow either vertically or laterally across process which is a powerful engagement model that can effectively retain employees to the organization.

## LEARNING AND DEVELOPMENT

The effectiveness of Learning and Development in PTTGC, the Individual Development Plan (IDP) requires a mutual settlement between Business Line Management and everyone, to ensure each individual path own career plan and prepare themselves to be readiness for assuming future assignment, especially those who are planned to be Talent and Successor. Supporting the development guideline of 70:20:10 (Experience: Exposure: Education), Special Project Assignment and Systematic Job Rotation in each job family per Career Plan and Individual Development Plan (IDP), are thoroughly followed. Stewardship and monitoring are closely coordinated by HR to ensure effective development system is fully exercised.

PTTGC has conducted the following training internally and externally as follow;

- In compliance with PTTGC's human-resource management strategy that support future business growth, we have developed the Development Roadmap and launched development programs for our employees, especially in the fields of Marketing and Sales, Business Development, Research and Development, and Human Resources. These programs include Marketing & Sales Competency Development (MSCD), Design Thinking, Merger and Acquisition (M&A), etc. Overseas Readiness program is offered to our employees to improve their English proficiency and foster their cultural awareness, preparing them to support our international expansion and projects.
- PTTGC Leadership Development Program and PTTGC Development Roadmap have been developed to support the leadership competency of junior staffs to become senior management pipeline. The programs enhance their managerial skills covering both functional and leadership competency. Additionally, our Executive also be nominated to participate in Leadership Development program conducted by PTT Group.
- Supporting the expansion and ensuring continuous growth of the corporation, PTTGC has initiated a concrete talent development program. Individual Performance and Potential are the criterion to identify these group of talents. In 2017, we accelerate their growth through people development framework ensuring strong talent pipeline feeding to support the business growth in the future. Talents and Successors are planned in People Portfolio via 9 grids model, this gives us a clearer outlook of talents pool and easier to evaluate Talent Capacity that can be pathed to assume key position or managerial positions in PTTGC Group.
- To support our safety, environmental and energy preservation policies, PTTGC provides over 50 domestic and overseas training courses for relevant persons in all level to equip them with relevant knowledge and skills. Some example of training course are Process Safety Management, Risk Management and Internal Control and Emergency Director Roles and Responsibilities to ensure integrity, safety and environmental friendly mindset is thoroughly embedded.
- In 2017 PTTGC has incorporated technology to create a more diverse range of new learning solutions for our people, especially new employees. They can now access basic courses, such as PTTGC Energy Management System, GC OEMS Introduction, Sustainability Management, and Corporate Governance & Corporate Compliance, via our new application (PTTGC M-Lerning), whether on their smartphone, laptop or desktop computer. Our plan for 2018 is to continue adding more courses to cover the needs of our employees in general, both



Leadership Development Program (LDP) for Developing Continuously All Level of Management

for operations and management levels, such as SAP Integration, Live Learning, Basic Safety, and Process Safety Management (PSM).

## SUCCESSION PLANNING

To ensure seamless transitions, PTTGC has established succession plans for its managerial positions stated from division manager level to senior executive positions, especially successor for retiring executives. In 2017, all planned retired position are properly filled with successors to start executing job shadowing. We also focus on continuous development of all managerial levels to ensure their readiness to be appointed to any key positions and become executive pipeline for upcoming retiring positions in PTTGC Group.

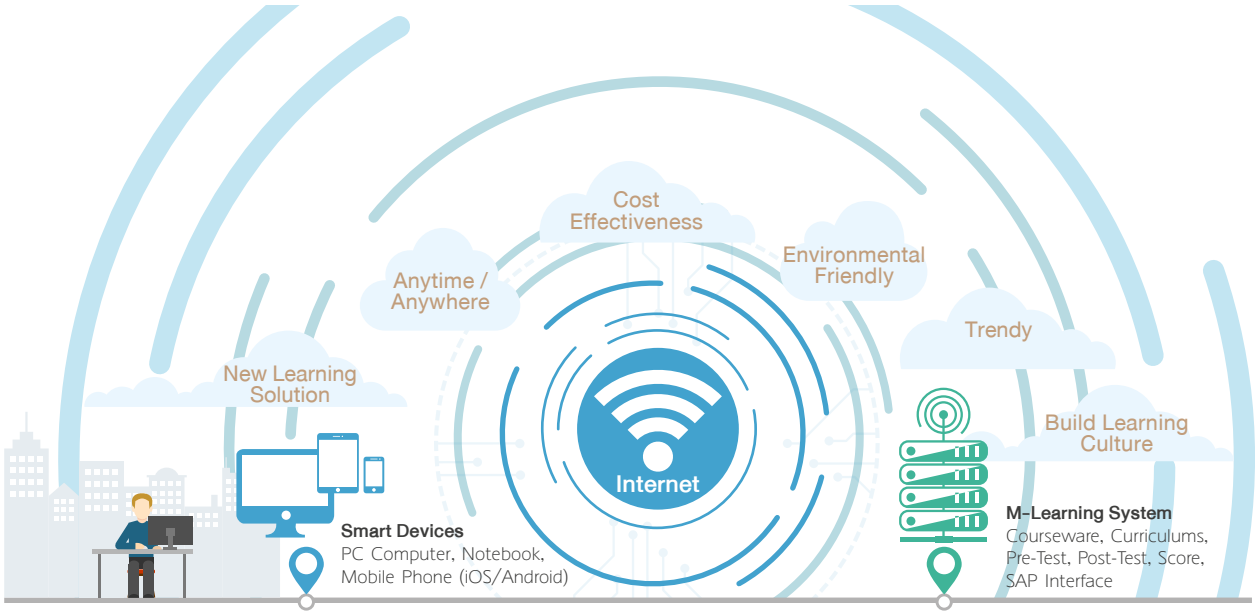
For newly appointed leaders, PTTGC offers a development program called "Strong Start in a New Role." The program has been created for all new leaders who assuming Division Manager and Vice President levels. It aims to on-board new leaders into their new roles, enhancing their understanding towards the assigned roles and equipping them with the skills they need to properly lead the organization. The program combines diverse learning and development modules including digital learning, classroom workshops, learning simulation, coaching, goal setting and execution, and evaluation of behavioral changes, this is to create confidence and capability to the new leader for effective transition into the new roles within the first 100 days.

## KNOWLEDGE MANAGEMENT

Knowledge management is one of the tools exploited by PTTGC to enable systematic development in technical know-how and capabilities of our people. The goal is to formulate mechanism that supports business growth. Knowledge Management framework is targeted to create Learning Organization while integrated criterion of Thailand Quality Awards (TQA), with the process of knowledge collection, retention, transfer and exchange between employee, team and stakeholders. For instance, we have compiled knowledge from Subject Matter Experts and retiring employees in different dimension such as Lessons Learned and Best Practices, and business relevant Future Knowledge. In 2017 there were various of activities that motivate the employees to be more initiative that can drive to a better result or business innovation such as Digital Collaborative Knowledge Management Platform which is a full-scaled of central knowledge sharing of Petrochemical and Refinery Knowledge Based System. The employee can search and access to the desired knowledge effectively from all locations. This is how we exploit leading-edge of technology to manage internal knowledge management infrastructure which is comparable to other world-class organization.

## GC SPIRIT AND CORE VALUES

Our commitment to instill and embedded PTTGC Core Values into each individual in order to unify our employees into one, while embracing the aspiration to bring PTTGC as PTT Flagship Business as Global Player in International stage, we therefore cultivate our people with knowledge, understanding and key practice via GC SPIRIT 4 Core Behaviors which are 1) Take initiative to create better results; 2) Keep improving self and inspiring teamwork; 3) Work proactively to serve customer's needs; and 4) Strive for the greater good. In 2017, to keep the focus, we emphasize #1 and #2 behaviors into practice and sustainment. When in execution phase, the 2017 plan is designed based on the continuation of 2016 plan as follows;






PTTGC Group
Seek Day 2017




Be the Catalyst of Change workshop

- "Be the Catalyst of Change Workshop" The workshop was conducted for Division Manager and Change Agents to promote understanding of GC SPIRIT 4 Core Behaviors and bring them into a concrete implementation plan. The workshop also translates Senior Management's vision to Middle Management and Change Agent for cascading to entire organization
- Functional Change Agent to incorporate GC SPIRIT 4 Core Behaviors to functional action plan or project to create a linkage between GC SPIRIT 4 Core Behaviors and daily operation
- A monthly meeting between GC SPIRIT culture committee and Change Agent, to path the direction while able to share their tactical plan with project initiatives that support cultural awareness
- GC SPIRIT 4 Core Behaviors has been integrated into people management system i.e. selection process and appointment, performance evaluation, talent identification, leadership development and competency development. In 2017, we have embedded GC SPIRIT 4 Core Behaviors into people selection process to ensure the candidate's cultural and norm fit through an effective assessment system

## INTERNATIONAL HUMAN RESOURCE MANAGEMENT

To support business growth internationally, the initiative to enhance our Oversea Secondment Management Process, aligning to corporate policy and local regulation of receiving countries. An integrated career management process during pre, mid and post assignment is planned to ensure the employee development through assignment, level of exposure and business needs. Additionally, we partnered with world-class universities through TUBC Program (Thammasart Undergraduate Business Challenge), by recurring the interns from world-class university such as University of California Berkeley, a collaborative effort between the university and Sirindhorn International Institute of Technology of Thammasat University to support future business growth and increase our foreign resource pool.

**PTTGC support our people with good work environment, job satisfaction, better living quality, safety and occupational health. We also commit to improve our organization and competency development in all dimensions to ensure we are creating capital workforce whom perceived as most valuable assets to promote sustainable growth of the corporation.**

# REPORT OF THE CORPORATE GOVERNANCE COMMITTEE

## Dear Shareholders,

The 4 members of the Corporate Governance Committee of 2017 are Professor Surapon Nitikraipot (Chairman), Mr. Don Wasantapruek, Mr. Auttapol Rerkpiboon and Colonel Nithi Chungcharoen (Directors). The Committee has duly performed its duties set forth in PTTGC's Corporate Governance Committee Charter and executed the tasks mandated by the Board of Directors. The Committee held a total of 5 meetings. Below is a summary of the Committee's key developments:

### 1. Ensuring compliance with applicable laws, regulations and best practices

- The Committee oversaw the preparation of the annual general shareholders' meeting (AGM) to ensure compliance with corporate governance (CG) principles and best practices. As a result, PTTGC's AGM has been awarded a perfect score of 100 for the sixth consecutive year.
- The Committee ensured that minority shareholders were given an opportunity to propose meeting agenda items and nominate persons to be elected as members of the Board of Directors more than 3 months in advance of the 2018 AGM date from September 15th to December 31st, 2017.
- The Committee has supervised compliance management processes to prevent violation of rules, regulations and laws that govern the PTTGC Group's businesses and to minimize risks that could arise as a result of such violation. The Committee also reviewed a summary of complaints submitted through the whistleblower system.

### 2. Securing compliance with Corporate Governance and Business Code of Conduct

- The Committee approved the Corporate Governance and the Corporate Compliance Plans for 2018 in accordance with the Corporate Governance Code for listed companies 2017 (CG Code) of the Securities Exchange Commission and the ASEAN CG Scorecard, as well as PTTGC's strategies. The Committee also reviewed the previous year's performance.
- The Committee reviewed the 2017 edition of the Corporate Governance and Business Code of Conduct Handbook to align its content with the CG Code.
- The Committee reviewed the Corporate Governance report in the 2017 Annual Report and in Form 56-1 to ensure complete disclosure of information and compliance with good corporate governance guidelines at both domestic and international levels. As a result of this practice, PTTGC was once again named "Excellent" in the CGR Awards.
- The Committee gave advice on the review of PTTGC's anti-corruption measures and the preparation of applying for membership recertification by Thailand's Private Sector Collective Action Coalition Against Corruption (CAC). PTTGC was certified for the second time on May 25th, 2017.
- The Committee gave advice on PTTGC's participation in the NACC Integrity Awards. PTTGC received an honorable mention by the Office of the National Anti-Corruption Commission (NACC) on November 17th, 2017.

### 3. Supervising sustainable-development processes

- The Committee has given advice on PTTGC's sustainable-development processes according to international practices and the PTTGC Sustainability Framework, ensuring that our processes were in line with future change in the trend's direction. The Committee also followed up on PTTGC's sustainability performance according to the established KPIs to maintain PTTGC's position as one of the top 10 DJSI world members, as well as supervised and has given suggestions on PTTGC's sustainability management.
- The Committee continued to monitor and supervise PTTGC's concrete operational responsibility towards various groups of stakeholders in accordance with the CG principles through the examination of reports submitted by departments responsible and community visit. The Committee also gave its opinions and advice on operational matters for PTTGC's sustainable growth.

- The Committee supported and pushed for the agreement between PTTGC and the government on the development of a fingerprint database for crude oil and its relative petroleum products. The database would help identify the sources of tar balls and oil slicks in Thailand. The agreement also included the creation of a centralized data library that would enhance the efficiency of Thailand's oil-slick detection, using PTTGC's scientific and petroleum knowledge and expertise.
- The Committee encouraged and valued caring for communities, society and the environment. Under the Giving Back to Society campaign, PTTGC has refrained from giving souvenirs to shareholders attending the AGM for the second consecutive year. In 2017, PTTGC donated 100 baht for every shareholder who registered at the AGM, a total amount of 477,000 baht to purchase medical equipment for Khao Chamao Chalermphrakiat 80 Years Hospital in the province of Rayong. PTTGC representatives also visited the hospital to see its operation.

### 4. Performance, assessment and development

- The Committee pre-set the dates for its meetings for the entire year, arranging at least one meeting per quarter. Ad-hoc meetings could also take place, should the need arise. In these meetings, the Committee considered and acknowledged PTTGC's performance and reports, as well as made recommendations to the Board of Directors and management.
- The Committee oversaw the development of Directors in accordance with good corporate governance principles by ensuring the provision of continuous training for the Board. We also encouraged Directors to take various classes at the Thai Institute of Directors and invited experts from outside our organization to give lectures to members of the Board.
- The Committee reviewed and enhanced the 2017 Board Performance Assessment Questionnaire in accordance with present circumstances, the CG Code and other global standards, such as the DJSI and the ASEAN CG Scorecard.
- The Committee reported its performance and the results of its 2017 individual and group performance assessments to the Board of Directors for their acknowledgement.
- The Committee reviewed and updated its charter in accordance with PTTGC's current business context and the CG Code.

The Corporate Governance Committee has placed much importance on the role it plays in ensuring that PTTGC strictly adheres to Corporate Governance Policy and Business Code of Conduct. The Committee shall endeavor to unceasingly develop our corporate governance in reflection of international practices. The Committee believes that good corporate governance plays a major role in ensuring PTTGC's efficient operation and contributes to the sustainability of our business. We hope that our efforts will help PTTGC earn the confidence of our stakeholders, as well as domestic and global recognition.

On behalf of the Corporate Governance Committee

*(Signed) Surapon Nitikraipot*
(Professor Surapon Nitikraipot)
Chairman of the Corporate Governance Committee

# REPORT OF THE NOMINATION AND REMUNERATION COMMITTEE

Dear Shareholders,

The 2017 Nomination and Remuneration Committee is comprised of Mr. Vasin Teeravechyan (Chairman), Professor Surapon Nitikraipot, and Mr. Sarun Rungkasiri. The Committee held a total of 4 meetings. We have duly performed their duties set forth in PTTGC's Nomination and Remuneration Committee Charter and executed the tasks mandated by the Board of Directors. Below is a summary of the Committee's key developments:

## 1. Nomination of Directors

- The Committee nominated persons to replace members of the Board of Directors who retire by rotation at the 2017 Annual General Shareholders' Meeting (AGM). A period of more than 3 months prior to the AGM was afforded to shareholders, during which they could nominate candidates for the positions. Since no nominations were submitted, the Committee nominated Mr. Prasert Bunsumpun, Mr. Sarun Rungkasiri, Mr. Auttapol Rerkpiboon, Mr. Amnuay Preemonwong and Mr. Praphon Wongtharua to stay in the post for one more term. All of these nominees possess qualifications that are aligned with PTTGC's strategic needs. At the AGM, shareholders voted to re-appoint these nominees as Directors.
- The Committee nominated Directors to the Sub-Committees, namely the Audit Committee, the Corporate Governance Committee, the Nomination and Remuneration Committee and the Risk Management Committee, who retired by rotation after 3 years of service to stay in the post for one more term. The Committee considered these nominees against established criteria, based on the components of each Sub-Committee, while taking into account their specific experiences and expertise that might benefit their roles. Members of the Nomination and Remuneration Committee who retired by rotation at this meeting refrained from voting to avoid creating a conflict of interest.
- The Committee reviewed and improved the skills matrix of the Board of Directors, rendering it more diverse and suitable for PTTGC's businesses. It now focuses more clearly on each Director's education, experience and training history, in accordance with the 2017 CG Code of the Securities Exchange Commission. The skills matrix is part of the nomination process and will serve as guidelines for Directors to develop themselves in whichever aspect that is needed.

## 2. Remuneration

- The Committee considered and proposed the 2017 remunerations for the Board of Directors and for the Directors to each Sub-Committee, as well as the Board's bonus for 2016. Considering the Board's performance, economic conditions, PTTGC's earnings and remunerations of Directors at other companies of similar sizes in the same industry, the Committee proposed that the remuneration policy and components remain the same. Shareholders voted to approve this proposal in the 2017 AGM.
- The Committee gave consideration to the 2017 remuneration of the President and Chief Executive Officer based on his performance and responsibilities. The proposed remuneration was presented to the Board of Directors for approval.

## 3. Assessment of the Board of Directors' 2017 Performance

- The Committee reviewed and improved the Board of Directors' 2017 performance assessment form, rendering it complete, up-to-date and in line with the 2017 CG Code and the global standards of the DJSI. The results of this assessment, in addition to PTTGC's performance, were among the criteria for determining the Directors' annual remunerations.
- The Committee gave consideration to the 2018 Board KPIs to ensure their alignment with the CG Code and the criteria of the DJSI on directors' roles and responsibilities. The Board of Directors has approved the new KPIs, which will be effective from 2018 onwards.

## 4. Performance Improvement and Development

- The Committee assessed its own 2017 performance, reported the results to the Board of Directors and disclosed them in the Annual Report.
- The Committee also reviewed and updated its charter for relevancy and compliance with any applicable rules and regulations that may have changed.

The Nomination and Remuneration Committee remains dedicated to performing its duty in a transparent manner and in compliance with rules and regulations established in accordance with principles of good corporate governance for the utmost benefit of the company. This dedication will culminate in PTTGC's excellent stature in the long run.

On behalf of the Nomination and Remuneration Committee

*(Signed) Vasin Teeravechyan*
(Mr. Vasin Teeravechyan)
Chairman of the Nomination and Remuneration Committee

# REPORT OF THE RISK MANAGEMENT COMMITTEE

Dear Shareholders,

PTTGC accomplished several of its goals in 2017, and these accomplishments are reflected in our performance. We would like to attribute this success to the cooperation from all parties involved and to our attentive risk management. We have adopted a number of international-standard risk-management systems and tools. Additionally, we have further developed our risk management and promoted a risk-management culture throughout our organization, especially in regard to operations and safety risks, which has always been significant to us. In 2017, PTTGC enhanced every plant's asset reliability and integrity management measures by having an internal expert conduct an asset integrity assessment and forming a dedicated team to oversee matters of reliability improvement. As a result, the rate of our unplanned shutdowns was at the lowest point in the last five years, achieving sales optimization as we had planned. Furthermore, the Risk Management Committee has closely monitored situations in the petroleum and petrochemical markets, as well as foreign exchange rates. We applied price and spread, inventory and foreign exchange hedging whenever the market became favorable to minimize impact on PTTGC caused by volatility in the petroleum and petrochemical markets, as well as foreign exchange rates.

In addition to the risk management of our current business, the Risk Management Committee also provides opinions and suggestions on the risk assessment and mitigation measures of major investment projects, which become part of the criteria in the Board of Directors' decision-making process. In 2017, we provided our opinions and suggestions on the Olefins Reconfiguration project to enhance our feedstock flexibility, and the Propylene Oxide project, the Polyols & PU System project and the acquisition of shares in companies in the propylene and biochemical fields, as well as companies offering related services, to expand our business to downstream products. To assure that PTTGC will be able to manage risks that may arise from these projects and that we will achieve the goals we have set in our strategic plan. Furthermore, the Risk Management Committee has considered and prepared for emerging risks that may affect our operations in the future, for both opportunities and obstacles, equipping PTTGC with suitable mitigation measures.

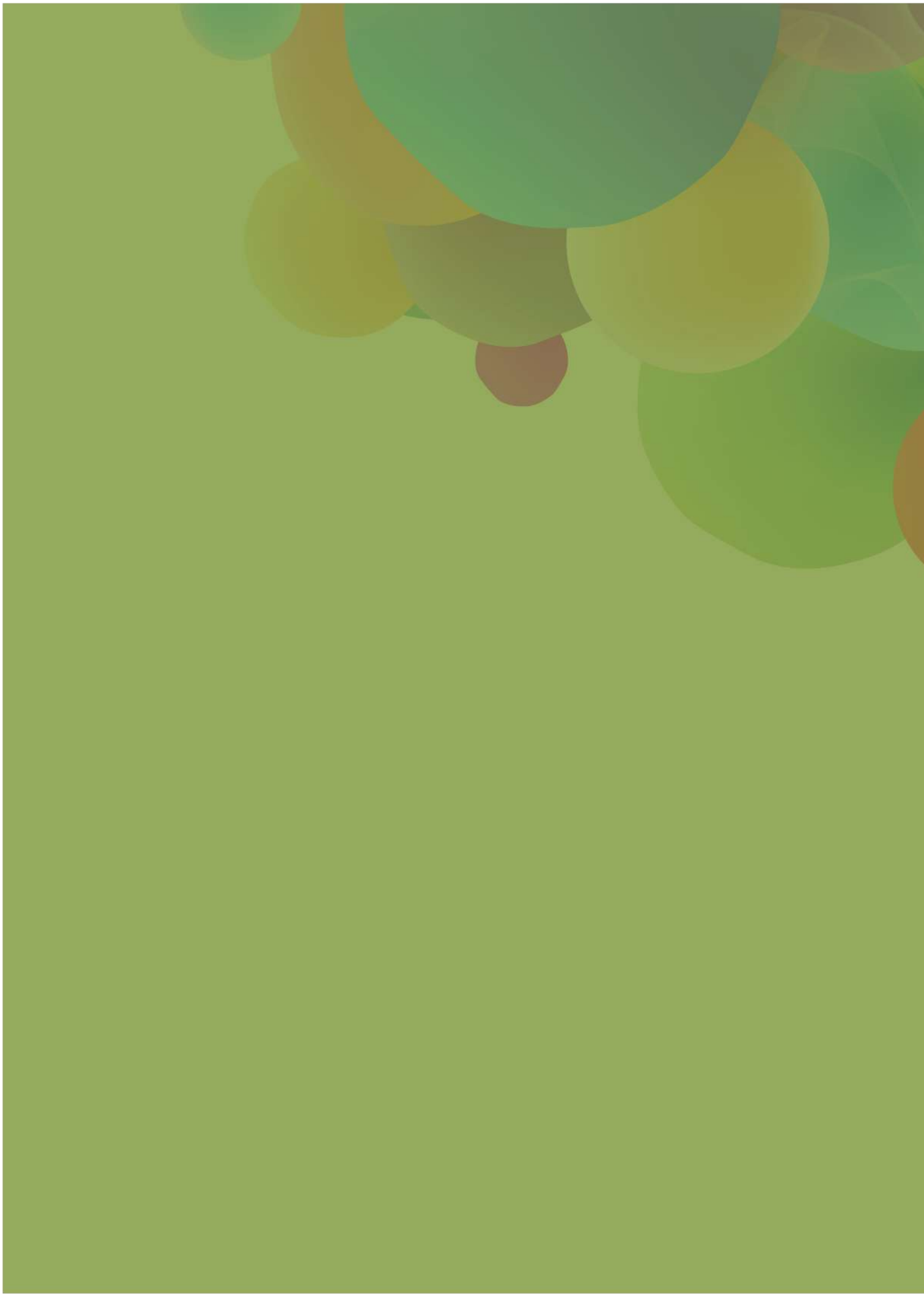
As the result, PTTGC was ranked in the top quartile of world members in the chemical sector by the Dow Jones Sustainability Indices (DJSI) in terms of risk and crisis management for the fifth consecutive year.

In 2018, PTTGC's operations are faced with many challenges, including the volatility in crude oil and product prices, foreign exchange rates, and disruptive technology, such as advanced robotics, 3-D printing and artificial intelligence, all of which are newly developed technologies that are changing the way of life, business and global economy. These are technologies that have the potential to change the world. Therefore, the Risk Management Committee will keep a close eye on the situation and provides the opinions and recommendations.

In conclusion, the Risk Management Committee has adequately and properly fulfilled its role throughout 2017 as prescribed in the Risk Management Charter, encompassing all major risk factors. As a result, PTTGC was able to achieve goals and objectives, meet the expectations of stakeholders in a manner set forth in its Corporate Governance and create sustainable value to the business in the long run.

On behalf of the Risk Management Committee

*(Signed) Anon Sirisaengtaksin*
(Mr. Anon Sirisaengtaksin)
Chairman of the Risk Management Committee



# SUSTAINABLE DEVELOPMENT



# CORPORATE SOCIAL RESPONSIBILITY AND SUSTAINABLE DEVELOPMENT

PTTGC is striving to become a world leader and role-model organization of sustainable development through balancing of economic, social and environmental responsibilities. Furthermore, we have incorporated the Dow Jones Sustainability Indices' criteria (DJSI's criteria) and the United Nations Global Compact's principles into our sustainability framework to maintain our place on the global stage as a role model organization of sustainability, specifically as one of the top 10 world members in the chemicals sector of the DJSI.

## SUSTAINABILITY FRAMEWORK,

as shown in figure 1, sustainability framework is comprised of 16 elements that, together, maintain a balance across three dimensions, namely economic, social and environment. The sustainability framework is reviewed annually to ensure its relevancy to the current global situations and the rapidly evolving challenges.

## THE PTTGC GROUP'S SUSTAINABILITY MANAGEMENT STRUCTURE

### THE PTTGC GROUP'S SUSTAINABILITY STEERING COMMITTEE (SSC)

- The SSC assures that sustainable development policies and goals will bring about the utmost benefit to all stakeholders in a well-balanced manner, considering PTTGC's position as a global leader and role-model organization of sustainability.
- The SSC ensures that our sustainable development work falls in line with guidelines of international bodies, such as the DJSI, the UN Global Compact and the Carbon Disclosure Project (CDP).
- The SSC supports the work of the PTTGC Group's Sustainable Development Committee, facilitating organization-wide implementation of our sustainable-development strategy in a consistent manner.



- The SSC is chaired by the President and Chief Executive Officer. Other members of the SSC include the Chief Operating Officer of Upstream Petrochemical Business (COU), the Chief Operating Officer of Downstream Petrochemical Business (COD) and the Chief Operating Officer of the Center of Excellence (COE).

## THE PTTGC GROUP'S SUSTAINABLE DEVELOPMENT COMMITTEE (SDC)

- The SDC establishes strategies, frameworks, guidelines and subjects that promote our organization's sustainable development according to PTTGC's strategy and goal of becoming a role model business of sustainable development. The SDC also assures the alignment of our guidelines with those of the PTT Group.
- The SDC develops a sustainability mechanism based on guidelines of international bodies, including the DJSI, the UN Global Compact, and the CDP.
- The SDC provides consultation and suitable resources, including human resources, to effectuate organization-wide implementation of our sustainable development strategy in a consistent manner.
- The SDC presents a performance summary, consisting of details of internal and external sustainability management, to the SSC and the Corporate Governance Committee.
- The highest ranking Executive Officer of Corporate Affairs (CAF) chairs the SDC. Its members are comprised of the highest ranking Executive Officers of all relevant functions.

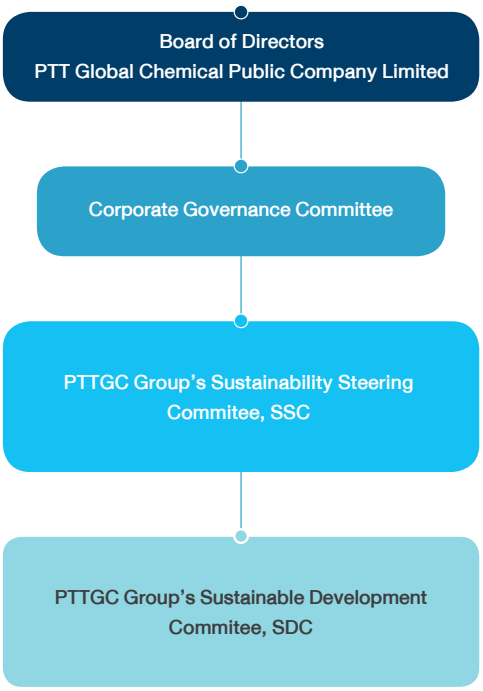
## BALANCING BUSINESS WITH SUSTAINABILITY IN 2017

In terms of balancing our business with sustainability, our goal has been to maintain our position as one of the top 10 world members in the chemicals sector of the Dow Jones Sustainability Indices (DJSI). For the fifth consecutive year we have achieved this goal with a score of 90 percent from the DJSI. Below is a summary of our efforts across the three dimensions:

## ECONOMIC

- The return on our social and environmental investments is clearly scalable. The DJSI has ranked us third in the world for the economic aspect of our sustainability management.
- In terms of materiality, we have been able to appropriately meet the demand of stakeholders. Our sustainability subjects have been prioritized according to the Global Reporting Initiatives (GRI). Moreover, PTTGC is Thailand's first company to commit to Integrated Reporting and participate in the IIRC's Global <IR> Network.
- We have a sustainable and transparency tax management, which is in accordance to the principle and company's strategies and goals. Moreover, in order for our tax management system to be effectually comparable to international standards, we have appropriately managed resources and created business resilient. To meet our intentions, we have set our tax strategy in three main pillars, as follows
  - Ethical tax practices: PTTGC ensures not only our own growth, but also our social contribution through our tax responsibility, in order to contribute to social betterment.
  - Tax risk management: PTTGC adheres and complies with the local laws and regulations, wherever we invest. Tax risk management and mitigation plan are in place to suitably handle the emerging risk, such as digitalization, tax compliance monitoring, CIT Calculation System, and Countries by Countries report. In addition, PTTGC has Tax Health Check and tax training courses to educate relevant personal regarding local laws and regulation.

### PTTGC GROUP'S SUSTAINABILITY MANAGEMENT STRUCTURE



- Tax transparency: PTTGC discloses all of our tax activities to the public in a transparent manner and in accordance with tax disclosure regulations.

## SOCIAL

- We have been ranked the first in the world by the DJSI for the social aspect of our sustainability management.
- We have instituted the Rayong Integration Monitoring (RIM). It is a sustainable development mechanism that fuses together the management of society, the environment and our Rayong plants. The RIM takes into account all stakeholders, including the surrounding communities, the media and the public. It includes assessments and analyses of problems, obstacles, opportunities, as well as proactive efforts. All of this has led to a better relationship with our stakeholders, especially the communities surrounding our plants, which is reflected in our community satisfaction score of 86.2 percent.
- Furthermore, the PTTGC Group has received a number of awards as testaments to the high standard of our responsibility as an industry operator toward society. Most notably, we have received the outstanding award for our plants' safety, occupational health and environment for the 19th consecutive year, a platinum level in 2017, from the Department of Labor Protection and Welfare, the Ministry of Labor.

## ENVIRONMENTAL

- The DJSI has ranked us tenth in the world for the environmental aspect of our sustainability efforts. The following are our notable efforts that have been met with success.
  - We have completed our product stewardship criteria and standards. Eco-design criteria have been added as part of the new product consideration process and quality assessment. Considering a product's quality throughout its life cycle has enabled us to ensure their eco-friendliness while meeting the demand of our customers and creating value-added. In 2017 the eco-design criteria were applied to products under development.
  - Our proactive environmental management has proven successful. As a result, we have been named a Green Industry 5 (the highest level) by the Department of Industrial Works. Furthermore, we have earned our place on the A List of the Carbon Disclosure Project.
- The PTTGC Group has concentrated on a quality management system with an aim to achieve excellence in organization-wide quality management. As a result, a PTTGC Group company has received an award from the Prime Minister's Industry Awards 2017. This token of honor also represents our dedication to taking our business to the global stage. It demonstrates our persistence in the creation of quality products that are not only environmentally friendly but also beneficial to the industrial development of the country. In addition, the award reminds us that we are a role model for other industrial operators.
- Plants within PTTGC Group received an Outstanding award from the Thailand Energy Awards 2017. The award demonstrates our commitment to energy conservation and the development of renewable energy, as well as our efficient and responsible use of energy.



# SAFETY, OCCUPATIONAL HEALTH AND ENVIRONMENTAL MANAGEMENT

PTTGC operates under the Quality, Security, Safety, Occupational Health, Environment and Business Continuity (QSHEB) Policy, which is based on principles of good corporate governance and other international standards. We also strictly adhere to other applicable safety, occupational health and environmental standards, laws and regulations. This practice has garnered us a score of prestigious awards and accolades that embody our determination for business excellence.

## QUALITY, SECURITY, SAFETY, OCCUPATIONAL HEALTH, ENVIRONMENT AND BUSINESS CONTINUITY (QSHEB) POLICY

PTTGC is committed to maintaining our stance as a leading chemical company and an organization of innovation with corporate social responsibility (CSR). Outlined below are the ways in which we uncreasingly improve our quality, security, safety, occupational health, environment and business continuity:

1. PTTGC complies with quality, security, safety, occupational health, environment and business continuity laws, rules and regulations, as well as other related standards and requirements.
2. PTTGC employs total quality management (TQM). We take advantage of quality, knowledge and productivity management tools to satisfy our customers and to develop environmentally-friendly innovations.
3. PTTGC exercises risk management to prevent dangers, work-related illnesses, accidental losses, injuries and property damage, while fostering the B-CAREs safety culture and exercising process safety management (PSM) to ensure the safety of every person.
4. PTTGC is vigilant of security threats to protect lives, assets, data, and business continuity of our organization.
5. PTTGC puts an emphasis on good occupational health and work environment, including the promotion of good health and a happy workplace.
6. PTTGC assesses and minimizes our impact on the environment, ecosystem and bio-diversity by focusing on at-source improvement and prevention, as well as efficient resource consumption. We also foster a strong environmentally aware culture by disseminating information and encouraging employees and stakeholders to become part of the culture.

Since all PTTGC's Executive Officers are responsible for ensuring the achievement of our goals and objectives, they are determined to lead by example and maintain our quality, security, safety, occupational health, environment and business continuity management system. By providing adequate resources, they encourage PTTGC's employees to adopt the QSHEB Policy as part of their everyday operations. Additionally, our Executive Officers are also tasked with relaying the results of QSHEB Policy implementation to all related parties.

