

Understanding Methane Intensity in Korean and Japanese LNG Supply Chains

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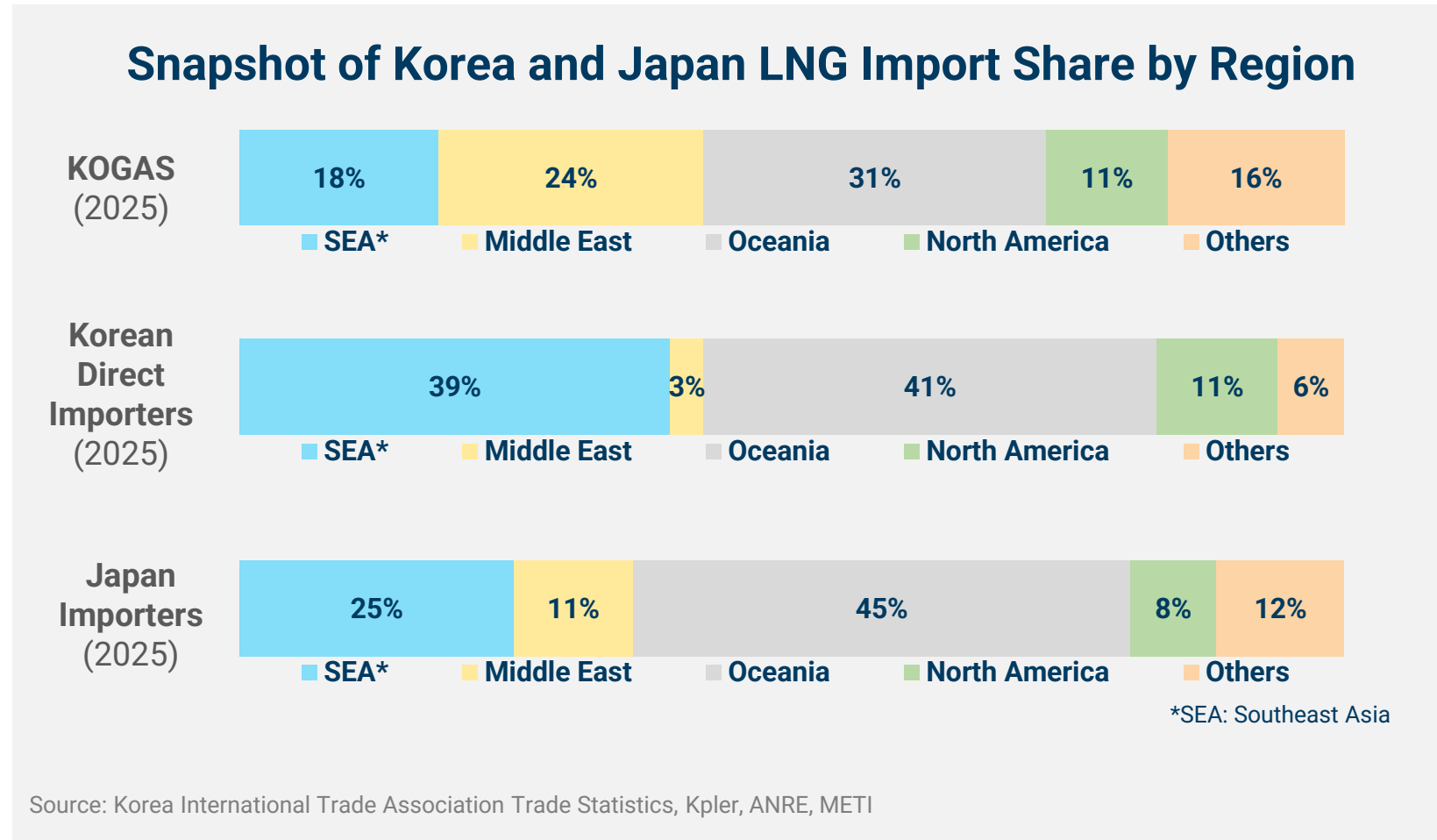
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Choosing a Methane Intensity Methodology

