

# Pertamina methane abatement: a bond proposal

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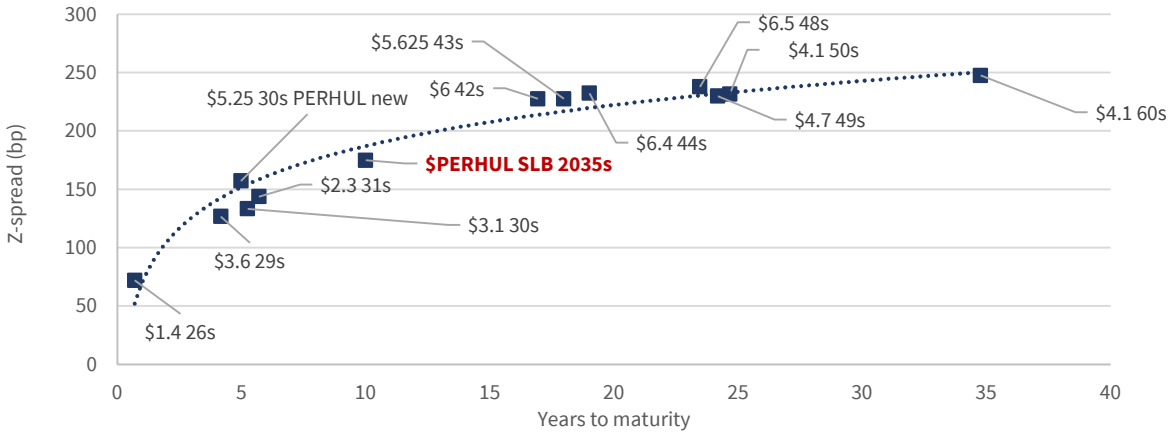
Pertamina Hulu Energi (PERHUL) issued maiden USD1bn 5yr bonds (US74449AAA97) on May 14. The company is a subsidiary of PT Pertamina, Indonesia's state-owned oil and natural gas corporation (PERTIJ), which is itself a frequent issuer to the debt capital markets. The new bonds qualify for inclusion in the JP Morgan Emerging Market Bond Index (EMBI).

**Pertamina is critical to meeting Indonesia's growing demand for energy. It is also positioning to be a leader in the country on climate commitments. The path to fulfilling this ambition runs through its approach to methane emissions. Methane abatement is highly feasible for Pertamina and should be the first step on its climate transition journey. A sustainability-linked bond (SLB) tied to methane abatement targets would allow investors to actively engage with Pertamina's transition journey, while clearly signalling the company's intent to align with global climate goals. To this end, we propose a USD10yr performance-linked structure for PERHUL.**

This paper analyses PERTIJ and PERHUL's approach to net zero, focusing on its methane emissions reduction strategy. In late 2024, Pertamina announced a five-year plan to reduce these emissions by 40% relative to a 2021 baseline. While the timeline is short, this goal can be achieved through operational improvements, technology adoption, and collaboration with partners in the industry.

Pertamina's current strategy is to expand oil and gas production to meet Indonesia's immediate energy needs while building out low carbon and renewables programs. This has the potential to complicate its methane-cutting ambitions. A performance-linked financial structure for methane abatement could set Pertamina on course for alignment with the Paris Agreement. Should Pertamina be successful in this initial stage, we would expect scaling of their low carbon renewable energy strategy over time, which could replace the need to expand oil and gas production.

*Figure 1. Bond curve for Pertamina (US$) and PERHUL 2030, and hypothetical PERHUL SLB 2035 traditional bond. Source: Bloomberg, accessed 30 May 2025*




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## Indonesia and Pertamina emission targets

Pertamina Hulu Energi is 99.99968% owned by PT Pertamina, a National Oil Company (NOC), which in turn is wholly owned by PT Biro Klasifikasi Indonesia. The latter is the operational holding company of Danantara, Indonesia's newly established sovereign wealth fund. The Government of Indonesia retains direct control of PT Pertamina through its ownership of 'golden shares' in the company.

PERHUL is the upstream oil and gas exploration unit of Pertamina, and the largest in Indonesia by all measures. Energy consumption in Indonesia is forecast to increase 44% by 2050, according to Rystad Energy,[1] and the country is targeting 1 million bbl/d production by 2030, up from a 2025 rate of 600,000 bbl/d. Given its existing oil fields are either maturing or declining, with a proven reserves replacement ratio at 7.7 years, Pertamina Hulu has plans to boost its development by exploring new greenfield projects.[2] Indonesia, Pertamina, and Pertamina Hulu's net zero strategies are shown in Table 1.

