

Risk Management and Risk Factors

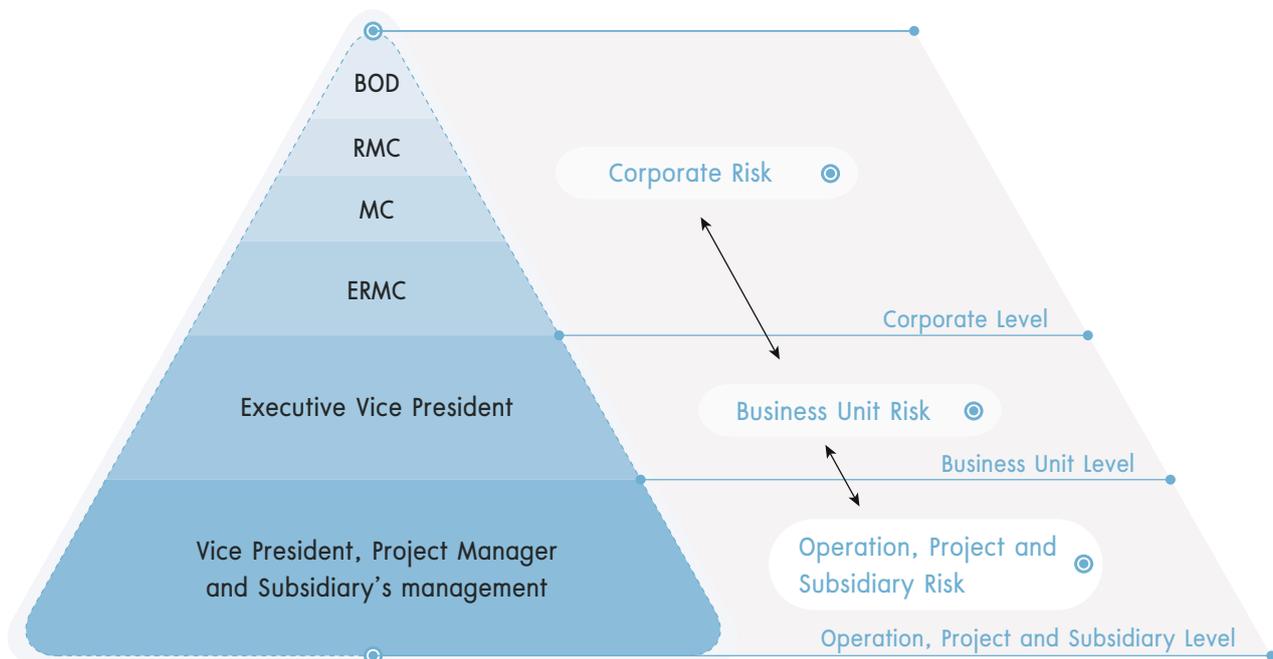
Risk Management

PTT Global Chemical Public Company Limited (PTTGC) places great importance on risk management and has incessantly strived for continual improvements for which we have applied the international risk management standard from the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and ISO 31000 of the International Organization for Standardization. Risk management is in place to manage possible adverse uncertainties against the Company's goals, to reduce the likelihood or potential loss from arising, and/or to attain business opportunities.

PTTGC's risk management structure is divided into three levels: corporate level, functional or business unit level,

and operation or subsidiary level. The Risk Management Committee (RMC), which is comprised of the Board members appointed by the Board of Directors, shall prescribe risk management policy and framework as well as monitor, review and provide recommendations on risk management. In 2015, PTTGC additionally established the Enterprise Risk Management Committee (ERMC), which is comprised of Executives, to closely monitor risk management on monthly basis.

Additionally, the Value Chain Management Committee (VCM), comprised of Executives from relevant functions, has been established to closely monitor the market situation on a weekly basis to manage feedstock, product price volatility and foreign exchange rate fluctuation under the risk management framework approved by the RMC.



Corporate Risk Management Framework

PTTGC has analyzed various uncertainties arisen from both internal and external factors, which may negatively impact (risk) or positively impact (opportunity) on our short and long-term business operation and investment. PTTGC identifies such risks and manages them on a holistic and integrated basis throughout the organization. The risk management tools,

such as risk maps, mitigation plans, and key risk indicators (KRI), are applied to corporate level, functional or business unit level, and important investment projects. PTTGC employs the Monte Carlo simulation technique known as Value at Risk (VaR) to assess the potential financial impact upon volatility of key risk factors. Furthermore, should external uncertainties

may occur in any way during the year, PTTGC has put an early warning system (EWS) in place to proactively monitor and manage risks.

To ensure sustainable growth, PTTGC has striven a risk culture throughout 2015 at all levels. It was driven by the following components:

- The Board of Directors and Executives have placed highly importance on the subject of risk management by establishing the risk management frameworks and guidelines, as well as continuously and closely monitoring the progress of risk management.
- Roles, duties, and responsibilities have been clearly and concretely assigned to all related parties.
- PTTGC has embedded understanding of risk management at all levels, from the Board of Directors, Executives and operational levels. Additionally, risk management has been included in PTTGC's training curriculum.
- PTTGC has developed an E-Learning program and a monthly newsletter to promote risk management awareness as well as getting involvement from employees in risk management activities.