Korean and Japan LNG Market Overview

LNG imports come from a variety of suppliers and regions

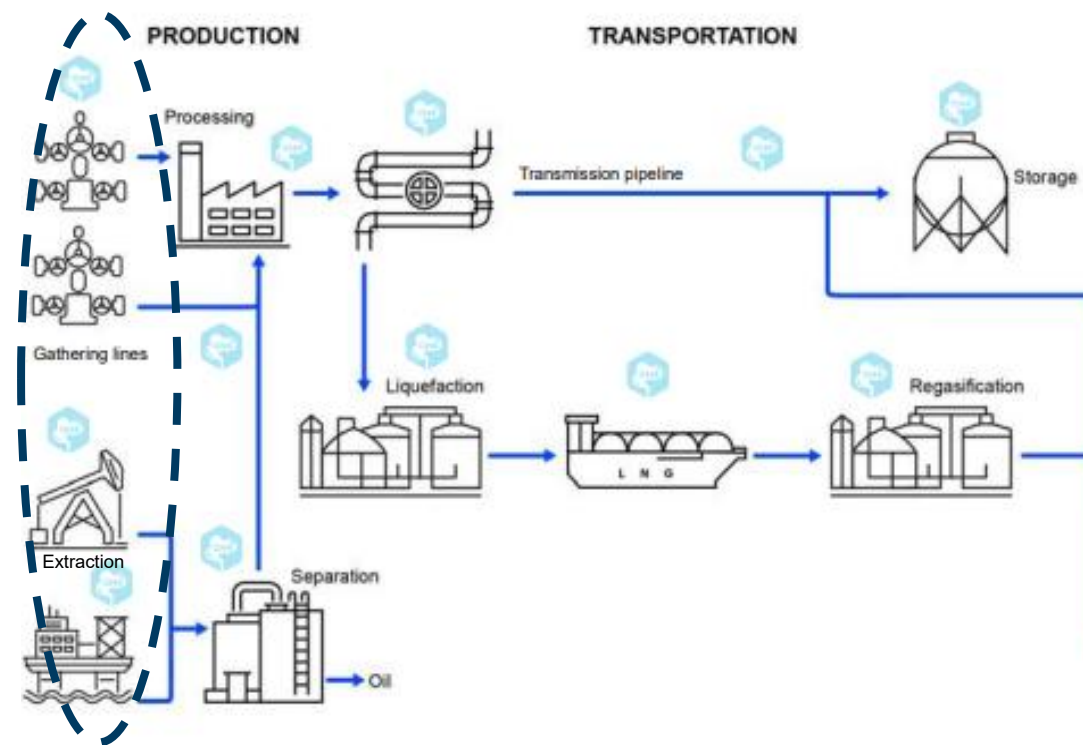
- **Korea and Japan are significant LNG buyers**, consistently among the top 3 LNG importers globally.
- Korean and Japanese buyers **import LNG from a variety of suppliers and regions** (see right).
- **Buyers need robust, comparable, and actionable methane intensity (MI) information to engage key markets and drive methane abatement across their suppliers.**



Methane Emissions from the LNG Supply Chain

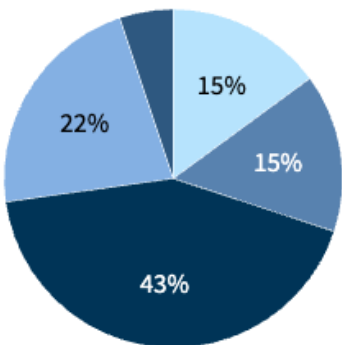
Upstream production drives the largest share and variation in LNG supply chain methane emissions

LNG Supply Chain



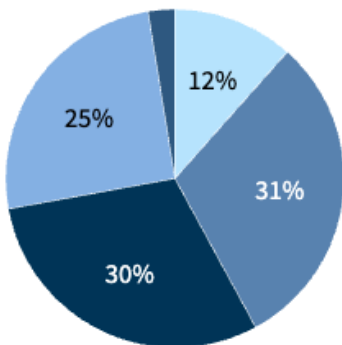
LNG emissions source by value chain component

Production CO2	Production Methane	Local Transport	LNG Liquefaction and Transport	Refining
2.0x low to high	5.4x low to high	1.1x low to high	1.0x low to high	1.6x low to high



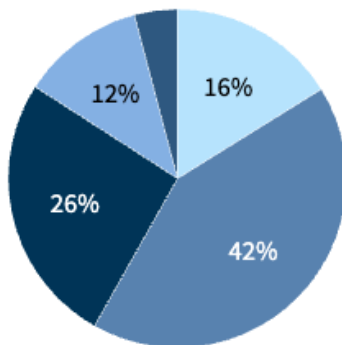
Low Emissions LNG

Total CO₂e /boe:
206



Average Emissions LNG

Total CO₂e /boe:
271



High Emissions LNG

Total CO₂e /boe:
396

Example assets with low and high emissions from OCI+ results modeled on a GWP 20 year horizon. The average chart shows the straight average of each component in the value chain. Excludes emissions from end use.

Source: OCI+, updated September 2025

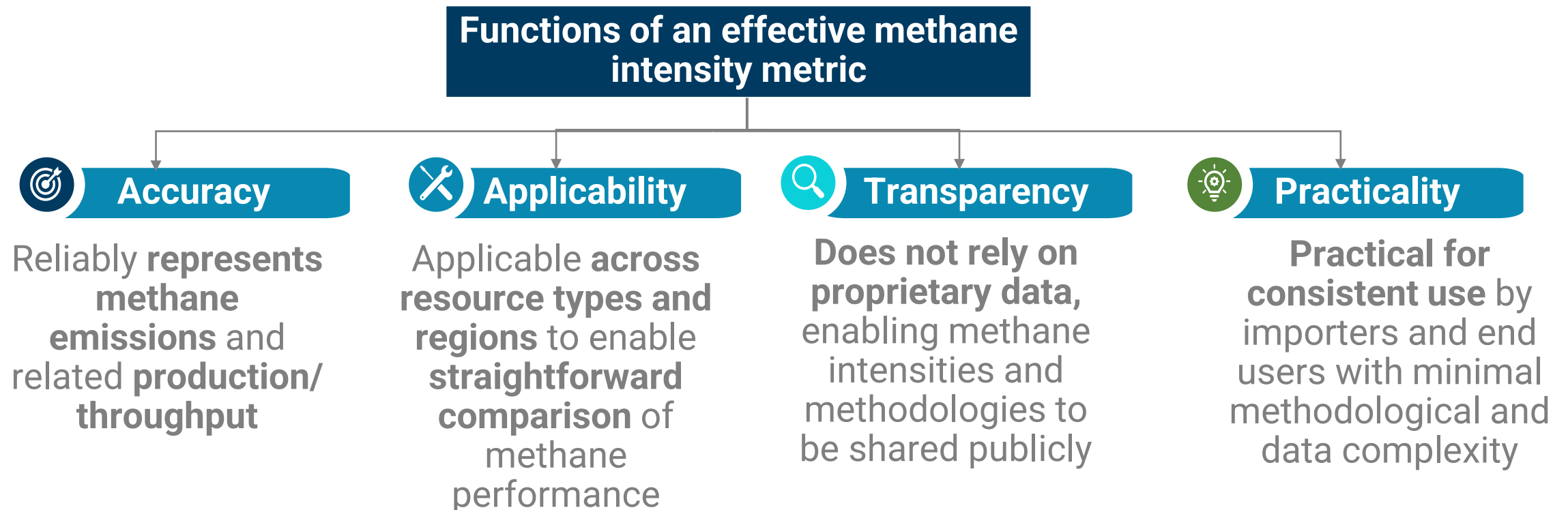


While methane emissions can occur along the entire LNG supply chain, **upstream production methane accounts for >30% of total supply chain GHG emissions**

