



METHANE
GUIDING
PRINCIPLES

Methane Guiding Principles Signatory

PETRONAS
2024



Company: PETRONAS

Year of Joining Methane Guiding Principles: March 2020

Senior Representative: Charlotte Wolff-Bye, Vice President and Chief Sustainability Officer, PETRONAS

Principle One: Continually reduce methane emissions

- Please state what specific activities or projects your company has undertaken to reduce methane emissions. Please refer to the previous year’s annual MGP reporting where applicable to refer to intended activity. Link to sustainability report where relevant to provide further detail.
- Describe how the reduction was achieved including description of the asset type, technology type, timeframe. What was the end result?
- Provide data to support your description e.g. the actual amount of emissions reduction achieved, or the reduction in methane intensity.

2023 completed activity	2024 intended activity
<p>In 2023, PETRONAS completed three flare and one vent reduction projects in Upstream Business in Malaysia, together amounting to 0.06 Mil tCO₂e methane emissions reduction.</p> <ul style="list-style-type: none"> • Flare reduction: Kinabalu platform, Bintulu Integrated Facilities, Sabah Oil and Gas Terminal • Vent reduction: Dulang platform <p>PETRONAS Integrated Report and Financial Report 2022 (page 171)</p> <p>In strengthening our focus on methane emissions reduction efforts, we are improving our quantification methods and reporting for PETRONAS operated facilities, in alignment with our signatory membership to the United Nations Environment Programme (UNEP)’s Oil and Gas Methane Partnership 2.0 (OGMP2.0) Reporting Framework. OGMP2.0 is a multi-stakeholder initiative launched by UNEP and the Climate and Clean Air Coalition. It is designed to provide a comprehensive, measurement-based reporting framework that improves accuracy and transparency of methane emissions reporting in the oil and gas sector.</p> <p>These methane emissions reduction activities align with our Net Zero Carbon Emissions by 2050 pathway, which includes methane emissions reduction targets for 2025 and 2030.</p>	<p>In 2024, PETRONAS plans to continue with our planned vent and flare reduction initiatives (e.g. Temana vent to flare conversion and energy efficiency projects in Upstream. In addition, continuous reliability and integrity activities to eliminate unplanned flaring and venting for Upstream and Gas facilities are planned via so called Key Results Area (KRA) programs. KRA refers to implementation of promising technologies highlighted through PETRONAS’ Race2Decarb open innovation challenge in 2023 are also planned, among other things: valve stem sealant to prevent fugitive leaks.</p> <p>PETRONAS plans to continue strengthening our efforts on methane emissions reduction through improvement in quantification methods and reporting in alignment to the OGMP2.0 reporting framework. This improved quantification will enable greater abatement focusing on material methane emissions sources.</p> <p>Planned projects under the PETRONAS – JOGMEC MoC such as Level 5 Quantification and Reconciliation as well as Feasibility Study on Routine Flaring elimination at identified offshore facilities will be executed.</p>

Principle Two:

Advance strong performance across the gas supply chain

Please include answers to the following questions:

1. Did you participate in any methane research or plan to do so?
2. Did you conduct any outreach on methane management?
 - Describe what action you have taken to engage industry players across the value chain to better understand how to achieve robust methane emissions management. Outreach activity could include training sessions, participation in webinars, influencing of NOJV partners, or publication of guidance. Activity could also include commercial incentives or engagement with investors to drive better performance by others.
 - Provide details of any outcomes that resulted from your action.