In 2015, PTTGC was placed among the top 10 global chemical companies in three consecutive years by the Dow Jones Sustainability Indices (DJSI), selected from over 3,000 leading companies around the world. PTTGC received 99 points from 100 points for the crisis and risk management section, demonstrating that the Company's standards for crisis and risk management are internationally acclaimed.

Risk Factors

There are some factors that may influence PTTGC performance and investment including the industry characteristic, the world economy slowdown situation, demand and supply

imbalance in feedstock and product, volatility of petroleum and petrochemicals prices, and geopolitics.

However, during the preparation of this report, other risks which are beyond PTTGC's capacity to foresee may occur. It may also be possible that a risk previously deemed insignificant or "within a risk appetite" may escalate. These may have a significant impact on PTTGC's or its subsidiaries' business goals, investments, and strategies.

Foreseeable risks that could hinder PTTGC from achieving its business goals, investments, and/or strategies in 2016 are listed below.

Price Risk

PTTGC's main feedstock and products are commodity products dependent on global prices. Currently, the crude oil price, main feedstock cost, still continues to be volatile in 2016 and results in petroleum and petrochemical products pricing. As such, price risk could have a high impact on PTTGC's performance either positively or negatively.

Mitigation Measures:

The following are measures that PTTGC has put forth to closely and continuously mitigate its price risk.

- PTTGC uses a sales-and-purchase agreement to transfer price risk from feedstock to products.
- PTTGC has an integrated supply chain management system to ensure PTTGC's positive performance under existing business limitations and conditions.
- PTTGC applies derivatives and/or advance sales-and-purchase agreements to protect itself from the risk of feedstock and product prices under the policy and framework approved by the RMC.

The aforementioned measures are under close supervision by the Value Chain Management Committee (VCM). PTTGC believes that these measures would minimize impact to an acceptable level (risk appetite) on par with 2015.

Long-Term Feedstock Risk

PTTGC relies on natural gas and condensate from the Gulf of Thailand as feedstock. In the long run, the Gulf's natural gas reserve is expected to decline. Meanwhile, legal and regulatory changes may also affect the existing price structure, leading to less competitiveness. These are the uncertainties that PTTGC is aware of, and has put in place the following measures:

Mitigation Measures:

To reduce the effect of this uncontrollable risk factor, PTTGC has further developed its production process to support alternative feedstocks, for example Naphtha feedstock which currently has a lower price, and to build the Company's resilience to handle such a situation. In addition, PTTGC has studied the possibility of importing and using alternative feedstock from other economically viable sources. These are beforehand measures that ensure the readiness of PTTGC to cope with long-term feedstock situation and to maintain PTTGC's competitiveness.

Operational and Safety Risk

As most of PTTGC's businesses are production-based, PTTGC has always placed precedence on operations and safety to ensure that its plants will be able to run continuously and effectively, as well as with the utmost safety. The operational and safety risk can stem from internal and external factors that cannot be foreseen, for example accidents, machine breakdown, and logistic problems etc.

Mitigation Measures:

In addition to the production standard of PTTGC which is in general practice in every plant, there are other measures:

- PTTGC has strengthened its production via the Operational Excellence Management System (OEMS), focusing on reliability and integrity of machinery and other production-related equipment. The OEMS requires that all equipment is systematically tested and maintained by using the same standards throughout the organization. Additionally, PTTGC analyzes and improves a Cash Operating Cost plan to ensure that the Company's

operating cost is competitive with peers in the same industry (benchmarking).

- PTTGC, in recognition of the importance of safety, security, health, and environment (SSHE), has laid down policies and guidelines that are implemented throughout the organization. It also promotes safety awareness among all employees and contractors and encourages them to be more attentive aware of safety in all operation areas through the B-CAREs culture. Furthermore, PTTGC has implemented Process Safety Management (PSM) to enhance safety in production processes.
- PTTGC applies Business Continuity Management (BCM) practices to events that are very low in the probability of occurrence but could have severe effects on the Company if they were to occur. The BCM will help shorten recovery time and/or reduce impact from such events.
- PTTGC has a policy to hold an All Risks Insurance Policy, Business Interruption Policy, and a Third Party Liability Insurance Policy in order to lower the financial loss to the Company and its subsidiaries to an acceptable level in the event of an accident actualizes.

These measures serve as testaments to PTTGC's emphasis on and our readiness to manage the operational and safety risks.

Water Management Risk

In 2015, severe drought greatly affected Thailand as a result of climate change. There was a lack of water in many parts of the country. An effective water management for all is vital. Despite not having been affected, PTTGC cannot rest assured that water shortage will not be a problem in future. Therefore, PTTGC has prepared the mitigation measures to ensure of our precautionary readiness.

Mitigation Measures:

PTTGC's strategy is to use water effectively through both reduction and reuse of water. PTTGC has already prepared a reserve of water supply in addition to closely monitor the government's water management.