Methane Intensity (MI) Key to Supply Differentiation

Incorporating a consistent MI into purchasing decisions enables buyers to incentivize reductions

- Objective: Determine a consistent MI methodology for Korea and Japan's gas buyers to **understand the methane risk of their supply** and **incorporate MI as a metric in purchasing decisions**.
- To achieve this objective a **consistent upstream MI methodology** that is **accurate, applicable, transparent, and practical** should be applied.



Leading Methane Intensity Metrics for Evaluation

Understanding nuances between leading MI methodologies enables comparison and evaluation

Metric Name	Simple Definition	Mathematical Determination	Units	User
Methane Emissions Intensity	Mass of total methane emissions over volume of oil and gas sold	$\frac{\text{Mass of methane emitted}}{\text{Oil and gas volume sold}}$	kg/BOE	MiQ, Colorado State Regulation, OCI+
Methane Energy Intensity	Energy of total methane emissions over energy of oil and gas sold	$\frac{\text{Energy of methane emitted}}{\text{Oil and gas energy sold}}$	g/MJ, kg/GJ, or %*	IEA
Allocated Methane Loss Rate	Mass of methane emissions from gas production over methane in gas sold	$\frac{\text{Mass of methane emitted (allocated to gas)}}{\text{Mass of methane in gas sold}}$	%	NGSI, One Future, GTI Veritas
Methane Loss Rate	Volume of total methane emissions over methane in volume of gas sold	$\frac{\text{Volume of methane emitted (unallocated)}}{\text{Volume of gas sold}}$	%	OGCI

1 Barrel Oil Equivalent (BOE)=6,118 MJ=6.118 GJ
*IEA uses an energy density of 55 MJ/kg methane to convert to %

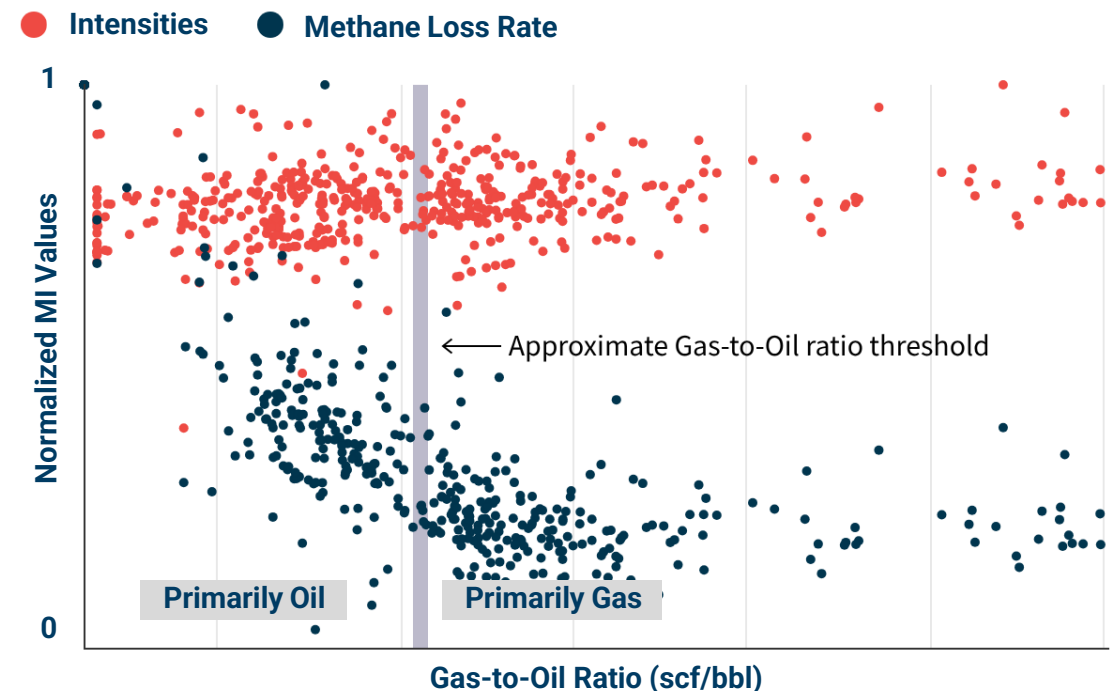
Accuracy – Builds Market Trust

Suitable metrics accurately represent total methane emissions across gas-to-oil ratios



Accuracy indicates how closely a metric represents the actual methane emissions associated with total production. Accurate metrics match scientific best practices, minimize assumptions, and reflect operational realities.

- **Metrics that incorrectly utilize emissions allocation to products can misrepresent oil and gas production’s methane impact.**
 - Allocating all emissions to gas only, as in the *methane loss rate metric*, creates supply chain accounting irregularities and data issues, especially for oil focused production.
- Using only allocated emissions from gas production in the numerator, as in the *allocated methane loss rate metric*, addresses some irregularities of loss rate metrics, but accuracy requires thorough underlying methods.



