



LRQA Group Independent Assurance Statement

Relating to Petrolim Nasional Berhad (PETRONAS) Greenhouse Gas (GHG) emissions for calendar years 2019, 2020, 2021 & 2022

This Assurance Statement has been prepared for Petrolim Nasional Berhad (PETRONAS) in accordance with our contract.

Terms of Engagement

LRQA INSPECTION MALAYSIA SDN. BHD. (LRQA) was commissioned by Petrolim Nasional Berhad (PETRONAS) to provide independent assurance of its greenhouse gas (GHG) emissions inventory in the PETRONAS Integrated Report 2022 ("the Report") for the calendar years 2019 through 2022 against the assurance criteria below to a limited level of assurance and materiality of the professional judgement of the verifier using LRQA's verification procedure that is in accordance with ISO 14064 - Part 3 for greenhouse gas emissions.

Our assurance engagement covered PETRONAS' entities related to its upstream, gas and downstream businesses and covered all operations globally that are under PETRONAS' Operational Control (refer Annex A). Our assurance engagement excludes PETRONAS' KLCC (Property) and MISC (Shipping) businesses. Our engagement specifically covered the following:

- Verifying conformance of the selected datasets with:
 - PETRONAS Technical Standard, PTS 18.72.05 Greenhouse Gas Emissions Management, Oct 2021.
 - World Resources Institute / World Business Council for Sustainable Development Greenhouse Gas Protocol: A corporate accounting and reporting standard, revised edition 2004 (otherwise referred to as the WRI/WBCSD GHG Protocol) for the GHG data¹.
- Reviewing whether the Report has taken account of:
 - The Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry issued by American Petroleum Institute (API), 2021².
 - The Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions, 2nd Edition, 2011 issued by IPIECA³, API and the IOGP⁴.
- Evaluating the accuracy and reliability of data and information for only the selected emission scopes listed below:
 - Direct (Scope 1) and Energy Indirect (Scope 2) expressed in tonnes CO₂e.

Our assurance engagement excluded the data and information of PETRONAS suppliers, contractors and any third-parties mentioned in the report.

LRQA's responsibility is only to PETRONAS. LRQA disclaims any liability or responsibility to others as explained in the end footnote. PETRONAS' responsibility is for collecting, aggregating, analysing and presenting all the data and information within the Report and for maintaining effective internal controls over the systems from which the Report is derived. Ultimately, the Report has been approved by, and remains the responsibility of PETRONAS.

¹<https://www.ghgprotocol.org/>

² <https://www.api.org/>

³ issued by the International Petroleum Industry Environmental Conservation Association (IPIECA), <https://www.ipieca.org/>

⁴ International Association of Oil & Gas Producers



LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that PETRONAS has not, in all material respects:

- Met the requirements of the criteria listed above; and
- Disclosed accurate and reliable performance data and information as summarized in Table 1.

The opinion expressed is formed on the basis of a limited level of assurance⁵ and at the materiality of the professional judgement of the verifier.

Table 1. Summary of PETRONAS GHG Emissions data for Scope 1 and Scope 2 emissions:

Scope	2019 (tCO ₂ e)	2020 (tCO ₂ e)	2021 (tCO ₂ e)	2022 (tCO ₂ e)
Scope 1 emissions	55,483,325	49,754,798	46,416,850	48,878,033
Scope 2 emissions (Location based)	1,012,636	912,693	712,219	695,805

LRQA's Approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks were undertaken as part of the evidence gathering process for this assurance engagement:

- Conducting GHG data verification through interaction with key personnel from sampled operating units from businesses as under:
 - Upstream – Remote audits at PMA, SKA and onsite at INO
 - Gas -Onsite audits at PLC MLNG, GPS, UK
 - Downstream – Remote audits at PCMSB, PETCO, PPTSB, PCARO and onsite audit at PRPC
- Reviewing processes related to the control of GHG emissions data and records;
- Interviewing relevant employees of the organization responsible for managing GHG emissions data and records at the operating unit level and corporate level; and
- Assessing PETRONAS data management systems and tools (SANGA and GCON) to confirm they are designed to prevent significant errors, omissions or mis-statements in the Report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal quality control.
- Verifying historical GHG emissions data and records at an aggregated level for the calendar years 2019 (base year), 2020, 2021 and 2022.

Observations

Further observations and findings, made during the assurance engagement, are:

- Various sites use either a design value or monthly analyses of fuel compositions in calculation of GHG emissions which introduces an error that is non-material.

Recommendations

- PETRONAS ought to move to online use of composition of fuels combusted in line with industry practice for calculation of its GHG Emissions.
- PETRONAS should consider reporting emissions due to exported electricity.

⁵ The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.



LRQA's Standards, Competence and Independence

LRQA implements and maintains a comprehensive management system that meets accreditation requirements for ISO 14065 *Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition* and ISO/IEC 17021 *Conformity audit – Requirements for bodies providing audit and certification of management systems* that are at least as demanding as the requirements of the International Standard on Quality Control and comply with the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants.