PTTGC's performance regarding quality, safety, occupational health and environmental management in 2017 is summarized below:

## SAFETY MANAGEMENT

### PERSONAL SAFETY

As PTTGC places a great deal of importance on the safety of our employees and contractors, we have raised awareness of their own safety and that of their colleagues through the B-CAREs safety culture: "safe behaviors, caring for each other, and stop if unsafe.". Our aim is to become a zero-accident organization. In addition, PTTGC has carried out occupational health, safety and environmental management according to the OHSAS 18001 standard, in which we integrate our employees and contractors into the safety culture through continuous safety-oriented activities. We have also created safety leaders through the launch of our Management Safety Leadership Commitment program for leaders of all levels. All of this pushes us towards having safety as an integral part of our organizational culture in a



Hand Injuries Awareness campaign to prevent hand injuries in the company




PTTGC Group SEEK Day 2017 under the "Transformation for Future" concept

proactive yet sustainable manner. In 2017, PTTGC carried out a number of safety initiatives as follows:

- Based on data from 2016, we realized that most injuries suffered at work were hand injuries, accounting for 55% of all workplace injuries. As a result, we launched the Hand Injuries Awareness campaign to help us determine the risks of hand injuries in our manufacturing processes, as well as to devise prevention and minimization measures. Thanks to the campaign, the number of hand injuries in 2017 has been reduced by 72% in comparison with the previous year.
- Our Senior Executive Officers continued to value and carry out the Management Safety, Energy and Reliability Walk. This initiative has been key to a sustainable safety culture of our organization. The activity took place every Thursday. Its location varied throughout the premises of PTT Global Chemical, fostering the safety culture amongst all employees and contractors through felt leadership.
- PTTGC conducted an organization-wide survey of our safety culture called the SSHE Culture Survey 2017. An analysis of the data would help us to find ways to improve our safety culture, which would lead us closer to the goal of becoming a zero-accident organization. Every level of employees, as well as Executives of every division, participated in this survey. The 2017 survey result reveals that our safety culture has moved up the scale since 2015 and is now at the 4.0 mark. This higher score illustrates better safety awareness among our people, both employees and Executives alike.
- Through the Safety Focus Proactive Program, PTTGC encouraged our employees and contractors to take part in the supervision of safety. Within the program's framework, every person proactively and seriously focused on risk-prone jobs, equipped themselves with risk-prevention knowledge, partook in the supervision of safety according to their own roles and aligned their understanding of work procedures. The objective of the program was to put an end to the atmosphere of accusation and foster am ambiance of interpersonal care.
- PTTGC held a contest called PTTGC Safety Short Film Year 2017, in which there were five main categories, namely B-CAREs, Line of Fire, Operational Discipline, Safety Inspiration Leadership and Office Safety. The purpose of the contest was to promote participants' understanding of safety, as well as to imbue the importance of safety in the minds of our Executive Officers and employees, as well as their family members. The contest also raised safety awareness within our organization, giving continuation to our safety campaign, reaching not only our employees but also the general public. Over 350 employees from 12 business units took part in the contest, creating a total of 47 short films. These films were uploaded on our Facebook pan page and garnered over 3,000 views.
- Because PTTGC's care for our employees' health also extended to our contractors, we began screening their blood pressure prior to allowing them to enter their work areas (health pre-screening) to lower chances of workplace accidents. A contractor whose blood pressure was found to be higher than 140/90

would not be permitted in the work area. Should their blood pressure remain high during the second examination, they would be required to see a physician at a hospital for a health checkup and professional diagnosis. The results would then be considered during the discussion with their respective team leaders about restricting their assignments.

- PTTGC Group SEEK Day 2017 was held under the concept of "Transformation for the Future". SEEK Day is an annual event that promotes employees' awareness of safety, hygiene and the environment under the frameworks of process safety management and the B-CAREs safety culture. Outstanding awards were given by the Chief Executive Officer and President of PTTGC to employees who were exemplary of workplace safety and environmental mindfulness. There was also an exhibition to share knowledge, foster a sense of pride and relish the achievements that were collectively made in safety, occupational health and environmental management.

The adherence to workplace safety standards of our Executive Officers, employees and contractors, as well as their participation in our safety-oriented projects, has helped PTTGC's safety management improve since 2016. Statistically, the total recordable injury rate (TRIR) in 2017 is 0.07 cases per 200,000 man hours, which is lower than the target of 0.12 cases per 200,000 man hours. Furthermore, our PTTGC Group plants received gold level awards for being an outstanding role model enterprise on safety, occupational health, and working environment for the 19th consecutive year (1998–2017) and an award from The Prime Minister's Industry Awards 2017, all of which are testaments to our unceasing excellence in safety management.

## PROCESS SAFETY

PTTGC's process safety management includes risk assessment, which extends from the design of a plant to the commissioning of machinery and to maintenance. We also conduct reviews on our safety standards in normal circumstances and emergency cases. These reviews are known as the Hazard Operability Study or HAZOP. All of this adheres to our operation excellence management system or OEMS strategy, which maintains the safety standards and reliability of our plants. Furthermore, we have initiated a process safety management enhancing project to ensure the optimal safety of our processes. We have also created the PTTGC PSM 5-Year Roadmap (2017–2021) with DuPont, a global leader in safety and protection, to further augment the standard of our process safety in hopes of achieving our ultimate goal of becoming a zero-accident organization. The details of the roadmap are as follows:

- According to the 5-step safety management framework, which is part of the PTTGC PSM 5-Year Roadmap (2017–2021), PTTGC must strengthen our leadership's safety awareness to bring about the realization of a true safety culture and an effective safety management system. As a result, we launched




PTTGC Safety Short Film Award 2017



Safety Stand Down Day

the Inspirational Leadership program in 2017. We also plan on developing a system of incident investigation, field risk assessment and management of change in people in 2018, as well as process safety information and process hazard analysis in 2019.

- The recently initiated Inspirational Leadership program pushes our Executives to become process-safety role models, enhancing the efficiency of our process safety management. Participating leaders are educated about risks in the manufacturing process, promoting their understanding and awareness of the issue of process safety. The program enables PTTGC to devise risk-management guidelines, which will lead to better efficiency in our process safety management. Our goal is to have 90% of our leaders participate in the program. As of 2017, a total of 52 Executive Officers have joined.

In addition to the aforementioned programs developed in conjunction with DuPont, PTTGC has launched other safety-oriented plans and projects to strengthen process safety management among our employees and contractors, such as the Safety Stand Down Day and the Contractor SHE Management program.

### 1) Safety Stand Down Day

Due to the many turnarounds and shutdowns of our plants, which effectively raised the likelihood of injuries among our employees and contractors, PTTGC launched the Safety Stand Down Day to reduces chances of work-related accidents. Our Executive Officers also expressed their commitment to the prevention of workplace accidents and communicate our safety performance during the first/second half of 2016 to our employees and contractors, raising their awareness of the possible dangers and the importance of workplace safety. We also encouraged everyone to express their commitment to safety and to the prevention of workplace accidents, which would lead us closer to our goal of becoming a zero-accident organization. The Safety Stand Down Day was held on the same date and at the same time throughout the PTTGC Group.

### 2) Contractor SHE Management

The contractor SHE management is divided into two periods: the normal period and the turnaround period. According to the established guidelines and procedure, the contractor SHE management starts from the selection process. It extends to their preparation, progress follow-ups and evaluation, the results of which will be used to make improvements in order to optimize our process safety management. The management also includes an environmental aspect, known as a "green turnaround," which ensures the minimization of impacts on the environment and surrounding communities.

### 3) Process Safety Management Effectiveness KPIs

These KPIs are guidelines that help us assess the effectiveness of our process safety management. The KPIs have been devised by relevant departments to ensure thoroughness and completeness of process safety management.

PTTGC has yet another role as a founding member of the Emergency Mutual Aid Group (EMAG) of the Map Ta Phut Industrial Estate. We have taken part in the drafting of emergency plans for Rayong and the industrial estate. PTTGC and a group of industrial plants in the industrial

estate have participated in a provincial-level emergency drill and an evacuation drill of communities around the estates. Additionally, we have assigned some of our employees with experiences and expertise in responding to and mitigating a state of emergency – in collaboration with the Rayong Provincial Governor, the Rayong Disaster Prevention Director, the Map Ta Phut Municipality and a group of industrial plants in the Map Ta Phut area – to help nearby communities set up and conduct emergency drills as preparation for possible plant accidents that may affect them. The implementation of a business continuity management system prepares PTTGC for an incident that may take place at any given moment. It ensures our business continuity by allowing us to effectively coordinate with related parties, respond to the situation and recover from it. Our Business Continuity Plan (BCP), outlining a structure of individuals with different responsibilities, serves as a standard and guidelines for the recovery of PTTGC Group plants. PTTGC 2 has already received an ISO22301:2012 certification. Moreover, PTTGC is the first group to receive the TIS 2677–2588 certification for our chemical lab safety management system.

## OCCUPATIONAL HEALTH MANAGEMENT

PTTGC highly values our employees' health, especially those working in the production process. We take a proactive approach to health monitoring by reviewing their health examination programs, especially for employees with higher chances of exposure to hazardous substances. Industrial hygiene measurements in operations areas – namely heat, light, noise and chemical levels – are taken according to the established plan. The acquired data are used to improve our workplace safety and to conduct health risk assessment in order to review the existing measures for the prevention of work-related illnesses. On top of the well-being of our employees', PTTGC also cares about people in the surrounding communities. We have set up two free-of-charge Pan Nam Jai Clinics to provide primary medical treatments for the locals, one of which is located at the Aromatics 2 plant while the other is in the Ban Nong Fab area near the Olefins 3 plant. Additionally, in collaboration with the Community Partnership Association (CPA), our mobile clinic unit sets out to provide basic checkups and healthcare knowledge to residents in the communities around the Map Ta Phut and Ban Chang areas with the assistance from volunteer employees who donate their time, even on their days off. Furthermore, in response to the seasonal flu epidemic, PTTGC provides free flu vaccinations to all employees and directly hired contractors. Our concern also extends to their family members, who can get vaccinated at cost price. The offer illustrates PTTGC's concern for everyone who works for us, as well as their family members.

In addition, as PTTGC places a great deal of importance on our employees' physical and mental well-being, we conduct a health risk assessment as a means to lower their health risks and prevent occupational health illnesses. Our health monitoring plan starts as soon as a candidate becomes an employee. An annual health checkup is provided to continually monitor employees' health. Additional checkups are also provided depending on the health risks of each group of employees. In 2017, PTTGC added colon cancer screening to our health monitoring program based on our studies and consideration of the likelihood of illnesses caused by work and home life. Our efforts assure that our employees will continue to have a good quality of life.

## ENVIRONMENTAL MANAGEMENT

PTTGC hopes to become a role-model organization that develops and grow in a sustainable manner on the foundation of operational excellence. To achieve this, we comply with domestic and international environmental standards, laws and regulations with environmental sustainability management.





Management
Safety

## STRICT ADHERENCE TO ALL ENVIRONMENTAL STANDARDS, LAWS AND REGULATIONS

The PTTGC Group places a great deal of environmental impact prevention. We employ a stringent set of prevention and control measures, which start with the designing phase. We also conduct a thorough environmental impact assessment (EIA) cover every project aspect and establish measures to prevent and mitigate impacts during construction and operations phases. Moreover, PTTGC prepares proper environmental quality monitoring plans and presents them to the responsible authorities to obtain the appropriate permits prior to the commencement of work. We strictly comply with these prevention and mitigation measures and report the performance to the supervisory authorities involved on a regular basis. In addition, we have employed an environmental management system that conforms the ISO 14001 standard as a fundamental practice in operations. Other international standards and best practices are implemented, including the Environmental, Health and Safety Guidelines by the World Bank Group's International Finance Corporation (IFC).

## ENVIRONMENTAL MANAGEMENT BEYOND LEGAL REQUIREMENTS AND SUSTAINABLE KPIs

The PTTGC Group has systematically and continuously employed a philosophy of resource management and sustainable business operation called Eco-Efficiency from the manual of the United Nations Conference on Trade and Development (UNCTAD) as indices of our environmental efficiency since 2008. To this end, we have put an emphasis on optimizing the use of resources while reducing our production processes and activities' impact on the environment. All of this has been done in conjunction with the development of a security, safety, health and environment (SSHE) performance database in accordance with the international standards of the Global Reporting Initiative (GRI) that encompasses every plant. Furthermore, we have received the ISO 14064-1:2006 certification for the inventory of greenhouse gas emissions. We are Thailand's first organization in the petrochemical and refinery sector to be ISO 14064-1:2006 certified. Continuous compliance with this standard has led to efficient greenhouse gas management. We have also established a 5-year strategic plan to manage and handle future climate changes, which falls in line with the United Nations' Sustainable Development Goal 13 (UN SDG 13: Climate Action).

The PTTGC Group takes pride in our greenhouse gas emission reduction goal of 10% (scope 1 and 2) by 2022, using 2012 as the base year. From 2014 to 2017, we have been able to reduce our greenhouse gas emissions from direct and indirect activities (Scope 1 and 2) by about 479,487 t-$CO_2$e* or about 61% of the target of 780,000 t-$CO_2$e by 2022. We are collecting and reporting our emissions from related activities (scope 3), which will lead to greenhouse gas emission management throughout the supply chain. Additionally, to support future demand for eco-friendly products, all products of the PTTGC Group have received the Carbon Footprint of Products label since 2014 from the Thailand Greenhouse Gas Management Organization (Public Organization), which is an organization under the Ministry of Natural Resources and Environment. We have also completed the life cycle assessment (LCA) of every product since 2016.

In addition, the PTTGC Group has formulated an air-quality management plan for our plants and the surrounding areas that may be affected by our activities with an aim is to assure that air quality remains above the safe standard. To achieve this, we have implemented at-source pollution prevention measures, which continue to improve our organization's air quality. Below are some examples of these measures:

- We compile an annual inventory of volatile organic compounds (VOC inventory) from every source. Should the total volatile organic compound (TVOCs) reading exceed our requirement of 300 ppm, which is more stringent than the legal requirement, we will immediately perform maintenance service on our equipment according to the established procedure to reduce any possible impact. During maintenance, we ensure the minimum VOCs emissions into the atmosphere, in addition to the installation of vapor recover unit (VRU) to recover hydrocarbon vapors emitted during truck loading.
- We have installed vapor return lines to recover hydrocarbon vapors that may have been emitted into the atmosphere back into product tanks for further beneficial use or proper management.
- We have studied ways to enhance production capabilities of low-sulfur diesel according to the Euro V

**Note :**

** The quantification of emissions is under review per ISO 14064-1. The exact figure will be disclosed on www.pttgcgroup.com after it has been certified by an external organization.*

provision of the Clean Fuels project. Consequently, PTTGC is able to provide environmentally friendly fuels, ultimately contributing to the overall reduction of air pollution in Thailand.

- We require the use of clean fuels to lower the emission of sulfur dioxide ($SO_2$). We have also improved the ignition of the gas-turbine power generators to lower the emission of oxides of nitrogen ($NO_x$).
- We have installed continuous emission monitoring systems (CEMs) at the top of the flue-gas stacks at plants and constantly send around-the-clock data to the Environmental Monitoring and Control Center located at the Map Ta Phut Industrial Estate Office.
- We have installed VOCs control and treatment equipment, using bio-filters, at production and wastewater treatment areas. The equipment uses microorganisms to break down vapors or hydrocarbon compounds, controlling the odor that effect to nearby communities and environmental friendly.
- We have traded carbon dioxide with operators who use it as a substrate in the production of sodium carbonate to reduce our greenhouse gas emissions. This scheme falls in line with the idea of a circular economy, in which waste from a production process can be used as raw material in another.

The PTTGC Group has also implemented the Waste Management Policy, which underlines efficient resource management and resource optimization. The policy covers every process from product development optimal waste reduction, using the 5Rs: reduce (use the resource effectively), reuse (use repeatedly), recycle, refuse (avoid using of hazardous material), and renewable (recirculate the natural resource). The policy is aligned with the UN SDG 12: Responsible Consumption and Production.

Additionally, we have implemented a system to manage and monitor waste, as well as prevent it from affecting communities, society and the environment, encompassing sorting, storage, transportation and disposal. The following are some of our successful efforts:

- Zero Waste to Landfill: PTTGC has achieved our goal of sending zero hazardous waste to landfill since 2014. This effort to minimize hazardous waste to landfill continues to this day. We manage waste at the source and reuse whatever we can to minimize the amount of waste. Moreover, we have built a collaborative network with communities, local authorities and community enterprises to reuse waste that is not harmful in accordance with the eco-industrial town sustainable development and promotion guidelines. Projects in this network include plant waste banks, community enterprise waste banks and effective microorganism (EM) production.
- Green Turnaround Management: PTTGC has formulated measures to prevent and reduce our impact on the environment caused by the maintenance of our machinery and equipment by reducing any waste, whether hazardous or not, from our turnarounds.
- Community Enterprise Waste Banks: PTTGC has established community enterprise waste banks as prototypes of waste management for communities and schools. With this effort, we hope to educate students on waste management and help them learn to sort waste correctly. We have also encouraged community enterprises to purchase recyclable waste in order to distribute revenue to communities and society.

## INTEGRATED ENVIRONMENTAL DEVELOPMENT, DESIGN AND MANAGEMENT

At PTTGC, we understand the leading role we play in handling climate change; therefore, we have implemented a policy to efficiently manage our energy consumption, which have led to numerous projects and campaigns to conserve energy and to enhance the efficiency of our energy use. Furthermore, to support the government's policy towards the 21$^{st}$ session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change, whose goal is to limit the global temperature rise to well below 2°C above pre-industrial levels, PTTGC has voluntarily set up a target to reduce our emission intensity by 52 percent by 2050, using 2012 as the base year, according to the Science Based Targets Initiative. We have also partaken in other endeavors, including the following:

- We have reported our environmental information to the CDP, formerly the Carbon Disclosure Project, whose classification reflects our efficient environmental management and attentiveness. We became part of their Climate Change program in 2013 and have been classified as a climate disclosure leader for five consecutive years. In addition, we entered into their Water program in 2016, in which we have been classified as a water disclosure leader for the past two years. We also received an A- for this past year's disclosure, an improvement from the previous year's B.

- We have entered into phase 1 of the Thailand Voluntary Emission Trading Scheme, which covers our upstream petrochemical plants. Our participation has enhanced our ability to manage and reduce greenhouse gas emissions internally. Our goal has been to reduce our carbon intensity by 2% during 2014 to 2016 from our business-as-usual baseline of 2012 to 2013. We have reduced carbon dioxide emissions by 56,844 t-$CO_{2e}$ or an equivalent Baht of 11.4 million in tradable revenue. At present, we are expanding this project to our plastic manufacturing plants and refineries.

In addition, the PTTGC Group has laid down the Sustainable Water Management Framework of 3Ws + 2Ws. Internally, we follow the three Ws: water saving (using water efficiently throughout the manufacturing process), water innovation (producing fresh water from seawater through a process called desalination to minimize using fresh water from natural sources) and water stewardship (assessing and reducing our impact on the water cycle). Externally, we follow the two Ws, namely water related to community (integrated water management with all stakeholders) and water conservation at water sources in a sustainable manner. This framework falls in line with the UN SDG 6: Clean Water and Sanitation. The following are our efforts on this subject matter:

- We have installed a wastewater recycling system that makes optimal use of treated water and reduces the discharge of effluent from our plants. In 2017 PTTGC recycled 892,799 cubic meters of wastewater. In addition, we have put in place a system to control and ensures that the quality of the discharge complies with legal requirements. In 2018, we plan to install a wastewater recycling system at the Olefins 3 plant (PTTGC11–PE), which can recycle up to 50% of the discharged wastewater.
- Through our Reforestation and Water Conservation Project at Huai Ma Haad Mountain Area, we have rehabilitated watershed areas and augment their biodiversity, as well as instilled an environmental resource conservation awareness among the locals through activities such as reforestation and building a check dam with winged plastic sacks, which are a PTTGC product.

Furthermore, PTTGC has led the following integrated environmental management activities:

- To bolster our environmental management and to create an economic, social and environmental balance, we assess the impact of our business on the environment using environmental management accounting (EMA) and environmental return on investment (EROI). The results of these assessments are used to make a decision about our environmental endeavors. We conducted these assessments on all business groups in 2017.
- We have effectuated a policy and a 5-year product-stewardship strategic plan. These are the framework by which we will manage, manufacture and develop products. The policy and plan take into account the minimization of our environmental impact and the augmentation of a product's safety throughout its life cycle.
- We have devised eco-design criteria, which we have added as part of the new product consideration process and quality assessment. Considering a product's quality throughout its life cycle has enabled us to ensure their eco-friendliness while meeting the demand of our customers and creating value-added. In 2017, the eco-design criteria were applied to products under development.






PTTGC received the Prime Minister's Industry Award 2017 for Excellence Industry.




PTTGC received Thailand Energy Awards 2017 for Outstanding Industry.



PTTGC receives certificates from Thailand Greenhouse Gas Management Organization Public.

- A PTTGC Group plant received an Outstanding award from the Thailand Energy Awards 2017. The award demonstrates our commitment to energy conservation and the development of renewable energy, as well as our efficient and responsible use of energy.

## SUSTAINABLE ENVIRONMENTAL DEVELOPMENT FOR ALL

PTTGC ensures sustainable environmental development for all through numerous projects, including the following:

- All of PTTGC's plants have received an Eco Factory certification from the Federation of Thai Industries since 2015, supporting our efforts and contributing to our transformation into an eco-industrial town.
- PTTGC has been certified a Green Industry Level 5 by the Ministry of Industry since 2016. This highest level of certification is a testament to our commitment as a leader of the green network and to our contribution to it. It also drives the value of Thailand's green gross domestic product up.
- We have taken part in a pilot project aimed at determining what green gross domestic product (green GDP) indicators in the refinery and upstream petrochemical sector (Aromatics and Olefins) could be. The ideal green GDP indicators would reflect the country's economic growth while considering impacts on the environment and natural resources. This pilot project falls in line with the country's sustainable development goals (SDGs) and the environmentally friendly growth for sustainable development aspect of the National Economic and Social Development Plan.

Moreover, the PTTGC Group has focused on the quality of our management, striving for continuous organization-wide management excellence. As a result, we have received an Excellent Industry award and an Outstanding Industry award from The Prime Minister's Industry Awards 2017. These honorable prizes demonstrate our commitment and dedication to elevating our business to the global stage. They also illustrate our persistence; diligent, creative and quality work; environmental friendliness; generation of benefits for the industrial development of the country; and stance as a role model for other business operators.

Our operation has yielded business successes while also taking into consideration quality, safety, occupational health and the environment throughout the supply chain. It also shows our leadership in the chemical industry, our stance as an organization of innovations and our corporate social responsibility. It is the base which our leadership in the chemical sector is built upon. As a leader, we strive to improve the quality of life and serve as a role model whose exemplary operation can be adopted or adapted by any relevant parties to create tangible results in a sustainable manner.

# FINANCIAL EXCELLENCE



# REPORT OF THE AUDIT COMMITTEE

## Dear Shareholders of PTT Global Chemical Public Company Limited,

The Audit Committee of PTT Global Chemical Public Company Limited (PTTGC) is comprised of three Independent Directors with experiences in the fields of law, financial and accounting management and economics. Our expertise allows us to carry out our duties with efficacy. The current Audit Committee consists of the following three members:

1. Mr. Somchai Kuvijitsuwan — Chairman of the Audit Committee
2. Mr. Amnuay Preemonwong — Director to the Audit Committee
3. Mr. Prasan Chuaphanich — Director to the Audit Committee

The Audit Committee's composition and qualifications are based on the announcements of the Stock Exchange of Thailand.

The Audit Committee has performed its duties as mandated by the Board of Directors and set out in its charter; these duties are consistent with announcements made by the Stock Exchange of Thailand and the Securities and Exchange Commission. It has been our policy to focus on good corporate governance and on compliance with the relevant laws, rules and regulations that apply to both our domestic and international operations. We have also underlined the adequacy and effectiveness of PTTGC's Internal Control and Internal Audit Systems, as well as the review of the performance of all business groups and major investments.

In 2017, the Audit Committee held a total of 11 meetings. All of our directors were present at all of these meetings. We performed our duties with independence. The following is a summary of opinions and key activities that we undertook:

**1. Review of Financial Reports:** The Audit Committee reviewed PTTGC's 2017 quarterly and annual financial statements, including connected transactions and possible conflicting interest transactions. Relevant members of management and the auditors attended these review sessions to provide explanations and respond to questions pertinent to the statements' accuracy and completeness, significant adjusted entries that affected the financial statements, the sufficiency of information disclosure and the auditors' notes. It is our opinion that PTTGC's financial statements present all entries fairly in accordance with the Thai Financial Reporting Standards. In addition, a meeting between the Audit Committee and the auditors without the presence of management was arranged to allow for an independent discussion on the financial statement preparation process and reporting, namely the auditors' annual audit plan and framework, risks, internal control, internal audit, allegations, fraud and other related issues that the auditors had not raised elsewhere. It is our opinion that the auditors received good cooperation and support from management, as well as independently performed their duties with sufficient knowledge, experience and an appropriate audit approach.

**2. Review of Risk Management:** PTTGC has given priority to risk management by assessing internal and external risk factors for their impact and likelihood, as well as developing risk mitigation measures to prevent or remain these risks within the boundaries of the company's tolerance levels. Moreover, PTTGC has established key risk indicators (KRIs) to monitor the changes in these risk factors and issued additional measures to enhance the effectiveness and timeliness of its responses to these risks. In addition, the Board of Directors has appointed the Risk Management Committee to oversee and closely examine PTTGC's risk management. The progress of risk management activities is reported to the board on a regular basis. Additionally, the Audit Committee acknowledged the effectiveness of PTTGC's Enterprise Risk Management and reviewed risk management based on business group's performance report and internal audit reports. Based on our observation, we have concluded that PTTGC conducts risk management in a systematic manner.

**3. Review of Internal Control Systems' Effectiveness:** The Audit Committee reviewed PTTGC's Internal Control System by examining the results of internal control assessment performed by management in accordance with the guidelines set forth by the Securities and Exchange Commission (SEC) as well as the internal audit reports and the auditors' reports. We discovered no irregularities that could significantly affect PTTGC. Moreover, management has continuously improved PTTGC's Internal Control System based on suggestions from us, the auditor and Internal Audit. All of this has led to the conclusion that PTTGC has prioritized internal control, which reasonably ensures its adequacy and effectiveness.

**4. Oversight of Internal Auditing:** The Audit Committee approved amendments to the Charter of Internal Audit, which sought to restructure Internal Audit and the scope of its responsibilities by elevating its status from a department to a function. The Audit Committee also approved the risk-based internal audit plan for significant control activities of PTTGC and its subsidiaries; its strategic plan focusing on the development of internal audit capabilities, alignment with company strategies and good relations with stakeholders; and the key performance indicators (KPIs) for Internal Audit's major tasks. From monitoring and assessing the execution of established plans, we found that Internal Audit succeeded in carrying out its tasks as described in the aforementioned plans and KPIs. The International Standards for the Professional Practice of Internal Auditing has been adapted, along with other best practices. Internal Audit has emphasized its adherence to the code of conduct for internal auditing and remained independent according to the established structure. In 2017, the Assurance Map was implemented among departments in charge of fostering assurance, allowing PTTGC to confidently make use of their work and reducing the overlap of their activities. Moreover, improvements were made to the Continuous Control Monitoring System (CCMS), which detects and monitors irregularities and fraud in the procure to pay process, to ensure its continuous appropriateness and alignment with PTTGC's business. Furthermore, it is required that Internal Audit conduct a self-assessment annually and receive an external assessment every five years. The objective of these assessments is to ensure the quality assurance of internal audit activity and its compliance with the International

Standards for the Professional Practice of Internal Auditing and other best practices. From the self-assessment in 2017, we found that most internal auditing activities complied with the standards. No cases of non-compliance that would significantly impact internal auditing were found. Furthermore, there was good coordination with the management, the auditors, as well as strong support for the Audit Committee. These findings signify that PTTGC has independent and effective internal auditing that complies with the international standard practices.

**5. Compliance with Securities and Stock Market Laws, Regulations of the Stock Exchange of Thailand and/or Other Applicable Laws:** The Audit Committee assigned Internal Audit to examine PTTGC's compliance with any laws pertinent to our operations. Internal Audit concluded that PTTGC has a system of control in place to ensure compliance, which includes the compilation of applicable laws and monitoring of legal changes and new provisions. PTTGC has also appointed individuals to oversee and monitor all matters of compliance. Internal Auditors did not find any non-compliance issues that would significantly affect the company. Furthermore, the Audit Committee did not receive any reports from the auditors, allegations from outsiders or management's information disclosure that indicated that PTTGC had breached any laws or regulations that would have a significant impact on us. It is our opinion that PTTGC has effective control of legal compliance and there are no issues of non-compliance that would significantly affect us.

**6. Review of Connected Transactions or Possible Conflicting Interest Transactions to Ensure Compliance with Laws and Stock Exchange of Thailand's Regulations:** The Audit Committee assigned Internal Audit to randomly review feedstock purchase and service and sale transactions between PTTGC and related parties. Internal Audit concluded that no connected transactions showed signs of irregularities from the approved contracts that were processed in accordance with the announcements of the Securities and Exchange Commission (SEC). Moreover, the Audit Committee reviewed the auditors' report on connected transaction or conflicting interest transaction disclosure. The auditors reported that PTTGC complied with laws and regulations of the Stock Exchange of Thailand and that no irregularities were found.

**7. Appointment of 2018 Auditors:** The Audit Committee nominated the following auditors: Mr. Charoen Phosamritlert (Auditor #4068) or Mr. Natthaphong Tantichattanon (Auditor #8829) or Mr. Waiyawat Korsamarnchaiyakij (Auditor #6333) from KPMG Phoomchai Audit Ltd. These auditors were selected from a pool of auditors who proposed their service to the company for three years, using 2016 as the base year. Taken into consideration were their qualifications, competence, service fees and distinguished auditing performance in 2017. All of the nominees were from the list approved by the Securities and Exchange Commission; they possess sufficient experience and have not audited or expressed their opinions on PTTGC's financial statements for more than five fiscal years consecutively. The Audit Committee nominated these individuals to the Board of Directors, who proposed these names at the shareholder meeting for appointment as the 2018 auditors, during which the audit fees for 2018 were also proposed for approval.

**8. Review of Good Corporate Governance:** The Corporate Governance Committee has played a leading role in the formulation of guidelines, policies and best practices on business code of conduct and ethical business practices according to principles of good corporate governance. These guidelines, policies and best practices have been presented to the Board of Directors and management. The Corporate Governance Committee has also supervised and offered consultation on PTTGC's compliance with principles of good corporate governance

and business code of conduct, especially in regard to corporate social and environmental responsibility and sustainable development, as well as assessed and reviewed its policies, to bring about trust and confidence among all stakeholders. Meanwhile, the Audit Committee has reviewed PTTGC's corporate governance based on reports from Internal Audit. We have concluded that the company complies with good corporate governance and the business code of conduct.

**9. Review of the Audit Committee's Charter:** The Audit Committee reviewed its charter to assure its alignment with the Stock Exchange of Thailand's 2015 announcement on the scope of responsibilities of an audit committee and qualifications of its members, the Audit Committee Manual of 2010 and the Corporate Governance Code for listed companies 2017 (CG Code). The Audit Committee proposed amendments to its charter, which were approved by the Board of Directors at board meeting no. 13/2017 held on October 30th, 2017.

**10. Assessments of the Audit Committee's Performance:** The Audit Committee evaluated its 2017 performance at committee and individual levels. The results of these assessments were reported to the board and are disclosed in this annual report.

**11. Performance Reports of the Audit Committee:** The Audit Committee provided reports on its activities to the Board of Directors on a regular basis. In 2017, a total of four reports were made.

Based on the aforementioned activities throughout 2017, we believe that PTTGC possesses good corporate governance, adequate internal control that suits its business, effective risk management, accurate and accountable financial and accounting reporting system in compliance with general accounting standards and compliance with all laws, rules and regulations pertinent to its operations.

The Audit Committee received good cooperation throughout 2017 from the Board of Directors, executive officers, auditors and all other relevant departments. We would like to express our gratitude here.

On behalf of the Audit Committee

*(Signed) Mr. Somchai Kuvijitsuwan*
(Mr. Somchai Kuvijitsuwan)
Chairman of the Audit Committee

# REPORT OF THE BOARD OF DIRECTORS' ACCOUNTABILITY TO FINANCIAL REPORT

The consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries was prepared in accordance with the Securities Exchange Commission under the Securities and Exchange Act B.E. 2535 and Department of Business Development, issued under the Accounting Act B.E. 2543 Section 11 paragraph 3 in accordance with the Federation of Accounting Professions' Thai Financial Reporting Standards.

The Company's Board of Directors is responsible for financial report of PTT Global Chemical Public Company Limited and its subsidiaries in providing reasonable assurance that the financial report present fairly financial position, financial performance and cash flows. The accounting data is sufficiently and accurately recorded to preserve the Company's assets and prevent fraud and irregularity. The financial report has been prepared accordingly to appropriate accounting policy and consistency practices, and in accordance with Thai Financial Reporting Standards. Significant information has been sufficiently disclosed in notes to financial statements, where the auditor expressed an opinion on the financial statements of PTT Global Chemical Public Company Limited and its subsidiaries in the auditor's report.

*(Signed) Prasert Bunsumpun*
(Mr. Prasert Bunsumpun)
Chairman

*(Signed) Supattanapong Punmeechaow*
(Mr. Supattanapong Punmeechaow)
President & Chief Executive Officer

# INDEPENDENT AUDITOR'S REPORT

## To the Shareholders of PTT Global Chemical Public Company Limited

### Opinion

I have audited the consolidated and separate financial statements of PTT Global Chemical Public Company Limited and its subsidiaries (the "Group") and of PTT Global Chemical Public Company Limited (the "Company"), respectively, which comprise the consolidated and separate statements of financial position as at 31 December 2017, the consolidated and separate statements of income and comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

In my opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of the Group and the Company, respectively, as at 31 December 2017, and their financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRSs).

### Basis for Opinion

I conducted my audit in accordance with Thai Standards on Auditing (TSAs). My responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements section of my report. I am independent of the Group and the Company in accordance with the Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that is relevant to my audit of the consolidated and separate financial statements, and I have fulfilled my other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

### Key Audit Matters

Key audit matters are those matters that, in my professional judgment, were of most significance in my audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of my audit of the consolidated and separate financial statements as a whole, and in forming my opinion thereon, and I do not provide a separate opinion on these matters.

## BUSINESS COMBINATION UNDER COMMON CONTROL

### REFER TO NOTES 3 (a) AND 4 TO THE FINANCIAL STATEMENTS.

| The key audit matter | How the matter was addressed in the audit |
|---|---|
| On 3 July 2017, the Company completed the purchase of the shares, the acceptance of the transfer of rights and obligations under the shareholders agreements and loan agreements, and the acceptance of the transfer of study results in the company operating the propylene and biochemical lines of the petrochemical business and related services business from PTT Public Company Limited and/or PTT PMMA Company Limited (renamed to PTT Global Management Company Limited) for the amount of Baht 25,061 million. The management considered this transaction as business combination under common control. Due to the materiality of the transaction and comparative financial statements have been restated in accordance with Thai Financial Reporting Standards, I considered this as the key audit matter. | My audit procedures included the following:<br>• Read the agreement of sale and purchase of the shares, the acceptance of the transfer of rights and obligations under the shareholders agreement and loan agreement, the acceptance of the transfer of study result, related publishing information and minute of meeting of the board of directors and shareholders to understand key terms and conditions;<br>• Assessed the transaction under the condition of business combination under common control and appropriateness of the identification of net assets acquired and net assets valuation procedures prepared by the management;<br>• Assessed the consistency of accounting policies of the acquired companies with the group's accounting policy;<br>• Tested the accuracy of the retrospective adjustments and;<br>• Evaluated the adequacy of the disclosures in accordance with the relevant Thai Financial Reporting Standards. |

## IMPAIRMENT OF PROPERTY, PLANT AND EQUIPMENT, INTANGIBLE ASSETS AND INVESTMENTS IN SUBSIDIARIES

### REFER TO NOTES 3 (k), 10, 13 AND 16 TO THE FINANCIAL STATEMENTS.

| The key audit matter | How the matter was addressed in the audit |
|---|---|
| Due to price pressure from petro-based succinic acid as a result of continuity low level of crude oil prices, the Group had undertaken a change in the operation plan for Myriant Corporation, a subsidiary within the Group by changed the operation plan of Myriant Corporation to become open innovation and technology scouting. The change in operation plan indicated impairment of the related assets and that the carrying amount of assets exceeded its recoverable amount. Therefore, the Group recognised impairment loss on related assets. The recoverable amount of assets is based on fair value less costs of disposal. Due to the materiality of the transaction, I considered this as the key audit matter. | My audit procedures included the following:<br>• Understand the management's process of the indicators identification and impairment testing process;<br>• Understand of the Group's strategic plan and detailed testing of recoverable amount of the related assets in accordance with the strategic plan;<br>• Assessed the independence and competency of the external specialist engaged by the Group for the valuation of fair value of relating assets;<br>• Evaluated the appropriateness of the fair value valuation methodology;<br>• Evaluated the adequacy of the disclosures in accordance with the relevant Thai Financial Reporting Standards. |

## VALUATION OF INVENTORIES

### REFER TO NOTES 3 (g) AND 9 TO THE FINANCIAL STATEMENTS.

| The key audit matter | How the matter was addressed in the audit |
|---|---|
| Inventory is valued at the lower of its cost and net realisable value. As a result of fluctuation in crude oil price may cause the net realisable value to be lower than its cost. The measurement of inventories together with their net realisable values are based on assumptions about the production yield of crude oil. | My audit procedures included the following:<br>• Assessed assumptions used in the key measurement of inventory by evaluating the production assumptions and comparing to the actual production in the past and randomly checked the selling price of each finished goods with reference market price;<br>• Tested the calculation of net realisable value;<br>• Evaluated the adequacy of the disclosures in accordance with the relevant Thai Financial Reporting Standards. |

## OTHER INFORMATION

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and my auditor's report thereon.