Source: OCI+, 2025, All global modeled assets graphed

	Methane Emissions Intensity	Methane Energy Intensity	Allocated Methane Loss Rate	Methane Loss Rate
Accuracy				

■ Fulfills key function ■ Does not fulfill key function

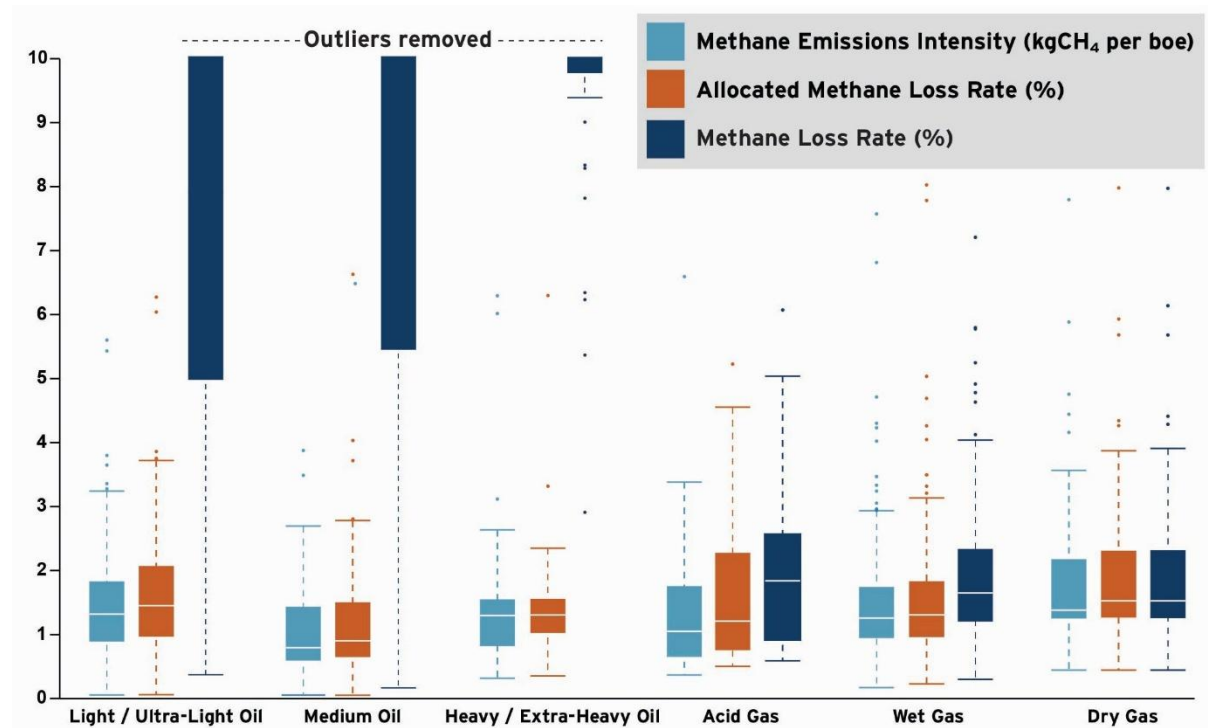
Applicability – Enables Comparison

Metrics must combine wide applicability with robust performance for global comparability



Applicability assesses how universally the metric can be employed across cases. Highly applicable metrics can be used across resource mix and type, region, and operational practices.

- MI metrics that fulfill this requirement must apply across a wide range of resource types to avoid introducing bias.
 - *Methane emissions intensity/methane energy intensity and allocated methane loss rate* demonstrate consistent metric results across the range of resource types including ultra-light oil and extra-heavy oil.
- **Loss rate metrics** require additional inputs for calculation, specifically the variable methane content in natural gas. Using generic defaults for methane content limits comparability and accuracy.



Source: OCI+, 2025, All global modeled assets graphed

	Methane Emissions Intensity	Methane Energy Intensity	Allocated Methane Loss Rate	Methane Loss Rate
Applicability	Fulfills key function	Fulfills key function	Fulfills key function	Does not fulfill key function

Fulfills key function Does not fulfill key function

Transparency and Practicality – Support Usability

Metrics should enable buyers to replicate calculations and apply across use cases



Transparency assesses whether buyers can verify the methodology and data behind a methane intensity metric. More transparent metrics can be replicated with public data, limiting reliance on producer-only inputs.

- **Allocation-based metrics** are less transparent because buyers are unlikely to have access to or be able to verify the inputs needed to allocate methane emissions across oil, gas, and other hydrocarbons.
- Metrics that require allocation or use production rather than marketed products **place a higher transparency burden on buyers.**



Practicality examines how easily a methane intensity metric can be used consistently by LNG buyers and end users. More practical metrics reduce data and methodological burden and are easier to apply across use cases.

- **Non percentage-based metrics** are more practical for end users because they can be directly applied across use cases: in procurement, scope 3 emissions inventory accounting, and product carbon footprints.
- Per BOE is slightly more practical than per MJ for a denominator, as **volume data is usually more accessible than energy-based data.**

	Methane Emissions Intensity	Methane Energy Intensity	Allocated Methane Loss Rate	Methane Loss Rate
Transparency				

■ Best fulfills key function ■ Fulfills key function ■ Does not fulfill key function

	Methane Emissions Intensity	Methane Energy Intensity	Allocated Methane Loss Rate	Methane Loss Rate
Practicality				

Using Methane Intensity (MI) to Differentiate Supply

Incorporating a consistent MI into purchasing decisions enables buyers to incentivize reductions

- A BOE-based methane emissions intensity is the best fit for global LNG market leaders like Korea and Japan and can be applied across supply contracts.

