Assurance Statement related to GHG Report 2016
prepared for
PTT Global Chemical Public Company Limited

Terms of Engagement
This Assurance Statement has been prepared for PTT Global Chemical Public Company Limited.

Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by PTT Global Chemical Public Company Limited (PTTGC) (555/1 Energy Complex, Building A, 14-18 Floor, Vibhavadi Rangsit Road Chatuchak, Bangkok 10900, Thailand) to assure its GHG Report for the calendar year 2016, (hereafter referred to as “the Report”).

The Report relates to direct GHG emissions and energy indirect GHG emissions and other indirect GHG emissions as summarized in Table 1 below.

The GHG emissions associated with the operations and the facilities located outside Thailand and where PTTGC has no operational control were excluded from the Report.

Management Responsibility
PTTGC’s management was responsible for preparing the Report and for maintaining effective internal controls over the data and information disclosed. LRQA’s responsibility was to carry out an assurance engagement on the Report in accordance with our contract with PTTGC.

Ultimately, the Report has been approved by, and remains the responsibility of PTTGC.

LRQA’s Approach
Our verification has been conducted in accordance with ISO 14064–3:2006, ‘Specification with guidance for validation and verification of greenhouse gas assertions’ to provide limited assurance that GHG data as presented in the Report have been prepared in conformance with ISO 14064–1:2006, ‘Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals’.

To form our conclusions the assurance engagement was undertaken as a sampling exercise and covered the following activities:

- conducted site visits to the corporate office at Rayong and its operations at PTTGC Branch 3 (Olefins plant), PTTGC Branch 4 & 5 (Aromatics plants) and PTTGC Branch 6 (Refinery plant);
- interviewed key personnel responsible for the management of GHG emissions data and information and for the preparation of the GHG Inventory at the above sites;
- reviewed processes for the management of GHG emissions data and information included in the GHG Inventory for all the above sites and conducted offsite review of the data for other indirect GHG emissions;
- sampled datasets and traced data back to aggregated levels to cover the GHG emissions data as summarised in Table 1;
- verified the historical GHG emissions data and records for the calendar year 2016; and
- verified the recalculation of the 2012 base year emissions to account for changes in the quantification methodologies that has further improved the data accuracy.

Level of Assurance & Materiality
The opinion expressed in this Assurance Statement has been formed on the basis of a limited level of assurance and at a materiality of the professional judgment of the Verifier.
LRQA’s Opinion
Based on LRQA’s approach nothing has come to our attention that would cause us to believe that the total direct GHG emissions and energy indirect GHG emissions and other indirect GHG emissions disclosed in the Report as summarized in Table 1 below are not materially correct and that the Report has not been prepared in conformance ISO 14064–1:2006.

LRQA’s Recommendations
PTTGC should:
• handover the ownership of GHG Inventory to facility-level management and maintain an effective internal verification program throughout all its branches and subsidiaries; and
• consider performing data uncertainty assessment and achieving a reasonable level assurance as described in the standard; this will further demonstrate its continuous efforts for supporting the Thailand’s GHG voluntary emission trading programme.

Signed

Dated: 30 April 2017

Opart Charuratana
LRQA Lead Verifier
On behalf of Lloyd’s Register International (Thailand) Ltd.
22th Floor, Sirinrat Building, 3388/78 Rama IV Road
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LRQA Reference: BGK6051248
Table 1. Summary of PTTGC, GHG Report 2016

<table>
<thead>
<tr>
<th>Scope of GHG emissions</th>
<th>CY2012 01 Jan - 31 December 2012 (as recalculated base year)</th>
<th>CY2016 01 Jan - 31 Dec 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct GHG emissions (Scope 1)</td>
<td>5,387,217</td>
<td>5,572,047</td>
</tr>
<tr>
<td>Energy indirect GHG emissions (Scope 2, Location-based)</td>
<td>1,848,350</td>
<td>1,639,845</td>
</tr>
<tr>
<td>Energy indirect GHG emissions (Scope 2, Market-based)</td>
<td>6,283</td>
<td>8,080</td>
</tr>
<tr>
<td>Other indirect GHG emissions (Scope 3)</td>
<td>2,501,841</td>
<td>10,539,077</td>
</tr>
<tr>
<td>Direct GHG Emissions (Scope 1) from combustion of biomass</td>
<td>52</td>
<td>93</td>
</tr>
</tbody>
</table>

Notes:
- Data is presented in tonnes of CO₂ equivalent except for the GHG emissions from combustion of biomass which is in tonnes of CO₂ only.
- Recalculation of the 2012 base year GHG emissions was done to account for changes in the quantification methodologies.
- Scope 3 emissions include those associated with the purchased goods and service (water withdrawal), capital goods (emissions of main raw material), upstream transportation and distribution (main raw material pipeline transportation), waste generated in operations (end-of-life industrial waste treatment by landfill and incineration), business travel (employee air travel), downstream transportation and distribution (polymer products), processing of sold products (polymer products), end-of-life treatment of sold product (polymer products), use of sold product (jet A1 fuel and biodiesel -B100).

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