My opinion on the consolidated and separate financial statements does not cover the other information and I will not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated and separate financial statements, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

## RESPONSIBILITIES OF MANAGEMENT AND THOSE CHARGED WITH GOVERNANCE FOR THE CONSOLIDATED AND SEPARATE FINANCIAL STATEMENTS

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's and the Company's financial reporting process.

## AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE CONSOLIDATED AND SEPARATE FINANCIAL STATEMENTS

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, I exercise professional judgment and maintain professional skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I also provide those charged with governance with a statement that I have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, I determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. I describe these matters in my auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, I determine that a matter should not be communicated in my report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.



(Charoen Phosamritlert)
Certified Public Accountant
Registration No. 4068
KPMG Phoomchai Audit Ltd.
Bangkok
19 February 2018

# FINANCIAL STATEMENTS

# STATEMENT OF FINANCIAL POSITION

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | | Consolidated financial statements | | | Separate financial statements | | |
|---|---|---|---|---|---|---|---|
| | | 31 December | | 1 January | 31 December | | 1 January |
| **Assets** | *Note* | 2017 | 2016 (Restated) | 2016 (Restated) | 2017 | 2016 (Restated) | 2016 (Restated) |
| | | | | *(in Baht)* | | | |
| ***Current assets*** | | | | | | | |
| Cash and cash equivalents | *6* | 43,429,391,977 | 32,720,385,251 | 13,336,286,293 | 34,435,521,847 | 27,949,661,787 | 6,948,680,839 |
| Current investments | *12* | 11,620,341,737 | 14,168,554,037 | 36,258,195,511 | 8,937,841,737 | 13,195,207,881 | 35,106,047,000 |
| Trade accounts receivable | *5, 7* | 41,696,848,016 | 37,752,095,265 | 29,673,085,486 | 34,957,003,232 | 34,318,805,032 | 26,565,899,697 |
| Other receivables | *5, 8* | 2,959,208,230 | 3,582,773,430 | 6,138,297,847 | 2,776,629,990 | 2,974,132,762 | 5,542,075,140 |
| Inventories | *9* | 37,754,918,812 | 38,358,009,945 | 31,908,980,654 | 29,071,922,068 | 26,259,815,101 | 23,392,590,733 |
| Short-term loans to related parties | *5* | - | - | - | 476,034,886 | 655,000,000 | 591,000,000 |
| Receivable from Oil Fuel Fund | | 751,741,364 | 13,428,346 | 17,505,196 | 751,741,364 | 13,428,346 | 17,505,196 |
| Value-added tax receivable | | 1,209,173,466 | 1,380,987,999 | 1,596,129,984 | - | - | 440,142,509 |
| Derivatives | *35* | 133,511,482 | 57,755,829 | 22,804,440 | 126,082,592 | 52,591,637 | 20,768,417 |
| Other current assets | | 1,182,451,180 | 1,134,915,350 | 851,926,081 | 974,645,265 | 879,118,257 | 718,860,278 |
| **Total current assets** | | **140,737,586,264** | **129,168,905,452** | **119,803,211,492** | **112,507,422,981** | **106,297,760,803** | **99,343,569,809** |
| ***Non-current assets*** | | | | | | | |
| Investments in subsidiaries | *5, 10* | - | - | - | 56,858,727,503 | 55,286,046,000 | 55,648,840,580 |
| Investments in joint ventures | *5, 11* | 27,577,183,336 | 26,284,657,931 | 27,220,910,861 | 15,372,927,810 | - | 210,000,000 |
| Investments in associates | *5, 11* | 14,001,546,169 | 13,026,186,055 | 12,392,623,078 | 9,322,699,660 | 9,322,699,660 | 9,322,699,660 |
| Other long-term investments | *12* | 10,274,865,759 | 5,886,683,106 | 573,614,909 | 9,991,989,242 | 5,603,806,590 | 290,738,392 |
| Long-term loans to related party | *5* | 6,665,493,000 | - | - | 6,665,493,000 | - | - |
| Long-term loans to other parties | | 670,106,429 | 734,690,566 | 739,978,684 | - | - | - |
| Property, plant and equipment | *13* | 219,688,698,105 | 223,991,791,496 | 222,593,802,913 | 165,997,946,625 | 170,166,576,127 | 171,521,410,627 |
| Land leasehold right | *14* | 323,932,996 | 362,329,692 | 400,939,481 | 323,932,996 | 362,045,490 | 400,262,401 |
| Goodwill | *15* | 931,328,672 | 931,328,672 | 1,267,501,158 | - | - | - |
| Intangible assets | *16* | 7,768,494,092 | 8,271,280,720 | 8,958,331,779 | 5,290,974,666 | 5,232,936,789 | 5,338,539,749 |
| Derivatives | *35* | 1,133,482 | - | 7,845,653 | 1,133,482 | - | 7,845,653 |
| Deferred tax assets | *17* | 309,107,686 | 320,439,647 | 313,990,432 | - | - | - |
| Other non-current assets | | 6,014,451,540 | 4,535,004,812 | 3,879,358,673 | 4,336,432,147 | 2,988,805,642 | 2,521,062,536 |
| **Total non-current assets** | | **294,226,341,266** | **284,344,392,697** | **278,348,897,621** | **274,162,257,131** | **248,962,916,298** | **245,261,399,598** |
| **Total assets** | | **434,963,927,530** | **413,513,298,149** | **398,152,109,113** | **386,669,680,112** | **355,260,677,101** | **344,604,969,407** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF FINANCIAL POSITION

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | | Consolidated financial statements | | | Separate financial statements | | |
|---|---|---|---|---|---|---|---|
| | | 31 December | | 1 January | 31 December | | 1 January |
| **Liabilities and shareholders' equity** | *Note* | 2017 | 2016 (Restated) | 2016 (Restated) | 2017 | 2016 (Restated) | 2016 (Restated) |
| | | | | *(in Baht)* | | | |
| ***Current liabilities*** | | | | | | | |
| Short-term borrowings from financial institutions | *18* | 263,463,734 | 562,609,893 | 651,668,697 | - | - | - |
| Trade accounts payable | *5, 19* | 31,137,032,511 | 28,426,414,825 | 20,129,140,695 | 26,450,571,031 | 23,885,752,801 | 15,873,557,469 |
| Other payables | *5, 20* | 13,522,571,669 | 10,129,570,110 | 7,983,596,627 | 11,335,502,774 | 7,816,954,585 | 5,625,059,921 |
| Payables to contractors | *5* | 2,157,593,433 | 1,909,117,797 | 2,131,516,025 | 1,637,668,922 | 1,842,693,528 | 2,212,474,187 |
| Short-term borrowings from related parties | *5, 18* | - | - | - | 2,558,006,526 | 1,513,795,970 | 880,120,417 |
| Current portion of long-term borrowings from financial institutions | *18* | 9,292,754,135 | 7,341,451,997 | 7,706,254,643 | 6,835,344,000 | 4,948,450,000 | 5,968,226,000 |
| Current portion of long-term borrowings from other parties | *18* | 669,374,118 | 746,906,105 | 754,909,442 | - | - | - |
| Current portion of debenture | *18, 35* | - | 2,798,938,302 | 1,058,000,000 | - | 2,798,938,302 | 1,058,000,000 |
| Income tax payable | | 2,421,170,849 | 1,888,033,401 | 682,156,204 | 2,154,263,817 | 1,670,555,166 | 557,903,488 |
| Derivatives | *35* | 715,734,181 | 166,696,998 | 431,666,704 | 137,783,625 | 155,250,926 | 425,768,667 |
| Current provisions | | 99,404,348 | 456,694,976 | 690,032,897 | - | - | - |
| Other current liabilities | | 33,783,794 | 43,147,196 | 40,153,127 | - | - | - |
| **Total current liabilities** | | **60,312,882,772** | **54,469,581,600** | **42,259,095,061** | **51,109,140,695** | **44,632,391,278** | **32,601,110,149** |
| ***Non-current liabilities*** | | | | | | | |
| Long-term borrowings from financial institutions | *18* | 31,820,572,241 | 36,710,847,227 | 44,885,299,423 | 14,423,215,179 | 19,471,550,000 | 31,588,854,000 |
| Long-term borrowings from other parties | *18* | 1,122,433,964 | 1,168,372,202 | 1,158,090,527 | - | - | - |
| Debentures | *18, 35* | 54,644,795,574 | 47,786,239,921 | 50,807,499,956 | 54,644,795,574 | 47,786,239,921 | 50,807,499,956 |
| Deferred tax liabilities | *17* | 1,839,865,302 | 2,238,629,584 | 2,227,324,764 | 1,610,730,739 | 1,807,050,827 | 1,608,628,604 |
| Non-current provisions for employee benefits | *21* | 4,010,707,568 | 3,144,074,693 | 2,975,245,593 | 2,831,669,846 | 2,113,277,613 | 1,963,199,810 |
| Derivatives | *35* | - | 23,629,844 | 97,080,566 | - | 23,629,844 | 97,080,566 |
| Other non-current provisions | | 464,945,102 | 458,380,989 | 397,827,667 | - | - | - |
| Other non-current liabilities | | 483,627,551 | 500,004,958 | 442,916,244 | 340,352,706 | 351,987,162 | 329,420,217 |
| **Total non-current liabilities** | | **94,386,947,302** | **92,030,179,418** | **102,991,284,740** | **73,850,764,044** | **71,553,735,367** | **86,394,683,153** |
| **Total liabilities** | | **154,699,830,074** | **146,499,761,018** | **145,250,379,801** | **124,959,904,739** | **116,186,126,645** | **118,995,793,302** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF FINANCIAL POSITION

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | | Consolidated financial statements | | | Separate financial statements | | |
|---|---|---|---|---|---|---|---|
| | | 31 December | | 1 January | 31 December | | 1 January |
| **Liabilities and shareholders' equity** | *Note* | 2017 | 2016 (Restated) | 2016 (Restated) | 2017 | 2016 (Restated) | 2016 (Restated) |
| | | | | *(in Baht)* | | | |
| ***Shareholders' equity*** | | | | | | | |
| Share capital | *22* | | | | | | |
| Authorised share capital | | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 |
| Issued and paid-up share capital | | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 | 45,088,491,170 |
| Treasury shares | *23* | - | (2,409,544,289) | (2,104,534,625) | - | (2,409,544,289) | (2,104,534,625) |
| Share premium | | 36,936,829,684 | 36,936,829,684 | 36,936,829,684 | 36,936,829,684 | 36,936,829,684 | 36,936,829,684 |
| Share premium on treasury shares | *23, 24* | 1,386,740,109 | 7,490,764 | - | 1,386,740,109 | 7,490,764 | - |
| Difference arising from business combination | | | | | | | |
| under common control | *4, 24* | 1,690,706,891 | (1,658,035,683) | (1,658,035,683) | 77,453,518 | 480,500,000 | - |
| Retained earnings | | | | | | | |
| Appropriated | | | | | | | |
| Legal reserve | *24* | 4,512,930,269 | 4,512,930,269 | 4,512,930,269 | 4,512,930,269 | 4,512,930,269 | 4,512,930,269 |
| Loan repayment reserve | | 807,802,564 | 807,802,564 | 807,802,564 | 807,802,564 | 807,802,564 | 807,802,564 |
| Projects expansion reserve | | 12,446,994,126 | 12,446,994,126 | 12,446,994,126 | 12,446,994,126 | 12,446,994,126 | 12,446,994,126 |
| Treasury shares reserve | *23, 24* | - | 2,409,544,289 | 2,104,534,625 | - | 2,409,544,289 | 2,104,534,625 |
| Unappropriated | | 172,015,687,267 | 147,220,167,889 | 132,503,486,704 | 160,555,120,605 | 138,850,652,172 | 125,816,128,292 |
| Other components of shareholders' equity | | (16,464,972) | 653,078,970 | 913,050,544 | (102,586,672) | (57,140,293) | - |
| **Equity attributable to owners of the parent** | | **274,869,717,108** | **246,015,749,753** | **231,551,549,378** | **261,709,775,373** | **239,074,550,456** | **225,609,176,105** |
| Former shareholder before business restructuring | | - | 18,330,742,219 | 18,602,149,461 | - | - | - |
| Non-controlling interests | | 5,394,380,348 | 2,667,045,159 | 2,748,030,473 | - | - | - |
| **Total shareholders' equity** | | **280,264,097,456** | **267,013,537,131** | **252,901,729,312** | **261,709,775,373** | **239,074,550,456** | **225,609,176,105** |
| **Total liabilities and shareholders' equity** | | **434,963,927,530** | **413,513,298,149** | **398,152,109,113** | **386,669,680,112** | **355,260,677,101** | **344,604,969,407** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF INCOME

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Note | Consolidated financial statements For the year ended 31 December 2017 | Consolidated financial statements For the year ended 31 December 2016 (Restated) | Separate financial statements For the year ended 31 December 2017 | Separate financial statements For the year ended 31 December 2016 |
|---|---|---|---|---|---|
| | | | *(in Baht)* | | |
| Revenues from sale of goods and rendering of service | *5* | 439,920,745,943 | 355,524,194,787 | 378,722,244,152 | 307,047,821,209 |
| Cost of sale of goods and rendering of services | *5* | (382,271,196,272) | (311,973,355,665) | (331,604,782,611) | (270,369,868,015) |
| **Gross profit** | | **57,649,549,671** | **43,550,839,122** | **47,117,461,541** | **36,677,953,194** |
| Investment income | *5* | 945,697,441 | 852,411,233 | 6,370,363,096 | 3,696,703,445 |
| Other income | *5* | 1,418,241,285 | 2,165,787,488 | 1,751,679,395 | 2,522,303,707 |
| Selling and distribution expenses | *5, 26* | (3,056,178,110) | (2,477,863,213) | (1,738,599,888) | (1,352,640,121) |
| Administrative expenses | *5, 27* | (11,140,628,972) | (10,199,681,810) | (7,721,084,582) | (7,066,620,069) |
| Loss from impairment of assets | *10, 13, 15, 16* | (2,296,219,775) | (655,533,811) | (4,720,383,021) | (3,847,721,967) |
| Net derivative loss | | (198,236,984) | (602,230,698) | (342,332,830) | (653,999,504) |
| Net foreign exchange gain | | 1,024,365,703 | 332,540,346 | 1,343,469,076 | 157,257,649 |
| Finance costs | *5, 30* | (3,935,049,416) | (4,277,279,760) | (3,072,187,725) | (3,528,810,613) |
| Share of profit of investments in joint ventures | *11* | 4,110,647,538 | 1,469,992,164 | - | - |
| Share of profit of investments in associates | *11* | 1,460,922,849 | 1,105,550,289 | - | - |
| **Profit before income tax expense** | | **45,983,111,230** | **31,264,531,350** | **38,988,385,062** | **26,604,425,721** |
| Tax expense | *31* | (3,863,252,511) | (3,090,423,175) | (3,465,441,780) | (2,783,719,580) |
| **Profit for the year** | | **42,119,858,719** | **28,174,108,175** | **35,522,943,282** | **23,820,706,141** |
| **Profit attributable to:** | | | | | |
| Owners of the Company | | 39,298,309,631 | 25,601,632,867 | 35,522,943,282 | 23,820,706,141 |
| Former shareholder before business restructuring | *4* | 2,369,790,494 | 2,314,837,128 | - | - |
| Non-controlling interests | | 451,758,594 | 257,638,180 | - | - |
| **Profit for the year** | | **42,119,858,719** | **28,174,108,175** | **35,522,943,282** | **23,820,706,141** |
| **Basic earnings per share** | *33* | **8.79** | **5.74** | **7.94** | **5.34** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF COMPREHENSIVE INCOME

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Note | Consolidated financial statements For the year ended 31 December 2017 | Consolidated financial statements For the year ended 31 December 2016 (Restated) | Separate financial statements For the year ended 31 December 2017 | Separate financial statements For the year ended 31 December 2016 |
|---|---|---|---|---|---|
| | | | *(in Baht)* | | |
| **Profit for the year** | | **42,119,858,719** | **28,174,108,175** | **35,522,943,282** | **23,820,706,141** |
| **Other comprehensive income (loss)** | | | | | |
| ***Items that will be reclassified subsequently to profit or loss*** | | | | | |
| Exchange differences on translating financial operations | | (463,605,102) | (283,477,619) | - | - |
| Gains (losses) on remeasuring available-for-sale investments | | 162,484,979 | (20,398,751) | 162,484,979 | (20,398,751) |
| Losses on cash flow hedges | | (753,189,044) | (86,362,650) | (207,931,358) | (36,741,542) |
| Share of other comprehensive income of joint ventures | *11* | 513,821,226 | 428,074,170 | - | - |
| Share of other comprehensive income of associates | *11* | 28,434,680 | 19,742,171 | - | - |
| **Total items that will be reclassified subsequently to profit or loss** | | **(512,053,261)** | **57,577,321** | **(45,446,379)** | **(57,140,293)** |
| ***Items that will not be reclassified to profit or loss*** | | | | | |
| Losses on remeasurements of defined benefit plans | | (459,926,590) | (36,879,098) | (383,377,148) | - |
| Share of other comprehensive income (loss) of joint ventures | *11* | (47,166,128) | (69,700,685) | - | - |
| Share of other comprehensive income (loss) of associates | *11* | (7,954,944) | 1,165,992 | - | - |
| **Total items that will not be reclassified to profit or loss** | | **(515,047,662)** | **(105,413,791)** | **(383,377,148)** | **-** |
| **Other comprehensive income (loss) for the year, net of tax** | | **(1,027,100,923)** | **(47,836,470)** | **(428,823,527)** | **(57,140,293)** |
| **Total comprehensive income for the year** | | **41,092,757,796** | **28,126,271,705** | **35,094,119,755** | **23,763,565,848** |
| **Total comprehensive income attributable to:** | | | | | |
| Owners of parent | | 38,128,591,842 | 25,242,891,872 | 35,094,119,755 | 23,763,565,848 |
| Former shareholder before business restructuring | *4* | 2,521,020,087 | 2,672,336,337 | - | - |
| Non-controlling interests | | 443,145,867 | 211,043,496 | - | - |
| **Total comprehensive income for the year** | | **41,092,757,796** | **28,126,271,705** | **35,094,119,755** | **23,763,565,848** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF CHANGES IN EQUITY

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | | | | | | | Retained earnings | |
|---|---|---|---|---|---|---|---|---|
| | Note | Issued and paid share capital | Treasury shares | Share premium | Share premium on treasury shares | Difference arising from business combination under common control | Legal reserve | Loans repayment reserve | Projects expansion reserve |
| **Year ended 31 December 2016** | | | | | | | | | |
| **Balance at 1 January 2016 - as reported** | | **45,088,491,170** | **(2,104,534,625)** | **36,936,829,684** | **-** | **(1,658,035,683)** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |
| Impact of business restructuring | *4* | - | - | - | - | - | - | - | - |
| **Balance at 1 January 2016 - restated** | | **45,088,491,170** | **(2,104,534,625)** | **36,936,829,684** | **-** | **(1,658,035,683)** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |
| **Transactions with owners, recorded directly in equity** | | | | | | | | | |
| ***Contributions by and distributions to owner of the parent*** | | | | | | | | | |
| Treasury shares purchased | *23* | - | (330,081,400) | - | - | - | - | - | - |
| Sale of treasury shares | *23* | - | 25,071,736 | - | 7,490,764 | - | - | - | - |
| Dividends to owners of the Company | *34* | - | - | - | - | - | - | - | - |
| ***Total contributions by and distributions to owners of the parent*** | | **-** | **(305,009,664)** | **-** | **7,490,764** | **-** | **-** | **-** | **-** |
| ***Changes in ownership interests in subsidiaries*** | | | | | | | | | |
| Increase investment in subsidiaries | *10* | - | - | - | - | - | - | - | - |
| ***Total changes in ownership interests in subsidiaries*** | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| ***Changes in interests from business restructuring*** | | | | | | | | | |
| Impact of business restructuring | *4* | - | - | - | - | - | - | - | - |
| ***Total changes in interests from business restructuring*** | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Total transactions with owners, recorded directly in equity** | | **-** | **(305,009,664)** | **-** | **7,490,764** | **-** | **-** | **-** | **-** |
| **Comprehensive income (loss) for the year (Restated)** | | | | | | | | | |
| Profit | | - | - | - | - | - | - | - | - |
| Other comprehensive income (loss) | | - | - | - | - | - | - | - | - |
| **Total comprehensive income (loss) for the year (Restated)** | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Balance at 31 December 2016 (Restated)** | | **45,088,491,170** | **(2,409,544,289)** | **36,936,829,684** | **7,490,764** | **(1,658,035,683)** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |

The accompanying notes are an integral part of these financial statements.

| Consolidated financial statements | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Other components of shareholders' equity | | | | | | | | | |
| Treasury shares reserve | Unappropriated | Translating financial operations | Gain (losses) on remeasuring available-for-sale investments | Gain (losses) on cash flow hedges | Share of other comprehensive income (loss) of joint ventures | Share of other comprehensive income (loss) of associates | Total other components of shareholder's equity | Equity attributable to owners of parent | Former shareholder before business restructuring | Non-controlling interests | Total shareholder's equity |
| | | *(in Baht)* | | | | | | | | | |
| **2,104,534,625** | **132,503,486,704** | **322,235,753** | **-** | **49,621,108** | **581,280,169** | **(40,086,486)** | **913,050,544** | **231,551,549,378** | **-** | **2,713,211,862** | **234,264,761,240** |
| - | - | 4,341,155 | - | - | (4,341,155) | - | - | - | 18,602,149,464 | 34,818,611 | 18,636,968,075 |
| **2,104,534,625** | **132,503,486,704** | **326,576,908** | **-** | **49,621,108** | **576,939,014** | **(40,086,486)** | **913,050,544** | **231,551,549,378** | **18,602,149,464** | **2,748,030,473** | **252,901,729,315** |
| 330,081,400 | (330,081,400) | - | - | - | - | - | - | (330,081,400) | - | - | (330,081,400) |
| (25,071,736) | 25,071,736 | - | - | - | - | - | - | 32,562,500 | - | - | 32,562,500 |
| - | (10,481,172,597) | - | - | - | - | - | - | (10,481,172,597) | - | (392,000,000) | (10,873,172,597) |
| **305,009,664** | **(10,786,182,261)** | **-** | **-** | **-** | **-** | **-** | **-** | **(10,778,691,497)** | **-** | **(392,000,000)** | **(11,170,691,497)** |
| - | - | - | - | - | - | - | - | - | - | 99,971,190 | 99,971,190 |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **99,971,190** | **99,971,190** |
| - | - | - | - | - | - | - | - | - | (2,943,743,582) | - | (2,943,743,582) |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **(2,943,743,582)** | **-** | **(2,943,743,582)** |
| **305,009,664** | **(10,786,182,261)** | **-** | **-** | **-** | **-** | **-** | **-** | **(10,778,691,497)** | **(2,943,743,582)** | **(292,028,810)** | **(14,014,463,889)** |
| - | 25,601,632,867 | - | - | - | - | - | - | 25,601,632,867 | 2,314,837,128 | 257,638,180 | 28,174,108,175 |
| - | (98,769,421) | (241,484,996) | (20,398,751) | (86,362,650) | 68,532,652 | 19,742,171 | (259,971,574) | (358,740,995) | 357,499,209 | (46,594,684) | (47,836,470) |
| **-** | **25,502,863,446** | **(241,484,996)** | **(20,398,751)** | **(86,362,650)** | **68,532,652** | **19,742,171** | **(259,971,574)** | **25,242,891,872** | **2,672,336,337** | **211,043,496** | **28,126,271,705** |
| **2,409,544,289** | **147,220,167,889** | **85,091,912** | **(20,398,751)** | **(36,741,542)** | **645,471,666** | **(20,344,315)** | **653,078,970** | **246,015,749,753** | **18,330,742,219** | **2,667,045,159** | **267,013,537,131** |

# STATEMENT OF CHANGES IN EQUITY

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | | | | | | | Retained earnings | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Note* | Issued and paid share capital | Treasury shares | Share premium | Share premium on treasury shares | Difference arising from business combination under common control | Legal reserve | Loans repayment reserve | Projects expansion reserve |
| **Year ended 31 December 2017** | | | | | | | | | |
| **Balance at 1 January 2017 - as reported** | | **45,088,491,170** | **(2,409,544,289)** | **36,936,829,684** | **7,490,764** | **(1,658,035,683)** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |
| Impact of business restructuring | *4* | - | - | - | - | - | - | - | - |
| **Balance at 1 January 2017 - restated** | | **45,088,491,170** | **(2,409,544,289)** | **36,936,829,684** | **7,490,764** | **(1,658,035,683)** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |
| **Transactions with owners, recorded directly in equity** | | | | | | | | | |
| ***Contributions by and distributions to owner of the parent*** | | | | | | | | | |
| Sale of treasury shares | *23* | - | 2,409,544,289 | - | 1,379,249,345 | - | - | - | - |
| Dividends to owners of the Company | *34* | - | - | - | - | - | - | - | - |
| ***Total contributions by and distributions to owners of the parent*** | | **-** | **2,409,544,289** | **-** | **1,379,249,345** | **-** | **-** | **-** | **-** |
| ***Changes in ownership interests in subsidiaries*** | | | | | | | | | |
| Increase in ownership interest in subsidiary | *10* | - | - | - | - | - | - | - | - |
| Increase in share capital of subsidiary | *10* | - | - | - | - | - | - | - | - |
| Acquisition of non-controlling interests without a change in control | *10* | - | - | - | - | - | - | - | - |
| ***Total changes in ownership interests in subsidiaries*** | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| ***Changes in interests from business restructuring*** | | | | | | | | | |
| Impact of business restructuring | *4* | - | - | - | - | 3,348,742,574 | - | - | - |
| ***Total changes in interests from business restructuring*** | | **-** | **-** | **-** | **-** | **3,348,742,574** | **-** | **-** | **-** |
| **Total transactions with owners, recorded directly in equity** | | **-** | **2,409,544,289** | **-** | **1,379,249,345** | **3,348,742,574** | **-** | **-** | **-** |
| **Comprehensive income (loss) for the year** | | | | | | | | | |
| Profit | | - | - | - | - | - | - | - | - |
| Other comprehensive income (loss) | | - | - | - | - | - | - | - | - |
| **Total comprehensive income (loss) for the year** | | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Balance at 31 December 2017** | | **45,088,491,170** | **-** | **36,936,829,684** | **1,386,740,109** | **1,690,706,891** | **4,512,930,269** | **807,802,564** | **12,446,994,126** |

The accompanying notes are an integral part of these financial statements.

| Consolidated financial statements | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Other components of shareholders' equity | | | | | | | | | |
| Treasury shares reserve | Unappropriated | Translating financial operations | Gain (losses) on remeasuring available-for-sale investments | Gain (losses) on cash flow hedges | Share of other comprehensive income (loss) of joint ventures | Share of other comprehensive income (loss) of associates | Total other components of shareholder's equity | Equity attributable to owners of parent | Former shareholder before business restructuring | Non-controlling interests | Total shareholder's equity |
| | | *(in Baht)* | | | | | | | | | |
| **2,409,544,289** | **147,220,167,889** | **81,276,513** | **(20,398,751)** | **(36,741,542)** | **649,287,065** | **(20,344,315)** | **653,078,970** | **246,015,749,753** | **-** | **2,653,009,220** | **248,668,758,973** |
| - | - | 3,815,399 | - | - | (3,815,399) | - | - | - | 18,330,742,219 | 14,035,939 | 18,344,778,158 |
| **2,409,544,289** | **147,220,167,889** | **85,091,912** | **(20,398,751)** | **(36,741,542)** | **645,471,666** | **(20,344,315)** | **653,078,970** | **246,015,749,753** | **18,330,742,219** | **2,667,045,159** | **267,013,537,131** |
| (2,409,544,289) | 2,409,544,289 | - | - | - | - | - | - | 3,788,793,634 | - | - | 3,788,793,634 |
| - | (15,844,641,990) | - | - | - | - | - | - | (15,844,641,990) | - | (531,354,408) | (16,375,996,398) |
| **(2,409,544,289)** | **(13,435,097,701)** | **-** | **-** | **-** | **-** | **-** | **-** | **(12,055,848,356)** | **-** | **(531,354,408)** | **(12,587,202,764)** |
| - | (582,931,911) | (14,794,976) | - | - | - | - | (14,794,976) | (597,726,887) | - | (346,469,449) | (944,196,336) |
| - | 1,302,886 | - | - | - | - | - | - | 1,302,886 | - | 135,184,564 | 136,487,450 |
| - | 28,905,296 | - | - | - | - | - | - | 28,905,296 | - | 3,026,828,615 | 3,055,733,911 |
| **-** | **(552,723,729)** | **(14,794,976)** | **-** | **-** | **-** | **-** | **(14,794,976)** | **(567,518,705)** | **-** | **2,815,543,730** | **2,248,025,025** |
| - | - | - | - | - | - | - | - | 3,348,742,574 | (20,851,762,306) | - | (17,503,019,732) |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **3,348,742,574** | **(20,851,762,306)** | **-** | **(17,503,019,732)** |
| **(2,409,544,289)** | **(13,987,821,430)** | **(14,794,976)** | **-** | **-** | **-** | **-** | **(14,794,976)** | **(9,274,624,487)** | **(20,851,762,306)** | **2,284,189,322** | **(27,842,197,471)** |
| - | 39,298,309,631 | - | - | - | - | - | - | 39,298,309,631 | 2,369,790,494 | 451,758,594 | 42,119,858,719 |
| - | (514,968,823) | (454,182,193) | 162,484,979 | (753,189,044) | 361,702,612 | 28,434,680 | (654,748,966) | (1,169,717,789) | 151,229,593 | (8,612,727) | (1,027,100,923) |
| **-** | **38,783,340,808** | **(454,182,193)** | **162,484,979** | **(753,189,044)** | **361,702,612** | **28,434,680** | **(654,748,966)** | **38,128,591,842** | **2,521,020,087** | **443,145,867** | **41,092,757,796** |
| **-** | **172,015,687,267** | **(383,885,257)** | **142,086,228** | **(789,930,586)** | **1,007,174,278** | **8,090,365** | **(16,464,972)** | **274,869,717,108** | **-** | **5,394,380,348** | **280,264,097,456** |

# STATEMENT OF CHANGES IN EQUITY

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Note | Issued and paid share capital | Treasury shares | Share premium | Share premium on treasury shares | Difference arising from business combination under common control |
|---|---|---|---|---|---|---|
| **Year ended 31 December 2016** | | | | | | |
| **Balance at 1 January 2016** | | **45,088,491,170** | **(2,104,534,625)** | **36,936,829,684** | **-** | **-** |
| **Transactions with owners, recorded directly in equity** | | | | | | |
| ***Contributions by and distributions to owners of the Company*** | | | | | | |
| Treasury shares purchased | *23* | - | (330,081,400) | - | - | - |
| Sale of treasury shares | *23* | - | 25,071,736 | - | 7,490,764 | - |
| Dividends to owners of the Company | *34* | - | - | - | - | - |
| ***Total contributions by and distributions to owners of the Company*** | | **-** | **(305,009,664)** | **-** | **7,490,764** | **-** |
| ***Changes in interests from business restructuring*** | | | | | | |
| Impact of business restructuring | *11* | - | - | - | - | 480,500,000 |
| ***Total changes in interests from business restructuring*** | | **-** | **-** | **-** | **-** | **480,500,000** |
| **Total transactions with owners, recorded directly in equity** | | **-** | **(305,009,664)** | **-** | **7,490,764** | **480,500,000** |
| **Comprehensive income (loss) for the year** | | | | | | |
| Profit | | - | - | - | - | - |
| Other comprehensive income (loss) | | - | - | - | - | - |
| **Total comprehensive income (loss) for the year** | | **-** | **-** | **-** | **-** | **-** |
| **Balance at 31 December 2016** | | **45,088,491,170** | **(2,409,544,289)** | **36,936,829,684** | **7,490,764** | **480,500,000** |

The accompanying notes are an integral part of these financial statements.

**Separate financial statements**

| Retained earnings | | | | | Other components of shareholders' equity | | | |
|---|---|---|---|---|---|---|---|---|
| Legal reserve | Loans repayment reserve | Projects expansion reserve | Treasury shares reserve | Unappropriated | Gain (losses) on remeasuring available-for-sale investments | Gain (losses) on cash flow hedges | Total other components of equity | Total shareholder's equity |
| | | *(in Baht)* | | | | | | |
| **4,512,930,269** | **807,802,564** | **12,446,994,126** | **2,104,534,625** | **125,816,128,292** | **-** | **-** | **-** | **225,609,176,105** |
| - | - | - | 330,081,400 | (330,081,400) | - | - | - | (330,081,400) |
| - | - | - | (25,071,736) | 25,071,736 | - | - | - | 32,562,500 |
| - | - | - | - | (10,481,172,597) | - | - | - | (10,481,172,597) |
| **-** | **-** | **-** | **305,009,664** | **(10,786,182,261)** | **-** | **-** | **-** | **(10,778,691,497)** |
| - | - | - | - | - | - | - | - | 480,500,000 |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **480,500,000** |
| **-** | **-** | **-** | **305,009,664** | **(10,786,182,261)** | **-** | **-** | **-** | **(10,298,191,497)** |
| - | - | - | - | 23,820,706,141 | - | - | - | 23,820,706,141 |
| - | - | - | - | - | (20,398,751) | (36,741,542) | (57,140,293) | (57,140,293) |
| **-** | **-** | **-** | **-** | **23,820,706,141** | **(20,398,751)** | **(36,741,542)** | **(57,140,293)** | **23,763,565,848** |
| **4,512,930,269** | **807,802,564** | **12,446,994,126** | **2,409,544,289** | **138,850,652,172** | **(20,398,751)** | **(36,741,542)** | **(57,140,293)** | **239,074,550,456** |

# STATEMENT OF CHANGES IN EQUITY

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Note | Issued and paid share capital | Treasury shares | Share premium | Share premium on treasury shares | Difference arising from business combination under common control |
|---|---|---|---|---|---|---|
| **Year ended 31 December 2017** | | | | | | |
| **Balance at 1 January 2017** | | **45,088,491,170** | **(2,409,544,289)** | **36,936,829,684** | **7,490,764** | **480,500,000** |
| **Transactions with owners, recorded directly in equity** | | | | | | |
| ***Contributions by and distributions to owners of the Company*** | | | | | | |
| Sale of treasury shares | *23* | - | 2,409,544,289 | - | 1,379,249,345 | - |
| Dividends to owners of the Company | *34* | - | - | - | - | - |
| ***Total contributions by and distributions to owners of the Company*** | | **-** | **2,409,544,289** | **-** | **1,379,249,345** | **-** |
| ***Changes in interests from business restructuring*** | | | | | | |
| Impact of business restructuring | *4* | - | - | - | - | (403,046,482) |
| ***Total changes in interests from business restructuring*** | | **-** | **-** | **-** | **-** | **(403,046,482)** |
| **Total transactions with owners, recorded directly in equity** | | **-** | **2,409,544,289** | **-** | **1,379,249,345** | **(403,046,482)** |
| **Comprehensive income (loss) for the year** | | | | | | |
| Profit | | - | - | - | - | - |
| Other comprehensive income (loss) | | - | - | - | - | - |
| **Total comprehensive income (loss) for the year** | | **-** | **-** | **-** | **-** | **-** |
| **Balance at 31 December 2017** | | **45,088,491,170** | **-** | **36,936,829,684** | **1,386,740,109** | **77,453,518** |

The accompanying notes are an integral part of these financial statements.