Methane Emissions Intensity → *Total methane emissions over total energy sold* → $\frac{\text{Mass of methane emitted (kg)}}{\text{Total oil and gas sold (BOE)}}$ → $\frac{\text{kg}}{\text{BOE}}$

The Methane Emissions Intensity metric is:



Accurate

Covers all methane emissions across oil and gas production, upholds scientific rigor



Applicable

Applicable across resource types and regions, allows comparability between heterogenous producers



Transparent

Does not rely on difficult to verify allocation methods or proprietary data, allows operator or buyer to share MEI publicly



Practical

Highly practical, already widely used in US Colorado state policy, existing methane intensity certification standard (MiQ), and an open-source model (OCI+)

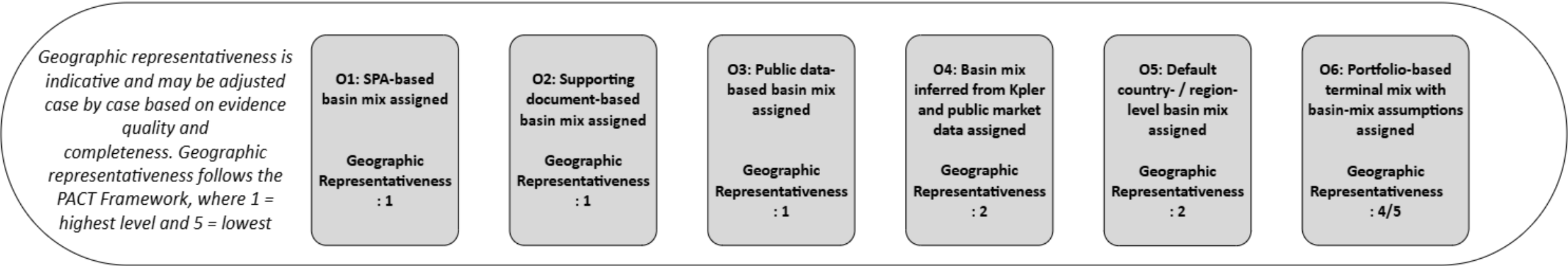
Note: This analysis is focused on the upstream segment because it is the segment with the most robust data to date and the focus of key policies like the EU Methane Emissions Regulation.

Mapping Contract Data to a Methane Intensity

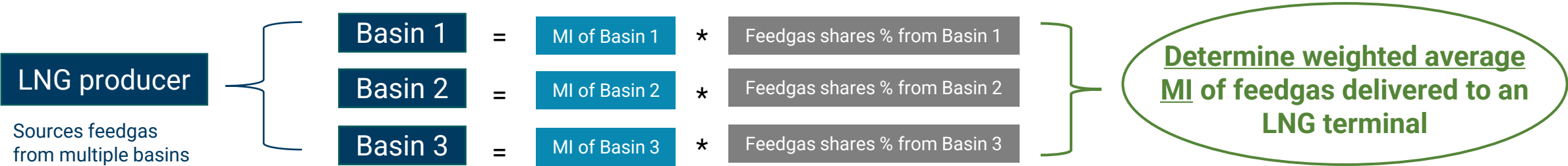
Mapping Contract Data to Methane Intensity

Followed a two-step approach to link contract data to producing basin's methane intensity

1. LNG Sales purchase agreement (SPA) data is reviewed to determine feedgas supply to a given LNG terminal at varying levels of geographic representativeness according to the specificity available in the contract (see decision tree below).

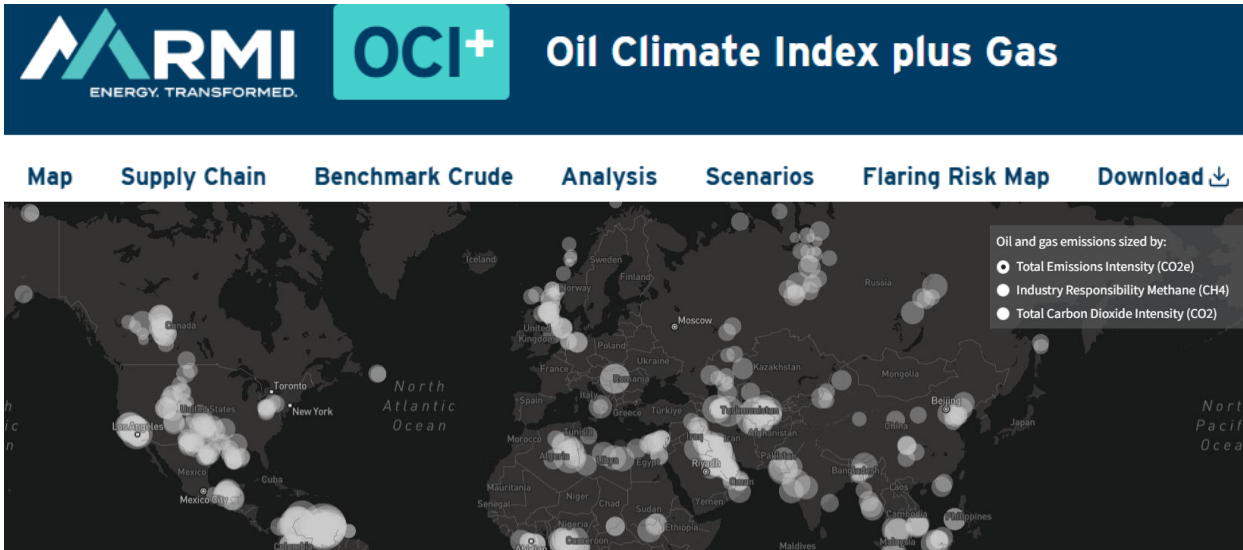


2. Weighted average methane intensity for the basin mix is determined according to production data from feedgas basins.



Oil Climate Index plus Gas (OCI+) Overview

Modeled values used to determine directional upstream methane intensities for fields/basins