*Table 1. Net zero strategy for Indonesia, Pertamina and Pertamina Hulu Energi. Source: Climate Action Tracker, Pertamina, Pertamina Hulu Energi*

| Target | Indonesia | | Pertamina | | Pertamina Hulu | |
|---|---|---|---|---|---|---|
| | Goal | Year | Goal | Year | Goal | Year |
| Net Zero Emissions | 0 emissions | 2060 | 0 emissions | 2060 | 0 emissions | 2060 |
| Emission targets | 32% reduction against 2030 BAU (Unconditional)/ up to 43% against 2030 BAU with foreign aid | 2030 | | | | |
| Scope 1&2 GHG emissions | NA | | 23%: 2025/ 32%: 2030 | 2025/ 2030 | 23%: 2025/ 32%: 2030 | 2025/ 2030 |
| Methane emissions reduction | 30% | 2030 | 40% | 2030 | 40%/ (Baseline 90K tons) | 2030 |
| Zero routine flaring | | | 0% | 2030 | 0% | 2030 |
| Capex/ ESG & low carbon projects | | | 15.3%: 2029/ 29%: 2040 | 2029/ 2040 | | |
| Scope 3 emissions reduction | NA | | No targets | | No targets | |

According to Climate Action Tracker, the Indonesian government's policy projections and climate targets paint a complex and contradictory picture. In August 2024, Indonesia issued a draft of its SNDC (Second Nationally Determined Contribution) for public consultation using updated 2030 targets and 2035 climate goals. The targets have been challenged, pointing toward the reliance on conditional pathways, which delay significant decarbonisation until after peak emissions are reached in 2035. From that point on, Indonesia would have to achieve very steep reductions to reach net zero by 2060.[3]

Pertamina's and Pertamina Hulu's net zero strategies reveal their intention to achieve net zero for Scope 1 & 2 emissions by 2060. However, there is no target for Scope 3 emissions, something common among NOCs. While Pertamina provides some emissions disclosure in its 2023

[1] PT Pertamina Hulu Energi Offering Memorandum dated May 5, 2025, pg. 2.
[2] PT Pertamina Hulu Energi Offering Memorandum dated May 5, 2025, pg. 37.
[3] "CAT Climate Target Update Tracker Indonesia", Climate Action Tracker, 10 Dec 2024.

Sustainability Report, there is no substantial information to confirm that its plans align with a Paris Agreement-aligned scenario.[4]

Pertamina and its upstream subsidiary are both focused on reducing methane emissions by 40% in 2030. Methane abatement is critical to net zero goals due to its outsized short term climate impact. It also has potential to be cost-effective for the companies, making it an attractive starting point.

In Nov 2024, President Subianto announced ambitious plans for Indonesia's energy transition, including a pledge to retire all fossil fuel- and coal-powered plants in 15 years and achieve net zero by 2050.[5] However, the current policy and regulatory framework is not aligned with these targets, indicating that significant additional efforts will be required. Achieving these goals may demand stronger policy coordination and increased efforts to attract foreign investment.

## Why focus on methane abatement?

Methane is a potent greenhouse gas, with a global warming potential that is 82.5 times greater than $CO_2$ over a 20yr period. In the ASEAN region, 0.32 million tonnes of methane — equivalent to about 9 $MtCO_2$ — were emitted by the oil and gas industry in 2023. Indonesia accounted for half of these emissions, with onshore oil and gas operations in Sumatra responsible for half of Indonesia's total.[6] Without intervention, methane emissions from Southeast Asia's energy sector could quadruple by 2050.

**The upstream oil and gas sector is critical to the mitigation of the region's methane emissions**. Methane abatement is the low-hanging fruit of the climate transition for oil and gas and can be inexpensive to achieve. Addressing methane in the short term also buys companies and countries time to implement longer time transition strategies.