**Separate financial statements**

| Retained earnings | | | | | Other components of shareholders' equity | | | |
|---|---|---|---|---|---|---|---|---|
| Legal reserve | Loans repayment reserve | Projects expansion reserve | Treasury shares reserve | Unappropriated | Gain (losses) on remeasuring available-for-sale investments | Gain (losses) on cash flow hedges | Total other components of shareholder's equity | Total shareholder's equity |
| | | *(in Baht)* | | | | | | |
| **4,512,930,269** | **807,802,564** | **12,446,994,126** | **2,409,544,289** | **138,850,652,172** | **(20,398,751)** | **(36,741,542)** | **(57,140,293)** | **239,074,550,456** |
| - | - | - | (2,409,544,289) | 2,409,544,289 | - | - | - | 3,788,793,634 |
| - | - | - | - | (15,844,641,990) | - | - | - | (15,844,641,990) |
| **-** | **-** | **-** | **(2,409,544,289)** | **(13,435,097,701)** | **-** | **-** | **-** | **(12,055,848,356)** |
| - | - | - | - | - | - | - | - | (403,046,482) |
| **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **(403,046,482)** |
| **-** | **-** | **-** | **(2,409,544,289)** | **(13,435,097,701)** | **-** | **-** | **-** | **(12,458,894,838)** |
| - | - | - | - | 35,522,943,282 | - | - | - | 35,522,943,282 |
| - | - | - | - | (383,377,148) | 162,484,979 | (207,931,358) | (45,446,379) | (428,823,527) |
| **-** | **-** | **-** | **-** | **35,139,566,134** | **162,484,979** | **(207,931,358)** | **(45,446,379)** | **35,094,119,755** |
| **4,512,930,269** | **807,802,564** | **12,446,994,126** | **-** | **160,555,120,605** | **142,086,228** | **(244,672,900)** | **(102,586,672)** | **261,709,775,373** |

# STATEMENT OF CASH FLOWS

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | For the year ended 31 December | | For the year ended 31 December | |
|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 |
| | | (Restated) | | |
| | | *(in Baht)* | | |
| ***Cash flows from operating activities*** | | | | |
| Profit for the year | 42,119,858,719 | 28,174,108,175 | 35,522,943,282 | 23,820,706,141 |
| *Adjustments for* | | | | |
| Depreciation and amortisation | 19,450,785,937 | 17,479,387,580 | 14,240,330,975 | 12,974,904,595 |
| Investment income | (945,697,441) | (852,411,233) | (6,370,363,096) | (3,696,703,445) |
| Finance costs | 3,935,049,416 | 4,277,279,760 | 3,072,187,725 | 3,528,810,613 |
| Unrealised gain on derivative | (224,340,459) | (383,961,859) | (213,058,305) | (391,492,766) |
| Unrealised gain on exchange | (2,940,426,690) | (79,953,026) | (3,032,735,152) | (18,850,722) |
| (Reversal of) bad and doubtful debt expenses | (18,544,833) | 4,202,068 | - | - |
| Loss from written-off of assets | 78,368,227 | 6,163,921 | 65,495,291 | 3,295,892 |
| Reversal of losses on inventories devaluation | (12,535,433) | (288,515,698) | - | (167,427,386) |
| Loss on impairment of assets | 2,296,219,775 | 655,533,811 | 4,720,383,020 | 3,847,721,967 |
| Loss on disposal of property, plant and equipment | 472,100,362 | 538,482,416 | 355,200,203 | 503,405,701 |
| Non-current provision for employee benefits | 483,451,117 | 310,262,111 | 347,063,749 | 214,493,012 |
| Realised deferred pipeline income and equipment and other income | (5,553,843) | (7,660,751) | (6,856,736) | (9,024,478) |
| Share of profit of investments in joint ventures, net of tax expense | (4,110,647,538) | (1,469,992,164) | - | - |
| Share of profit of investments in associates, net of tax expense | (1,460,922,849) | (1,105,550,289) | - | - |
| Tax expense | 3,863,252,511 | 3,090,423,175 | 3,465,441,780 | 2,783,719,580 |
| | 62,980,416,978 | 50,347,797,997 | 52,166,032,736 | 43,393,558,704 |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF CASH FLOWS

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | For the year ended 31 December | | For the year ended 31 December | |
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | *(in Baht)* | | |
| ***Cash flows from operating activities (continue)*** | | | | |
| *Changes in operating assets and liabilities* | | | | |
| Trade accounts receivable | (3,878,776,109) | (8,152,878,953) | (644,600,060) | (7,747,460,329) |
| Other receivables | 910,375,604 | 2,374,384,900 | 455,798,383 | 2,295,124,649 |
| Inventories | 613,270,808 | (5,911,342,215) | (2,877,414,849) | (2,703,092,874) |
| Value-added tax receivable | 179,013,441 | (236,458,760) | - | - |
| Other current assets | (972,648,074) | (451,047,734) | (833,872,282) | (156,207,190) |
| Other non-current assets | 42,308,241 | (191,341,590) | 41,813,698 | (133,140,172) |
| Trade accounts payable | 2,644,282,969 | 8,401,525,880 | 2,566,532,062 | 8,010,513,513 |
| Other payables | 3,428,240,381 | 2,535,926,076 | 3,483,421,668 | 2,643,575,273 |
| Current provisions | (136,966,151) | (210,667,389) | - | - |
| Other current liabilities | (13,497,520) | 4,302,484 | - | - |
| Non-current provisions for employee benefits | (180,672,040) | (149,893,586) | (83,657,575) | (64,415,209) |
| Other non-current provisions | (8,682,547) | 80,132,805 | - | - |
| Other non-current liabilities | (19,547,570) | 82,305,861 | (15,105,616) | 15,498,480 |
| Net cash generated from operating | 65,587,118,411 | 48,522,745,776 | 54,258,948,165 | 45,553,954,845 |
| Taxes paid | (3,631,882,330) | (1,956,255,089) | (3,106,447,170) | (1,472,645,680) |
| **Net cash from operating activities** | **61,955,236,081** | **46,566,490,687** | **51,152,500,995** | **44,081,309,165** |
| ***Cash flows from investing activities*** | | | | |
| Interest received | 798,717,604 | 1,112,991,297 | 722,256,362 | 1,075,549,631 |
| Dividends received | 3,435,719,653 | 596,599,761 | 5,500,774,450 | 2,903,624,761 |
| Acquisition of property, plant and equipment | (15,637,761,330) | (18,291,708,073) | (9,879,598,901) | (11,280,550,748) |
| Proceeds from sale of property, plant and equipment | 32,893,064 | 15,395,349 | 21,844,549 | 14,061,672 |
| Acquisition of intangible assets | (729,386,072) | (431,160,431) | (505,687,032) | (336,114,780) |
| Acquisition of other non-current assets | (2,625,924,412) | (1,371,898,296) | (2,223,435,844) | (968,052,390) |
| Decrease in current investments | 3,489,423,199 | 23,643,437,551 | 5,198,577,042 | 23,464,635,197 |
| Acquisition of available-for-sale securities | (5,163,662,114) | (7,213,907,470) | (5,163,662,114) | (7,213,907,470) |
| Acquisition of other long-term investments | (1,875,000) | (500,000) | (1,875,000) | (500,000) |
| Proceeds from short-term loans to related parties | - | - | 1,065,000,000 | 786,000,000 |
| Proceeds from long-term loans to related party | 1,127,928,297 | - | 1,127,928,297 | - |
| Increase in short-term loans to related parties | - | - | (886,034,886) | (850,000,000) |
| Increase in long-term loan to related party | (8,461,650,425) | - | (8,461,650,425) | - |
| Proceeds from capital pay back of subsidiaries | - | - | 113,440 | 50,000,000 |
| Acquisition of investment in subsidiaries, joint ventures and associates | (17,809,320,079) | (16,650,075) | (21,374,127,184) | (3,534,927,386) |
| Proceeds from sale of interest in joint venture | - | - | - | 690,500,000 |
| **Net cash used in investing activities** | **(41,544,897,615)** | **(1,957,400,387)** | **(34,859,577,246)** | **4,800,318,487** |

The accompanying notes are an integral part of these financial statements.

# STATEMENT OF CASH FLOWS

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

| | Note | For the year ended 31 December 2017 | For the year ended 31 December 2016 (Restated) | For the year ended 31 December 2017 | For the year ended 31 December 2016 |
|---|---|---|---|---|---|
| | | | *(in Baht)* | | |
| ***Cash flows from financing activities*** | | | | | |
| Finance costs paid | | (3,801,195,904) | (4,202,946,573) | (3,010,335,432) | (3,494,936,459) |
| Dividends paid | | (16,500,996,398) | (11,123,172,597) | (15,844,641,990) | (10,481,172,597) |
| Repayment of finance lease liabilities | | (185,986,789) | (194,226,321) | (125,139,768) | (120,566,621) |
| Proceeds from short-term borrowings from financial institutions | | 182,600,154 | 5,528,505,380 | - | - |
| Proceeds from short-term borrowings from related parties | | - | - | 1,059,906,592 | 640,926,520 |
| Proceeds from long-term borrowings from financial institutions | | 7,371,460,962 | 14,928,845,971 | 4,974,989,995 | 7,050,000,000 |
| Proceeds from long-term borrowings from other parties | | 57,095,474 | 50,745,266 | - | - |
| Repayment of short-term borrowings from financial institutions | | (486,595,503) | (5,600,712,757) | - | - |
| Repayment of short-term borrowings from related parties | | - | - | (15,696,036) | (7,250,967) |
| Repayment of long-term borrowings from financial institutions | | (10,248,229,100) | (23,166,406,411) | (7,843,400,000) | (20,056,900,000) |
| Repayment of long-term borrowings from other parties | | (65,310,503) | (51,819,156) | - | - |
| Proceeds from change in ownership interest in subsidiary without a change in control | | 3,192,221,361 | - | - | - |
| Proceeds from increase in investment in subsidiary from non-controlling interests | | - | 92,717,076 | - | - |
| Proceeds from debentures | | 9,985,105,044 | - | 9,985,105,044 | - |
| Repayment of debentures | | (2,800,000,000) | (1,058,000,000) | (2,800,000,000) | (1,058,000,000) |
| Proceeds from sale of treasury shares | | 3,788,793,634 | 32,562,500 | 3,788,793,634 | 32,562,500 |
| Repayment of treasury shares | | - | (330,081,400) | - | (330,081,400) |
| **Net cash used in financing activities** | | **(9,511,037,568)** | **(25,093,989,022)** | **(9,830,417,961)** | **(27,825,419,024)** |
| Net increase in cash and cash equivalents, before effect of exchange rates | | 10,899,300,898 | 19,515,101,278 | 6,462,505,788 | 21,056,208,628 |
| Effect of exchange rate changes on cash and cash equivalents | | (190,294,172) | (131,002,320) | 23,354,272 | (55,227,680) |
| **Net increase in cash and cash equivalents** | | **10,709,006,726** | **19,384,098,958** | **6,485,860,060** | **21,000,980,948** |
| Cash and cash equivalents at beginning of period | | 32,720,385,251 | 13,336,286,293 | 27,949,661,787 | 6,948,680,839 |
| **Cash and cash equivalents at ending of period** | ***6*** | **43,429,391,977** | **32,720,385,251** | **34,435,521,847** | **27,949,661,787** |

The accompanying notes are an integral part of these financial statements.

# NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

FOR THE YEAR ENDED 31 DECEMBER 2017


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These notes form an integral part of the financial statements.

The financial statements issued for Thai statutory and regulatory reporting purposes are prepared in the Thai language. These English language financial statements have been prepared from the Thai language statutory financial statements and, were approved and authorised for issue by the Board of Directors on 19 February 2018.

## 1 General information

PTT Global Chemical Public Company Limited, the "Company", was registered on 19 October 2011 in accordance with the Public Company Limited Act, B.E. 2535 (1992).

The Board of Governors of the SET approved the listing of the Company on the day that the Registrar accepted the registration on 19 October 2011.

The Company is a company in the PTT Public Company Limited ("PTT") group of companies. PTT is incorporated in Thailand and is the major shareholder of the Company, holding 48.89% of the Company's issued and paid-up share capital.

The Company is incorporated in Thailand and has its registered offices as follows:

| | | |
|---|---|---|
| Head Office | : | 555/1, Energy Complex, Building A, 14th - 18th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand |
| Branch 1 (Rayong office Branch) | : | 59, Radniyom Road, Tambon Noenphra, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 2 (Olefin 1 Branch) | : | 14, I-1 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 3 (Olefin 2 Branch) | : | 9, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 4 (Aromatics 1 Branch) | : | 4, I-2 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 5 (Aromatics 2 Branch) | : | 98/9, Rayong 3191 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 6 (Refining Branch) | : | 8, I-8 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 7 (Jetty and Buffer Tank Farm Branch) | : | 19, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 8 (Aromatics reserve Branch) | : | 11, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |

| | | |
|---|---|---|
| Branch 9 (Lab Service Center Branch) | : | 24/9, Pakorn Songkrao-Rat Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 10 (PTTGC 10 Branch) | : | 555/1, Energy Complex, Building A, 3rd and 10th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand |
| Branch 11 (Olefin 3 Branch) | : | 8, Phadang Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 12 (Polyethylene Branch) | : | 8, Map Ta Phut Industrial Estate, I-10 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand |
| Branch 13 (Innoplus Solution Center Branch) | : | 83/9-10, Moo 5, Tambon Tabma, Amphoe Mueang Rayong, Rayong, Thailand |

The principal businesses of the Company are production and distribution of ethylene, propylene polyethylene and biochemical products. By-products are mixed C4, cracker bottom and tail gas, refining and provision of integrated petroleum products, and production and distribution of aromatics products with plans to proceed with the production of aromatic products. Minor activities are production and distribution of electricity, water, steam and other utilities. In addition, the Company also operates production support facilities such as jetty and buffer tank farm services for liquid chemical, oil and gas.

Details of the Company's subsidiaries as at 31 December 2017 and 2016 were as follows:

| **Name of the entity** | **Type of business** | **Country of incorporation** | **Ownership interest (%)** | |
|---|---|---|---|---|
| | | | 31 December 2017 | 31 December 2016 |
| ***Direct subsidiaries*** | | | | |
| Global Green Chemicals Plc. | Manufacturing and distributing biochemical products | Thailand | 72.29 | 100 |
| GC Polyols Co., Ltd. | Manufacturing and distributing petrochemical products | Thailand | 82.10 | - |
| GC Treasury Center Co., Ltd. | Liquidity management and financing vehicle of the Group | Thailand | 100 | - |
| GC Oxirane Co., Ltd. | Manufacturing and distributing petrochemical products | Thailand | 100 | - |
| Solution Creation Co., Ltd. | Manufacturing and distributing petrochemical products and health and nutrition products | Thailand | 100 | 100 |
| TOC Glycol Co., Ltd. | Manufacturing and distributing petrochemical products | Thailand | 100 | 100 |

| Name of the entity | Type of business | Country of incorporation | Ownership interest (%) | |
|---|---|---|---|---|
| | | | 31 December 2017 | 31 December 2016 |
| ***Direct subsidiaries (continue)*** | | | | |
| Thai Tank Terminal Limited | Service for the storage and handling of liquid chemicals, oil and gas | Thailand | 51 | 51 |
| Thai Styrenics Co., Ltd. | Manufacturing and distributing petrochemical products | Thailand | 100 | 100 |
| Bangkok Polyethylene Plc. (In process of liquidation) | Manufacturing and distributing petrochemical products | Thailand | - | 100 |
| Bio Spectrum Co., Ltd. (In process of liquidation) | Manufacturing and distributing biochemical products | Thailand | 100 | 100 |
| PTT Phenol Co., Ltd. | Manufacturing and distributing petrochemical products | Thailand | 100 | 100 |
| PTT Maintenance and Engineering Co., Ltd. | Factory maintenance and engineering services | Thailand | 100 | 60 |
| PTT Polymer Marketing Co., Ltd. (99% Direct interest and 1% Indirect interest since 3 July 2017 from business combination under common control) | Development, marketing and distributing polymers products, byproducts and other polymers-related products | Thailand | 100 | 50 |
| PTT Polymer Logistics Co., Ltd. (99% Direct interest and 1% Indirect interest since 3 July 2017 from business combination under common control) | Transportation, warehouse and bagging packing management of polyethylene | Thailand | 100 | 50 |
| Auria BioChemicals Co., Ltd. (54% Direct interest and 46% Indirect interest) | Research and development of bio-based chemicals | Thailand | 100 | 100 |
| NPC Safety and Environmental Service Co., Ltd. | Safety and environmental services | Thailand | 100 | 100 |
| PTT Chemical International Pte. Ltd. | Holding and operating international business | Singapore | 100 | 100 |
| PTTGC America Corporation | Holding and operating international business | United States of America | 100 | 100 |
| ***Indirect subsidiaries*** | | | | |
| Thai Fatty Alcohols Co., Ltd. | Manufacturing and distributing biochemical products | Thailand | 100 | 100 |
| PTT Chemical International (Asia Pacific ROH) Ltd. (In process of liquidation) | Services rendering to the Group | Thailand | 100 | 100 |

| Name of the entity | Type of business | Country of incorporation | Ownership interest (%) | |
|---|---|---|---|---|
| | | | 31 December 2017 | 31 December 2016 |
| ***Indirect subsidiaries (continue)*** | | | | |
| PL Global Transport Co., Ltd. | Transportation of polyethylene | Thailand | 100 | - |
| NPC S&E Security Guard Co., Ltd. | Safety services | Thailand | 100 | 100 |
| Myriant Corporation | Research and development of bio-based chemicals | United States of America | 100 | 100 |
| Polymer Marketing DMCC | Distributing polymer products and other polymers-related products | United Arab Emirates | 100 | - |
| Polymer Marketing Vietnam Company Limited | Distributing polymer products and other polymers-related products | Vietnam | 100 | - |
| PTTGC International (USA) Inc. | Holding and operating international business | United States of America | 100 | 100 |
| PTTGC International (Netherlands) B.V. | Holding and operating international business | Netherlands | 100 | 100 |
| PTTGC America LLC | Operating petrochemical business | United States of America | 100 | 100 |
| Vencorex Holding | Manufacturing and distributing chemical specialties | France | 90.82 | 85 |

## 2 Basis of preparation of the financial statements

### *(a) Statement of compliance*

The financial statements are prepared in accordance with Thai Financial Reporting Standards (TFRS); guidelines promulgated by the Federation of Accounting Professions ("FAP"); and applicable rules and regulations of the Thai Securities and Exchange Commission.

The FAP has issued new and revised TFRS effective for annual accounting periods beginning on or after 1 January 2017. The application of these new and revised TFRS has resulted in changes in certain of the Group's accounting policies. These changes have no material effect on the financial statements.

In addition to the above new and revised TFRS, the FAP has issued a number of other new and revised TFRS which are effective for annual financial periods beginning on or after 1 January 2018 and have not been adopted in the preparation of these financial statements.

The Group has made a preliminary assessment of the potential initial impact on the consolidated and separate financial statements of these new and revised TFRS and expects that there will be no material impact on the financial statements in the period of initial application.

***(b) Basis of measurement***

The financial statements have been prepared on the historical cost basis, except as described in accounting policy.

***(c) Functional and presentation currency***

The financial statements are presented in Thai Baht which is the Company's functional currency. All financial information presented in Thai Baht has been rounded in notes to the financial statements to the nearest million unless otherwise stated.

***(d) Use of judgements and estimates***

The preparation of financial statements in conformity with TFRS requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised prospectively.

Information about assumptions and estimation uncertainties is included in the following notes:

| | |
|---|---|
| Notes 10, 11, 13, 15 and 16 | Impairment test: key assumptions underlying recoverable amounts |
| Note 21 | Measurement of defined benefit obligations: key actuarial assumptions |

*Measurement of fair values*

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial assets and liabilities.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Further information about the assumptions made in measuring fair values is included in note 35: Financial instruments.

## 3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

### *(a) Basis of consolidation*

The consolidated financial statements relate to the Company and its subsidiaries (together referred to as the "Group") and the Group's interests in joint ventures and associates.

*Business combinations*

The Group applies the acquisition method for all business combinations when control is transferred to the Group, as describe in subsidiaries section, other than those with entities under common control.

The Group recognises goodwill at the acquisition date measured as the excess of (1) over (2) as:

(1) The aggregate of:
- the fair value of the consideration transferred;
- the recognised amount of any non-controlling interests in the acquiree; and
- if the business combination is achieved in stages, the fair value of the existing equity interest in the acquiree.

(2) The net fair value of the identifiable assets acquired and liabilities assumed.

If value of (1) is less than (2), difference is contributed to gain on bargain purchase and recognised immediately in profit or loss.

The consideration transferred is recognised at fair value at the acquisition date.

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognized at that date.

*Acquisitions from entities under common control*

Business combinations of entities or businesses under common control, the Group considers common control in accordance with the Guideline issued in 2009 by the FAP and are accounted for using a method similar to the pooling of interest method. The acquirer recognises assets and liabilities of the combined entities at the carrying amounts of those entities in the consolidated financial statements of ultimate parent company at the date of business combinations under common control incurred. The difference between the carrying amount of the combined entities and the consideration paid are recognised as different arising from business combination under common control in equity. The different arising from business combination under common control will be derecognised when investments or businesses were disposed of.

After business combination under common control, the results of entities or businesses acquired from business combination under common control will be included in the consolidated financial statements since the date that those entities or businesses were under common control or the beginning of the period of comparative financial statements, whenever later, until the date on which control ceases.

*Subsidiaries*

Subsidiaries are entities controlled by the Group. The Group controls an entity when it has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

*Non-controlling interests*

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

*Loss of control*

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

*Interests in equity–accounted investees*

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than the rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

Interests in joint ventures and associates are accounted for using the equity method. They are recognised initially at cost. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity–accounted investees, until the date on which joint control or significant influence ceases.

*Transactions eliminated on consolidation*

Intra-group balances and transactions and any unrealised income or expenses arising from intra-group transactions are eliminated in preparing the consolidated financial statements. Unrealised gains and losses arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee.

***(b) Foreign currencies***

*Foreign currency transactions*

Transactions in foreign currencies are translated to the respective functional currency of Group entities at exchange rate at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rates at the dates of the transactions.

Foreign currency differences arising on retranslation are generally recognised in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges to the extent that the hedges are effective are recognised in other comprehensive income.

*Foreign operations*

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition of foreign operations, are translated to Thai Baht at the exchange rates at the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at rates approximating the exchange rates at the dates of the transactions.

Foreign exchange differences are recognised in other comprehensive income and presented in the foreign currency translation reserve in equity until disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

***(c) Derivative financial instruments***

Derivative financial instruments are used to manage exposure to foreign exchange, interest rate arising from operating and financing activities. Derivative financial instruments are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognised initially at fair value; attributable transaction costs are recognised in profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognised immediately in profit or loss.

The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract and using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price as the reporting date, if available. If a listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

***(d) Hedging accounting***

*Cash flow hedges accounting of the non-financial assets or non-financial liabilities*

When a derivative is designated as the hedging instrument in a hedge of the variability in cash flows of a non-financial asset or non-financial liability, the effective portion of gain or loss from subsequent measurement of fair value of the derivative financial instrument is recognised in other comprehensive income and presented in the hedging reserve in equity. Any ineffective portion is recognised immediately in profit or loss.

When a hedge of a non-financial asset or non-financial liability occurs, the gain or loss recognised in other comprehensive income is included in the cost of the non-financial asset or non-financial liability.

*Discontinuing hedge accounting*

When the hedging instrument expires or is sold, terminated, or no longer qualifies for hedge accounting, the hedge accounting is discontinued prospectively. Any cumulative gain or loss on the hedging instrument existing in equity is retained in equity. When the hedge of the non-financial assets or non-financial liabilities item ultimately occurs, the gain or loss is adjusted according to cash flow hedges accounting.

When the non-financial assets or non-financial liabilities item is no longer expected to occur, the cumulative gain or loss that was reported in equity is recognised in profit or loss immediately.

***(e) Cash and cash equivalents***

Cash and cash equivalents comprise cash balances, call deposits and highly liquid current investments.

***(f) Trade and other receivables***

Trade and other receivables are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of overdue aging and future expectations of customer payments. Bad debts are written off when incurred.

***(g) Inventories***

Inventories are stated at the lower of cost and net realisable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

***(h) Investments***

*Investments in subsidiaries, joint ventures and associates*

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

*Investments in other debt securities and equity securities*

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for trading or intended to be held to maturity, are classified as available-for-sale investments. Available-for-sale investments are, subsequent to initial recognition, stated at fair value, and changes therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. Where these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

*Disposal of investments*

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

***(i) Property, plant and equipment***

*Recognition and measurement*

*Owned assets*

Property, plant and equipment are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

*Leased assets*

Leases in terms of which the Group substantially assumes all the risk and rewards of ownership are classified as finance leases. Property, plant and equipment acquired by way of finance leases are capitalised at the lower of their fair value and the present value of the minimum lease payments at the inception of the lease, less accumulated depreciation and impairment losses. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged directly to the profit or loss.

*Subsequent costs*

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

*Depreciation*

Depreciation is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment. The estimated useful lives are as follows:

| | |
|---|---|
| Land improvement | 5-30 years |
| Plant, machinery, equipment and factory tools | 5-40 years |
| Buildings and buildings improvement | 5-30 years |
| Furniture, fixtures and office equipment | 3-10 years |
| Vehicles | 5-25 years |

No depreciation is provided on freehold land or assets under construction.

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

**(j) *Intangible assets***

*Goodwill*

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, impairment loss on such an investment is deducted directly in investment in joint ventures and associates.

*Other intangible assets*

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses.

*Subsequent expenditure*

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognised in profit or loss as incurred.

*Amortisation*

Amortisation is based on the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives for the current and comparative periods are as follows:

| | |
|---|---|
| Production licence fees | 10-30 years |
| Computer software | 3-20 years |
| Customer contracts and the related customer relationships | 5 years |
| Right to use pipe rack | 6-15 years |
| Right to use - others | 3-20 years |

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

***(k) Impairment***

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

*Calculation of recoverable amount*

The recoverable amount of held-to-maturity securities carried at amortised cost is calculated as the present value of the estimated future cash flows discounted at the original effective interest rate.

The recoverable amount of available-for-sale financial assets is calculated by reference to the fair value.

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

*Reversals of impairment*

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss.

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

***(l) Interest-bearing liabilities***

Interest-bearing liabilities are recognised initially at fair value less attributable transaction charges. Subsequent to initial recognition, interest-bearing liabilities are stated at amortised cost with any difference between cost and redemption value being recognised in profit or loss over the period of the borrowings on an effective interest basis.

***(m) Trade and other payables***

Trade and other payables are stated at cost.

***(n) Employee benefits***

*Defined contribution plans*

Obligations for contributions to defined contribution plans are expensed as the related service is provided.

*Defined benefit plans*

The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the net defined benefit liability, actuarial gain or loss are recognised immediately in OCI. The Group determines the interest expense on the net defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Net interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

*Other long-term employee benefits*

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

*Termination benefits*

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

*Short-term employee benefits*

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

***(o) Provisions***

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount on provisions is recognised as finance cost.

***(p) Repurchase of share capital (treasury shares)***

When share capital recognised as equity is repurchased, the amount of consideration paid, including directly attributable costs, is classified as treasury shares and recognised as a deduction from equity. An equal amount is appropriated from retained earnings and taken to a reserve for treasury shares within equity. When treasury shares are sold, the amount received is recognised as an increase in equity by crediting the cost of the treasury shares sold, calculated using the weighted average method, to the treasury shares account and transferring the equivalent amount back from reserve for treasury shares to retained earnings. Surpluses on the sale of treasury shares are taken directly to a separate category within equity, 'Share premium on treasury shares'. Net deficits on sale or cancellation of treasury shares are debited to retained earnings after setting off against any remaining balance of surplus on treasury shares.

***(q) Revenue***

Revenue excludes value added taxes and is arrived at after deduction of trade discounts.

*Sale of goods and services rendered*

Revenue is recognised in profit or loss when the significant risks and rewards of ownership have been transferred to the buyer. No revenue is recognised if there is continuing management involvement with the goods or there are significant uncertainties regarding recovery of the consideration due, associated costs or the probable return of goods. Service income is recognised as services are provided.

*Investments*

Revenue from investments comprises dividend and interest income from investments and bank deposits.

*Dividend income*

Dividend income is recognised in profit or loss on the date the Group's right to receive payments is established.

*Interest income*

Interest income is recognised in profit or loss as it accrues.

***(r) Finance costs***

Finance costs is recognised using the effective interest method and comprise interest expense on borrowings, unwinding of the discount on provisions and contingent consideration, fair value losses on financial assets at fair value through profit or loss, impairment losses recognised on financial assets (other than trade receivables), and losses on hedging instruments that are recognised in profit or loss.

Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

***(s) Lease payments***

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

Contingent lease payments which the lease adjustment is confirmed are accounted for by revising the minimum lease payments over the remaining term of the lease.

***(t) Income tax***

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they are relate to the items recognised in equity are recognised in equity are recognised in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts and taxable value of assets and liabilities, using tax rates enacted or substantively enacted to the temporary differences when they reverse.

Deferred tax is not recognised for the following temporary differences:

- the initial recognition of goodwill and related transactions
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss
- differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognised to the extent that it is probable that deferred tax assets can be utilised as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

***(u) Earnings per share***

The Group presents basic earnings per share (EPS) data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the year, adjusted for treasury shares.

***(v) Segment reporting***

Segment results that are reported to the Group's Management Committee (the chief operating decision maker) include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

## 4 Business combination under common control

On 3 July 2017, the Company completed the purchase of the shares, the acceptance of the transfer of rights and obligations under the shareholders agreements and loan agreements, and the acceptance of the transfer of study results in the company operating the propylene and biochemical lines of the petrochemical business and related services business from PTT Public Company Limited and/or PTT PMMA Company Limited (renamed to PTT Global Management Company Limited) for the amount of Baht 25,061 million. The details of holding portion by the Group before and after share purchasing are as follows;

| Company | Proportion of shareholding before the purchase | Proportion of shareholding after the purchase |
|---|---|---|
| | *(%)* | |
| PTT Asahi Chemical Co., Ltd. | - | 50 |
| HMC Polymers Co., Ltd. | - | 41.44 |
| PTT MCC Biochem Co., Ltd. | - | 50 |
| PTT Polymer Logistics Co., Ltd. | 50 | 100 |
| PTT Polymer Marketing Co., Ltd. | 50 | 100 |
| PTT Maintenance and Engineering Co., Ltd. | 60 | 100 |

The consolidated and separate financial statements have been prepared on the basis of a business combination under common control. The acquired net assets and interest of the share purchased are accounted for at book values as similar to pooling of interests method. The difference between the consideration paid and the carrying amount of net assets are presented as "different arising from business combination under common control". The details of consideration transferred for business combination under common control and net book value of the net assets acquired are as follows;

| | **Consolidated financial statements** | **Separate financial statements** |
|---|---|---|
| | *(in million Baht)* | |
| Cash and cash equivalents | 1,580 | - |
| Inventories | 1,183 | - |
| Trade account receivables | 4,448 | - |
| Investment in subsidiaries | - | 1,188 |
| Investment in joint ventures | 17,958 | 15,373 |
| Long-term loan to related party | 8,060 | 8,060 |
| Property, plant and equipment | 2,710 | - |
| Trade account payables | (6,665) | - |
| Long-term loan from financial institutions | (1,050) | - |
| Other assets / (Other liabilities) – Net | 173 | 37 |
| **Net identifiable asset and liabilities** | **28,397** | **24,658** |
| *Add* Non-controlling interests | 12 | - |
| **Net assets acquired** | **28,409** | **24,658** |
| *Less* Consideration paid | 25,061 | 25,061 |
| **Difference arising from business combination under common control** | **3,348** | **(403)** |

The consolidated and separate statements of financial position, the consolidated statement of income, comprehensive income and cash flows have been restated accordingly. The effects of the change from the retrospective adjustments are summarised as follows:

| *Statement of financial position* | Consolidated financial statements | | | | | |
|---|---|---|---|---|---|---|
| | At 1 January 2016 | | | At 31 December 2016 | | |
| | As previously reported | Adjustment | As restated | As previously reported | Adjustment | As restated |
| | *(in million Baht)* | | | | | |
| Inventories | 29,930 | 1,979 | 31,909 | 35,754 | 2,604 | 38,358 |
| Investments in joint ventures | 11,110 | 16,111 | 27,221 | 10,298 | 15,987 | 26,285 |
| Property, plant and equipment | 220,213 | 2,381 | 222,594 | 221,514 | 2,478 | 223,992 |
| Others | 116,292 | 136 | 116,428 | 125,600 | (722) | 124,878 |
| **Total assets** | **377,545** | **20,607** | **398,152** | **393,166** | **20,347** | **413,513** |
| Current liabilities | 41,221 | 1,038 | 42,259 | 53,267 | 1,203 | 54,470 |
| Non-current liabilities | 102,059 | 932 | 102,991 | 91,230 | 800 | 92,030 |
| **Total liabilities** | **143,280** | **1,970** | **145,250** | **144,497** | **2,003** | **146,500** |
| Owners of the parent | 231,552 | - | 231,552 | 246,016 | - | 246,016 |
| Former shareholder before business restructuring | - | 18,602 | 18,602 | - | 18,330 | 18,330 |
| Non-controlling interests | 2,713 | 35 | 2,748 | 2,653 | 14 | 2,667 |
| **Total shareholders' equity** | **234,265** | **18,637** | **252,902** | **248,669** | **18,344** | **267,013** |
| **Total liabilities and shareholders' equity** | **377,545** | **20,607** | **398,152** | **393,166** | **20,347** | **413,513** |

| *Statement of financial position* | Separate financial statements | | | | | |
|---|---|---|---|---|---|---|
| | At 1 January 2016 | | | At 31 December 2016 | | |
| | As previously reported | Adjustment | As restated | As previously reported | Adjustment | As restated |
| | *(in million Baht)* | | | | | |
| Investments in subsidiaries | 54,706 | 943 | 55,649 | 54,343 | 943 | 55,286 |
| Investments in joint ventures | 1,153 | (943) | 210 | 943 | (943) | - |
| | | - | | | - | |

| *Statement of income* *For the year ended 31 December 2016* | Consolidated financial statements | | |
|---|---|---|---|
| | As previously reported | Adjustment | As restated |
| | | *(in million Baht)* | |
| Revenues from sale of goods and rendering of services | 349,101 | 6,423 | 355,524 |
| Cost of sale of goods and rendering of services | (307,064) | (4,909) | (311,973) |
| Selling and distribution and administrative expenses | (11,590) | (1,088) | (12,678) |
| Share of profit (loss) of investments in joint ventures | (489) | 1,959 | 1,470 |
| Others | (4,078) | (91) | (4,169) |
| **Profit for the year** | **25,880** | **2,294** | **28,174** |
| **Profit (loss) attributable to:** | | | |
| Owners of the parent | 25,602 | - | 25,602 |
| Former shareholder before business restructuring | - | 2,315 | 2,315 |
| Non-controlling interests | 278 | (21) | 257 |
| **Profit for the year** | **25,880** | **2,294** | **28,174** |
| **Basic earnings per share *(Baht)*** | **5.74** | **-** | **5.74** |

| *Statement of comprehensive income* *For the year ended 31 December 2016* | Consolidated financial statements | | |
|---|---|---|---|
| | As previously reported | Adjustment | As restated |
| | | *(in million Baht)* | |
| Profit for the year | 25,880 | 2,294 | 28,174 |
| Other comprehensive income (loss) for the year | (405) | 357 | (48) |
| **Total comprehensive income for the year** | **25,475** | **2,651** | **28,126** |
| **Total comprehensive income (loss) attributable to:** | | | |
| Owners of the parent | 25,243 | - | 25,243 |
| Former shareholder before business restructuring | - | 2,672 | 2,672 |
| Non-controlling interests | 232 | (21) | 211 |
| **Total comprehensive income for the year** | **25,475** | **2,651** | **28,126** |

| *Statement of cash flows* *For the year ended 31 December 2016* | Consolidated financial statements | | |
|---|---|---|---|
| | As previously reported | Adjustment | As restated |
| | | *(in million Baht)* | |
| Net cash from operating activities | 44,490 | 1,988 | 46,478 |
| Net cash used in investing activities | (111) | (1,758) | (1,869) |
| Net cash used in financing activities | (24,584) | (510) | (25,094) |
| **Net increase (decrease) in cash and cash equivalents, before effect of exchange rates** | **19,795** | **(280)** | **19,515** |
| Effect of exchange rate changes on cash and cash equivalents | (134) | 3 | (131) |
| **Net increase (decrease) in cash and cash equivalents** | **19,661** | **(277)** | **19,384** |

## 5 Related parties

A related party is as follows;

- An individual or an entity which has the ability, directly or indirectly, to control or joint control or exercise significant influence over the Group in making financial and operating decisions or;
- An individual or an entity which is subject to common control or common significant influence with the Group or;
- The Group has the ability, directly or indirectly, to control or joint control or exercise significant influence over an individual or an entity in making financial and operating decisions.