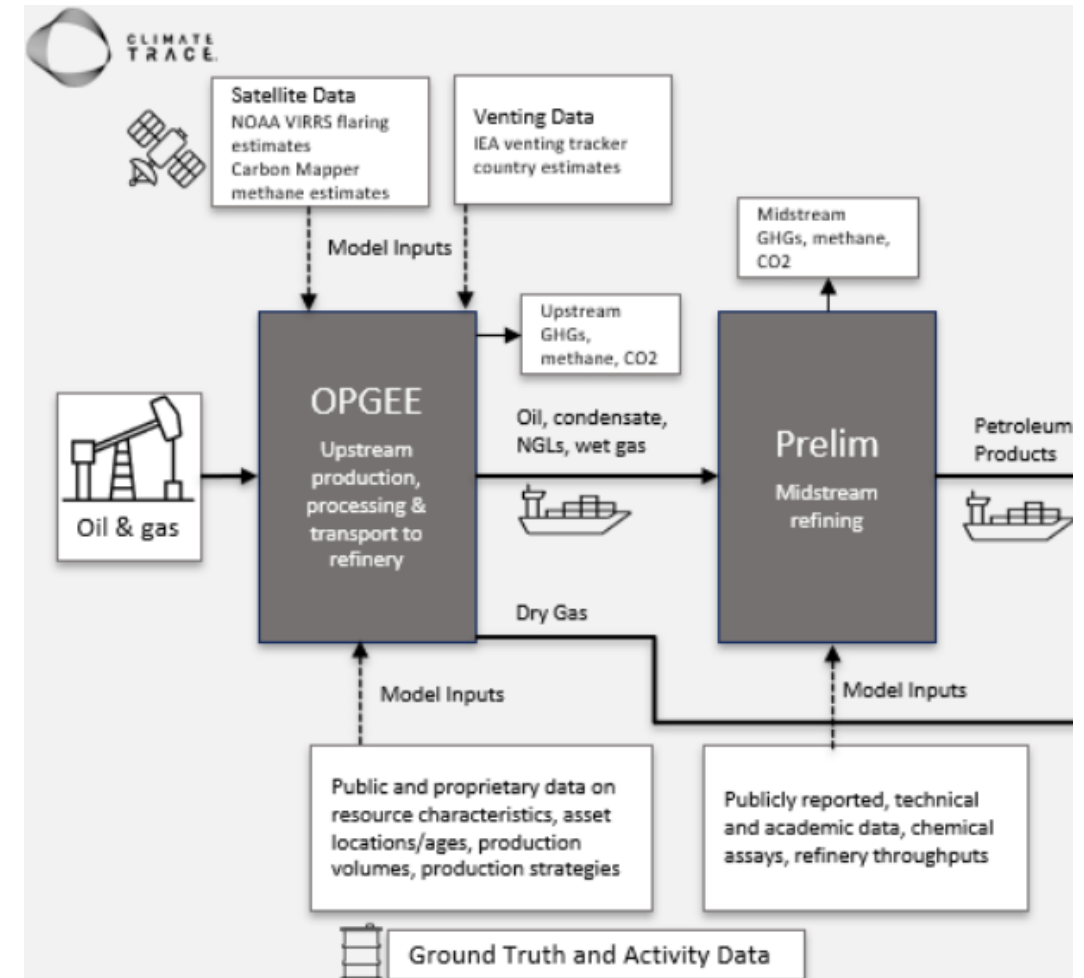


- **Data sources**

- Oil and gas asset characteristics (public and proprietary data)
- Operational inputs (public and proprietary data)
- Satellite data

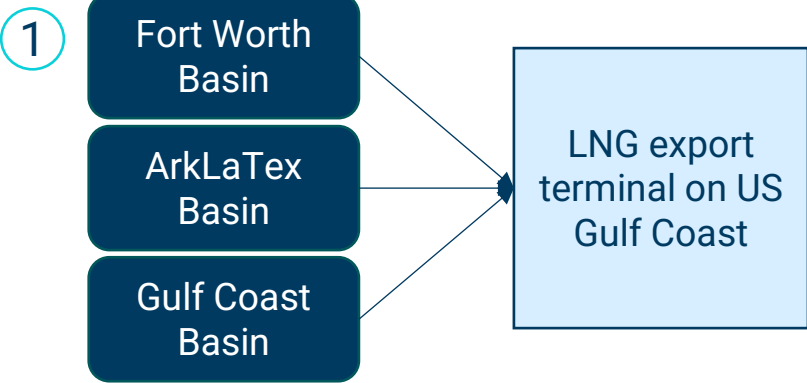
- **Peer-reviewed, open-source models**

- OPGEE: Oil Production Greenhouse Gas Estimator used by California's Low Carbon Fuel Standard



Example: Production Weighted Average Calculation

Basin MI data from OCI+ weighted average by production to determine LNG terminal MI



RESOURCE DETAIL
United States Fort Worth TX [compare](#)