There are four ways in which the oil and gas industry emits emissions. One, through direct release via venting or fugitive emissions; two, through the use of fuels to power machinery and drilling equipment; three, through flaring; and four, through direct venting of the $CO_2$ present in recovered gases.[7] Oil developers often burn or vent the natural gas that is released during the exploration process unless it makes economic sense to capture it, (i.e., there is sufficient infrastructure to transport the gas). Inefficient or defective flaring equipment causes methane to be released directly into the atmosphere. These fugitive emissions are difficult to track and are often under reported. To reduce these emissions, oil companies like Pertamina first have to detect and quantify the leaks before replacing the defective equipment and investing in new technologies that can recover the gas.

### Indonesia methane regulation and policy

In Indonesia, the Minister of Energy and Mineral Resources (MEMR) has regulatory power over flaring by oil and gas companies. Contractors can only flare gas in specific circumstances, and there are limits on the amount of natural gas that can be burned in oil fields. New oil and gas refineries must also be designed to eliminate routine gas flaring. The regulation also prohibits

[4] "Sustainability Quality of the Issuer and Sustainable Finance Framework", ISS Corporate Second Party Opinion, 28 Feb 2024.
[5] "Prabowo's ambitious decarbonization goal requires visionary project implementation", IEEFA, 16 Dec 2024.
[6] "Methane Abatement Towards Sustainable Petroleum Industry", ASEAN Centre for Energy, 2024.
[7] "The true cost of methane abatement: A crucial step in oil and gas decarbonization", McKinsey & Company, accessed 26 May 2025.

business entities with processing permits from engaging in routine gas flaring. Moreover, any gas flaring event lasting longer than one day, with an average volume over 20 million Standard Cubic Feet per Day (MMSCFD), must be reported to the head of inspection within 24 hours. As a result of these regulations, the volume of gas flared in Indonesia dropped from 3.5 billion cubic metres in 2012 to 1.7 billion cubic metres in 2022.[8]

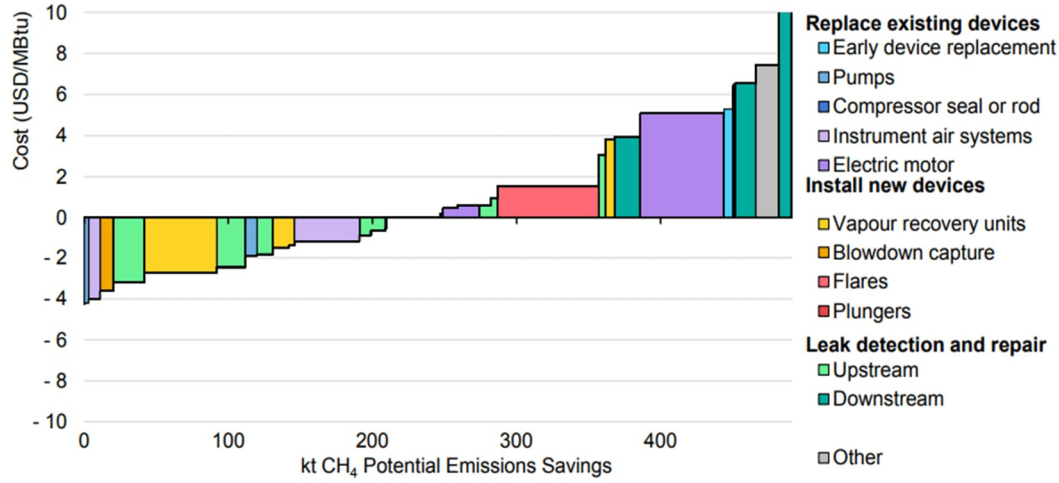
## Pertamina's methane reduction strategy

Pertamina and Pertamina Hulu have set a target to reduce methane emissions 40% by 2030. Indonesia and Pertamina are part of the Global Methane Pledge and Oil and Gas Methane Partnership (OGMP) 2.0, respectively. However, although it made its methane commitment in Nov 2024, Pertamina has yet to publish a definitive roadmap on its abatement strategy.

Currently, Pertamina is focused on efforts to measure its methane emissions. Because taking accurate measurements is complex and costly, Pertamina has partnered with JOGMEC (Japan Organization for Metals and Energy Security), to measure, quantify, and reduce emissions from its upstream oil and gas operations.[9] On Aug 23, 2024, the two companies announced a Joint Study Agreement to study methane emissions and identify mitigation measures at the Donggi-Matindok and JOB Tomori fields.