Relationships with related parties were as follows:

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| PTT Plc. | Thailand | Parent, some common directors and management and the Company's director as a management |
| Global Green Chemicals Plc. | Thailand | Subsidiary, 72.29% shareholding, some common directors and the Company's management as a director |

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| GC Polyols Co., Ltd. | Thailand | Subsidiary, 82.10% shareholding and the Company's management as a director |
| GC Treasury Center Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| GC Oxirane Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| Solution Creation Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| TOC Glycol Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| Thai Tank Terminal Limited | Thailand | Subsidiary, 51% shareholding and the Company's management as a director |
| Thai Styrenics Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| Bio Spectrum Co., Ltd. (In process of liquidation) | Thailand | Subsidiary, 100% shareholding |
| PTT Phenol Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| PTT Polymer Marketing Co., Ltd. | Thailand | Subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director |
| PTT Polymer Logistics Co., Ltd. | Thailand | Subsidiary, 100% shareholding by the Group and the Company's management as a directo |
| PTT Maintenance and Engineering Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| Auria BioChemicals Co., Ltd. | Thailand | Subsidiary, 100% shareholding by the Group |
| NPC Safety and Environmental Service Co., Ltd. | Thailand | Subsidiary, 100% shareholding and the Company's management as a director |
| PTT Chemical International Pte. Ltd. | Singapore | Subsidiary, 100% shareholding, some common directors and management and the Company's management as a director |
| PTTGC America Corporation | United States of America | Subsidiary, 100% shareholding, some common management and the Company's management as a director |

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| PTTGC America LLC | United States of America | Indirect subsidiary, 100% shareholding by the Group, some common management and the Company's management as a director |
| Thai Fatty Alcohols Co., Ltd. | Thailand | Indirect subsidiary, 100% shareholding by the Group |
| PTT Chemical International (Asia Pacific ROH) Ltd. (In process of liquidation) | Thailand | Indirect subsidiary, 100% shareholding by the Group |
| PL Global Transport Co., Ltd. | Thailand | Indirect subsidiary, 100% shareholding by the Group |
| NPC S&E Security Guard Co., Ltd. | Thailand | Indirect subsidiary, 100% shareholding by the Group |
| Vencorex (Thailand) Co., Ltd. | Thailand | Indirect subsidiary, 100% shareholding by the Group |
| Myriant Corporation | United States of America | Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director |
| Polymer Marketing DMCC | United Arab Emirates | Indirect subsidiary, 100% shareholding by the Group |
| Polymer Marketing Vietnam Company Limited | Vietnam | Indirect subsidiary, 100% shareholding by the Group |
| PTTGC International (Netherlands) B.V. | Netherlands | Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director |
| PTTGC International (USA) Inc. | United States of America | Indirect subsidiary, 100% shareholding by the Group, some common directors and management, the Company's director as a management and the Company's management as a director |
| Vencorex France S.A.S. | France | Indirect subsidiary, 100% shareholding by the Group |
| Vencorex Holding | France | Indirect subsidiary, 90.82% shareholding by the Group, some common directors and the Company's management as a director |
| PTT Asahi Chemical Co., Ltd. | Thailand | Joint venture, 50% shareholding and some common directors |

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| PTT MCC Biochem Co., Ltd. | Thailand | Joint venture, 50% shareholding and the Company's management as a director |
| HMC Polymers Co., Ltd. | Thailand | Joint venture, 41.44% shareholding and the Company's management as a director |
| Thai Ethoxylate Co., Ltd. | Thailand | Indirect joint venture, 50% shareholding by the Group |
| NatureWorks Asia Pacific Co., Ltd. | Thailand | Indirect joint venture, 50% shareholding by the Group |
| Rayong Olefins Co., Ltd. | Thailand | Indirect joint venture, 47.35% shareholding by the Group |
| Emery Oleochemicals (M) Sdn. Bhd. | Malaysia | Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director |
| Emery Specialty Chemicals Sdn. Bhd. | Malaysia | Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director |
| Emeryoleo Specialties (M) Sdn. Bhd. | Malaysia | Indirect joint venture, 50% shareholding by the Group |
| NatureWorks LLC | United States of America | Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director |
| Global Power Synergy Plc. | Thailand | Associate, 23% shareholding, shareholding by parent company, some common directors and the Company's management as a director |
| PTT Energy Solutions Co., Ltd. | Thailand | Associate, 20% shareholding, shareholding by parent company and the Company's management as a director |
| PTT Digital Solutions Co., Ltd. (Formerly PTT ICT Solutions Co., Ltd.) | Thailand | Associate, 40% shareholding, shareholding by parent company and the Company's management as a director |
| Vinythai Plc. | Thailand | Associate, 25% shareholding and the Company's management as a director |
| Eastern Fluid Transport Co., Ltd. | Thailand | Associate, 22.65% shareholding by the Group |
| Thai Eastern Topseeds Oil Co., Ltd. | Thailand | Indirect associate, 30% shareholding by the Group |

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| S.P. Petpack Inter Group Co., Ltd. | Thailand | Indirect associate, 25% shareholding by the Group |
| PT. Indo Thai Trading | Indonesia | Indirect associate, 49% shareholding by the Group and the Company's management as a director |
| Advanced Biochemical (Thailand) Co., Ltd. | Thailand | Related party, shareholding by associate |
| Thai Petroleum Pipeline Co., Ltd. | Thailand | Related party, shareholding by parent company |
| Dhipaya Insurance Plc. | Thailand | Related party, shareholding by parent company |
| Thai Paraxylene Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| Thai Oil Plc. | Thailand | Related party, shareholding by parent company and some common directors |
| TOP Solvent Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| TOP Solvent (Vietnam) LLC. | Vietnam | Related party, indirect shareholding by parent company |
| Business Services Alliance Co., Ltd. | Thailand | Related party, shareholding by parent company, the Company and two Company's associates, each of 25% shareholding of preferred stock |
| PTT Natural Gas Distribution Co., Ltd. | Thailand | Related party, shareholding by parent company |
| PTT Retail Services Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| PTT Retail Management Co., Ltd. | Thailand | Related party, indirect shareholding by parent company and some common directors |
| PTTEP Siam Limited | Thailand | Related party, indirect shareholding by parent company |
| PTTEP International Limited | Thailand | Related party, indirect shareholding by parent company |
| PTT Exploration and Production Plc. | Thailand | Related party, shareholding by parent company |
| PTT Tank Terminal Limited | Thailand | Related party, shareholding by parent company |

| Name of entities | Country of incorporation/ nationality | Nature of relationships |
|---|---|---|
| PTT Energy Resources Co., Ltd. | Thailand | Related party, shareholding by parent company |
| PTT LNG Co., Ltd. | Thailand | Related party, shareholding by parent company |
| Rak Phasak Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| LABIX Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| Sak Chaisidhi Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| Sport Services Alliance Co., Ltd. | Thailand | Related party, indirect shareholding by parent company and the Company's management as a director |
| Community Partnership Association | Thailand | The Company's management as a director |
| Amata Natural Gas Distribution Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| Energy Complex Co., Ltd. | Thailand | Related party, shareholding by parent company |
| UBE Chemicals (Asia) Plc. | Thailand | Related party, indirect shareholding by parent company |
| IRPC Plc. | Thailand | Related party, shareholding by parent company |
| IRPC Polyol Co., Ltd. | Thailand | Related party, indirect shareholding by parent company |
| Carigali-PTTEPI Operating Company Sdn. Bhd. | Malaysia | Related party, indirect shareholding by parent company |
| PTT Green Energy Pte. Ltd. | Singapore | Related party, shareholding by parent company |
| PTT International Trading DMCC | United Arab Emirates | Related party, indirect shareholding by parent company |
| PTT International Trading Pte. Ltd. | Singapore | Related party, shareholding by parent company |
| Alliance Petrochemical Investment (Singapore) Pte. Ltd. | Singapore | The Company's management as a director |

The pricing policies for particular types of transactions are explained further below:

| **Transactions** | **Pricing policies** |
|---|---|
| Sale of goods | Contract price / Regional market price / World market price |
| Rendering of services | Contract price |
| Purchase of goods / raw materials / services | Contract price / Market price |
| Interest on loan | Average cost of fund / Contractually agreed rate |

Significant transactions for the year ended 31 December 2017 and 2016 with related parties were as follows:

| | **Consolidated financial statements** | | **Separate financial statements** | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | | *(in million Baht)* | | |
| **Parent** | | | | |
| Sales of goods or rendering of services | 148,614 | 115,162 | 142,927 | 109,243 |
| Purchases of goods or receiving of services | 244,807 | 191,566 | 244,075 | 191,256 |
| Other income | 40 | 85 | 24 | 69 |
| Other expense | 88 | 102 | 64 | 75 |
| **Subsidiaries** | | | | |
| Sales of goods or rendering of services | - | - | 95,027 | 84,580 |
| Purchases of goods or receiving of services | - | - | 3,203 | 2,953 |
| Interest income | - | - | 22 | 25 |
| Dividend income | - | - | 3,160 | 2,383 |
| Other income | - | - | 805 | 706 |
| Interest expense | - | - | 26 | 21 |
| Other expense | - | - | 2,131 | 1,742 |
| **Joint ventures** | | | | |
| Sales of goods or rendering of services | 9,691 | 8,901 | 5,342 | 4,932 |
| Purchases of goods or receiving of services | 4,437 | 4,887 | 236 | 270 |
| Interest income | 134 | - | 132 | - |
| Dividend income | - | - | 1,781 | - |
| Other income | 34 | 25 | 27 | 22 |
| Other expense | 10 | 9 | 10 | 9 |
| **Associates** | | | | |
| Sales of goods or rendering of services | 9,591 | 7,661 | 6,195 | 5,191 |
| Purchases of goods or receiving of services | 8,642 | 8,500 | 4,207 | 4,215 |
| Dividend income | 2 | 2 | 561 | 507 |
| Other income | 81 | 61 | 81 | 61 |
| Other expense | 460 | 400 | 325 | 317 |
| **Other related parties** | | | | |
| Sales of goods or rendering of services | 46,950 | 31,029 | 44,170 | 28,413 |
| Purchases of goods or receiving of services | 16,089 | 11,430 | 15,123 | 10,763 |
| Dividend income | - | 14 | - | 14 |
| Other income | 229 | 1,181 | 213 | 1,174 |
| Other expense | 374 | 372 | 306 | 293 |

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| **Key management personnel** | | | | |
| Key management personnel compensation | | | | |
| Short-term benefits | 357 | 311 | 208 | 168 |
| Post-employment benefits and other long-term benefits | 6 | 5 | 4 | 5 |
| **Total key management personnel compensation** | **363** | **316** | **212** | **173** |

Balances as at 31 December with related parties were as follows:

***Trade accounts receivable - related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| Parent | 12,625 | 12,169 | 12,215 | 11,631 |
| Subsidiaries | - | - | 8,475 | 9,811 |
| Joint ventures | 1,193 | 1,292 | 458 | 486 |
| Associates | 979 | 756 | 668 | 544 |
| Other related parties | 4,979 | 3,336 | 4,720 | 3,081 |
| Total | 19,776 | 17,553 | 26,536 | 25,553 |
| *Less* allowance for doubtful accounts | - | - | - | - |
| **Net** | **19,776** | **17,553** | **26,536** | **25,553** |
| Bad and doubtful debts expense for the year | - | - | - | - |

***Other receivables - related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| Parent | 210 | 411 | 207 | 409 |
| Subsidiaries | - | - | 599 | 185 |
| Joint ventures | 40 | 14 | 32 | 7 |
| Associates | 95 | 41 | 31 | 25 |
| Other related parties | 670 | 1,482 | 578 | 1,391 |
| Total | 1,015 | 1,948 | 1,447 | 2,017 |
| *Less* allowance for doubtful accounts | - | - | - | - |
| **Net** | **1,015** | **1,948** | **1,447** | **2,017** |
| Bad and doubtful debts expense for the year | - | - | **-** | - |

***Loans to related parties***

| | Interest rate | | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 |
| | *(% per annum)* | | *(in million Baht)* | | | |
| ***Short-term loans*** | | | | | | |
| Subsidiaries | 1.87 - 4.42 | 4.10 - 4.36 | - | - | 476 | 655 |
| Total | | | - | - | 476 | 655 |
| *Less* allowance for doubtful accounts | | | - | - | - | - |
| **Net** | | | **-** | **-** | **476** | **655** |
| ***Long-term loans*** | | | | | | |
| Joint venture | LIBOR plus margin | - | 6,665 | - | 6,665 | - |
| Total | | | 6,665 | - | 6,665 | - |
| *Less* allowance for doubtful accounts | | | - | - | - | - |
| **Net** | | | **6,665** | **-** | **6,665** | **-** |
| ***Summary of loans to related parties*** | | | | | | |
| Short-term loans | | | - | - | 476 | 655 |
| Long-term loans | | | 6,665 | - | 6,665 | - |
| Total | | | 6,665 | - | 7,141 | 655 |
| *Less* allowance for doubtful accounts | | | - | - | - | - |
| **Net** | | | **6,665** | **-** | **7,141** | **655** |
| Bad and doubtful debts expense for the year | | | - | - | - | - |

Movements during the years ended 31 December 2017 and 2016 of loans to related parties were as follows:

***Loans to related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***Short-term loans*** | | | | |
| **Subsidiaries** | | | | |
| At 1 January | - | - | 655 | 591 |
| Increase | - | - | 886 | 850 |
| Decrease | - | - | (1,065) | (786) |
| **At 31 December** | **-** | **-** | **476** | **655** |
| ***Long-term loans*** | | | | |
| **Joint venture** | | | | |
| At 1 January | - | - | - | - |
| Increase | 8,060 | - | 8,060 | - |
| Decrease | (1,128) | - | (1,128) | - |
| Effect of change in exchange rates | (267) | - | (267) | - |
| **At 31 December** | **6,665** | **-** | **6,665** | **-** |

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| **Investments in subsidiaries *(Note 10)*** | **-** | **-** | **56,859** | **55,286** |
| **Investments in joint ventures *(Note 11)*** | **27,577** | **26,285** | **15,373** | **-** |
| **Investments in associates *(Note 11)*** | **14,002** | **13,026** | **9,323** | **9,323** |

***Trade accounts payable - related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| Parent | 23,189 | 20,610 | 23,147 | 20,576 |
| Subsidiaries | - | - | 81 | 69 |
| Joint ventures | 362 | 485 | 30 | 32 |
| Associates | 1,662 | 762 | 778 | 362 |
| Other related parties | 1,572 | 1,495 | 1,350 | 1,403 |
| **Total** | **26,785** | **23,352** | **25,386** | **22,442** |

***Other payables - related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| Parent | 36 | 976 | 20 | 964 |
| Subsidiaries | - | - | 652 | 583 |
| Joint ventures | 13 | 7 | 10 | 5 |
| Associates | 143 | 118 | 100 | 90 |
| Other related parties | 805 | 212 | 788 | 197 |
| **Total** | **997** | **1,313** | **1,570** | **1,839** |

***Payables to contractor - related parties***

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Parent | - | 1 | - | - |
| Subsidiaries | - | - | 443 | 391 |
| Associates | 68 | 72 | 48 | 54 |
| Other related parties | 8 | 4 | 8 | 4 |
| **Total** | **76** | **77** | **499** | **449** |

***Short-term loans from related parties***

| | Interest rate | | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 |
| | *(% per annum)* | | *(in million Baht)* | | | |
| Subsidiaries | 1.08 - 1.39 | 1.24 - 1.86 | - | - | 2,558 | 1,514 |
| **Total** | | | **-** | **-** | **2,558** | **1,514** |

Movements during the year ended 31 December 2017 and 2016 of loans from related parties were as follows:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 |
| | *(in million Baht)* | | | |
| **Subsidiaries** | | | | |
| At 1 January | - | - | 1,514 | 880 |
| Increase | - | - | 1,060 | 641 |
| Decrease | - | - | (16) | (7) |
| **At 31 December** | **-** | **-** | **2,558** | **1,514** |

***Significant agreements with related parties***

As at 31 December 2017, the Group has significant agreements with related parties as follows:

***Olefins Sales and Purchase Agreements***

The Company has 4 Ethylene sales and purchase agreements with a parent company and 2 related parties. Selling prices are determined based on Ethylene price in the world market. These agreements are for the periods from 7 years to 21 years, commencing from the effective date specified in each agreement. One agreement that is expired in July 2018 is automatically renewed except for advance cancellation not less than 1 year through written notice by each party. Other three agreements will expire in December 2021, May 2022 and December 2027.

The Company has 4 Propylene sales and purchase agreements with 3 related parties. Selling prices are determined based on Polypropylene and Propylene prices in the world market. Three agreements are for the periods from 3 years to 15 years, commencing from the effective date specified in each agreement and expiring in December 2019, December 2023 and December 2026 and another agreement is for the period 15 years, start from the plant commercial operation date.

***By-Product Sales and Purchase Agreements***

The Company has a Hydrogen sales and purchase agreement with a related party. The selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in March 2024.

The Company has a Tail Gas sales and purchase agreement with a related party. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in August 2021.

***Utilities and Other Services Agreements***

The Company has 3 Power Supply agreements with 3 related parties. Selling prices in these agreements are determined based on reference price from the Provincial Electricity Authority. These agreements are for the period of 6 years 8 months and 15 years, commencing from the date as specified in each agreement and expiring in September 2022, June 2027 and September 2028.

The Company has 6 Utilities agreements covering electricity, steam and demineralised water with a related party. These agreements are for the periods from 12 years to 19 years 9 months, commencing from the date as specified in each agreement and expiring in December 2028.

The Company and certain related parties have various Utilities agreements for the industries covering electricity, steam, and water with a related party. These agreements are for the periods from 15 years to 20 years, commencing from the date as specified in each agreement and expiring from December 2021 to June 2033 and two agreements are for the period 15 years, start from the plant commercial operation date. All agreements can be renewed for the period of 5 years with the terms and conditions agreed by both parties.

The Company has a Product Transportation agreement with a related party. The agreement is for the period of 3 years, commencing from the date as specified in the agreement and expiring in December 2018. The agreement is automatically renewed for another period of 3 years, except for advance cancellation through written notice by each party, not exceeding a total period of 15 years.

***Feedstock and Fuel Gas Sales and Purchase Agreements***

The Company has 3 LPG sales and purchase agreements with a parent company. The selling price is determined based on the Polypropylene price. The agreement is for the period from 8 years 7 months to 15 years, commencing from the date as specified in the agreement. Two agreements will expire in December 2020 and one agreement will expire in May 2021.

The Company has a Natural Gas sales and purchase agreement with a parent company. The selling price is determined based on gas price as specified in the agreement. The agreement is for the period of 20 years, commencing from the date as specified in the agreement and expiring in December 2018. The agreement is renewable for the period of 4 years, by providing not less than 1 year advance written notice to the counterparty.

The Company has 2 Natural Gas sales and purchase agreements with a parent company. Selling prices are determined based on gas price as specified in the agreement and Thailand Producer Price Index as classification of products by activity (CPA). These agreements are for the period of 10 years, commencing from the date as specified in each agreement and expiring in May 2018 and May 2022.

The Company and 2 related parties have various Natural Gas sales and purchase agreements with a parent company. Selling price in an agreement is determined based on fuel oil prices and Thailand Producer Price Index (PPI). These agreements are for the periods from 10 years to 15 years, commencing from the date as specified in each agreement and expiring from March 2018 to March 2027.

The Company has a Natural Gas Liquid sales and purchase agreement with a parent company. The selling price is determined based on the standard price of Naphtha in the region. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in May 2021. The agreement is renewable for the period of 5 years with the agreement of both parties.

The Company has 2 Ethane, Propane and LPG sales and purchase agreements with a parent company. Selling price in the agreement is determined based on the high density Polyethylene and Polypropylene price and another agreement is determined based on the high density Polyethylene price. These agreements have been extended and consequently will expire in December 2020.

The Company has an Ethane sales and purchase agreement with a parent company. The selling price is determined based on prices prevailing in the high density Polyethylene price in the world market. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in January 2025. The agreement is renewable for 5 years, by providing not less than 1 year advance written notice to the counterparty.

The Company has an Ethane Rich Gas sales and purchase agreement with a related party. The selling price is determined based on prevailing prices of Polyethylene and Polypropylene in the region. This agreement is for the period of 10 years and will expire in January 2021.

From 1 August 2012, the Company has entered into the adjustment of the pricing formula in the sales and purchase agreements of petrochemical natural gas feedstock with a parent company.

***Petroleum Product Offtake Agreement***

The Company has a Petroleum Product sales and purchase agreement with a parent company and another company. For domestic sales, the product price reflects prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing international spot price for that product. These agreements are for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

***Expansion Phase Product Offtake Agreement***

The Company has an expansion phase product offtake agreement with a parent company, whereas a parent company agree to purchase 100% of the volume of refined petroleum products produce by reforming and upgrading complexes. As specified in the Product Offtake Agreement, at least 50% of such volume will be sold at a competitive domestic market price and the remaining sold at a competitive export market price or other mutually agreed price. The agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

***Long-term Crude Oil and Other Raw materials Supply Agreements***

The Company entered into 2 supply agreements for crude oil and other raw materials with a parent company, the reference price being based on market price of crude oil and other raw materials. These agreements are for the periods of 18 years and 20 years, will expire in December 2018 and February 2024. The agreements are automatically renewed except for advance cancellation through written notice by each party.

***Crack Spread Swap Agreements***

The Company has entered into crack spread swap agreements with a parent company to hedge the Company's oil refinery margin. Under the agreements the floating amount of the basket refinery margin, (calculated based on the Singapore price of refined petroleum products, Gasoil, Kerosene and Fuel Oil against the price of Dubai crude oil), is swapped for a fixed amount of the basket refinery margin for a fixed quantity per month. Under the agreement, the Company shall make payment or receive of the crack spread difference according to terms and conditions stipulated in the agreements.

***Crude Oil and Feedstock Time Spread Agreements***

The Company has entered into crude oil and feedstock time spread agreements to mitigate price risk with a parent company, calculated based on the difference of the average price of crude oil and feedstock for the current month and the price of the following month. The Company shall make payment or receive of the difference according to terms and conditions stipulated in the agreements. As at 31 December 2017, the Company has oil volume under the agreement totaling 4,600,000 barrels.

***Sales and Purchase Aromatics Product Agreements***

The Company, a parent company, related parties and various other companies have entered into raw material and product sales and purchase agreements. The sales and purchase prices of raw material and product are based on the prices specified in the agreements. These agreements are for the periods from 1 year to 15 years, commencing from the effective date as specified in each agreement. The agreements will expire in December 2018, December 2023 and December 2026. Other agreements are automatically renewed except for a 1-2 years advance cancellation through written notice by each party.

***Polyethylene Sales and Purchase Agreements***

The Company and a related party have 2 Polyethylene sales and purchase agreements with a related party. The Company agrees to sell all Polyethylene to a related party for distributing to the customers in the market. Under which the Polyethylene pricing structure is changed to link to the Polyethylene product price, that the Company sells to end customers, adjusted by the appropriate marketing expenses for fairness to both parties. These agreements are for the period of 15 years, commencing from the effective date as specified in each agreement. One agreement will expire in December 2021 and another will expire in June 2023.

***Lending and Borrowing Agreements***

The Company has unsecured short-term lending agreements for the period of 3 years through Liquidity Management System "LMS" with 5 related parties with the credit facility of Baht 1,000 million, Baht 800 million, Baht 350 million, Baht 80 million and Baht 20 million. These loans bear interest based on market rate referenced to BIBOR O/N plus interest rate spread.

The Company has an unsecured long-term lending agreement for the period of 3.5 years with related party with the credit facility of USD 238.36 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has unsecured short-term borrowing agreements for the period of 3 years through Liquidity Management System "LMS" with 5 related parties with the credit facility of Baht 4,000 million, Baht 200 million, Baht 60 million and Baht 50 million. These loans bear interest based on market rate referenced to BIBOR O/N minus interest rate spread.

***Service Agreements***

The Company has Shared Service agreements with 17 related parties for the provision of general services. All of these agreements are effective from the date as specified in the agreements and are automatically renewed except for 3 months advance cancellation through written notice by each party. The service charges will be agreed in the fourth quarter of each year.

The Company has a Technical Services agreement with a related party. Under which the Company agreed to obtain certain technical advisory services. The agreement is for the period of 3 years 4 months and will expire in December 2019.

The Company has Management and Engineering agreement, Design, Supply, Construction and Installation agreement, Inspection of Construction, Equipment and Machinery agreement and Management and Maintenance Work agreement with a related party. These agreements are for the periods from 6 months to 3 years 3 months, commencing from the date as specified in the agreements and expiring in December 2019.

The Company has 3 Services agreements to have the right to lay the pipelines for delivery of raw material and product on pipeline structure with a parent company. These agreements are for the period of 15 years from the agreement date and will expire in June 2025.

The Company has a Security Service agreement with a related party. Under which the related party agrees to provide security service to asset, employees and visitors in the location of the Company. The agreement is for the period of 2 years and will expire in December 2018.

The Company has a Safety Inspection Service agreement with a related party. The agreement is for the period of 4 years and will expire in December 2018.

The Company has 5 Warehouse Management agreements with a related party. The agreements are for the periods from 3 years to 21 years 3 months and will expire in December 2018 and December 2030.

The Company has a Tank Maintenance Service agreement with a related party. The agreement is for the period of 2 years 6 months and will expire in February 2018.

The Company has a Logistics Services agreement with a related party. The agreement is for the period of 4 years 7 months and will expire in December 2020.

The Company has entered into 2 Information and Communication Technology Service agreements with a related party. Under which the related party agrees to provide Information Technology system maintenance and support services, system structure and data centre management, system supporting and advisory, including system design and development as the Company's requirements. These agreements are for the periods from 5 years to 15 years, commencing from the date as specified in the agreements and expiring in December 2018 and December 2027.

The Company has Share Service agreement for Engineering, Procurement and Construction (EPC) Phase with 2 related parties. The agreement is effective from the date as specified in the agreement for the period of 3 years. This agreement will expire at least 6 months before the completion of EPC Phase and can be terminated by providing not less than 3 months advance written notice to the counter party.

***Rental Agreements***

The Company has Office Rental and Service agreement with a related party. The agreement is for the period of 1 year and will expire in September 2018 with rental and service rate and conditions as stipulated in the agreement.

The Company has entered into Land Lease agreement with a parent company to operate jetty and buffer tank farm services. The agreement is for the period of 22 years 6 months, commencing from the date signed in the agreement by both parties, and will expire in December 2037 with land lease rate and condition as specified in the agreement,.

The Company has various Land Lease agreements with related parties. These agreements are for the periods from 14 years to 16 years, commencing from the date as specified in the agreements, and will expire in October 2033 with land lease rate and condition as specified in the agreement.

## 6 Cash and cash equivalents

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Cash on hand | 2 | 2 | 2 | 2 |
| Cash and highly liquid current investments (Private funds) | 443 | 440 | 443 | 440 |
| Cash at banks - current accounts | 1,032 | 382 | 5 | 4 |
| Cash at banks - savings accounts | 10,119 | 7,024 | 3,340 | 4,786 |
| Cash at banks - foreign accounts | 1,849 | 868 | 1,453 | 697 |
| Highly liquid current investments | 29,984 | 24,004 | 29,193 | 22,021 |
| **Total** | **43,429** | **32,720** | **34,436** | **27,950** |

## 7 Trade accounts receivable

| | Note | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|
| | | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | *(in million Baht)* | | | |
| Related parties | 5 | 19,776 | 17,553 | 26,536 | 25,553 |
| Other parties | | 21,954 | 20,281 | 8,440 | 8,785 |
| **Total** | | **41,730** | **37,834** | **34,976** | **34,338** |
| *Less* allowance for doubtful accounts | | (33) | (82) | (19) | (19) |
| **Net** | | **41,697** | **37,752** | **34,957** | **34,319** |
| (Reversal of) bad and doubtful debts expense for the year | | (19) | 4 | - | - |

Aging analyses for trade accounts receivable were as follows:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| **Related parties** | | | | |
| Within credit terms | 19,686 | 17,534 | 26,367 | 25,553 |
| Overdue: | | | | |
| Less than 3 months | 86 | 19 | 169 | - |
| 3 - 6 months | 4 | - | - | - |
| 6 - 12 months | - | - | - | - |
| Over 12 months | - | - | - | - |
| | 19,776 | 17,553 | 26,536 | 25,553 |
| *Less* allowance for doubtful accounts | - | - | - | - |
| **Net** | **19,776** | **17,553** | **26,536** | **25,553** |
| **Other parties** | | | | |
| Within credit terms | 21,310 | 19,941 | 8,362 | 8,759 |
| Overdue: | | | | |
| Less than 3 months | 608 | 248 | 59 | 7 |
| 3 - 6 months | - | 3 | - | - |
| 6 - 12 months | - | 5 | - | - |
| Over 12 months | 36 | 84 | 19 | 19 |
| | 21,954 | 20,281 | 8,440 | 8,785 |
| *Less* allowance for doubtful accounts | (33) | (82) | (19) | (19) |
| **Net** | **21,921** | **20,199** | **8,421** | **8,766** |
| **Total** | **41,697** | **37,752** | **34,957** | **34,319** |

The normal credit term granted by the Group ranges from 14 days to 90 days.

## 8 Other receivables

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Prepaid expenses | 1,642 | 1,561 | 1,257 | 1,059 |
| Receivable from oil hedging contracts | 39 | 339 | 39 | 339 |
| Accrued income | 583 | 314 | 705 | 406 |
| Other account receivables | 356 | 1,074 | 690 | 1,067 |
| Prepaid income tax expense | 13 | 7 | - | - |
| Receivable from Revenue Department | 126 | 110 | - | - |
| Others | 200 | 178 | 86 | 103 |
| **Total** | **2,959** | **3,583** | **2,777** | **2,974** |

## 9 Inventories

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Finished goods | 14,805 | 14,757 | 10,878 | 8,161 |
| Work in progress | 1,759 | 1,920 | 1,171 | 1,125 |
| Raw materials | 7,002 | 6,449 | 5,477 | 5,011 |
| Factory supplies and spare parts | 9,228 | 8,967 | 7,516 | 7,420 |
| Goods in transit | 5,180 | 6,456 | 4,111 | 4,574 |
| | 37,974 | 38,549 | 29,153 | 26,291 |
| *Less* allowance for decline in value | (12) | (25) | - | - |
| allowance for obsolescence | (207) | (166) | (81) | (31) |
| **Net** | **37,755** | **38,358** | **29,072** | **26,260** |
| Inventories recognised as an expense in 'cost of sales of goods': | | | | |
| - Cost | 380,366 | 310,102 | 331,386 | 270,257 |
| - Reversal of write-down to net realisable value | (13) | (289) | - | (168) |
| **Net** | **380,353** | **309,813** | **331,386** | **270,089** |

As at 31 December 2017 and 2016, the Company's inventories included petroleum legal reserve of 353 million liters with approximated value of Baht 4,671 million and 294 million liters with approximated value of Baht 3,424 million, respectively.

## 10 Investments in subsidiaries

| | Separate financial statements | |
|---|---|---|
| | 2017 | 2016 (Restated) |
| | *(in million Baht)* | |
| ***Subsidiaries*** | | |
| At 1 January (Restated) | 55,286 | 55,649 |
| Acquisition | 6,001 | 3,535 |
| Capital distribution | - | (50) |
| Impairment losses | (4,428) | (3,848) |
| **At 31 December** | **56,859** | **55,286** |

# NOTES TO THE FINANCIAL STATEMENTS

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

## FOR THE YEAR ENDED 31 DECEMBER 2017

Investments in subsidiaries as at 31 December 2017 and 2016, and dividend income from those investments for the years then ended, were as follows:

| | Separate financial statements | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ownership Interest | | Paid-up capital | | Cost | | Impairment | | At cost-net | | Fair value of listed securities | | Dividend income | |
| | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) |
| | *(%)* | | *(in million Baht)* | | | | | | | | | | | |
| ***Subsidiaries*** | | | | | | | | | | | | | | |
| Global Green Chemicals Plc. | 72 | 100 | 10,237 | 7,400 | 7,400 | 7,400 | - | - | 7,400 | 7,400 | 11,322 | - | 370 | 1,406 |
| GC Polyols Co., Ltd. | 82 | - | 763 | - | 626 | - | - | - | 626 | - | - | - | - | - |
| GC Treasury Center Co., Ltd. | 100 | - | 3 | - | 3 | - | - | - | 3 | - | - | - | - | - |
| GC Oxirane Co., Ltd. | 100 | - | 2,212 | - | 2,212 | - | - | - | 2,212 | - | - | - | - | - |
| Solution Creation Co., Ltd. | 100 | 100 | 166 | 116 | 166 | 116 | - | - | 166 | 116 | - | - | - | - |
| TOC Glycol Co., Ltd. | 100 | 100 | 5,395 | 5,395 | 5,395 | 5,395 | - | - | 5,395 | 5,395 | - | - | 2,158 | 324 |
| Thai Tank Terminal Co., Ltd. | 51 | 51 | 900 | 900 | 459 | 459 | - | - | 459 | 459 | - | - | 509 | 408 |
| Thai Styrenics Co., Ltd. | 100 | 100 | 190 | 190 | 190 | 190 | - | - | 190 | 190 | - | - | - | - |
| Bangkok Polyethylene Plc. (In process of liquidation) | - | 100 | - | 1,700 | - | 1 | - | - | - | 1 | - | - | - | - |
| Bio Spectrum Co., Ltd. (In process of liquidation) | 100 | 100 | 146 | 146 | 96 | 96 | (95) | (95) | 1 | 1 | - | - | - | - |
| PTT Phenol Co., Ltd. | 100 | 100 | 11,851 | 11,851 | 13,155 | 13,155 | - | - | 13,155 | 13,155 | - | - | - | - |
| PTT Maintenance and Engineering Co., Ltd. | 100 | 100 | 137 | 137 | 155 | 82 | - | - | 155 | 82 | - | - | - | - |
| PTT Polymer Marketing Co., Ltd.* | 99 | 99 | 40 | 40 | 451 | 250 | - | - | 451 | 250 | - | - | 123 | 245 |
| PTT Polymer Logistic Co., Ltd.* | 99 | 99 | 1,200 | 1,200 | 1,607 | 693 | - | - | 1,607 | 693 | - | - | - | - |
| Auria BioChemicals Co., Ltd. | 54 | 54 | 90 | 90 | 49 | 49 | (7) | - | 42 | 49 | - | - | - | - |
| NPC Safety and Environmental Service Co., Ltd. | 100 | 100 | 165 | 165 | 165 | 165 | - | - | 165 | 165 | - | - | - | - |

| | Separate financial statements | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ownership Interest | | Paid-up capital | | Cost | | Impairment | | At cost-net | | Fair value of listed securities | | Dividend income | |
| | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) |
| | (%) | | (in million Baht) | | | | | | | | | | | |
| ***Subsidiaries (continue)*** | | | | | | | | | | | | | | |
| PTT Chemical International Pte. Ltd. | 100 | 100 | 29,968 | 28,498 | 29,968 | 28,498 | (9,497) | (5,076) | 20,471 | 23,422 | - | - | - | - |
| PTTGC America Corporation | 100 | 100 | - | - | 4,361 | 3,908 | - | - | 4,361 | 3,908 | - | - | - | - |
| **Total** | | | | | **66,458** | **60,457** | **(9,599)** | **(5,171)** | **56,859** | **55,286** | **11,322** | **-** | **3,160** | **2,383** |

*The comparative information for 2016 for PTT Polymer Marketing Co., Ltd. and PTT Polymer Logistics Co., Ltd. were reclassified as if the group had the ownership interest of 99% due to the transaction accounted for the business combination under common control as described in note 4.