2023 completed activity	2024 intended activity
<p>In 2023, PETRONAS in collaboration with ASEAN energy operators, government agencies, and international organisations, launched the ASEAN Energy Sector Methane Leadership Program (MLP). The programme was launched at the Methane High-Level session, on 26 June 2030, during the Energy Asia conference, in the Kuala Lumpur.</p> <p>The ASEAN Energy Sector MLP, an 18-month initiative, delivered through masterclasses and workshops, focuses on capacity and capability building to strengthen ASEAN energy companies' plans, targets, and financing options for reducing methane emissions. The MLP partners constitute several stakeholders with common goals; ASEAN Centre of Energy (ACE), ASEAN Council on Petroleum (ASCOPE), Environmental Defense Fund (EDF), Japan Organization for Metals and Energy Security (JOGMEC), Methane Guiding Principles (MGP), PERTAMINA, PETRONAS, PTTEP, The World Bank, United Nations Environment Programme International Methane Emissions Observatory (UNEP IMEO), United States Agency for International Development (USAID), United States Department of Energy and United States Trade and Development Agency (USTDA).</p> <p>The effort is in support of Global Methane Pledge that 150 countries have signed up to. The MLP provides a platform for the ASEAN oil and gas industry to demonstrate practical action and signal commitment to reducing methane emissions; create awareness for</p>	<p>In 2024, PETRONAS plans to continue the ASEAN Energy Sector Methane Leadership Program, by delivering masterclasses and workshops towards completing the 18-month program by the end of 2024.</p> <p>PETRONAS plans to continue exploring collaboration opportunities with ASEAN and global partners on methane abatement efforts towards supporting the Global Methane Pledge.</p> <p>PETRONAS will also continue to provide technical support on behalf of Government of Malaysia for the Methane MMRV initiative.</p> <p>PETRONAS will also be participating in the IOGP Methane Expert Group to support the proposed Oil and Gas Decarbonization Alliance (OGDA).</p>

a sustainable change; inspire others to act and encourage greater accountability from all stakeholders.

Under the MLP, the following programs was executed in 2023:

- Technical Workshop on ASEAN Deep Dive on Methane Emissions Management, co-hosted by PETRONAS, USAID and EDF was held from 27 to 28 June, in conjunction with Energy Asia 2023.
- Masterclass on Methane Emissions Management co-hosted by PETRONAS and USAID was held from 15 – 16 Nov 2023 in Johor Bahru, in conjunction with the United Nations Framework Convention on Climate Change (UNFCCC) Asia Pacific Climate Week (APWC) 2023.

PETRONAS continues to leverage on existing partnerships between the Malaysia's Production Sharing Contract (PSC) contractors to enhance knowledge sharing on methane measurement technologies for improved methane emissions management for Malaysia operations, especially in alignment with the Methane Guiding Principles and the United Nations Environment Programme Oil & Gas Methane Partnership 2.0 (UNEP OGMP 2.0).

PETRONAS is a contributing member to the technical working group for the Methane Measurement, Monitoring, Reporting and Verification (MMRV) Framework, established under the global initiative of United States Department of Energy (US DOE). The collaboration aims to identify key elements of the MMRV framework that would enable credible certification of methane, carbon dioxide and other GHG emissions across the international supply chain for natural gas.

On 3 March 2023, PETRONAS signed a Memorandum of Cooperation (MoC) with Japan Organization for Metals and Energy Security (JOGMEC) to cooperate on energy transition initiatives towards achieving common energy transition and decarbonisation targets. The initiatives include potential collaboration on green/blue hydrogen and fuel ammonia development, carbon capture and storage (CCS), as well as greenhouse gas (GHG) emissions management.



On 26 June 2023, under the MoC, PETRONAS and JOGMEC announced collaboration on methane abatement flagship projects, covering methane quantification surveys, viable solutions towards achieving zero routine flaring, and potential future collaboration on an electrification hub. These projects are in support of the increased demand for stable supply of low carbon energy to Japan, Malaysia's commitment to the Global Methane Pledge and are aligned with PETRONAS' commitments to the World Bank's Zero Routine Flaring initiative by 2030 and UNEP Oil & Gas Methane Partnership (OGMP 2.0).

PETRONAS also supports methane research projects by universities funded by EDF, including on: Methane Policy in Malaysia and Marginal Abatement Cost (MAC) curve development for Upstream Malaysia.

Principle Three: Improve accuracy of methane emissions data

- Describe action taken to improve methane emissions data collection methodologies. This could be application of new technology at an operated site(s), investment and participation in R&D initiatives, development of monitoring/modelling software, or support to research that improves the accuracy of the quantification of methane emissions.
- Where new technology /software has been piloted or adopted, it is helpful to describe how it works, the reasons it was selected, and how it was deployed. Any data that can be shared to demonstrate improvements is useful.
- How these new methods/technologies has been adopted into your accounting process if at all.