Pertamina is also addressing equipment leaks and operational inefficiencies as part of its methane reduction programme. This includes detecting equipment leaks using infrared cameras. In addition, the company aims to reduce flare gas by replacing liquid fuels with gas alternatives and by optimising gas sales for commercial and industrial consumers. Another part of the strategy involves lowering its own energy consumption using an Energy Management System (EMS). According to the International Energy Agency (IEA), most methane abatement measures are inexpensive, costing less than US$5 per tonne $CO_2$ equivalent.[10] The same study estimates it would cost Indonesia roughly USD1bn to abate its methane emissions through 2030, based on 2022 emissions levels. Pertamina's share of this is USD400mn. However, costs could spiral higher, given Indonesia's archipelagic geography. Aging tech and inadequate infrastructure also pose challenges to the country's abatement mission.

*Figure 2. Marginal abatement cost curve in Indonesia. Source: IEA*




[8] "Scoping Methane Emissions in ASEAN's Oil and Gas Sector", ASEAN Centre for Energy, Apr 2025.
[9] "PERTAMINA and JOGMEC Strengthen Commitment on Energy Transition with Joint Study Agreement on Methane Emission Measurement and Quantification", Pertamina, 23 Aug 2024.
[10] "Financing Reductions in Oil and Gas Methane Emissions", IEA, Jun 2023.

# PERHUL methane abatement-linked bond financing proposition

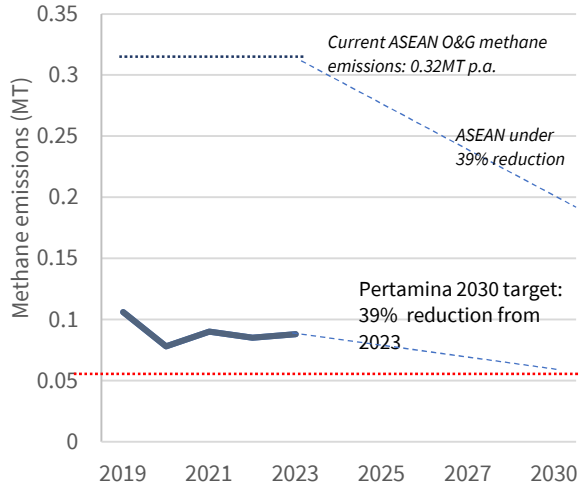
Between 2025 and 2027, Pertamina Hulu Energi plans to spend an average of USD6.6bn annually on capital expenditures.[11] PERHUL will use the capex for discretionary exploration and to manage production declines. Because PERHUL is pivotal to Indonesia's energy supply, the company is expected to focus on securing fresh oil and gas reserves while simultaneously pursuing a long-term climate transition strategy.

As noted above, methane abatement measures could be cost effective for the company. Given investors' relative willingness to finance ambitious methane reduction efforts, linking financing directly to methane abatement presents a logical opportunity. This could be achieved through a performance-linked debt instrument, such as a sustainability-linked or transition-linked bond, where the coupon adjusts by 50 bp depending on whether PERHUL meets its methane reduction targets. Several other oil and gas companies have already used transition-linked bonds to fund methane abatement, including Gasunie, which raised EUR300mn through 15yr bonds in 2021,[12] and SNAM, which issued EUR500mn in 6yr bonds in 2019.[13]

Both Pertamina and the Indonesia sovereign have good access to debt capital markets. This bodes well for an ambitious methane abatement bond, if other demand factors are favourable. A USD-denominated SLB would enable a fair number of climate-focused investors to participate in the company's transition. We would expect interest in such a bond to be substantial, even though some investors would be barred from investing under their sustainability mandates. By issuing this kind of bond, PERHUL would also be the first NOC to use a SLB to financialise its transition goals and signal to investors its commitment to its methane targets. The importance of this first-mover status should not be underestimated.

To structure this hypothetical SLB, we start with data on Pertamina Group's methane emissions (see Figure 3), using these as a proxy for PERHUL's own methane emissions, which are not disclosed separately.