*Change in investment in subsidiaries*

On 14 February 2017, Solution Creation Co., Ltd. has called for paid capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on 14 February 2017 to invest in S.P. Petpack Inter Group Co., Ltd. at Baht 50 million, of which fully received in February 2017.

At the Board of Directors' Meeting of the Company held on 22 May 2017, the Board approved to establish GC Oxirane Co., Ltd. for conducting a Propylene Oxide Project which is 100% owned by the Company. Subsequently on 2 June 2017, GC Oxirane Co., Ltd. registered the initial authorised share capital of Baht 5,530 million and called for paid-up capital of 55.30 million shares at Baht 25 per share, totaling Baht 1,382.50 million, of which fully received in June 2017. Subsequently on 5 October 2017, the Board of Directors' Meeting approved to call for the additional paid-up capital of the remaining share capital at Baht 15 per share, totaling Baht 829.50 million, of which fully received in October 2017.

At the Board of Directors' Meeting of the Company held on 22 May 2017, the Board approved to establish GC Polyols Co., Ltd. ("GCP") for conducting a Polyols & PU System Project which is 100% owned by the Company. On 2 June 2017, GCP registered the initial authorised share capital of Baht 2,502 million and called for paid-up capital of 25.02 million shares at Baht 25 per share, totaling Baht 625.50 million, of which fully received in June 2017. Subsequently on 25 August 2017, the Company entered into a joint venture agreement with Sanyo Chemical Industries, Ltd. and Toyota Tsusho Corporation. GCP increased the registered capital to Baht 3,050 million and called for paid-up capital by the Extraordinary meeting of shareholder of subsidiary held on 11 September 2017 at 5.48 million shares at Baht 25 per share, totaling Baht 137 million, of which fully paid in September 2017. GCP registered an increase in share capital with the Ministry of Commerce on 5 October 2017.

On 6 June 2017, PTT Chemical International Pte. Ltd. ("CH Inter") has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on 20 February 2014 to invest in PTTGC International (Netherlands) B.V. ("PTTGC NL") for the purpose of investing in Vencorex Holding S.A.S. ("Vencorex") which a subsidiary holds an interest through PTTGC NL and for the purpose of corporate operation at EUR 31.37 million or equivalent to Baht 1,202.94 million, of which fully received in June 2017. Subsequently on 21 June 2017, PTTGC NL in which the Company holds a 100% interest through a subsidiary CH Inter, settled the payment of 34% of the share capital in Vencorex which PTTGC NL acquired from Perstorp Holding AB ("Perstorp") since 28 August 2014, and as a result its shareholding interest in Vencorex also increased by 5.82% from 85% to 90.82% in accordance with the terms of the agreement. The Group paid for the additional share capital totalling EUR 31.09 million (approximately Baht 1,168.63 million).

At the Board of Directors' Meeting of the Company held on 30 October 2017, the Board approved to establish GC Treasury Center Co., Ltd. ("GCTC") for liquidity management and financing vehicle of the Group which is 100% owned by the Company. Subsequently on 19 December 2017, GCTC registered the initial authorised share capital of Baht 5 million and called for paid-up capital of 0.05 million shares at Baht 50 per share, totaling Baht 2.50 million, of which fully received in December 2017.

During the year ended 31 December 2017, PTT Chemical International Pte. Ltd. has called for paid capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on 21 December 2016 to invest in Myriant Corporation at USD 7.61 million or equivalent to Baht 266.86 million, of which fully received during the year ended 31 December 2017.

During the year ended 31 December 2017, PTTGC America Corporation has called for paid capital from the capital increase by the Board of Directors' Meeting held on 29 June 2015 for the purpose of US Petrochemical Complex project at USD 13.20 million or equivalent to Baht 453.16 million, of which fully received during the year ended 31 December 2017.

On 24 March 2016, PTT Phenol Co., Ltd. has called for paid-up capital from the capital increase by the Extraordinary General Meeting of shareholders of subsidiary held on 11 July 2013 for the purpose of Phenol 2 project at Baht 25 per share, 25.99 million shares, totalling Baht 649.80 million, of which fully received in March and May 2016.

At the Board of Directors' Meeting of NPC Safety and Environmental Service Co., Ltd. held on 20 April 2016, the Board approved to establish NPC S&E Security Guard Co., Ltd. under the Business Security Act B.E. 2558 which the Company holds a 100% interest through NPC Safety and Environmental Service Co., Ltd. The share capital was registered at Baht 5 million, of which fully paid in May 2016.

On 12 May 2016, PTT Chemical International Pte. Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of subsidiary held on 20 February 2014 to invest in Vencorex Holding which the Company holds a 100% interest through PTTGC International (Netherlands) B.V. in accordance with business plan of Vencorex group. The share capital was registered and called at EUR 14.03 million or equivalent to Baht 566.50 million (1,402.5 million shares at EUR 0.01 par value), of which fully received in May 2016.

On 8 August 2016, PTT Chemical International Pte. Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on 25 July 2016 for the purpose of corporate operation at USD 0.80 million or equivalent to Baht 27.86 million, of which fully received in August 2016.

During the year ended 31 December 2016, PTT Chemical International Pte. Ltd. has called for paid-up capital increase by the Board of Directors' Meeting of subsidiary held on 25 September 2015 to invest in Myriant Corporation at USD 14.63 million or equivalent to Baht 516.17 million, of which fully received during the period ended 31 December 2016.

During the year ended 31 December 2016, PTTGC America Corporation has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on 29 June 2015 for the purpose of US Petrochemical Complex project at USD 50 million or equivalent to Baht 1,774.60 million, of which fully received during the year ended 31 December 2016.

*Impairment loss on investment in subsidiary*

During the year ended 31 December 2017, the Company recognised impairment loss on the investment in PTT Chemical International Pte Ltd. and Auria BioChemicals Co., Ltd. totalling Baht 4,420.97 million and 7.25 million, respectively in the separate financial statements as the recoverable amount of investment was less than its carrying amount due to change in operation plan of Myriant Corporation to become open innovation and technology scouting, according to the Company's strategy on research and development and also the approval on the cancelation of Joint Venture Agreement between the Company and Myriant Corporation in Auria BioChemicals Co., Ltd.

During the year ended 31 December 2016, the Company recognised impairment loss on the investment in Bio Spectrum Co., Ltd. totalling Baht 54.19 million in the separate financial statements as the recoverable amount of investment was less than its carrying amount. On 31 March 2016, the subsidiary registered the dissolution with Department of Business Development, Ministry of Commerce. Subsequently on 28 December 2016, the subsidiary distributed capital to the Company amounting to Baht 50 million. As at 31 December 2017, Bio Spectrum Co., Ltd. is in the liquidation process.

During the year ended 31 December 2016, the Company recognised impairment loss on the investment in PTT Chemical International Pte. Ltd. totalling Baht 6.74 million in the separate financial statements for the year ended 31 December 2016 as the recoverable amount of investment of PTT Chemical International Pte. Ltd. in PTT Chemical International (Asia Pacific ROH) Limited ("AP ROH") was less than its carrying amount due to the dissolution of AP ROH. On 30 November 2016, AP ROH, which is 100% owned by PTT Chemical International Pte. Ltd., a subsidiary of the Company, registered the dissolution with Department of Business Development, Ministry of Commerce. As at 31 December 2017, PTT Chemical International (Asia Pacific ROH) Ltd. is in the liquidation process.

The Company recognised impairment loss on the investment in PTT Chemical International Pte. Ltd. totalling Baht 3,787 million in the separate financial statements for the year ended 31 December 2016 as the recoverable amount of investment of PTT Chemical International Pte. Ltd. in Myriant Corporation was less than its carrying amount. The recoverable amount was determined using the estimated future cash flows discounted to their present value. The key assumptions included the oil and bio-succinic acid prices in the future and discount rates. The forecast oil and bio-succinic acid prices in the future obtained from independent expert. The discount rate is derived from weighted average cost of capital of 9.39%.

*Initial public offering of Global Green Chemicals Plc. ordinary shares*

On 2 May 2017, Global Green Chemicals Plc. ("GGC") which is a subsidiary of the Company completed its Initial Public Offering ("IPO") on the Stock Exchange of Thailand by issuing 246.67 million new ordinary shares with an offering price of Baht 11.20 per share (par value of Baht 10 per share and share premium of Baht 1.20 per share) amounting to Baht 2,763 million with over-allotment of 37 million shares from the Company to the Over-allotment Agent in order to deliver them to the subscribers of GGC shares. Subsequently on 2 June 2017, the Over-allotment Agent procured shares in order to deliver them to the Company by means of exercising its over-allotment option to purchase newly issued ordinary shares from GGC. GGC has sold these shares to the Over-allotment Agent and increased its paid-up capital, and the Over-allotment Agent has returned the shares to the Company. Therefore, the Group received proceeds from issuing 283.67 million ordinary shares of GGC with price of Baht 11.20 per share, totalling of Baht 3,177 million.

Details of the change in ownership are as follows:

| | **Consolidated financial statements** *(in million Baht)* |
|---|---|
| Consideration received | 3,177 |
| *Less* Transaction costs from issuance of Global Green Chemicals Plc.'s ordinary shares | (121) |
| **Net** | **3,056** |
| Dilution of ownership interest to non-controlling interest | (3,027) |
| **Change in parent's equity** | **29** |

As a result of IPO, the Company's ownership interest in Global Green Chemicals Plc. decreased from 100% to 72.29%.

## 11 Investments in joint ventures and associates

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | *(in million Baht)* | | | |
| ***Joint ventures*** | | | | |
| At 1 January (Restated) | 26,285 | 27,221 | - | 210 |
| Acquisitions | - | - | 15,373 | - |
| Share of profit of investment in joint ventures | 4,111 | 1,470 | - | - |
| Share of other comprehensive income of joint ventures | 466 | 359 | - | - |
| Dividend income | (3,285) | (2,765) | - | - |
| Disposal of investment | - | - | - | (210) |
| **At 31 December** | **27,577** | **26,285** | **15,373** | **-** |
| ***Associates*** | | | | |
| At 1 January | 13,026 | 12,392 | 9,323 | 9,323 |
| Acquisitions | 80 | 17 | - | - |
| Share of profit of investment in associates | 1,461 | 1,106 | - | - |
| Share of other comprehensive income (loss) of associates | (2) | 20 | - | - |
| Dividend income | (563) | (509) | - | - |
| **At 31 December** | **14,002** | **13,026** | **9,323** | **9,323** |
| ***Total*** | | | | |
| At 1 January (Restated) | 39,311 | 39,613 | 9,323 | 9,533 |
| Acquisitions | 80 | 17 | 15,373 | - |
| Share of profit of investment in joint ventures and associates | 5,572 | 2,576 | - | - |
| Share of other comprehensive income of joint ventures and associates | 464 | 379 | - | - |
| Dividend income | (3,848) | (3,274) | - | - |
| Disposal of investment in joint ventures | - | - | - | (210) |
| **At 31 December** | **41,579** | **39,311** | **24,696** | **9,323** |

# NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

FOR THE YEAR ENDED 31 DECEMBER 2017

Investments in joint ventures and associates as at 31 December 2017 and 2016, and dividend income from those investments for the years then ended were as follows:

| | Consolidated financial statements | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ownership interest | | Paid-up capital | | Cost | | Equity | | Impairment | | Equity - net | | Dividend income | |
| | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 (Restated) |
| | (%) | | | | (in million Baht) | | | | | | | | | |
| ***Direct joint ventures*** | | | | | | | | | | | | | | |
| PTT Asahi Chemical Co., Ltd.* | 50 | 50 | 13,819 | 13,819 | 996 | 996 | 6,555 | 4,311 | - | - | 6,555 | 4,311 | - | - |
| PTT MCC Biochem Co., Ltd.* | 50 | 50 | 1,860 | 1,860 | 160 | 160 | 452 | 551 | - | - | 452 | 551 | - | - |
| HMC Polymers Co., Ltd.* | 41 | 41 | 3,790 | 3,790 | 14,217 | 14,217 | 12,848 | 12,315 | - | - | 12,848 | 12,315 | 2,195 | 2,694 |
| | | | | | **15,373** | **15,373** | **19,855** | **17,177** | **-** | **-** | **19,855** | **17,177** | **2,195** | **2,694** |
| ***Indirect joint ventures*** | | | | | | | | | | | | | | |
| Thai Ethoxylate Co., Ltd. | 50 | 50 | 420 | 420 | 210 | 210 | 709 | 688 | - | - | 709 | 688 | 72 | 71 |
| Emery Oleochemicals (M) Sdn. Bhd. | 50 | 50 | 4,530 | 4,530 | 4,966 | 4,966 | 4,526 | 5,102 | - | - | 4,526 | 5,102 | - | - |
| Emery Specialty Chemicals Sdn. Bhd. | 50 | 50 | 818 | 818 | 407 | 407 | - | 82 | - | - | - | 82 | - | - |
| Nature Works LLC | 50 | 50 | 43,167 | 43,167 | 4,793 | 4,793 | 2,487 | 3,236 | - | - | 2,487 | 3,236 | 1,018 | - |
| | | | | | **10,376** | **10,376** | **7,722** | **9,108** | **-** | **-** | **7,722** | **9,108** | **1,090** | **71** |
| **Total - joint ventures** | | | | | **25,749** | **25,749** | **27,577** | **26,285** | **-** | **-** | **27,577** | **26,285** | **3,285** | **2,765** |

*The comparative information for 2016 for PTT Asahi Chemical Co., Ltd., PTT MCC Biochem Co., Ltd. and HMC Polymers Co., Ltd. were adjusted by equity method as if the group had the ownership interest of 50%, 50% and 41%, respectively, due to the transaction accounted for the business combination under common control as described in note 4.

| | Consolidated financial statements | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ownership interest | | Paid-up capital | | Cost | | Equity | | Impairment | | Equity - net | | Dividend income | |
| | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 | 2016 |
| | (%) | | | | | | (in million Baht) | | | | | | | |
| ***Direct associates*** | | | | | | | | | | | | | | |
| Global Power Synergy Plc. | 23 | 23 | 14,983 | 14,983 | 5,934 | 5,934 | 8,402 | 8,078 | - | - | 8,402 | 8,078 | 392 | 358 |
| PTT Energy Solution Co., Ltd. | 20 | 20 | 150 | 150 | 30 | 30 | 51 | 48 | - | - | 51 | 48 | - | - |
| PTT Digital Solutions Co., Ltd. (Formerly PTT ICT Solutions Co., Ltd.) | 40 | 40 | 150 | 150 | 60 | 60 | 606 | 510 | - | - | 606 | 510 | 31 | 26 |
| Vinythai Plc. | 25 | 25 | 7,111 | 7,111 | 3,297 | 3,297 | 4,632 | 4,210 | - | - | 4,632 | 4,210 | 133 | 118 |
| Eastern Fluid Transport Co., Ltd. | 23 | 23 | 10 | 10 | 2 | 2 | 20 | 16 | - | - | 20 | 16 | 7 | 7 |
| | | | | | **9,323** | **9,323** | **13,711** | **12,862** | **-** | **-** | **13,711** | **12,862** | **563** | **509** |
| ***Indirect associates*** | | | | | | | | | | | | | | |
| PT. Indo Thai Trading | 49 | 49 | 255 | 255 | 124 | 124 | 201 | 148 | - | - | 201 | 148 | - | - |
| Thai Eastern Top Seeds Oil Co., Ltd. | 30 | 30 | 156 | 56 | 47 | 17 | 45 | 16 | - | - | 45 | 16 | - | - |
| S.P. Petpack Inter Group Co., Ltd. | 25 | - | 200 | - | 50 | - | 45 | - | - | - | 45 | - | - | - |
| | | | | | **221** | **141** | **291** | **164** | **-** | **-** | **291** | **164** | **-** | **-** |
| **Total - associates** | | | | | **9,544** | **9,464** | **14,002** | **13,026** | **-** | **-** | **14,002** | **13,026** | **563** | **509** |
| **Total** | | | | | **35,293** | **35,213** | **41,579** | **39,311** | **-** | **-** | **41,579** | **39,311** | **3,848** | **3,274** |

# NOTES TO THE FINANCIAL STATEMENTS

## PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

## FOR THE YEAR ENDED 31 DECEMBER 2017

| | Separate financial statements | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ownership interest | | Paid-up capital | | Cost | | Impairment | | At cost - net | | Fair value of listed securities | | Dividend income | |
| | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) | 2017 | 2016 | 2017 | 2016 (Restated) |
| | (%) | | (in million Baht) | | | | | | | | | | | |
| ***Joint ventures*** | | | | | | | | | | | | | | |
| PTT Asahi Chemical Co., Ltd. | 50 | 50 | 13,819 | 13,819 | 996 | - | - | - | 996 | - | - | - | - | - |
| PTT MCC Biochem Co., Ltd. | 50 | 50 | 1,860 | 1,860 | 160 | - | - | - | 160 | - | - | - | - | - |
| HMC Polymers Co., Ltd. | 41 | 41 | 3,790 | 3,790 | 14,217 | - | - | - | 14,217 | - | - | - | 1,781 | - |
| | | | | | **15,373** | **-** | **-** | **-** | **15,373** | **-** | **-** | **-** | **1,781** | **-** |
| ***Associates*** | | | | | | | | | | | | | | |
| Global Power Synergy Plc. | 23 | 23 | 14,983 | 14,983 | 5,934 | 5,934 | - | - | 5,934 | 5,934 | 24,521 | 12,686 | 392 | 358 |
| PTT Energy Solution Co., Ltd. | 20 | 20 | 150 | 150 | 30 | 30 | - | - | 30 | 30 | - | - | - | - |
| PTT Digital Solutions Co., Ltd. (Formerly PTT ICT Solutions Co., Ltd.) | 40 | 40 | 150 | 150 | 60 | 60 | - | - | 60 | 60 | - | - | 31 | 26 |
| Vinythai Plc. | 25 | 25 | 7,111 | 7,111 | 3,297 | 3,297 | - | - | 3,297 | 3,297 | 6,128 | 4,885 | 133 | 118 |
| Eastern Fluid Transport Co., Ltd. | 15 | 15 | 10 | 10 | 2 | 2 | - | - | 2 | 2 | - | - | 5 | 5 |
| | | | | | **9,323** | **9,323** | **-** | **-** | **9,323** | **9,323** | **30,649** | **17,571** | **561** | **507** |
| **Total** | | | | | **24,696** | **9,323** | **-** | **-** | **24,696** | **9,323** | **30,649** | **17,571** | **2,342** | **507** |

*Joint Venture and Associate*

The following table summarises the financial information of the joint venture and associate as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarized financial information to the carrying amount of the Group's interest in these companies.

| | HMC Polymers Co., Ltd. | Global Power Synergy Plc. |
|---|---|---|
| | *(in million Baht)* | |
| **For the year ended 31 December 2017** | | |
| **Statement of income** | | |
| Revenue | 30,009 | 19,325 |
| Profit for the year | 5,117 | 3,165 |
| Other comprehensive income (loss) | 1,468 | (16) |
| **Total comprehensive income for the year** | **6,585** | **3,149** |
| | | |
| **As at 31 December 2017** | | |
| **Statement of financial position** | | |
| Current assets | 7,768 | 9,908 |
| Non-current assets | 28,481 | 50,050 |
| Current liabilities | (4,322) | (3,970) |
| Non-current liabilities | (8,255) | (15,507) |
| **Net assets** | **23,672** | **40,481** |

| | HMC Polymers Co., Ltd. |
|---|---|
| | *(in million Baht)* |
| Remark: | |
| Depreciation and amortisation | 1,692 |
| Cash and cash equivalents | 1,121 |

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in this company.

| | HMC Polymers Co., Ltd. | Global Power Synergy Plc. |
|---|---|---|
| | *(in million Baht)* | |
| Group's interest in net assets of investee at 1 January 2017 | 12,315 | 8,078 |
| Total comprehensive income attributable to the Group | 2,728 | 716 |
| Dividends received during the year | (2,195) | (392) |
| **Carrying amount of interest in investee at 31 December 2017** | **12,848** | **8,402** |

*Immaterial joint ventures and associates*

The summarised financial information for the Group's interest in immaterial joint ventures and associates based on the amounts reported in the Group's consolidated financial statements:

| | Immaterial Joint ventures | Immaterial Associates |
|---|---|---|
| **For the year ended 31 December 2017** | *(in million Baht)* | |
| Carrying amount of interests in immaterial joint ventures and associates | 14,729 | 5,600 |
| Group's share of: | | |
| - Profit for the year | 1,991 | 742 |
| - Other comprehensive income (loss) | (142) | 1 |
| - Total comprehensive income for the year | 1,849 | 743 |

*Change in investment in joint venture and associates*

On 25 January 2017, Solution Creation Co., Ltd. which is a subsidiary of the Company signed a joint venture agreement with S.P. Petpack Co., Ltd. ("S.P. PETPACK"). On 23 February 2017, Solution Creation Co., Ltd. purchased the shares to hold 25% of the issued and paid capital of S.P. Petpack Inter Group Co., Ltd., a subsidiary of S.P. PETPACK, at Baht 50 million for the purpose of jointly investment expansion in building plastic packaging manufacturing plant and develop packaging market in the Republic of the Union of Myanmar. This project follows strategic direction and business strategy of the Group to expand into Cambodia-Laos-Myanmar-Vietnam ("CLMV") market.

During the year ended 31 December 2017, Thai Eastern Top Seeds Oil Company Limited which is an indirect associate of the Company has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on 16 December 2016 for the purpose of working capital at Baht 45.11 per share, 665,999 shares, totalling Baht 30.04 million, of which fully received in April 2017.

On 31 March 2016, the Company sold ordinary shares totalling 2,100,000 shares or equivalent to 50% shareholding interest in Thai Ethoxylate Co., Ltd. to Global Green Chemicals Plc. which is a subsidiary of the Company at the selling price of Baht 328.8 per share, totalling Baht 690.5 million. The Company recognised the difference from the divestment of the joint venture in "Difference arising from business combination under common control" totalling Baht 480.5 million in the separate financial statements for the year ended 31 December 2016.

On 6 October 2016, Global Green Chemicals Plc. which is a subsidiary of the Company made a new investment in 30% of the issued and paid up capital of Thai Eastern Top Seeds Oil Co., Ltd., incorporated in Thailand, for a consideration of Baht 16.65 million. Thai Eastern Top Seeds Oil Co., Ltd. thereby became an indirect associate of the Group.

## 12 Other investments

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***Current investment*** | | | | |
| Promissory notes - financial institutions | 8,572 | 12,244 | 5,890 | 11,271 |
| Available-for-sale debt securities | 40 | 43 | 40 | 43 |
| Available-for-sale debt securities (Private funds) | 3,008 | 1,881 | 3,008 | 1,881 |
| | **11,620** | **14,168** | **8,938** | **13,195** |
| ***Other long - term investments*** | | | | |
| Available-for-sale debt securities | 2,555 | 1,650 | 2,555 | 1,650 |
| Available-for-sale debt securities (Private funds) | 6,779 | 3,663 | 6,779 | 3,663 |
| Available-for-sale equity securities | 365 | - | 365 | - |
| Other non-marketable equity securities | | | | |
| Alliance Petrochemical Investment (Singapore) Pte. Ltd. (15.34% shareholding by the Company) | 290 | 290 | 290 | 290 |
| Exeltium SAS (4% shareholding by the Group) | 283 | 283 | - | - |
| Other | 3 | 1 | 3 | 1 |
| | **10,275** | **5,887** | **9,992** | **5,604** |
| **Total** | **21,895** | **20,055** | **18,930** | **18,799** |

During the third quarter of 2016, the Company established private funds and engaged independent assets management companies for the purpose of cash balance management of the Company. Those private funds have invested in debt securities which had high liquidity and credit quality. As at 31 December 2017, the value of private funds outstanding totalling Baht 10,229 million *(2016: Baht 6,013 million)*.

## 13 Property, plant and equipment

| | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Land improvement | Plant, machinery, equipment and factory tools | Buildings and buildings improvement | Furniture, fixtures and office equipment | Vehicles | Assets under construction | Total |
| | | | | *(in million Baht)* | | | |
| ***Cost*** | | | | | | | |
| At 1 January 2016 (Restated) | 7,226 | 307,085 | 15,657 | 3,026 | 851 | 32,300 | 366,145 |
| Additions | 979 | 430 | 12 | 192 | 70 | 16,550 | 18,233 |
| Transfers | 39 | 26,478 | 512 | 29 | - | (27,402) | (344) |
| Disposals | (6) | (2,033) | (90) | (197) | (64) | (205) | (2,595) |
| Effect of change in exchange rates | (12) | (362) | (46) | (1) | - | (106) | (527) |
| **At 31 December 2016 and 1 January 2017 (Restated)** | **8,226** | **331,598** | **16,045** | **3,049** | **857** | **21,137** | **380,912** |
| Additions | 228 | 353 | 21 | 284 | 76 | 15,285 | 16,247 |
| Transfers | 655 | 11,640 | 941 | 71 | - | (13,626) | (319) |
| Disposals | (17) | (4,069) | (198) | (813) | (90) | (270) | (5,457) |
| Effect of change in exchange rates | (18) | 188 | 25 | (12) | (1) | (577) | (395) |
| **At 31 December 2017** | **9,074** | **339,710** | **16,834** | **2,579** | **842** | **21,949** | **390,988** |

| | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Land improvement | Plant, machinery, equipment and factory tools | Buildings and buildings improvement | Furniture, fixtures and office equipment | Vehicles | Assets under construction | Total |
| | | | | *(in million Baht)* | | | |
| ***Depreciation and impairment losses*** | | | | | | | |
| At 1 January 2016 (Restated) | (676) | (131,447) | (5,953) | (2,324) | (616) | (2,536) | (143,552) |
| Depreciation charge for the year | (81) | (14,591) | (663) | (256) | (61) | - | (15,652) |
| Transfers | 15 | (98) | 38 | (33) | - | - | (78) |
| Disposals | 2 | 1,555 | 57 | 195 | 61 | - | 1,870 |
| Reversal of impairment losses | - | 23 | 1 | - | - | 271 | 295 |
| Effect of change in exchange rates | - | 164 | 16 | - | - | 17 | 197 |
| **At 31 December 2016 and 1 January 2017 (Restated)** | **(740)** | **(144,394)** | **(6,504)** | **(2,418)** | **(616)** | **(2,248)** | **(156,920)** |
| Depreciation charge for the year | (108) | (16,315) | (684) | (274) | (63) | - | (17,444) |
| Transfers | (157) | (613) | (16) | (2) | - | 786 | (2) |
| Disposals | 13 | 3,609 | 174 | 810 | 87 | - | 4,693 |
| Impairment losses | (321) | (1,169) | (36) | (7) | - | (270) | (1,803) |
| Effect of change in exchange rates | 25 | (21) | (4) | 9 | - | 168 | 177 |
| **At 31 December 2017** | **(1,288)** | **(158,903)** | **(7,070)** | **(1,882)** | **(592)** | **(1,564)** | **(171,299)** |

# NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

FOR THE YEAR ENDED 31 DECEMBER 2017

| | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Land improvement | Plant, machinery, equipment and factory tools | Buildings and buildings improvement | Furniture, fixtures and office equipment | Vehicles | Assets under construction | Total |
| | | | | *(in million Baht)* | | | |
| ***Net book value*** | | | | | | | |
| **At 1 January 2016 (Restated)** | | | | | | | |
| Owned assets | 6,533 | 175,620 | 9,719 | 464 | 147 | 29,765 | 222,248 |
| Assets under finance leases | 32 | 18 | 3 | 205 | 88 | - | 346 |
| | **6,565** | **175,638** | **9,722** | **669** | **235** | **29,765** | **222,594** |
| **At 31 December 2016 and 1 January 2017 (Restated)** | | | | | | | |
| Owned assets | 7,470 | 187,199 | 9,541 | 443 | 130 | 18,889 | 223,672 |
| Assets under finance leases | 16 | 5 | - | 188 | 111 | - | 320 |
| | **7,486** | **187,204** | **9,541** | **631** | **241** | **18,889** | **223,992** |
| **At 31 December 2017** | | | | | | | |
| Owned assets | 7,786 | 180,807 | 9,764 | 539 | 110 | 20,385 | 219,391 |
| Assets under finance leases | - | - | - | 158 | 140 | - | 298 |
| | **7,786** | **180,807** | **9,764** | **697** | **250** | **20,385** | **219,689** |

The gross amount of the Group's fully depreciated property and equipment that was still in use as at 31 December 2017 amounted to Baht 14,712 million. *(2016: Baht 14,896 million)*

*Security*

At 31 December 2017, the Group's properties with a net book value of Baht 18,355 million *(2016: Baht 9,245 million)* were registered to secure Bank loan (see note 18).

*Property, plant and equipment under construction*

Capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 141 million *(2016: Baht 168 million)*, with a capitalization rate of 2.81% to 5.00% *(2016: 3.73% to 5.00%)*.

*Impairment of assets in Myriant Corporation*

Due to price pressure from petro-based succinic acid as a result of continuity low level of crude oil prices, during the year 2016, the Group had undertaken a change in operation plan for Myriant Corporation, a subsidiary within the Group by changed the commercial production plant of bio-succinic acid to pilot plant for research and development of other bio-based chemicals. Subsequently, during the year 2017, the Group changed the operation plan of Myriant Corporation to become open innovation and technology scouting. The change in operation plan indicated impairment of the related assets and that the carrying amount of assets exceeded its recoverable amount. Therefore, the Group recognised impairment loss on related assets. The recoverable amount of the property, plant and equipment was based on the fair values less costs of disposal and the intangible assets from business acquisition relating to bio-succinic acid license were fully impaired.

The Group recognised impairment charges relating to the assets in the consolidated statement of income for the year ended 31 December 2017 and 2016 were as follows:

| | | Consolidated financial statements | |
|---|---|---|---|
| | | 2017 | 2016 |
| | *Note* | *(in million Baht)* | |
| **Impairment loss** | | | |
| Property, plant and equipment | | 1,533 | - |
| Intangible assets | *16* | 471 | 319 |
| Goodwill | *15* | - | 337 |
| Total | | 2,004 | 656 |
| *Less* Effect from the reversal related deferred tax liabilities | | (165) | (112) |
| **Net** | | **1,839** | **544** |

# NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

FOR THE YEAR ENDED 31 DECEMBER 2017

| | Separate financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Land improvement | Plant, machinery, equipment and factory tools | Buildings and buildings improvement | Furniture, fixtures and office equipment | Vehicles | Assets under construction | Total |
| | | | | *(in million Baht)* | | | |
| ***Cost*** | | | | | | | |
| At 1 January 2016 | 5,033 | 249,320 | 9,047 | 2,206 | 554 | 15,007 | 281,167 |
| Additions | 978 | 325 | 8 | 147 | 48 | 9,596 | 11,102 |
| Transfers | 25 | 15,225 | 269 | 16 | - | (15,646) | (111) |
| Disposals | - | (1,486) | (42) | (173) | (54) | - | (1,755) |
| **At 31 December 2016 and 1 January 2017** | **6,036** | **263,384** | **9,282** | **2,196** | **548** | **8,957** | **290,403** |
| Additions | 222 | 332 | 15 | 147 | 62 | 8,936 | 9,714 |
| Transfers | 36 | 4,720 | 153 | 41 | - | (4,976) | (26) |
| Disposals | (15) | (2,761) | (141) | (747) | (71) | (268) | (4,003) |
| **At 31 December 2017** | **6,279** | **265,675** | **9,309** | **1,637** | **539** | **12,649** | **296,088** |
| ***Depreciation*** | | | | | | | |
| At 1 January 2016 | (438) | (103,689) | (3,318) | (1,768) | (433) | - | (109,646) |
| Depreciation charge for the year | (55) | (11,233) | (380) | (173) | (33) | - | (11,874) |
| Disposals | - | 1,028 | 32 | 173 | 51 | - | 1,284 |
| **At 31 December 2016 and 1 January 2017** | **(493)** | **(113,894)** | **(3,666)** | **(1,768)** | **(415)** | **-** | **(120,236)** |
| Depreciation charge for the year | (56) | (12,295) | (381) | (175) | (35) | - | (12,942) |
| Disposals | 12 | 2,409 | 119 | 747 | 71 | - | 3,358 |
| Impairment loss | - | - | - | - | - | (270) | (270) |
| **At 31 December 2017** | **(537)** | **(123,780)** | **(3,928)** | **(1,196)** | **(379)** | **(270)** | **(130,090)** |

| | Separate financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Land improvement | Plant, machinery, equipment and factory tools | Buildings and buildings improvement | Furniture, fixtures and office equipment | Vehicles | Assets under construction | Total |
| | | | | *(in million Baht)* | | | |
| ***Net book value*** | | | | | | | |
| **At 1 January 2016** | | | | | | | |
| Owned assets | 4,595 | 145,631 | 5,729 | 283 | 85 | 15,007 | 171,330 |
| Assets under finance leases | - | - | - | 155 | 36 | - | 191 |
| | **4,595** | **145,631** | **5,729** | **438** | **121** | **15,007** | **171,521** |
| **At 31 December 2016 and 1 January 2017** | | | | | | | |
| Owned assets | 5,543 | 149,490 | 5,616 | 280 | 75 | 8,957 | 169,961 |
| Assets under finance leases | - | - | - | 148 | 58 | - | 206 |
| | **5,543** | **149,490** | **5,616** | **428** | **133** | **8,957** | **170,167** |
| **At 31 December 2017** | | | | | | | |
| Owned assets | 5,742 | 141,895 | 5,381 | 318 | 67 | 12,379 | 165,782 |
| Assets under finance leases | - | - | - | 123 | 93 | - | 216 |
| | **5,742** | **141,895** | **5,381** | **441** | **160** | **12,379** | **165,998** |

The gross amount of the Company's fully depreciated property and equipment that was still in use as at 31 December 2017 amounted to Baht 9,131 million *(2016: Baht 8,743 million)*.

*Property, plant and equipment under construction*

Capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 119 million *(2016: Baht 62 million)*, with a capitalisation rate of 5% *(2016: 5%)*.