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification audits is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

We have conducted gap analyses to PETRONAS for their methodology of reporting GHG emissions under equity share and GHG emissions from sold products. The verification audits are the only work undertaken by LRQA for PETRONAS and as such does not compromise our independence or impartiality.

Signed

Dated: 15 March 2024

A handwritten signature in black ink, appearing to read 'K. Deshmukh', is written over a horizontal line.

Ketan Deshmukh

LRQA GROUP LIMITED Lead Verifier

On behalf of LRQA INSPECTION MALAYSIA SDN. BHD., Level 25, Naza Tower, Platinum Park, No.10, Persiaran KLCC, 50088 Kuala Lumpur

LRQA GROUP LIMITED reference: KLR00000809

LRQA GROUP LIMITED its affiliates and subsidiaries, and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'LRQA'. LRQA GROUP LIMITED assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant LRQA GROUP LIMITED entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

The English version of this Assurance Statement is the only valid version. LRQA GROUP LIMITED assumes no responsibility for versions translated into other languages.

This Assurance Statement is only valid when published with the Report to which it refers. It may only be reproduced in its entirety.

Copyright © LRQA, 2024.

Annex A

List of Operating Units

Business Unit	Abbreviation	Asset Entity	Remarks
UPSTREAM	SKO	SARAWAK OIL	Sarawak Asset known as SKO and SKG for 2019-2021 and merged as SKA in 2022
	SKG	SARAWAK GAS	
	SKA	SARAWAK ASSET	
	PMA	PENINSULAR MALAYSIA ASSET	
	SBA	SABAH ASSET	
	IO	IRAQ OPERATION	Iraq-Garaaf operated under the development and production service contract
	TO	TURKMENISTAN OPERATION	
	CAN	CANADA OPERATION	
	VOB	VESTIGO OPERATED BLOCK	
	INA	INDONESIA OPERATION	
DOWNSTREAM	ABFSB	ASEAN BINTULU FERTILIZER	
	PCARO	PETRONAS CHEMICAL AROMATICS SDN BHD	
	PDB (PNGV)	PETRONAS DAGANGAN BERHAD PETRONAS NATURAL GAS VEHICLE	Includes PNGV
	PCASB	PETRONAS CHEMICAL AMMONIA SDN BHD	PCASB and PCLDPE have merged to PCLA in 2022
	PCLDPE	PETRONAS CHEMICAL LDPE SDN BHD	
	PCLA	PETRONAS CHEMICAL LDPE AND AMMONIA	
	PCESB	PETRONAS CHEMICAL ETHYLENE SDN BHD	
	PCFKSB	PETRONAS CHEMICAL FERTILIZER KEDAH SDN BHD	
	PCFSSB	PETRONAS CHEMICAL FERTILIZER SABAH SDN BHD	
	PCMSB	PETRONAS CHEMICAL METHANOL SDN BHD	
	PCMTBE	PETRONAS CHEMICAL MTBE SDN BHD	
	PCOGD BUT	PETRONAS CHEMICAL OLEFIN GLYCOLS DERIVATIVES - Butane	
	PCOGD DER	PETRONAS CHEMICAL OLEFIN GLYCOLS DERIVATIVES - Derivatives	
	PCOGD GLY	PETRONAS CHEMICAL OLEFIN GLYCOLS DERIVATIVES - Glycol	
	PCOGD OLE	PETRONAS CHEMICAL OLEFIN GLYCOLS DERIVATIVES-Olefin	

Business Unit	Abbreviation	Asset Entity	Remarks
	PCOGD UTL	PETRONAS CHEMICAL OLEFIN GLYCOLS DERIVATIVES-Utilities	
	PCPSB	PETRONAS CHEMICAL POLYETHYLENE SDN BHD	
	ENGEN	ENGEN LIMITED	
	MRCSB	MALAYSIA REFINERY COMPANY SDN BHD	
	PLISB	PETRONAS LUBRICANTS INTERNATIONAL SDN BHD	
	PPTSB	PETRONAS PENAPISAN TERENGGANU SDN BHD	
	PETCO	PETRONAS TRADING CORPORATION SDN BHD	
	PRPC	PETRONAS REFINERY AND PETROCHEMICAL CORPORATION	Includes PRPC UF (PRPC UTILITIES AND FACILITIES SDN BHD) and PAMER (PROJEK AIR MENTAH RAPID)
GAS	GPK	GAS PROCESSING KERTEH	
	GPS	GAS PROCESSING SANTONG	
	GT	GAS TRANSMISSION	
	PFLNG1	PETRONAS FLOATING LIQUIFIED NATURAL GAS 1	
	PLC	PETRONAS LNG Complex	Reported as MALAYSIA LIQUIFIED NATURAL GAS (MLNG)
	PFLNG2	PETRONAS FLOATING LIQUIFIED NATURAL GAS 2	
	RGTP	REGASIFICATION TERMINAL Pengerang	
	RGTSU	REGASIFICATION TERMINAL SUNGAI UDANG	
	TSET	TANJUNG SULONG EXPORT TERMINAL	
	UG	UTILITIES GEBENG	
	UK	UTILITIES KERTEH	