Characteristics Emission Intensity

2

Total Production Volume ⓘ High

Crude Production Volume ⓘ Low

Flare Rate Low Flare

Fracked Yes

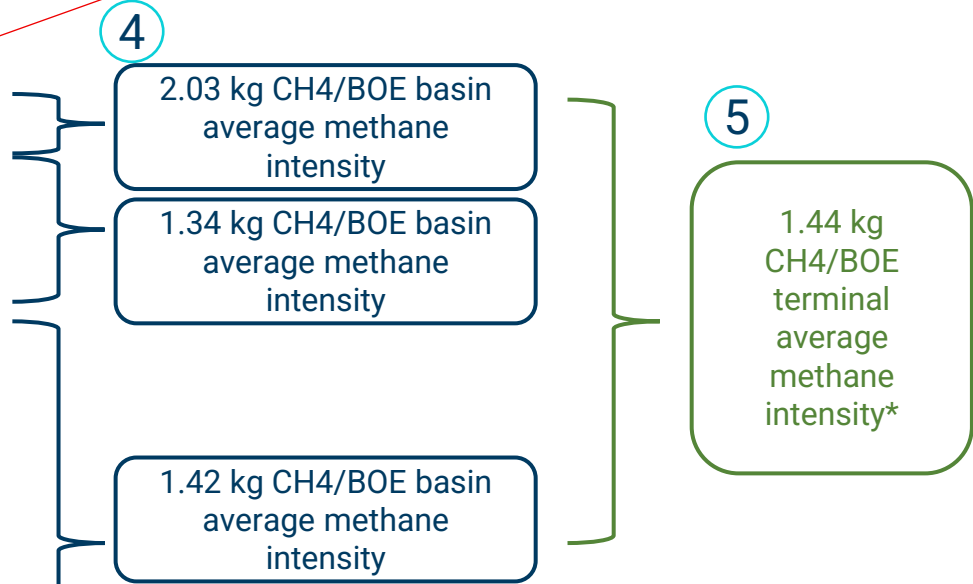
Upstream Methane Intensity ⓘ 2.03

Transport Methane Intensity ⓘ 0.39

Upstream Gas Loss ⓘ 4.76%

Midstream Gas Loss ⓘ 0.01%

General Basin Name	OCI+ Fields	3 Production	Upstream MI
Fort Worth	Fort Worth	high	2.03
ArklaTex	ArklaTex LA-TX-MS	low	2.09
	ArklaTex Haynesville LA	very high	1.22
	ArklaTex Haynesville TX	very high	1.15
Gulf Coast	Western Gulf Dry Gas TX	medium	2.04
	Western Gulf Gas LA	low	1.04
	Western Gulf Oil LA	low	1.43
	Western Gulf Oil TX	medium	1.83
	Western Gulf Wet Gas TX	medium	1.38
	Western Gulf Eagle Ford Dry Gas TX	high	1.40
	Western Gulf Eagle Ford Light Oil TX	very high	1.32
	Western Gulf Eagle Ford Ultra Light Oil TX	very high	1.24
	Western Gulf Eagle Ford Wet Gas TX	medium	1.15



*Note: publicly available information from resources like the EIA on relative production from these basins was used to estimate production for the weighted average

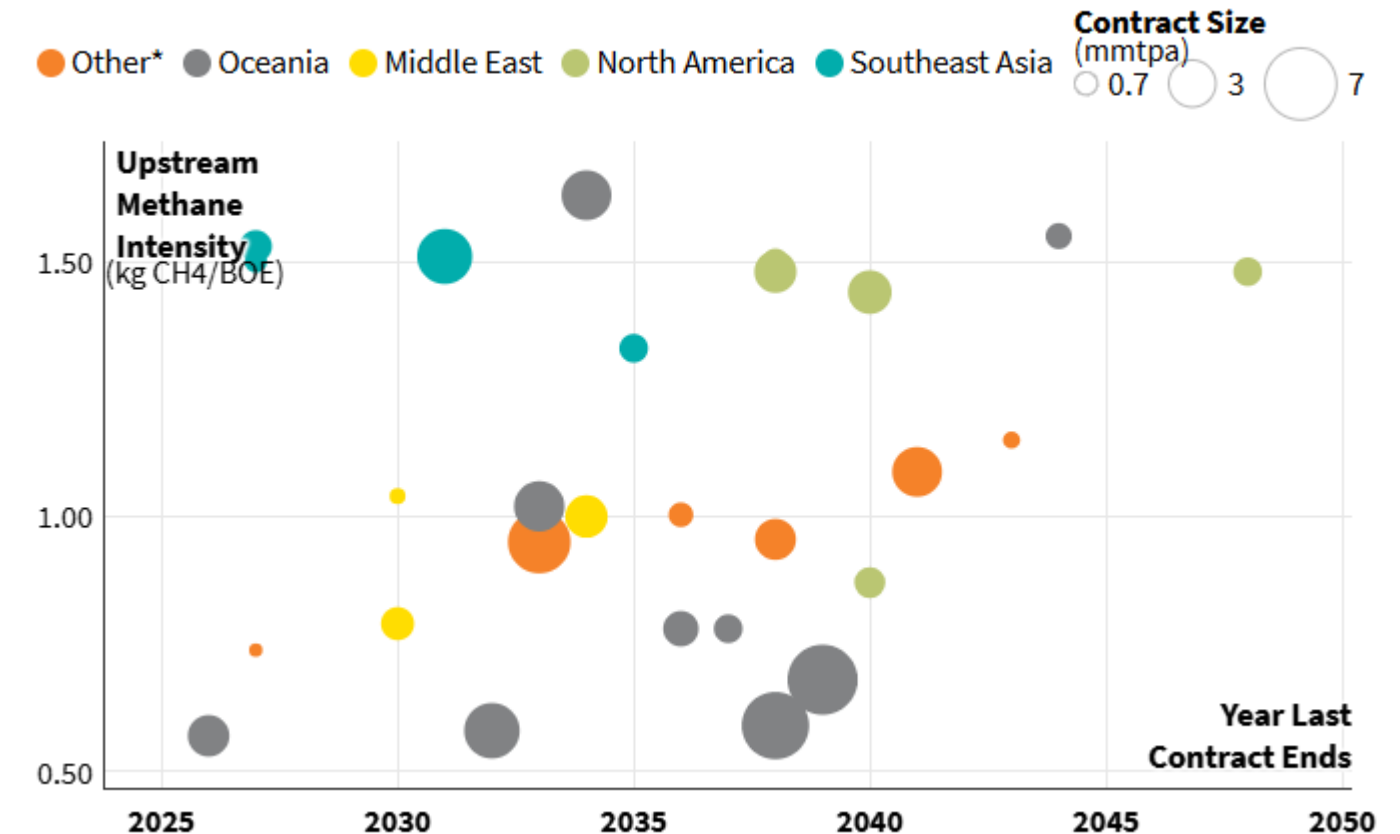
Comparing MI for Korean and Japanese LNG Suppliers