*Figure 3. Pertamina's methane emissions targets (left) and historical emissions of GHG, $CO_2$ and methane (right).*




| | Scope1 emissions (MT $CO_2e$) | | | | |
|---|---|---|---|---|---|
| | 2023 | 2022 | 2021 | 2020 | 2019 |
| Total GHG (MT) | 24.7 | 24.8 | 24.6 | 21.9 | 24.7 |
| $CO_2$ (MT) | 19.4 | 19.4 | 19.2 | NA | NA |
| Methane (MT) | 0.088 | 0.085 | 0.09 | 0.106 | 0.078 |

[11] PT Pertamina Hulu Energi Offering Memorandum, dated May 5, 2025.
[12] "European gas TSOs: one pipeline to transport them all", AFII, 26 Nov 2024.
[13] "Snam: successfully launched the first Climate Action Bond in Europe", SNAM, 21 Feb 2019.

The methane reduction target of 40% by 2030 appears ambitious for the group. If we assume that methane levels were flat in 2024, between 2025 and 2029 emissions would have to fall 7.5% each year until 2030 for the target to be met, an expedited rate. However, our base assumption is that Pertamina can achieve its goal if sufficient capital is raised for this purpose. We therefore assign a 50% probability that Pertamina will meet its target.

Based on this assumption, we propose an SLB with a 10yr maturity and a Sustainability Performance Target (SPT) tied to its 2030 methane target using the 2021 baseline. The SPT will be observed in year 6, after the publication of the 2030 methane levels. If the target is missed, the bond's coupon will be adjusted by 50 bp on the first coupon date of year 6.

The pricing of such a performance-linked structure will be highly dependent on the likelihood that Pertamina achieves its targets,[14] which in turn will be dependent upon assumptions of drift/trend toward the targets, as well as the underlying volatility of Pertamina's methane emissions. We tabulate a set of different values for these variables in Table 2. For example, if we assume an abatement rate of 7.5% per annum, and a volatility of 5%, then the corresponding value of the step-up would be 0.1%, or 10bps. The implied probability of the step-up triggering would be 43%. In bond pricing terms, if we assume that the 10yr bond prices at 6%,[15] then the fair-value pricing/coupon of the methane performance-linked bond would be 5.9%.

Other assumptions in the table span the methane abatement seen over the past three years: -5.71% and -6.82%, based on average abatement, or absolute abatement on a percentage basis. Using these as drift assumptions, the option value of the step-up ranges from 22bps to 11bps depending on the level of volatility. The 22bps premium at 2% vol and 5.71% drift implies an almost 0% probability that the issuer would achieve the target, which appears quite negative. On the other hand, if we assume a methane abatement capacity at PERHUL of 10% per annum, the optionality is worth between 0bps to 4bps. The former value implies an almost 100% probability of success, which seems overly positive. **Going back to our initial estimate of a 50% probability of success, we would value the step-up option at around 10bps in coupon terms.**

*Table 2. Coupon premiums for the PERHUL methane-abatement-link proposal under varying drift and volatility assumptions. Source: AFII.*

| | | Volatility assumption | | |
|---|---|---|---|---|
| | | 2% | 5% | 10% |
| Reduction drift assumption | -5.71% | 0.22% | 0.17% | 0.14% |
| | -6.82% | 0.16% | 0.13% | 0.11% |
| | -7.50% | 0.08% | 0.10% | 0.09% |
| | -10% | 0.00% | 0.01% | 0.04% |

[14] See chapters 2 and 5 of "Sustainability-linked Bond Handbook: A Practitioner's Guide", AFII, 2024, for a full pricing methodology.
[15] For interested readers, Bloomberg has a template bond for this structure registered under FIGI BBG01TV3QYY4.

## Conclusion

Pertamina is a key player in Indonesia's energy security and transition strategy. Its ability to meet the country's growing energy needs while pursuing its net zero goals will be critical to Indonesia's overall climate progress. Pertamina has a fairly ambitious methane abatement target: a 40% reduction by 2030 from 2021 levels. Methane abatement could prove a cost-effective means of transitioning for the company. However, the company requires capital to measure, quantify and reduce these emissions.

We propose a methane abatement-linked SLB structure as a practical financing solution for Pertamina. Such a structure would provide credibility to the issuer, signalling to the market its commitment to what will be a long climate transition. It would also offer cost-of-capital differentiation to Pertamina, depending on its success. For investors, the bond would provide both a meaningful reduction in portfolio greenhouse gas emissions and a direct avenue for engagement on the critical issue of methane abatement.

Indeed, PERHUL could be a pioneer among NOCs by utilising a performance-linked bond to signal and financialise its transition goals.

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