

**Assurance Statement related to Greenhouse Gas Report 2019  
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 (GC) (555/1 Energy Complex, Building A, 14-18 Floor, Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900, Thailand) to assure its *Greenhouse Gas (GHG) Report for the calendar year 2019*, (hereafter referred to as "the Report").

The Report relates to direct GHG emissions, 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 GC has no operational control were excluded from the Report.

**Management Responsibility**

GC'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 GC.

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

**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 GC's Branch 2 (Olefins and Utilities plants), Branch 3 (Olefins plant), Branch 4 (Aromatics plant), Branch 6 (Refinery plant), Branch 11 (Olefins plant), TTT (Thai Tank Terminal), GGC (Global Green Chemicals), PTTAC (PTT Asahi Chemical) and GC-M PTA; and reviewed processes related to control of GHG emissions data and records.
- interviewed key personnel responsible for the management of GHG emissions data & records and for the preparation of the GHG Inventory at the above sites;
- conducted offsite review of the GHG emissions 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 2019; 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.



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### **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, 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**

GC should further:

- encouraging stewardship of GHG program and deploying science-based targets to facility-level management while ensuring effective internal verification programs across its branches and subsidiaries;
- improving reliability and accuracy of GHG inventory reporting from VOC combustion facilities.

Signed

Dated: 12 May 2020

A handwritten signature in black ink, appearing to read 'Opart Charuratana'.

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: BGK00000495



**Table 1. Summary of GC, GHG Report 2019**

<b>Scope of GHG emissions</b>	<b>CY 2012</b> 01 Jan - 31 Dec 2012 (as recalculated base year)	<b>CY 2019</b> 01 Jan - 31 Dec 2019
Direct GHG emissions (Scope 1)	5,758,161	6,097,554
Energy indirect GHG emissions (Scope 2, Market-based)	2,909,830	2,394,662
Energy indirect GHG emissions (Scope 2, Location-based)	27,993	13,267
Other indirect GHG emissions (Scope 3)	2,872,135	11,025,112
Direct GHG Emissions (Scope 1) from combustion of biomass	52	143
<p>Notes:</p> <ul style="list-style-type: none"> <li>• Data is presented in tonnes of CO<sub>2</sub> equivalent except for the GHG emissions from combustion of biomass which is in tonnes of CO<sub>2</sub> only.</li> <li>• Recalculation of the 2012 base year GHG emissions was done to account for changes in the quantification methodologies and addition of operational control boundary to GC-M PTA and TRPC</li> <li>• Scope 3 emissions include those associated with the purchased goods and service (emissions of main raw material), capital goods (water withdrawal), upstream transportation and distribution (main raw material pipeline transportation and electric power transmission and distribution losses), waste generated in operations (end-of-life industrial waste treatment by landfill, incineration and wastewater treatment), 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), and use of sold product (jet A1 fuel and biodiesel-B100).</li> </ul>		

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