## 14 Land leasehold right

| | Consolidated financial statements | Separate financial statements |
|---|---|---|
| | *(in million Baht)* | |
| ***Cost*** | | |
| At 1 January 2016 | 1,131 | 1,130 |
| Additions | - | - |
| Effect of change in exchange rates | - | - |
| **At 31 December 2016 and 1 January 2017** | **1,131** | **1,130** |
| Additions | - | - |
| Effect of change in exchange rates | - | - |
| **At 31 December 2017** | **1,131** | **1,130** |
| ***Amortisation*** | | |
| At 1 January 2016 | (730) | (730) |
| Amortisation charge for the year | (39) | (38) |
| **At 31 December 2016 and 1 January 2017** | **(769)** | **(768)** |
| Amortisation charge for the year | (38) | (38) |
| **At 31 December 2017** | **(807)** | **(806)** |
| ***Net book value*** | | |
| **At 1 January 2016** | **401** | **400** |
| **At 31 December 2016 and 1 January 2017** | **362** | **362** |
| **At 31 December 2017** | **324** | **324** |

## 15 Goodwill

| | *Note* | Consolidated financial statements *(in million Baht)* |
|---|---|---|
| ***Cost*** | | |
| At 1 January 2016 | | 1,648 |
| Effect of change in exchange rates | | - |
| **At 31 December 2016 and 1 January 2017** | | **1,648** |
| Effect of change in exchange rates | | - |
| **At 31 December 2017** | | **1,648** |
| ***Impairment losses*** | | |
| At 1 January 2016 | | (380) |
| Impairment loss | *13* | (337) |
| **At 31 December 2016 and 1 January 2017** | | **(717)** |
| Impairment loss | *13* | - |
| **At 31 December 2017** | | **(717)** |
| ***Net book value*** | | |
| **At 1 January 2016** | | **1,268** |
| **At 31 December 2016 and 1 January 2017** | | **931** |
| **At 31 December 2017** | | **931** |

## 16 Intangible assets

| | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Production licence fees | Computer software | Customer contracts and the related customer relationships | Right to use pipe rack | Right to use - others | Intangible in progress | Total |
| | | | | *(in million Baht)* | | | |
| ***Cost*** | | | | | | | |
| At 1 January 2016 (Restated) | 5,564 | 3,803 | 164 | 459 | 2,786 | 1,234 | 14,010 |
| Additions | - | 33 | - | - | - | 399 | 432 |
| Transfers | 441 | 222 | - | 49 | (9) | (703) | - |
| Disposals | (32) | (28) | - | - | - | - | (60) |
| Effect of change in exchange rates | - | (5) | (2) | - | (58) | (3) | (68) |
| **At 31 December 2016 and 1 January 2017 (Restated)** | **5,973** | **4,025** | **162** | **508** | **2,719** | **927** | **14,314** |
| Additions | 7 | 33 | - | - | 37 | 689 | 766 |
| Transfers | - | 207 | - | - | 66 | (281) | (8) |
| Disposals | - | (56) | - | - | (11) | - | (67) |
| Effect of change in exchange rates | - | 1 | (13) | - | (68) | 2 | (78) |
| **At 31 December 2017** | **5,980** | **4,210** | **149** | **508** | **2,743** | **1,337** | **14,927** |

# NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND ITS SUBSIDIARIES

FOR THE YEAR ENDED 31 DECEMBER 2017

| | Note | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Production licence fees | Computer software | Customer contracts and the related customer relationships | Right to use pipe rack | Right to use - others | Intangible in progress | Total |
| | | | | | *(in million Baht)* | | | |
| ***Amortisation and impairment losses*** | | | | | | | | |
| At 1 January 2016 (Restated) | | (1,985) | (1,859) | (117) | (294) | (797) | - | (5,052) |
| Amortisation charge for the year | | (201) | (292) | (13) | (31) | (206) | - | (743) |
| Disposals | | - | 13 | - | - | - | - | 13 |
| Reversal of impairment (losses) | *13* | 33 | - | - | - | (319) | - | (286) |
| Effect of change in exchange rates | | - | 5 | 2 | - | 18 | - | 25 |
| **At 31 December 2016 and 1 January 2017 (Restated)** | | **(2,153)** | **(2,133)** | **(128)** | **(325)** | **(1,304)** | **-** | **(6,043)** |
| Amortisation charge for the year | | (202) | (296) | (12) | (33) | (210) | - | (753) |
| Transfers | | - | 2 | - | - | - | - | 2 |
| Disposals | | - | 56 | - | - | 8 | - | 64 |
| Impairment losses | *13* | - | - | - | - | (471) | (22) | (493) |
| Effect of change in exchange rates | | - | (1) | 10 | - | 55 | - | 64 |
| **At 31 December 2017** | | **(2,355)** | **(2,372)** | **(130)** | **(358)** | **(1,922)** | **(22)** | **(7,159)** |
| ***Net book value*** | | | | | | | | |
| **At 1 January 2016 (Restated)** | | **3,579** | **1,944** | **47** | **165** | **1,989** | **1,234** | **8,958** |
| **At 31 December 2016 and 1 January 2017 (Restated)** | | **3,820** | **1,892** | **34** | **183** | **1,415** | **927** | **8,271** |
| **At 31 December 2017** | | **3,625** | **1,838** | **19** | **150** | **821** | **1,315** | **7,768** |

| | Separate financial statements | | | | | |
|---|---|---|---|---|---|---|
| | Production licence fees | Computer software | Right to use pipe rack | Right to use - others | Intangible in progress | Total |
| | | | *(in million Baht)* | | | |
| ***Cost*** | | | | | | |
| At 1 January 2016 | 3,950 | 2,960 | 367 | - | 925 | 8,202 |
| Additions | - | 10 | - | - | 326 | 336 |
| Transfers | 163 | 217 | 48 | - | (428) | - |
| Disposals | - | (20) | - | - | - | (20) |
| **At 31 December 2016 and 1 January 2017** | **4,113** | **3,167** | **415** | **-** | **823** | **8,518** |
| Additions | 7 | 26 | - | - | 473 | 506 |
| Transfers | - | 150 | - | - | (150) | - |
| Disposals | - | (55) | - | - | - | (55) |
| **At 31 December 2017** | **4,120** | **3,288** | **415** | **-** | **1,146** | **8,969** |
| ***Amortisation*** | | | | | | |
| At 1 January 2016 | (1,342) | (1,300) | (221) | - | - | (2,863) |
| Amortisation charge for the year | (153) | (249) | (27) | - | - | (429) |
| Disposals | - | 7 | - | - | - | 7 |
| **At 31 December 2016 and 1 January 2017** | **(1,495)** | **(1,542)** | **(248)** | **-** | **-** | **(3,285)** |
| Amortisation charge for the year | (149) | (247) | (30) | - | - | (426) |
| Disposals | - | 55 | - | - | - | 55 |
| Impairment loss | - | - | - | - | (22) | (22) |
| **At 31 December 2017** | **(1,644)** | **(1,734)** | **(278)** | **-** | **(22)** | **(3,678)** |
| ***Net book value*** | | | | | | |
| **At 1 January 2016** | **2,608** | **1,660** | **146** | **-** | **925** | **5,339** |
| **At 31 December 2016 and 1 January 2017** | **2,618** | **1,625** | **167** | **-** | **823** | **5,233** |
| **At 31 December 2017** | **2,476** | **1,554** | **137** | **-** | **1,124** | **5,291** |

## 17 Deferred tax

Deferred tax assets and liabilities as at 31 December were as follows:

| | Consolidated financial statements | | | |
|---|---|---|---|---|
| | Assets | | Liabilities | |
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Total | 1,371 | 1,541 | (2,902) | (3,460) |
| Set off of tax | (1,062) | (1,221) | 1,062 | 1,221 |
| **Net deferred tax assets (liabilities)** | **309** | **320** | **(1,840)** | **(2,239)** |

| | Separate financial statements | | | |
|---|---|---|---|---|
| | Assets | | Liabilities | |
| | 2017 | 2016 | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Total | 957 | 1,134 | (2,568) | (2,941) |
| Set off of tax | (957) | (1,134) | 957 | 1,134 |
| **Net deferred tax liabilities** | **-** | **-** | **(1,611)** | **(1,807)** |

Movements in total deferred tax assets and liabilities during the year were as follows:

| | Consolidated financial statements | | | | |
|---|---|---|---|---|---|
| | | (Charged) / credited to: | | | |
| | **At 1 January 2017 - Restated** | Profit and loss *(note 31)* | Other comprehensive income | Exchange differences | **At 31 December 2017** |
| | | | *(in million Baht)* | | |
| ***Deferred tax assets*** | | | | | |
| Inventories | - | 10 | - | - | 10 |
| Employee benefit expenses | 505 | 100 | 83 | - | 688 |
| Capital distribution from subsidiaries | 386 | (364) | - | - | 22 |
| Others | 650 | 7 | - | (6) | 651 |
| **Total** | **1,541** | **(247)** | **83** | **(6)** | **1,371** |
| ***Deferred tax liabilities*** | | | | | |
| Property, plant and equipment | (3,029) | 188 | - | (6) | (2,847) |
| Finance lease assets | (6) | (1) | - | - | (7) |
| Others | (425) | 366 | - | 11 | (48) |
| **Total** | **(3,460)** | **553** | **-** | **5** | **(2,902)** |
| **Net** | **(1,919)** | **306** | **83** | **(1)** | **(1,531)** |

| | Consolidated financial statements | | | | |
|---|---|---|---|---|---|
| | | (Charged) / credited to: | | | |
| | **At 1 January 2016 - Restated** | Profit and loss *(note 31)* | Other comprehensive income | Exchange differences | **At 31 December 2016 - Restated** |
| | | | *(in million Baht)* | | |
| ***Deferred tax assets*** | | | | | |
| Inventories | 1 | (1) | - | - | - |
| Employee benefit expenses | 464 | 42 | (1) | - | 505 |
| Capital distribution from subsidiaries | 374 | 12 | - | - | 386 |
| Others | 706 | (55) | - | (1) | 650 |
| **Total** | **1,545** | **(2)** | **(1)** | **(1)** | **1,541** |
| ***Deferred tax liabilities*** | | | | | |
| Property, plant and equipment | (2,991) | (48) | - | 10 | (3,029) |
| Finance lease assets | (5) | (1) | - | - | (6) |
| Others | (462) | 32 | - | 5 | (425) |
| **Total** | **(3,458)** | **(17)** | **-** | **15** | **(3,460)** |
| **Net** | **(1,913)** | **(19)** | **(1)** | **14** | **(1,919)** |

| | Separate financial statements | | | |
|---|---|---|---|---|
| | | (Charged) / credited to: | | |
| | **At 1 January 2017** | Profit and loss *(note 31)* | Other comprehensive income | **At 31 December 2017** |
| | | *(in million Baht)* | | |
| ***Deferred tax assets*** | | | | |
| Inventories | - | 10 | - | 10 |
| Employee benefit expenses | 420 | 82 | 71 | 573 |
| Capital distribution from subsidiaries | 386 | (364) | - | 22 |
| Others | 328 | 24 | - | 352 |
| **Total** | **1,134** | **(248)** | **71** | **957** |
| ***Deferred tax liabilities*** | | | | |
| Inventories | (1) | - | - | (1) |
| Property, plant and equipment | (2,705) | 175 | - | (2,530) |
| Finance lease assets | (4) | (1) | - | (5) |
| Compensation for damage of assets | (231) | 231 | - | - |
| Others | - | (32) | - | (32) |
| **Total** | **(2,941)** | **373** | **-** | **(2,568)** |
| **Net** | **(1,807)** | **125** | **71** | **(1,611)** |

| | Separate financial statements | | | |
|---|---|---|---|---|
| | | (Charged) / credited to: | | |
| | **At 1 January 2016** | Profit and loss *(note 31)* | Other comprehensive income | **At 31 December 2016** |
| | | *(in million Baht)* | | |
| ***Deferred tax assets*** | | | | |
| Inventories | 1 | (1) | - | - |
| Employee benefit expenses | 393 | 27 | - | 420 |
| Capital distribution from subsidiaries | 374 | 12 | - | 386 |
| Others | 375 | (47) | - | 328 |
| **Total** | **1,143** | **(9)** | **-** | **1,134** |
| ***Deferred tax liabilities*** | | | | |
| Inventories | (120) | 119 | - | (1) |
| Property, plant and equipment | (2,624) | (81) | - | (2,705) |
| Finance lease assets | (3) | (1) | - | (4) |
| Compensation for damage of assets | - | (231) | - | (231) |
| Others | (5) | (5) | - | - |
| **Total** | **(2,752)** | **(189)** | **-** | **(2,941)** |
| **Net** | **(1,609)** | **(198)** | **-** | **(1,807)** |

## 18 Interest-bearing liabilities

Interest bearing liabilities are defined as loans, debentures and finance lease liabilities which are as follows;

| | | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|
| | *Note* | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | | *(in million Baht)* | | |
| ***Current*** | | | | | |
| Short-term loans from financial institutions | | | | | |
| secured | | - | 342 | - | - |
| unsecured | | 263 | 221 | - | - |
| Short-term loans from related parties | | | | | |
| unsecured | *5* | - | - | 2,558 | 1,514 |
| **Short-term loans** | | **263** | **563** | **2,558** | **1,514** |
| Current portion of long-term loans from financial institutions | | | | | |
| secured | | 1,290 | 1,289 | - | - |
| unsecured | | 8,003 | 6,052 | 6,835 | 4,948 |
| Current portion of long-term loans from other parties | | | | | |
| secured | | 642 | 725 | - | - |
| unsecured | | 27 | 22 | - | - |
| Current portion of debentures | | | | | |
| unsecured | | - | 2,799 | - | 2,799 |
| **Current portion of long-term loans** | | **9,962** | **10,887** | **6,835** | **7,747** |
| Current portion of financial lease liabilities | | 138 | 173 | 103 | 109 |
| **Total current** | | **10,363** | **11,623** | **9,496** | **9,370** |

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***Non-current*** | | | | |
| Long-term loans from financial institutions | | | | |
| secured | 8,103 | 9,272 | - | - |
| unsecured | 23,718 | 27,439 | 14,423 | 19,472 |
| Long-term loans from other parties | | | | |
| secured | 876 | 962 | - | - |
| unsecured | 246 | 207 | - | - |
| Debentures | | | | |
| unsecured | 54,645 | 47,786 | 54,645 | 47,786 |
| **Long-term loans** | **87,588** | **85,666** | **69,068** | **67,258** |
| Finance lease liabilities | 175 | 168 | 118 | 108 |
| **Total non-current** | **87,763** | **85,834** | **69,186** | **67,366** |
| **Total** | **98,126** | **97,457** | **78,682** | **76,736** |

As at 31 December 2017, the Group had unutilised credit facilities totalling Baht 22,595 million *(2016 (Restated): Baht 9,927 million)*.

The periods to maturity of interest-bearing liabilities, excluding finance lease liabilities, as at 31 December were as follows:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Within one year | 10,225 | 11,450 | 9,393 | 9,261 |
| After one year but within five years | 78,761 | 40,783 | 66,073 | 31,414 |
| After five years | 8,827 | 44,883 | 2,995 | 35,844 |
| **Total** | **97,813** | **97,116** | **78,461** | **76,519** |

Long-term loans as at 31 December were secured on the following assets;

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Property, plant and equipment | 18,355 | 9,245 | - | - |

Debentures and Loans from financial institutions of the Group were as follow;

*Debentures*

As at 31 December 2017, the Company had unsubordinated and unsecured debentures in US dollar and Thai Baht in the amount of Baht 54,645 million *(2016: Baht 50,585 million)*. These debentures have maturity periods between 4 years to 10 years, bear different interest rates and repayment schedules as specified in each agreement.

Details of the Company's debentures as at 31 December 2017 were as follows:

| | Currency | Facilities *(in million)* | Face value per share | Years | Interest rates (%) p.a. | Repayment Terms |
|---|---|---|---|---|---|---|
| Unsubordinated debenture unsecured with a debenture holders' representative | Baht | 1,942 | 1,000 | 10 | 5.50 | Interest is payable on semi-annual basis and maturity in June 2019 |
| Unsubordinated debenture at 99.108% of the face value unsecured with a debenture holders' representative | USD | 1,000 | 1,000 | 10 | 4.25 | Interest is payable on semi-annual basis and maturity in September 2022 |
| Unsubordinated debenture unsecured with a debenture holders' representative | Baht | 10,000 | 1,000 | 7 | 4.50 | Interest is payable on semi-annual basis and maturity in August 2021 |
| Unsubordinated debenture unsecured with a debenture holders' representative and debenture issuer has rights to redeem the debentures prior to maturity after one year of issuance | Baht | 10,000 | 1,000 | 4 | 3.05 | Interest is payable on semi-annual basis and maturity in August 2021 |

*Loans from financial institution*

As at 31 December 2017, the Group had long-term and revolving long-term credit facility agreements with several financial institutions totalling Baht 41,114 million and Baht 21,258 million, respectively *(2016 (Restated): Baht 44,052 million and Baht 24,420 million, respectively)* bear different interest rates as specified in each agreement. The Group is required to comply with certain covenants pertaining to maintenance of certain financial ratios, percentage of share held by the major shareholder and other conditions as specified in each agreement.

Details of the Group's loans as at 31 December 2017 were as follows:

| Currency | Facilities *(in million)* | Interest Rates (%) p.a. | Repayment Terms |
|---|---|---|---|
| **The Company** | | | |
| Baht | 2,500 | THBFIX 6 M plus margin | Principal is repayable on annual basis, in 3 instalments commencing from July 2016. |
| Baht | 7,500 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 15 instalments commencing from August 2011. |
| Baht | 3,000 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 10 instalments commencing from July 2015. |
| Baht | 7,000 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 15 instalments commencing from September 2013. |
| USD | 100 | LIBOR 6M plus margin | Principal is repayable on semi-annual basis, in 10 instalments commencing from March 2016. |
| Baht | 3,000 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 14 instalments commencing from March 2014. |
| Baht | 6,000 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 10 instalments commencing from March 2016. |
| Baht | 5,000 | THBFIX 6M plus margin | Principal is repayable in 2 instalments in December 2020 and June 2023 |
| **Subsidiaries** | | | |
| Baht | 6,320 | Highest interest rate for 6 month-fixed deposit of 4 banks plus margin | Principal is repayable on semi-annual basis, in 11 instalments commencing from September 2013. |

| Currency | Facilities *(in million)* | Interest Rates (%) p.a. | Repayment Terms |
|---|---|---|---|
| **Subsidiaries (continue)** | | | |
| Baht | 3,650 | Highest interest rate for 6 month-fixed deposit of 4 banks plus margin | Principal is repayable on semi-annual basis, in 17 instalments commencing from September 2013. |
| Baht | 7,000 | Highest interest rate for 6 month-fixed deposit of 4 banks plus margin | Principal is repayable on semi-annual basis, in 20 instalments commencing from March 2017. |
| Baht | 700 | BIBOR 3 M plus a margin | Principal is repayable on quarterly basis, in 16 instalments, commencing from September 2014. |
| EURO | 190 | EURIBOR 3 M plus a margin | Principal is repayable on annually basis, in 6 instalments commencing from 2017. |
| Baht | 1,000 | Fixed rate | Principal is repayable on quarterly basis, in 16 instalments commencing from September 2016. |
| Baht | 700 | BIBOR 3 M plus a margin | Principal is repayable on quarterly basis, in 20 instalments, commencing from March 2016. |
| Baht | 900 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 14 instalments commencing from April 2016. |
| Baht | 900 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 14 instalments commencing from May 2016. |
| Baht | 900 | Highest interest rate for 6 month-fixed deposit plus margin | Principal is repayable on semi-annual basis, in 12 instalments commencing from May 2017. |
| Baht | 500 | Fixed rate | Principal is repayable on quarterly basis, in 33 instalments commencing from June 2019. |
| Baht | 14,357 | THBFIX 3 M plus a margin | Principal is repayable on semi-annual basis, in 24 instalments commencing from February 2021. |
| Baht | 6,004 | THBFIX 3 M plus a margin | Principal is repayable on semi-annual basis, in 20 instalments commencing from February 2021. |

## 19 Trade accounts payable

| | Note | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|
| | | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | *(in million Baht)* | | | |
| Related parties | 5 | 26,785 | 23,352 | 25,386 | 22,442 |
| Other parties | | 4,352 | 5,074 | 1,065 | 1,444 |
| **Total** | | **31,137** | **28,426** | **26,451** | **23,886** |

## 20 Other payables

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Accrued operating expenses | 2,884 | 2,389 | 2,084 | 1,518 |
| Accrued interest expenses | 727 | 705 | 698 | 671 |
| Other account payables | 5,056 | 4,394 | 4,707 | 3,991 |
| Deposits and advances received | 435 | 363 | 149 | 17 |
| Retention payables | 42 | 79 | 14 | 47 |
| Current portion of finance lease liabilities | 138 | 173 | 103 | 109 |
| Withholding tax payable | 347 | 327 | 233 | 240 |
| Accrued other tax expenses | 3,438 | 1,246 | 3,343 | 1,221 |
| Others | 456 | 454 | 5 | 3 |
| **Total** | **13,523** | **10,130** | **11,336** | **7,817** |

## 21 Non-current provisions for employee benefits

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| **Statement of financial position** | | | | |
| **Non-current provisions for:** | | | | |
| Present value of unfunded obligation | 3,467 | 2,770 | 2,366 | 1,781 |
| Other long-term employee benefits | 544 | 374 | 466 | 332 |
| **Total** | **4,011** | **3,144** | **2,832** | **2,113** |

Movement in the present value of the defined benefit obligations:

| | Note | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|
| | | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | *(in million Baht)* | | | |
| At 1 January | | 3,144 | 2,975 | 2,113 | 1,963 |
| **Include in profit or loss:** | *28* | | | | |
| Current service costs | | 226 | 237 | 137 | 134 |
| Interest on obligation | | 105 | 103 | 86 | 80 |
| Past service costs | | - | (30) | - | - |
| Actuarial loss | | 152 | - | 124 | - |
| | | 483 | 310 | 347 | 214 |
| **Included in other comprehensive income** | | | | | |
| Actuarial loss | | 543 | 37 | 456 | - |
| Currency translation differences | | 22 | (28) | - | - |
| | | 565 | 9 | 456 | - |
| **Others** | | | | | |
| Benefits paid by the plan | | (181) | (150) | (84) | (64) |
| | | (181) | (150) | (84) | (64) |
| **At 31 December** | | **4,011** | **3,144** | **2,832** | **2,113** |

Losses recognised in other comprehensive income arising from:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Demographic assumptions | 38 | (4) | 49 | - |
| Financial assumptions | 350 | 60 | 325 | - |
| Experience adjustment | 155 | (19) | 82 | - |
| **Total** | **543** | **37** | **456** | **-** |

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| **Year ended 31 December** | | | | |
| **Statement of income:** | | | | |
| **Recognised in profit or loss:** | | | | |
| Long-term employee benefit obligations | 272 | 244 | 184 | 176 |
| Other long-term employee benefit obligations | 211 | 66 | 163 | 38 |
| **Total** | **483** | **310** | **347** | **214** |

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| **Statement of comprehensive income:** | | | | |
| **Recognised in other comprehensive income:** | | | | |
| Actuarial losses recognised during the year | 543 | 37 | 456 | - |
| Cumulative actuarial losses recognised | 1,051 | 508 | 824 | 368 |

The expense is recognised in the following line items in the statement of income:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Cost of sales | 192 | 171 | 122 | 116 |
| Selling and distribution and administrative expenses | 291 | 139 | 225 | 98 |
| **Total** | **483** | **310** | **347** | **214** |

***Actuarial assumptions***

The following were the principal actuarial assumptions at the reporting date (expressed as weighted averages).

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(%)* | | | |
| Discount rate | 1.4-2.9 | 1-4.2 | 2.9 | 4.2 |
| Future salary growth | 2.5-7 | 2.5-7 | 7 | 7 |
| Turnover rate | 0-15 | 0-15 | 0-3 | 0-3 |
| Retirement age | 55-65 years | 55-65 years | 60 years | 60 years |

Assumptions regarding future mortality have been based on published statistics and mortality tables.

At 31 December 2017, the weighted-average duration of the defined benefit obligation was 18 years *(2016: 12 years)*.

***Sensitivity analysis***

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below;

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | Increase | Decrease | Increase | Decrease |
| | *(in million Baht)* | | | |
| **At 31 December 2017** | | | | |
| Discount rate (1% movement) | (411) | 485 | (288) | 340 |
| Future salary growth (1% movement) | 410 | (353) | 278 | (241) |
| **At 31 December 2016 (Restated)** | | | | |
| Discount rate (1% movement) | (311) | 365 | (210) | 247 |
| Future salary growth (1% movement) | 372 | (322) | 254 | (217) |

## 22 Share capital

| | Par value per share *(Baht)* | 2017 Number | 2017 Amount | 2016 Number | 2016 Amount |
|---|---|---|---|---|---|
| | | *(million shares / million Baht)* | | | |
| ***Authorised*** | | | | | |
| At 1 January ordinary shares | *10* | 4,508.8 | 45,088.5 | 4,508.8 | 45,088.5 |
| **At 31 December ordinary shares** | *10* | **4,508.8** | **45,088.5** | **4,508.8** | **45,088.5** |
| ***Issued and paid-up*** | | | | | |
| At 1 January ordinary shares | *10* | 4,508.8 | 45,088.5 | 4,508.8 | 45,088.5 |
| **At 31 December ordinary shares** | *10* | **4,508.8** | **45,088.5** | **4,508.8** | **45,088.5** |

## 23 Treasury shares

At the Board of Directors' Meeting of the Company held on 24 August 2015, the Board approved a share repurchase program for financial management purpose (Treasury Stocks) not exceeding 90 million shares, or approximately 2 percent of the total issued shares, with the maximum amount of Baht 4,500 million. The Company can purchase the shares through the Stock Exchange of Thailand within the period of 6 months, during the period from 8 September 2015 to 7 March 2016. The shares purchased may be resold after 6 months from the date of purchase but must not exceed 3 years from such completion.

As at 7 March 2016, the Company has repurchased the shares under the program totalling 48.6 million shares, equivalent to 1.08% of issued share and paid-up capital, at a total cost of Baht 2,434.6 million with an equivalent amount had been appropriated from retained earnings to treasury shares reserve.

At the Board of Directors' Meeting of the Company held on 22 August 2016, the Board approved the sale of 48.6 million treasury shares, equivalent to 1.08% of issued share and paid-up capital. The specified selling period is from 8 September 2016 to 7 March 2019 through the Stock Exchange of Thailand.

During the year ended 31 December 2017, the Company has sold 48.1 million treasury shares, amounting to Baht 3,788.8 million and recognised surplus on treasury shares of Baht 1,379.3 million. *(2016: 0.5 million treasury shares amounting to Baht 32.6 million and surplus on treasury shares of Baht 7.4 million)*

As at 31 December 2017, the Company has no treasury shares outstanding. *(2016: 48.1 million treasury shares, equivalent to 1.07% of issued share and paid capital)*

## 24 Additional paid-in capital and reserves

***Share premium***

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account ("share premium"). Share premium is not available for dividend distribution.

***Surplus on treasury shares***

The surplus on treasury shares represents the accumulated surplus on sale of treasury shares, net of any deficits on sale or cancellation of treasury shares. The surplus on treasury shares is not available for dividend distribution.

***Difference arising from business combination under common control***

Difference on common control transactions arising within equity represents the difference of the book values of certain entities or businesses under common control under their cost as of the date of their acquisition. The reserve is non-distributable and will be retained until the respective businesses are sold or otherwise disposed of.

***Legal reserve***

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account ("legal reserve"), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

***Treasury shares reserve***

The treasury shares reserve represents the amount appropriated from retained earnings equal to the cost of the Company's own shares held by the Company. The treasury shares reserve is not available for dividend distribution.

***Other components of equity***

*Currency translation differences*

The currency translation differences account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as from the translation of liabilities that hedge the Company's net investment in a foreign operation.

*Fair value changes in available-for-sale investments*

The fair value changes in available-for-sale investments account within equity comprises the cumulative net change in the fair value of available-for-sale investments until the investments are derecognised or impaired.

*Cash flow hedges*

The cash flow hedges account within equity comprises the cumulative net change in the fair value of cash flow hedges related to hedged transactions that have not yet occurred for effective portion.

*Movements in reserves*

Movements in reserves are shown in the statements of changes in equity.

## 25 Segment information

The Group has significant business segments which offer different products and services, and are managed separately. For each of the business segments, the chief operating decision maker (CODM) reviews internal management reports on at least a quarterly basis. The operations in each of the Group's reportable segments have 7 reportable segments. The Group has reviewed business segments and resulted in changes in reportable segments as follows;

| | Previous | New |
|---|---|---|
| Segment 1 | Refinery and shared facilities | Refinery and shared facilities |
| Segment 2 | Aromatics | Aromatics |
| Segment 3 | Olefins and Derivatives | Olefins and Derivatives |
| Segment 4 | EO-Based Performance | Green Chemicals |
| Segment 5 | Green Chemicals | Performance Materials and Chemicals |
| Segment 6 | High Volume Specialities | Service and Others |
| Segment 7 | Service and Others | Investments in Other Joint Ventures and Associates |

The group has restated the reported segment information according to new reportable segments above.

Performance information of each reportable segment is measured based on segment profit before interest expense, tax, depreciation and amortisation which as included in the internal management reports that are reviewed by the Group's CODM. Management believes that using profit before interest expense, tax, depreciation and amortisation to measure performance is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries.

**Information about reporting segments for the year ended 31 December 2017**

| | Refinery and shared facilities | Aromatics | Olefins and Derivatives | Green Chemicals | Performance Materials and Chemicals | Service and Others | Investments in Other Joint Ventures and Associates | Elimination | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | *(in million Baht)* | | | | |
| External revenues | 187,424 | 65,195 | 127,874 | 18,195 | 39,198 | 2,035 | - | - | 439,921 |
| Inter-segment revenues | 17,561 | 44,687 | 19,242 | 1,196 | 124 | 3,828 | - | (86,638) | - |
| **Total revenues** | **204,985** | **109,882** | **147,116** | **19,391** | **39,322** | **5,863** | **-** | **(86,638)** | **439,921** |
| Cost of sales and rendering of services | (190,434) | (99,383) | (106,412) | (17,608) | (34,167) | (4,090) | - | 88,089 | (364,005) |
| Selling and administrative expenses | (642) | (1,462) | (6,451) | (869) | (2,314) | (1,899) | - | 1,258 | (12,379) |
| **Profit before interest expense, tax, depreciation and amortisation** | **12,450** | **9,176** | **34,983** | **996** | **3,368** | **742** | **-** | **1,765** | **63,480** |
| Interest income | 167 | 108 | 480 | 36 | 34 | 167 | - | (49) | 943 |
| Finance costs | (485) | (154) | (743) | (196) | (613) | (1,793) | - | 49 | (3,935) |
| Depreciation and amortisation | (3,646) | (3,968) | (8,440) | (855) | (2,850) | (522) | - | 197 | (20,084) |
| Loss from impairment of assets | - | (25) | (267) | (2,004) | - | - | - | - | (2,296) |
| Dividend income | - | - | - | - | - | 5,585 | - | (5,582) | 3 |
| Share of profit of investments in joint ventures | - | - | - | 88 | - | - | 4,015 | 8 | 4,111 |
| Share of profit (loss) of investments in associates | - | - | (5) | (1) | - | - | 1,476 | (9) | 1,461 |
| Others | (204) | 124 | 442 | (99) | (78) | 2,505 | - | (390) | 2,300 |
| **Profit (loss) before income tax** | **8,282** | **5,261** | **26,450** | **(2,035)** | **(139)** | **6,684** | **5,491** | **(4,011)** | **45,983** |
| **Profit (loss) for reportable segment - owner of the parent** | **7,026** | **4,696** | **24,328** | **(1,933)** | **(47)** | **5,996** | **3,277** | **(4,045)** | **39,298** |

**Information about reporting segments for the year ended 31 December 2016 (Restated)**

| | Refinery and shared facilities | Aromatics | Olefins and Derivatives | Green Chemicals | Performance Materials and Chemicals | Service and Others | Investments in Other Joint Ventures and Associates | Elimination | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | *(in million Baht)* | | | | |
| External revenues | 129,778 | 63,218 | 115,098 | 16,288 | 29,018 | 2,124 | - | - | 355,524 |
| Inter-segment revenues | 11,480 | 33,967 | 16,099 | 978 | 51 | 3,356 | - | (65,931) | - |
| **Total revenues** | **141,258** | **97,185** | **131,197** | **17,266** | **29,069** | **5,480** | **-** | **(65,931)** | **355,524** |
| Cost of sales and rendering of services | (130,885) | (86,891) | (99,892) | (15,214) | (25,535) | (4,371) | - | 67,262 | (295,526) |
| Selling and administrative expenses | (562) | (1,164) | (5,563) | (882) | (2,160) | (1,589) | - | 698 | (11,222) |
| **Profit before interest expense, tax, depreciation and amortisation** | **8,756** | **9,207** | **27,174** | **1,217** | **1,747** | **240** | **-** | **1,397** | **49,738** |
| Interest income | 126 | 106 | 567 | 12 | 30 | 40 | - | (46) | 835 |
| Finance costs | (513) | (341) | (900) | (190) | (486) | (1,901) | - | 54 | (4,277) |
| Depreciation and amortisation | (3,251) | (3,002) | (8,404) | (621) | (2,255) | (546) | - | 177 | (17,902) |
| Loss from impairment of assets | - | - | - | (656) | - | - | - | - | (656) |
| Dividend income | - | - | - | - | - | 2,110 | - | (2,093) | 17 |
| Share of profit (loss) of investments in joint ventures | - | - | - | 99 | - | - | 1,376 | (5) | 1,470 |
| Share of profit of investments in associates | - | - | - | - | - | - | 1,098 | 8 | 1,106 |
| Others | 114 | 129 | 484 | 34 | 124 | 259 | - | (210) | 934 |
| **Profit (loss) before income tax** | **5,232** | **6,099** | **18,921** | **(105)** | **(840)** | **202** | **2,474** | **(718)** | **31,265** |
| **Profit (loss) for reportable segment - owner of the parent** | **4,333** | **5,784** | **17,080** | **4** | **(712)** | **(439)** | **337** | **(785)** | **25,602** |

| | Refinery and shared facilities | Aromatics | Olefins and Derivatives | Green Chemicals | Performance Materials and Chemicals | Service and Others | Investments in Other Joint Ventures and Associates | Elimination | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | *(in million Baht)* | | | | |
| **At 31 December 2017** | | | | | | | | | |
| Segment assets | 73,828 | 77,364 | 156,873 | 15,687 | 49,549 | 64,848 | 40,780 | (43,965) | 434,964 |
| Investment in joint ventures and associates | - | - | 45 | 754 | - | - | 40,780 | - | 41,579 |
| Change in non-current assets | (2,830) | (467) | 626 | (2,013) | 1,149 | 11,749 | 2,173 | (495) | 9,892 |
| **At 31 December 2016 (Restated)** | | | | | | | | | |
| Segment assets | 75,827 | 73,761 | 154,602 | 15,403 | 45,156 | 53,349 | 38,607 | (43,192) | 413,513 |
| Investment in joint ventures and associates | - | - | - | 704 | - | - | 38,607 | - | 39,311 |
| Change in non-current assets | (51) | (2,920) | 1,158 | (1,028) | 1,812 | 5,093 | (347) | 2,280 | 5,997 |

***Geographical segments***

In presenting information on the basis of geographical segments, segment sales and service revenues are based on the geographical location of customers. Segment non-current assets (exclude derivatives and deferred tax) are based on the geographical location of the assets.

***Geographical information***

| | **Revenues** | |
|---|---|---|
| | 2017 | 2016 (Restated) |
| | *(in million Baht)* | |
| Thailand | 286,497 | 230,992 |
| The People's Republic of China | 50,476 | 40,047 |
| Vietnam | 22,240 | 17,368 |
| Singapore | 19,940 | 21,647 |
| India | 7,142 | 4,197 |
| Malaysia | 5,619 | 4,349 |
| Indonesia | 5,466 | 4,041 |
| Japan | 5,061 | 3,638 |
| United States of America | 2,171 | 2,025 |
| Other countries | 35,309 | 27,220 |
| **Total** | **439,921** | **355,524** |

| | **Non-current assets (excluding deferred tax assets and derivatives)** | |
|---|---|---|
| | 2017 | 2016 (Restated) |
| | *(in million Baht)* | |
| Thailand | 272,814 | 258,763 |
| United States of America | 7,705 | 11,074 |
| France | 8,662 | 8,840 |
| Malaysia | 4,531 | 5,194 |
| Other countries | 204 | 153 |
| **Total** | **293,916** | **284,024** |

***Major customers***

The Group's sales and service revenues mainly comprise revenue from one customer of Refinery and shared facilities, Aromatics and Olefins and derivatives segment representing Baht 148,614 million *(2016 (Restated): Baht 115,162 million)*.