2023 completed activity	2024 intended activity
<p>In 2023, we submitted PETRONAS’ first report to UNEP’s OGMP2.0 Reporting Framework, along with a five (5) year implementation plan towards achieving OGMP2.0 Gold Standard. PETRONAS received the Gold Standard Pathway for the 2022 reporting year in August 2023.</p> <p>As part of the operationalisation of PETRONAS’ methane emissions internal standard and guideline and our continued efforts to improve methane measurement accuracy, PETRONAS explored several measurement technologies in 2023, which include: Light Detection and Ranging (LiDAR), Quantitative Optical Gas Image (QOGI) and Systematic Observations of Facility Intermittent Emissions (SOOFIE).</p> <p>The use of QOGI has been adopted in upstream operations in conducting Leak, Detection and Repair (LDAR) exercises where the measurements will support methane emissions reporting for fugitive emissions, compressor seals as well as any releases from tanks.</p> <p>PETRONAS also initiated piloting of methane quantification technologies combining physical sensors with Cloud-Based system to provide better insights on our methane emission profile.</p> <p>PETRONAS continues to implement enhancement of methane emissions quantification for our operated and non-operated facilities in Malaysia. In 2023, the focus was on the ongoing Level 4 (source level measurements) activities for our material assets at Upstream and Gas Business.</p>	<p>PETRONAS plans to continue our efforts on improving the accuracy of our methane emissions data and reporting as part of PETRONAS’ OGMP2.0 implementation plan.</p> <p>PETRONAS plans to conduct OGMP2.0 Level 5 (site level measurement and reconciliation works) on a representative sample of our material assets.</p> <p>Planned projects under the PETRONAS – JOGMEC MoC such as Level 5 Quantification and Reconciliation as well as Feasibility Study on Routine Flaring elimination at identified Offshore facilities will be executed.</p>

Principle Four:

Advocate sound policy and regulations on methane emissions

Advocacy consists of active participation in legal consultation processes, external policy statements, and direct engagement with government

- Consider providing details on the region or regulation involved, how you undertook your advocacy, others involved, and the outcome.

2023 completed activity	2024 intended activity
<p>PETRONAS continues to lead methane advocacy in Malaysia as the designated regulator for oil and gas Upstream operations and has spearheaded collaboration efforts on methane emissions management advocacy and engagement in the ASEAN region.</p> <p>PETRONAS hosted the fourth ASEAN Energy Sector Methane Roundtable on 27 June 2023, in conjunction with Energy Asia 2023 in Kuala Lumpur, Malaysia. The fourth roundtable was organized in partnership with United States Agency for International Development (USAID) Smart Power Program (SPP), ASEAN Centre for Energy (ACE), alongside Thailand’s PTT Exploration and Production (PTTEP) and Indonesia’s PERTAMINA. The event focused on effective regulation for ASEAN methane emission reduction, driving internal change and financing methane emissions reduction projects.</p> <p>PETRONAS hosted the fifth ASEAN Energy Sector Methane Roundtable virtually, as part of the 48th ASCOPE Council Meeting, held on 22 November 2023. The discussion was focused on ASEAN methane emission reduction aspirations within the context of COP28 and driving actions through collaboration and partnerships among ASCOPE members.</p> <p>The ASEAN Energy Sector Methane Roundtable has convened five times since October 2021, with the express aim of driving improved emissions performance by the oil and gas sector in the ASEAN region. It is a 5-year program, with two roundtables each year.</p> <p>PETRONAS through Malaysia Petroleum Management (MPM) as the host authority of Malaysia’s upstream activities, continued to enforce</p>	<p>PETRONAS plans to continue hosting the ASEAN Energy Sector Methane Roundtable in 2024 to promote capacity building and technical knowledge sharing for improved performance and transparency in reporting, aligned with internationally recognised frameworks and standards. Consideration will be given to invite a broader cross section of government agencies.</p>

and monitor methane emissions measurements, quantifications, and reporting by all Production Sharing Contractors (PSC) operating in Upstream Malaysia operations. Through this enforcement, the reported numbers for methane emissions by Upstream Malaysia operations are of similar level of accuracy, which informed further methane emissions reduction efforts.

Throughout 2023, PETRONAS advocates for strengthened methane emissions management globally through our speaking engagements during Achieving Energy Security Through Diversification by Eurocham Malaysia in Kuala Lumpur, Global Methane Initiative (GMI) subcommittee meeting virtually, Global Methane Summit 2023 in Houston, Loss Prevention Asia in Kuala Lumpur and Conference of Parties 28 (COP28) in Dubai.