-  The 3R's (reduce, reuse, and recycle) project has been applied to manage water, emphasizing the reduction of water consumption to a suitable level by improving the production (reduce), reusing water to curb reliance on outside water sources (reuse), and treating water to recirculate it back into the production process (recycle). This project will reduce PTTGC's reliance on outside water sources in overall.
-  PTTGC utilizes water supplies from the Seawater Reverse Osmosis plant (SWRO) and the Company's reservoir.
-  PTTGC collaborates with government agencies to support and drive government projects related to prevention and mitigation of overall drought problems, especially on finding additional sources and diverting water from the available sources.
-  A water management working team to oversee sustainable water management has been established. It comprises representatives from related functions to concretely set up measures to prevent water shortage.

As such, PTTGC is confident in its preparedness to handle drought situations and will be even better equipped when all the measures are put in place.

Foreign Exchange Rate Risk

The fluctuation of foreign exchange rate is a major financial risk to PTTGC. Since most of PTTGC's feedstock costs, revenue, and foreign debts are linked to the US Dollar, the fluctuation in exchange rate always affects PTTGC's financial performance, which are reported in the Thai currency.

Mitigation Measures:

To mitigate the effects of foreign exchange rate fluctuations, PTTGC manages this risk, both revenue and foreign debts in US currency, by selling US Dollars forward, together with ensuring that the debts in US currency remains at an appropriate portion by using financial instruments such as forward contract or cross currency swap (CCS). These measures are implemented under the framework mandated by the RMC and supervised by the VCM to

ensure that the impact from foreign exchange rate is within an acceptable level.

Investment Risk

To achieve the business growth target, investment to expand and maintain competitiveness of the Company is vital. To fulfill this goal, PTTGC has expanded its production base to new regions, where there is feedstock advantage, such as the US petrochemical complex project. PTTGC has also taken up new ventures, including its expansion into the green business and downstream business like Propylene Oxide/ Polyols project. PTTGC is consistently looking for investment opportunities.

The successful investment will favor long-term growth. However, in the meantime, countless uncertainties may arise. These could be both risks and opportunities. PTTGC has put in place measures to ensure that the Company's investments achieve the target.

Mitigation Measures:

Investment is a business opportunity in which time is crucial in order to achieve benefit for PTTGC and lead to long-term growth. PTTGC has the following measures to manage investment risks.

-  To evaluate investment projects, PTTGC has implemented a Stage Gate process which covers opportunity seeking, feasibility study, and obtaining approval from the Board of Directors. In each step, Executives and experts in charge provide recommendations including its conformity to PTTGC's growth strategies, returns on investment in accordance with Company guidelines, and investment risk management.
-  Risks associated with overseas investment tend to be higher than in the domestic arena; around the end of 2015, PTTGC has established a new business function known as International Business Operations (IBO) to oversee all foreign businesses of the Company. In the target country, PTTGC's expert, who understands the local business context and market competition, will be PTTGC's representative to foster good relations with the local community government and related agencies.

- PTTGC has further put in place an additional process, the scrutiny from the RMC, for the high capital investment projects. The RMC considers the sufficiency of risk assessment and risk management plan prior to proposing to the Board level. The RMC also regularly monitors the progress of risk management as demanded.

- For the completed projects, there is process to collect the lessons learned as well as reasonable caution and will be shared across all related functions to ensure of success in future projects.

The aforementioned measures shall ensure that PTTGC will be able to manage investments effectively and achieve the long-term growth targets as planned.

Innovation Risk

PTTGC is dedicated to research & development (R&D), and innovation, which are key components in augmenting the Company's strength and competitiveness. Innovation also enables PTTGC to consistently grow with sustainability. PTTGC focuses on product development to meet customer expectation and on process innovation to increase its efficiency and productivity. In the past year, PTTGC has developed new products to create further added value, as well as taken part in investments that will provide access to technologies and uplifting its capability.

Mitigation Measures:

The following are measures that will allow PTTGC to grow steadily and sustainably through works of research, development, and innovation.

- Considering the crucial factor toward the successful research, PTTGC has come up with competency development guidelines to enhance the potential and readiness for researchers and employees in Research & Development function.

- To retain personnel with expertise, PTTGC offers a recognition and incentives program comparable to international standards in the Sciences and Innovation occupation.

- Inter-organizational employee exchange program with Joint Venture (JV) companies allows knowledge transfer to PTTGC's research and development function.

- PTTGC has organized an International Innovation Advisory Board (IIAB) conference, comprising leading experts in the field of research and development from educational institutes and the industrial sector. They gave their opinions and suggestions toward the Company's R&D, and innovation plans to ensure that PTTGC is going in the right direction.

- Innovation Stage Gate Process, in accordance with international standards, has been set up to effectively consider PTTGC's innovation projects starting from the feasibility study, lab scale, pilot scale, and commercial scale. These processes will ensure that the benefits of innovative projects be attained as stipulated in the business plan.

- PTTGC enforces a breakthrough innovation by seeking new technologies. Investing in innovation can be done through acquisitions which in turn creates networks in both foreign and domestic companies, and integration/synergy with a joint venture company will deliver technology transfer to enhance PTTGC's capability.

These measures will strengthen PTTGC's potential in R&D, which in turn shall lead to a strong and sustainable business growth for the Company.