## 26 Selling and distribution expenses

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Distribution | 2,694 | 2,154 | 1,681 | 1,318 |
| Promotional | 100 | 95 | 22 | 18 |
| Marketing | 93 | 64 | 36 | 17 |
| Personnel | 169 | 165 | - | - |
| **Total** | **3,056** | **2,478** | **1,739** | **1,353** |

## 27 Administrative expenses

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Personnel expense | 5,138 | 4,865 | 3,355 | 3,124 |
| Professional and consultancy fee | 1,121 | 843 | 1,191 | 873 |
| Depreciation and amortisation | 1,313 | 1,085 | 654 | 654 |
| Loss on disposal of fixed assets | 744 | 541 | 626 | 503 |
| Donation | 225 | 96 | 219 | 68 |
| Secondment fee | 55 | 60 | 215 | 198 |
| Others | 2,545 | 2,710 | 1,461 | 1,647 |
| **Total** | **11,141** | **10,200** | **7,721** | **7,067** |

## 28 Employee benefit expenses

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| Salaries, bonus, wages and other welfares | 12,732 | 11,823 | 7,762 | 6,960 |
| Contribution to provident funds | 529 | 496 | 439 | 407 |
| Defined benefit plans | 272 | 244 | 184 | 176 |
| Other long-term employee benefits | 211 | 66 | 163 | 38 |
| **Total** | **13,744** | **12,629** | **8,548** | **7,581** |

*Defined benefit plans*

Details of the defined benefit plans are given in note 21.

*Defined contribution plans*

The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and the Group contributes at the minimum rate as required by law not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed Fund Manager.

## 29 Expenses by nature

The statements of income include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***Included in cost of sales of goods:*** | | | | |
| Changes in inventories of finished goods and work in progress | 114 | (2,059) | (2,764) | (589) |
| Raw materials used | 309,939 | 250,170 | 253,686 | 202,519 |
| Personnel expense | 8,437 | 7,599 | 5,193 | 4,457 |
| Depreciation of property, plant and equipment | 16,466 | 14,890 | 12,494 | 11,424 |
| Amortisation of intangible assets | 367 | 420 | 220 | 225 |
| ***Included in selling and distribution and administrative expenses:*** | | | | |
| Personnel expense | 5,307 | 5,030 | 3,355 | 3,124 |
| Depreciation of property, plant and equipment | 978 | 762 | 448 | 450 |
| Amortisation of intangible assets | 335 | 323 | 206 | 204 |
| Minimum lease payments recognised as an operating lease expense | 640 | 699 | 334 | 348 |

## 30 Finance costs

| | Note | Consolidated financial statements 2017 | Consolidated financial statements 2016 (Restated) | Separate financial statements 2017 | Separate financial statements 2016 |
|---|---|---|---|---|---|
| | | | *(in million Baht)* | | |
| ***Interest expense :*** | | | | | |
| Subsidiaries | *5* | - | - | 26 | 21 |
| Debentures | | 2,200 | 2,254 | 2,200 | 2,254 |
| Bank loans and overdrafts | | 1,341 | 1,656 | 681 | 1,034 |
| Loans from other parties | | 114 | 130 | - | - |
| **Total interest expense** | | **3,655** | **4,040** | **2,907** | **3,309** |
| Other finance costs | | 421 | 405 | 284 | 282 |
| *Less:* Capitalised as cost of assets under construction | *13* | (141) | (168) | (119) | (62) |
| **Net** | | **3,935** | **4,277** | **3,072** | **3,529** |

## 31 Income tax expense

| | Note | Consolidated financial statements 2017 | Consolidated financial statements 2016 (Restated) | Separate financial statements 2017 | Separate financial statements 2016 |
|---|---|---|---|---|---|
| | | | *(in million Baht)* | | |
| ***Current tax expense*** | | | | | |
| Current year | | 4,144 | 3,078 | 3,574 | 2,583 |
| (Over) under provided in prior years | | 25 | (7) | 16 | 3 |
| | | 4,169 | 3,071 | 3,590 | 2,586 |
| ***Deferred tax expense*** | | | | | |
| Movements in temporary differences | *17* | (306) | 19 | (125) | 198 |
| **Total** | | **3,863** | **3,090** | **3,465** | **2,784** |

| ***Reconciliation of effective tax rate*** | Consolidated financial statements 2017 | | Consolidated financial statements 2016 (Restated) | |
|---|---|---|---|---|
| | *Rate (%)* | *(in million Baht)* | *Rate (%)* | *(in million Baht)* |
| Profit before income tax expense | | 45,983 | | 31,265 |
| Income tax using the Thai corporation tax rate | 20.0 | 9,197 | 20.0 | 6,253 |
| Effect of different tax rates in foreign jurisdictions | | 200 | | 184 |
| Income not subject to tax | | (6,616) | | (4,340) |
| Expenses not deductible for tax purposes | | 1,014 | | 989 |
| (Over) under provided in prior years | | 25 | | (7) |
| Others | | 43 | | 4 |
| **Total** | **8.4** | **3,863** | **9.9** | **3,090** |

| | Separate financial statements | | | |
|---|---|---|---|---|
| | 2017 | | 2016 | |
| | *Rate (%)* | *(in million Baht)* | *Rate (%)* | *(in million Baht)* |
| Profit before income tax expense | | 38,988 | | 26,604 |
| Income tax using the Thai corporation tax rate | 20.0 | 7,798 | 20.0 | 5,321 |
| Income not subject to tax | | (5,356) | | (3,483) |
| Expenses not deductible for tax purposes | | 1,007 | | 943 |
| Under provided in prior years | | 16 | | 3 |
| **Total** | **8.9** | **3,465** | **10.5** | **2,784** |

*Income tax reduction*

Revenue Code Amendment Act No. 42 B.E. 2559 dated 3 March 2016 grants a reduction of the corporate income tax rate to 20% of net taxable profit for accounting periods which begin on or after 1 January 2016.

## 32 Promotional privileges

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company has been granted privileges by the Board of Investment relating to production of upstream, intermediate and downstream petrochemical, utilities and production support facilities, jetty for transportation and storage of liquid product and transportation by marine vessels, production of petroleum product, research and development of polymer products and chemical formula, lab testing services and refinery. The privileges granted include:

(a) exemption from payment of import duty on machinery approved by the Board;

(b) exemption from payment of income tax not over 100 percent of investment excluded land and working capital of certain operations for a period of eight years from the date on which the income is first derived from such operations

(c) a 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenues from promoted and non-promoted businesses:

| | Separate financial statements | | | | | |
|---|---|---|---|---|---|---|
| | 2017 | | | 2016 | | |
| | Promoted businesses | Non-promoted businesses | Total | Promoted businesses | Non-promoted businesses | Total |
| | | | *(in million Baht)* | | | |
| Export sales | 5,566 | 39,635 | 45,201 | 1,044 | 28,823 | 29,867 |
| Local sales | 76,051 | 256,998 | 333,049 | 79,325 | 197,381 | 276,706 |
| Service income | 16 | 456 | 472 | 17 | 458 | 475 |
| **Total revenue** | **81,633** | **297,089** | **378,722** | **80,386** | **226,662** | **307,048** |

Certain subsidiaries in the Group have been granted promotional privileges as same as the Company.

## 33 Basic earnings per share

The calculation of basic earnings per share for the year ended 31 December 2017 and 2016 were based on the profit for the years attributable to ordinary shareholders of the Company and the weighted average number of ordinary shares outstanding during the years as follows:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 | 2017 | 2016 |
| | *(in million Baht / million shares)* | | | |
| Profit attributable to ordinary shareholders of the Company (basic) | 39,298.31 | 25,601.63 | 35,522.94 | 23,820.71 |
| Number of ordinary shares as at 1 January | 4,508.85 | 4,508.85 | 4,508.85 | 4,508.85 |
| Effect of treasury shares | (37.18) | (48.19) | (37.18) | (48.19) |
| Weighted average number of ordinary shares outstanding (basic) | 4,471.67 | 4,460.66 | 4,471.67 | 4,460.66 |
| **Earnings per share (basic) *(in Baht)*** | **8.79** | **5.74** | **7.94** | **5.34** |

## 34 Dividends

At the Board of Directors' Meeting of the Company held on 21 August 2017, the Board approved the appropriation of interim dividends from the earnings from 1 January 2017 to 30 June 2017 at Baht 1.75 per share. The dividend amounting to Baht 7,815 million was paid to the rightful shareholders in September 2017.

At the Annual General Meeting of the shareholders of the Company held on 5 April 2017, the shareholders approved the appropriation of annual dividend from 2016 performance at Baht 2.85 per share, amounting to Baht 12,713 million. The Company had paid an interim dividend of the first half year of 2016 at Baht 1.05 per share, amounting to Baht 4,683 million on 20 September 2016. The remaining dividend was paid for the second half year of 2016 at Baht 1.80 per share, amounting to Baht 8,029 million. The dividend was paid to the shareholders in April 2017.

At the Board of Directors' Meeting of the Company held on 22 August 2016, the Board approved the appropriation of interim dividends from the earnings from 1 January 2016 to 30 June 2016 at Baht 1.05 per share, amounting to Baht 4,683 million. The dividend amounting to Baht 4,683 million was paid to the rightful shareholders in September 2016.

At the Annual General Meeting of the shareholders of the Company held on 5 April 2016, the shareholders approved the appropriation of annual dividend from 2015 performance at Baht 2.80 per share, amounting to Baht 12,561 million. The Company had paid an interim dividend of the first half year of 2015 at Baht 1.50 per share, amounting to Baht 6,763 million on 22 September 2015. The remaining dividend was paid for the second half year of 2015 at Baht 1.30 per share, amounting to Baht 5,798 million. The dividend was paid to the shareholders in April 2016.

## 35 Financial instruments

***Financial risk management policies***

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligations by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

***Capital management***

The Company's Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor, partners and other stakeholders. In addition, the Board monitors the return on capital and the level of dividends to ensure business sustainability.

***Interest rate risk***

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because the Group's finances loans which have both floating and fixed interest rates for their operations. The Group has managed this risk to ensure the appropriateness to the business operation.

The effective interest rates of interest-bearing liabilities at 31 December 2017 and 2016 and the periods in which those liabilities mature or re-price were disclosed in note 18 to the financial statements.

***Foreign currency risk***

The Group is exposed to foreign currency risk relating to purchases, sales, and construction payment, including borrowings which are denominated in foreign currencies. The Group primarily utilises forward exchange contracts to hedge such financial assets and liabilities denominated in foreign currencies. The forward exchange contracts entered into at the reporting date also relate to anticipated purchases and sales, denominated in foreign currencies, for the subsequent period.

At 31 December, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***USD*** | | | | |
| Cash and cash equivalents | 13,744 | 8,615 | 11,048 | 6,940 |
| Trade accounts receivable | 10,473 | 8,423 | 7,928 | 7,059 |
| Other receivables | 293 | 602 | 246 | 449 |
| Value-added tax receivable | - | 3 | - | - |
| Long-term loans to related party | 6,665 | - | 6,665 | - |
| Long-term loans to other parties | 670 | 735 | - | - |
| Other investments | 4,129 | 9,271 | 4,129 | 9,271 |
| Interest-bearing liabilities | (36,212) | (40,529) | (34,687) | (38,725) |
| Trade accounts payable | (2,296) | (1,545) | (1,579) | (1,064) |
| Payable to contractors | (808) | (239) | (408) | (233) |
| Other payables | (2,856) | (2,767) | (2,268) | (2,144) |
| **Gross statement of financial position exposure** | **(6,198)** | **(17,431)** | **(8,926)** | **(18,447)** |
| **Currency forwards** | **6,621** | **(14,323)** | **(3,270)** | **(13,459)** |

The Group performs foreign currency risk management on assets and liabilities held in USD. The Group has net liabilities under USD currency. The Group manages net USD liabilities by naturally hedged USD portion of net profit to minimise the impact from fluctuations in foreign currency to the Group's performance.

In addition to forward exchange contracts, the Group uses derivatives financial instruments, principally currency swaps and interest rate swap, to manage exposure to fluctuations in interest rates and in exchange rates. As at 31 December 2017, the Group entered into interest rate swap contracts, totalling Baht 11 million *(2016: Baht 50 million)* to repay certain interest bearing liabilities in foreign currencies.

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***EUR*** | | | | |
| Cash and cash equivalents | 483 | 67 | - | - |
| Trade accounts receivable | 1,494 | 1,433 | - | - |
| Other receivables | 110 | 176 | 4 | 5 |
| Value-added tax receivable | 109 | - | - | - |
| Other investments | 283 | 283 | - | - |
| Interest-bearing liabilities | (6,529) | (5,020) | - | - |
| Trade accounts payable | (1,870) | (1,973) | - | - |
| Payable to contractors | (11) | (7) | (9) | (7) |
| Other payables | (550) | (608) | (59) | (62) |
| **Gross statement of financial position exposure** | **(6,481)** | **(5,649)** | **(64)** | **(64)** |
| **Currency forwards** | **18** | **139** | **-** | **-** |

| | Note | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|---|
| | | 2017 | 2016 (Restated) | 2017 | 2016 |
| | | *(in million Baht)* | | | |
| ***SGD*** | | | | | |
| Cash and cash equivalents | | 24 | 12 | - | - |
| Other payables | | (7) | (2) | (4) | (1) |
| **Gross statement of financial position exposure** | | **17** | **10** | **(4)** | **(1)** |
| **Currency forwards** | | **-** | - | **-** | **-** |
| ***JPY*** | | | | | |
| Trade accounts payable | | (1) | (1) | - | - |
| Payable to contractors | | (13) | (4) | (13) | (4) |
| Other payables | | (2) | (7) | (2) | (7) |
| **Gross statement of financial position exposure** | | **(16)** | **(12)** | **(15)** | **(11)** |
| **Currency forwards** | | **543** | - | **-** | **-** |
| ***Others*** | | | | | |
| Cash and cash equivalents | | 27 | 7 | - | 1 |
| Trade accounts receivable | | 175 | 304 | - | - |
| Other receivables | | 24 | 16 | - | - |
| Trade accounts payable | | (15) | (9) | - | - |
| Other payables | | (9) | (13) | (2) | (7) |
| **Gross statement of financial position exposure** | | **202** | **305** | **(2)** | **(6)** |
| **Currency forwards** | | **-** | **-** | **-** | **-** |

***Credit risk***

Credit risk is risk of failure from a customer or a counterparty to settle its obligations to the Group as and when they fall due.

Management has a policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. At the reporting date, there were no significant concentrations of credit risk. The maximum exposure to credit risk is represented by the carrying amount of each financial asset in the statement of financial position. However, the majority of the customers are on the long-term contracted commitment and parts of them are the Company's shareholders which the company has consistently collected from them. For the customers who do not have the long-term contracted commitments, the Group monitors the risk on an ongoing basis and would do the business only with the credible customers by limiting the credit lines and requesting the guarantee on some cases. For the export, the credit of counterparty will be considered. The Group will demand a payment on a case to case basis and also has commercial credit insurance. Management does not anticipate material losses from its debt collection.

***Liquidity risk***

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

***Carrying amount and fair values***

As at 31 December 2017 and 2016, fair values of financial assets and liabilities are taken to approximately the carrying value, except the following items:

| | Consolidated financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Carrying value | | | Fair value | | | |
| | Current | Non-current | Total | Level 1 | Level 2 | Level 3 | Total |
| | *(in million Baht)* | | | | | | |
| **31 December 2017** | | | | | | | |
| ***Financial assets*** | | | | | | | |
| Debt securities available-for-sale | 3,048 | 9,334 | 12,382 | - | 12,382 | - | 12,382 |
| Equity securities available-for-sale | - | 365 | 365 | 365 | - | - | 365 |
| Derivatives | 134 | 1 | 135 | - | 135 | - | 135 |
| ***Financial liabilities*** | | | | | | | |
| Debentures | - | 54,645 | 54,645 | - | 57,668 | - | 57,668 |
| Derivatives | 716 | - | 716 | - | 716 | - | 716 |
| **31 December 2016** | | | | | | | |
| ***Financial assets*** | | | | | | | |
| Debt securities available-for-sale | 1,924 | 5,313 | 7,237 | - | 7,237 | - | 7,237 |
| Derivatives | 58 | - | 58 | - | 58 | - | 58 |
| ***Financial liabilities*** | | | | | | | |
| Debentures | 2,799 | 47,786 | 50,585 | - | 53,083 | - | 53,083 |
| Derivatives | 167 | 24 | 191 | - | 191 | - | 191 |

| | Separate financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Carrying value | | | Fair value | | | |
| | Current | Non-current | Total | Level 1 | Level 2 | Level 3 | Total |
| | *(in million Baht)* | | | | | | |
| **31 December 2017** | | | | | | | |
| ***Financial assets*** | | | | | | | |
| Debt securities available-for-sale | 3,048 | 9,334 | 12,382 | - | 12,382 | - | 12,382 |
| Equity securities available-for-sale | - | 365 | 365 | 365 | - | - | 365 |
| Derivatives | 126 | 1 | 127 | - | 127 | - | 127 |
| ***Financial liabilities*** | | | | | | | |
| Debentures | - | 54,645 | 54,645 | - | 57,668 | - | 57,668 |
| Derivatives | 138 | - | 138 | - | 138 | - | 138 |

| | Separate financial statements | | | | | | |
|---|---|---|---|---|---|---|---|
| | Carrying value | | | Fair value | | | |
| | Current | Non-current | Total | Level 1 | Level 2 | Level 3 | Total |
| | *(in million Baht)* | | | | | | |
| **31 December 2016** | | | | | | | |
| ***Financial assets*** | | | | | | | |
| Debt securities available-for-sale | 1,924 | 5,313 | 7,237 | - | 7,237 | - | 7,237 |
| Derivatives | 53 | - | 53 | - | 53 | - | 53 |
| ***Financial liabilities*** | | | | | | | |
| Debentures | 2,799 | 47,786 | 50,585 | - | 53,083 | - | 53,083 |
| Derivatives | 155 | 24 | 179 | - | 179 | - | 179 |

Level 2 fair values for debt instrument are based on the yield rate quoted by the Thai Bond Market Association or other markets and for simple over-the-counter derivative financial instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate.

## 36 Commitments with non-related parties

| | Consolidated financial statements | | Separate financial statements | |
|---|---|---|---|---|
| | 2017 | 2016 (Restated) | 2017 | 2016 |
| | *(in million Baht)* | | | |
| ***Capital commitments*** | | | | |
| *Contracted but not provided for* | | | | |
| Land | 3 | 2 | 3 | 2 |
| Plant, machinery and equipment | 24,663 | 4,213 | 2,273 | 3,686 |
| Buildings | 25 | 39 | 23 | 39 |
| Others | 910 | 713 | 439 | 713 |
| **Total** | **25,601** | **4,967** | **2,738** | **4,440** |
| ***Non-cancellable operating lease commitments*** | | | | |
| Within one year | 180 | 177 | 116 | 113 |
| After one year but within five years | 884 | 889 | 657 | 657 |
| After five years | 2,542 | 2,623 | 2,236 | 2,353 |
| **Total** | **3,606** | **3,689** | **3,009** | **3,123** |
| ***Other commitments*** | | | | |
| Unused letters of credits | 94 | 353 | - | - |
| Bank guarantees | 2,627 | 2,756 | 323 | 1,001 |
| Guarantees for credit facilities and bank guarantees | 8,419 | 8,307 | 8,419 | 8,306 |
| Other agreements | 9,700 | 10,212 | 9,358 | 9,719 |
| **Total** | **20,840** | **21,628** | **18,100** | **19,026** |

## 37 Litigation

### (a) Purchase and sales of raw materials agreement legal case

On 3 December 2009, a company filed for arbitration against PTT Plc. ("PTT") and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 13,805 million. On 8 March 2010, the dispute was thrown out of the case-list by the arbitration ruling that the Company was not a party to the contract.

On 27 August 2010, the said company filed a civil suit against PTT and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 9,380 million. In this regards, the Company filed objections against the indictment with the civil court on the basis that the Company was not a party to the contract.

On 21 May 2013, the Civil Court considered that the arbitration process between such company and PTT has not yet finalised; therefore, they have temporarily thrown out of the case-list until the final decision has been reached under arbitration process. Then, either party or both parties can resubmit the case to the Civil Court for the further trail.

Subsequently, on 25 March 2016, the arbitration has reached a conclusion for PTT to compensate the damages in some amount. Currently, this case is under consideration of Civil Court as per the petition of PTT requesting to withdraw award of arbitrator. The Company believes that the outcome of the consideration will not result in any liability to the Company, and therefore, has not provided against any loss that may result from this matter in the financial statements.

### (b) Oil spill incident legal case

During the 3rd quarter of 2014, the number of people in Rayong filed several lawsuits with the Civil Court and Rayong Provincial Court against the Company to claim the extra compensation from oil spill incident and to perform the rehabilitation of the sea and natural environmental recovery. Some cases have been dismissed and some cases have been passed a judgement by the Civil Court on 25 August 2016 ordered the Company to compensate for damages including interest and rehabilitation, of approximately Baht 11.26 million. The Company has appealed on 17 February 2017. Nevertheless, there are remaining cases that are still on trial by Rayong Provincial Court, in which the Company believes that the outcome of the consideration will not result in material damage and material financial impact to the Company. Therefore, the Company has not provided against any loss that may result from this matter in the financial statements.

## 38 Events after the reporting period

Solution Creation Co., Ltd. ("Sol C") which is a subsidiary of the Company has processed for payments of paid-up capital totaling USD 500,000 in January 2018 to TPBI & Myanmar Star Company Limited ("TPBIMS") under the shareholders agreement made by Sol C, TPBI International Company Limited, and Myanmar Star Group Company Limited on 17 August 2017. TPBIMS is established with the objective to expand the polymer market in the Republic of the Union of Myanmar.

PTT Polymer Marketing Co., Ltd. ("PTTPM") which is a subsidiary of the Company has established a subsidiary company Polymer Marketing Vietnam Company Limited ("PM Vietnam") on 1 November 2017 and processed for the capital paid-up on 24 January 2018 with the amount of USD 200,000. PM Vietnam is 100% owned by PTTPM. PM Vietnam is established with the objective to support the trading business on import and export, and distribution of Polymers products in Socialist Republic of Vietnam.

At the Board of Directors' meeting held on 19 February 2018, the Board approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2017 dividend payment at the rate of Baht 4.25 per share, of which Baht 1.75 per share was paid as an interim dividend in September 2017 as discussed in note 34. Thus, the remaining dividend will be at the rate of Baht 2.50 per share to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on 9 April 2018.

# AUDIT FEE AND NON-AUDIT FEE

## 1. AUDIT FEE

PTTGC and its subsidiaries paid the audit fee to:

- KPMG Phoomchai Audit Limited, which is the auditor of PTTGC and its subsidiaries for the fiscal year of 2017 amounting to THB 8,055,000 and USD 5,000. Of this amount PTTGC paid THB 3,300,000 and its subsidiaries paid THB 4,755,000 and USD 5,000.
- The audit company that the auditor worked for, including persons or entities that are related to the auditors and the audit company for the fiscal year of 2017 amounting to SGD 25,400, EUR 397,150 and USD 241,100.

## 2. NON-AUDIT FEE

PTTGC and its subsidiaries paid the non-audit fee for tax compliance and tax consulting services, and other audits by agreed-upon procedures to:

- KPMG Phoomchai Audit Limited, which is the auditor of PTTGC and its subsidiaries for the fiscal year of 2017 amounting to THB 1,760,000.
- The audit company that the auditor worked for, including persons or entities that are related to the auditors and the audit company for the fiscal year of 2017 amounting to THB 6,156,910, EUR 64,630 and USD 91,394; plus for incomplete services in the fiscal year of 2017 that will be paid for a total of THB 570,000.



# APPENDIX



# COMPANY INFORMATION

| | | |
|---|---|---|
| **NAME** | : | PTT Global Chemical Public Company Limited |
| **INITIAL** | : | PTTGC |
| **WEBSITE** | : | www.pttgcgroup.com |
| **REGISTERED NUMBER** | : | 0107554000267 |
| **NUMBER AND VALUE OF ISSUED SHARES** | : | As at December 31st, 2017, the Company's registered share capital was Baht 45,088,491,170 made up of 4,508,849,117 common shares at a par value of Baht 10 per share. Paid-up capital was Baht 45,088,491,170 |
| **ESTABLISHMENT** | : | October 19th, 2011 |
| **FIRST DAY TRADE ON THE SET** | | October 21st, 2011 |

**BUSINESS STRUCTURE AND VALUE CHAIN**

| | | | | |
|---|---|---|---|---|
| : | Group Performance Center - Refinery & Shared Facilities | : | Green Chemical Business Unit |
| : | Group Performance Center - Aromatics | : | Phenol Business Unit |
| : | Group Performance Center - Olefins | : | Performance Materials and Chemicals |
| : | Polymer Business Unit | | |
| : | EO - Based Performance Business Unit | : | Services & Others |

| | | |
|---|---|---|
| **NUMBER OF EMPLOYEES** | : | 6,334 as of December 31st, 2017 |

## CONTACT


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Email: ir@pttgcgroup.com

**Corporate Governance & Secretarial**

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Email: cg@pttgcgroup.com

**Head Office**

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Tel: 66(0) 2 265-8400
Fax: 66(0) 2 265-8500

**Branch 1: Rayong Office**

59 Ratniyom Road, Noen-Phra Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3899-4111

**Branch 2: Olefins I-1**

14, I-1 Road, Map Ta Phut Industrial Estate, Map Ta Phut Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3899-4111

**Branch 3: Olefins I-4**

9, I-4 Road, Map Ta Phut Industrial Estate, Map Ta Phut Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3899-4111

**Branch 4: Aromatics I**

4, I-2 Road, , Map Ta Phut Industrial Estate, Map Ta Phut Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3897-1000
Fax: 66(0) 3899-4111

**Branch 5: Aromatics II**

98/9 Rayong Highway Road 3191, RIL Industrial Estate, Map Ta Phut Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3897-1000
Fax: 66(0) 3899-4111

**Branch 6: Refinery**

8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut Sub-District, Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3897-1000
Fax: 66(0) 3899-4111

**Branch 7: Jetty and Buffer Tank Farm**

19 Rong-Pui Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3899-4111

**Branch 8: Aromatics Tank Farm**

11, I-4 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66(0) 3897-1000
Fax: 66(0) 3899-4111

**Branch 9: Laboratory Service Center**

24/9 Pakorn Songkrorat Road, Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3899-411

**Branch 10: PTTGC 10**

555/1 Energy Complex, Building A, 3rd, 10th Floor
Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900
Tel: 66(0) 2 265-8400
Fax: 66(0) 2 265-8500

**Branch 11: Olefins III**

8, Padaeng Road, Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3897-6205

**Branch 12: Polyethylene**

8, I-10 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66(0) 3899-4000
Fax: 66(0) 3897-6977

**Branch 13: InnoPlus Solution Center**

83/9-10, Moo 5, Tub-ma Sub-District,
Muang Rayong District, Rayong Province 21000
Tel: 66(0) 3899-4526
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## REFERENCES

**Securities Registrar**

**Thailand Securities Depository Company Limited**
93 Rachadapisek Road, Dindaeng, Dindaeng,
Bangkok 10400
Tel: 66(0) 2009-9000 Call center : 66(0) 2009-9999
Fax: 66(0) 2009-9991 www.set.or.th/tsd

**Registrar and Debenture Holders Representative**

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1222 Rama III Road, Bang Phongphang,
Yan Nawa, Bangkok 10120
Tel: 66(0) 2296-3582,5557 Fax: 66(0) 2683-1298
www.krungsri.com

**Registrar Services**

**The Siam Commercial Bank Public Company Limited**
**Registrar Services 1, Markets Operations Division**
Building 2, 3rd Fl., 1060 New Phetchburi Road,
Mukkasun, Ratchathewi, Bangkok 10400
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Fax: 66(0) 2256-2406

**Global Transaction Services Division Corporate Trust**
7th Fl. Zone A, 9 Ratchadapisek Road,
Chatuchak, Bangkok 10900
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**US$ Bond Registrar**

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39th Floor, Citibank Tower,
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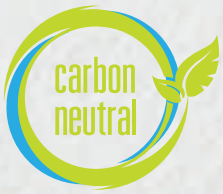
# TECHNICAL TERMS & ABBREVIATIONS

| Technical Terms & Abbreviations | |
|---|---|
| Acrylonitrile (AN) | AN is used as material for many applications such as Acrylic fiber (for clothes, carpet, blanket, carbon fiber), Automotive part and electric appliances. |
| Aromatics | A group of unsaturated cyclic hydrocarbons containing one or more benzene rings of six carbon atoms. They are highly reactive and chemically versatile. The group name is derived from the strong and not unpleasant odor characteristic of most chemicals in this family. |
| Bio-based Polybutylene Succinate (Bio-PBS) | Bio-PBS is a bio-based material which is made from Bio-succinic acid and 1,4-Butanediol. It can be used in many applications such as paper coating, compound-injection, and flexible packaging. |
| Bis Phenol A (BPA) | BPA is an intermediate product produced from acetone and phenol used to produce polycarbonate and epoxy resins. |
| Butadiene | Butadiene is an intermediate in 4 carbon atoms family, used in the making of synthetic rubber. It is also used extensively in the production of plastics. |
| Butene -1 | Butene-1 is an organic chemical base, derived from cracking of petroleum or C4 distillate, and used mainly to produce butadiene and butanol. |
| Carotenoid | Carotenoid is used as a colorant in food for human consumption and as constituents in vitamins and dietary supplements. |
| EO Base Performance Product | EO Based is Ethylene Oxide derivatives such as Ethylene Oxide, Ethylene Glycol, Ethanolamine Product and Ethoxylate. |
| Ethanolamine (EA) | EA include Monoethanolamine, Diethanolamine and Triethanolamine. Ethanolamine are used as sweeteners, detergent and specialty cleaner formulations, flexible urethane foam catalysts, and pharmaceuticals. |
| Ethoxylate | Ethoxylate is produced from Ethylene Oxide and is often processed to be used as a foaming control agent in soap and detergent. |
| Ethylene | Ethylene is an essential organic chemical base derived from the thermal cracking of Ethane and Naphtha or from dehydration of Ethanol. It is used to produce many organic chemical intermediates, such as Polyethylene, Ethylene Oxide, Ethylene Glycol, Vinyl Chloride, Styrene, Acetaldehyde and Ethanol. |
| Ethylene Glycol (EG) | EG is produced from Ethylene (ethene), via the intermediate Ethylene Oxide. Ethylene Oxide reacts with water to produce Ethylene Glycol. On purpose product is Monoethylene Glycol and major byproducts are the Ethylene Glycol Oligomers Diethylene Glycol and Triethylene Glycol. |
| Ethylene Oxide (EO) | EO is a highly reactive chemical intermediate used in the production of Ethylene Glycol and other Oxide derivatives such as Glycol Ethers, Polyethylene Glycol, Polyether Polyols, Diethylene and Triethylene Glycols, and Ethanolamine. |
| Fatty Alcohol | Fatty alcohol is produced from Methyl Ester and Hydrogen (Hydrogenation). Fatty alcohol may be used in personal care product. |
| Glycerin | Glycerin is a by-product from Methyl Ester production. Glycerin may be used in pharmaceutical, food, and personal care products. |

| Technical Terms & Abbreviations | |
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| Hexamethylene Diisocyanate (HDI) | HDI is an intermediary chemical used in the production of polyurethane. |
| High Density Polyethylene (HDPE) | Produced from Ethylene, HDPE is an inexpensive, flexible, durable and Chemical-resistant. One of the major uses of HDPE are in blow-molding applications, such as bottles for milk and non-carbonated drinks, fuel tanks for automobiles and containers of household and industrial chemicals. HDPE is also used for films and pipes. |
| Hydrocracking | Hydrocracking is an oil refinery process that makes use of hydrogen. The process may be used for producing gasoline, jet fuels and high-quality lubricating oils. It may also convert distillation residues into lighter oils. |
| Linear Low Density Polyethylene (LLDPE) | LLDPE is a type of Polyethylene and has basic properties similar to LDPE. LDPE and LLDPE are certain extent substitutable product for each other. |
| Low Density Polyethylene (LDPE) | LDPE is a type of Polyethylene used for thin films, tubes, mechanical parts, toys and electric wire insulation. |
| Methyl Amines | Methyl Amines derivatives have beneficial uses in many industries, including water treatment, gas and oil treatment, animal nutrient, agricultural chemicals and personal care products. |
| Methyl Ester | Methyl Ester are oleochemicals derived from vegetable feedstock, such as palm-kernel oils. Methyl Ester may be used in the esterification reaction for biodiesel resources. |
| Methyl Methacrylate (MMA) | MMA is an intermediate product for Poly Methyl Methacrylate (PMMA) which is used for light guide panel in LCD screen, car tail light and electric appliances part, Acrylic sheet used for advertisement/ sign board, sanitary, furniture, decorating items. MMA also used as a raw material of many products such as paint, and coating resin. |
| Mixed C4s | Mixed C4s are the colorless gases produced from naphtha crackers. It may be used in as a raw material for the production of Butadiene and Butane-1. |
| Mixed Xylenes | Mixed Xylenes are the mixture containing xylenes such as Orthoxylene, Metaxylene and Paraxylene and are used in the production of solvents and high value downstream product. |
| Mono Ethylene Glycol (MEG) | MEG is an organic chemical compound derived from the oxidation of Ethylene. It is produced by the reaction of Ethylene Oxide and water. MEG is mainly used for Polyester and anti-freeze production. |
| Naphtha | Naphtha is a general term used for low boiling hydrocarbon fractions that is a product of crude oil or condensate splitter. |
| Olefins | Olefins are straight or branched-chain hydrocarbon with at least one unsaturated carbon-carbon bond. Produced by cracking feedstock from raw materials such as natural gas and light naphtha. The main Olefins are Ethylene and Propylene and also include Butadiene, and C4 derivatives. |
| Oleochemicals | Oleochemicals are bio-based and environmentally friendly chemicals derived from plants and animal fats, which have similar functions as petrochemicals derived from petroleum. |
| O-Xylene or Orthoxylene (OX) | An Aromatic compound used in the manufacture of plasticizers and unsaturated polyester. |
| Polymers | When certain individual molecules (Monomers) come together and link up in a chain-like fashion, they form a Polymer. The chemical reaction that forms a Polymer is called polymerization. |

| Technical Terms & Abbreviations | |
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| Polypropylene | Polypropylene is a thermoplastic polymer used in a wide variety of applications such as packaging and labeling, textiles, plastic parts. Polypropylene is made from propylene. |
| Polyethylene Terephthalate (PET) | PET is made by the combination of Ethylene Glycol and Terephthalic acid. Typical end uses for PET are packaging and fibers. |
| Polyurethane (PU) | PU is a Polymer composed of a chain of organic units joined by urethane links. |
| Polyvinyl Chloride (PVC) | PVC is a versatile thermoplastic polymer produced from Vinyl Chloride Monomer (VCM). It is extensively used in the construction sector for a variety of applications including pipes, siding and window/door profiles, wire and cable insulation, rigid film/sheet and flooring. |
| Propylene | Propylene is a flammable gas which is largely derived either as a co-product of the refinery FCC process used to make gasoline or as a co-product of the steam cracking process used to make Ethylene. Propylene has virtually no independent end use, but is an important input for a significant number of industrial products, and is the main feedstock used to make Polypropylene and Acrylonitrile. |
| P-xylene or Paraxylene (PX) | PX is an Aromatic Hydrocarbon in the form of a colorless, flammable liquid that is recovered from mixed Xylenes streams by adsorption and by Isomerization of Aromatics. It is an upstream raw material for PTA and DMT, which are used for production of downstream Polyester fiber and Polyethylene Terephthalate. |
| Pyrolysis Gasoline | Pyrolysis Gasoline is a naphtha-range product with a high aromatics content used in the production of Benzene, Toluene and Mixed Xylenes and as a motor vehicle gas blending stock. |
| Toluene | Toluene is an Aromatic Hydrocarbon used as an octane enhancer in gasoline, as a chemical intermediate in the production of Benzene, Paraxylene, toluene diisocyanate and as a solvent in paints. |
| Toluene Diisocyanate (TDI) | TDI is an intermediary chemical used in the production of polyurethane. |
| Vinyl Chloride Monomer (VCM) | VCM is a hydrocarbon compound which is used as a reactant for PVC production. VCM is gas, colorless, and sweet smell. |




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