Participated in development of "Academic Research Promoting Transparency, Public Engagement, and Progress of Methane Emissions in Malaysia" Policy Brief led by University of Malaya.

Principle Five: Increase transparency

Please include answers to the following question:

1. Are you participating in OGMP 2.0 or do you intend to do so? If you are participating in OGMP 2.0 you may provide a link to the website.
 - Describe what activity you have carried out e.g. providing information in relevant external reports on methane emissions data, methodologies, and progress and challenges in methane emissions management.
 - If you have contributed towards the standardisation of comparable external methane reporting describe the activity you have taken.

2023 completed activity	2024 intended activity
<p>PETRONAS has been a signatory member to the OGMP2.0 framework since November 2022. In 2023, PETRONAS submitted the first report aligned with UNEP OGMP2.0 Reporting Framework, along with a five (5) year implementation plan towards achieving OGMP2.0 Gold Standard. PETRONAS has received the Gold Standard Pathway for the 2022 reporting year in August 2023.</p> <p>PETRONAS disclosed its methane emissions and reduction efforts in our PETRONAS Integrated Report (PIR) 2022.</p> <p>PETRONAS is a contributing member to the technical working group for the Methane Measurement, Monitoring, Reporting and Verification (MMRV) Framework, established under the global initiative of United States Department of Energy (US DOE). The collaboration aims to identify key elements of the MMRV framework that would enable credible certification of methane, carbon dioxide and other GHG emissions across the international supply chain for natural gas.</p>	<p>In 2024, PETRONAS plans to continue our disclosure in accordance with the OGMP2.0 reporting framework requirements.</p> <p>PETRONAS plans to continue publishing methane emissions and reduction efforts in our PETRONAS integrated report 2023.</p> <p>PETRONAS will also continue to provide technical support on behalf of Government of Malaysia for the Methane MMRV initiative.</p>

Methane Emissions

<p>Do you report absolute methane emissions within your sustainability report?</p> <p><i>If so provide link.</i></p>	<p>Yes / No</p> <p>PETRONAS Integrated Report and Financial Report 2022</p>
<p>Do you report a methane intensity within your sustainability report?</p> <p><i>If so provide link.</i></p>	<p>Yes / No</p>
<p>What are your organisation's total absolute methane emissions?</p> <p>Provide a figure in tonnes.</p> <p>Provide latest data publicly available.</p>	<p>199.97 thousand tonnes of methane emission in 2022 for PETRONAS' natural gas value chain (under operational control in Malaysia and International).</p> <p>PETRONAS Integrated Report and Financial Report 2022 (page 173)</p>
<p>State your methodology.</p>	<p>2022 methane emissions data are based on reported numbers from flaring, venting, and combustion sources, primarily measured using flowmeters (Level 4 measurement accuracy according to OGMP2.0). The other eight (8) sources were based on engineering calculations (Level 3 measurement accuracy according to OGMP2.0).</p>
<p>State your reporting boundary.</p>	<p>2022 methane emissions represents PETRONAS' natural gas value chain (under operational control in Malaysia and International).</p>
<p>What are your organisation's methane intensity?</p> <p>Provide latest data publicly available.</p>	<p>Currently not disclosed</p>
<p>State your methodology.</p>	<p>Currently not disclosed</p>
<p>State your reporting boundary.</p>	<p>Currently not disclosed</p>
<p>Do you have a methane emission target?</p> <p>If yes, please state what it is, including the boundaries and methodology.</p>	<p>Yes.</p> <p>The methane emissions reduction targets are as follows:</p> <ul style="list-style-type: none"> • Short-term target: 50% reduction of methane emissions by 2025 for PETRONAS Groupwide natural gas value chain from 2019 baseline • Mid-term targets: <ul style="list-style-type: none"> ➢ 50% reduction in absolute methane emissions by 2030 for Malaysia's Natural Gas Value Chain from 2019 baseline in support of Malaysia's Global Methane Pledge;



<p>If no, are you developing such a target? Please state your intended timeline.</p>	<p>➤ 70% reduction in absolute methane emissions by 2030 for PETRONAS Groupwide natural gas value chain from 2019 levels.</p> <p>The targets are based on operational control approach in accordance with GHG Protocol.</p>
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