Japan LNG Supply Methane Intensity Takeaways

Given diversity of suppliers, incorporating MI in contract decisions is key to portfolio MI reductions

- Japan's LNG contract data demonstrates a **diversity of MIs across diverse geographic supply, contract sizes, and sellers.**
- In general, **Australian and Middle Eastern LNG terminals demonstrate the lowest average methane emissions intensities.**
- In contrast, **US and Southeast Asian LNG terminals typically have the highest average methane emissions intensities.**

Japan Kpler Contract Methane Intensity



Source: Kpler, OCI+

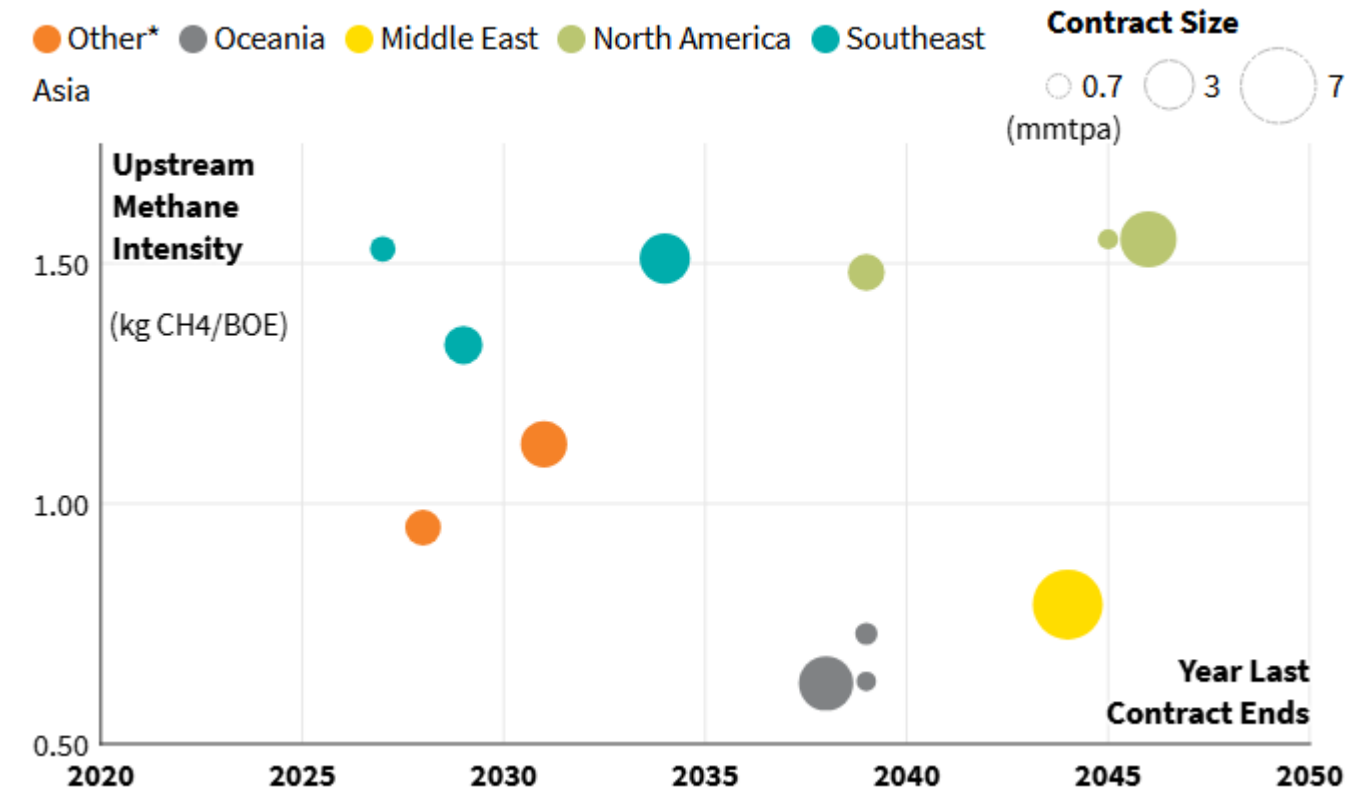
*Other includes portfolio supplier contracts sourcing LNG from multiple terminals as well as contracts linked to LNG terminals in Africa and Russia.

Korean LNG Supply Methane Intensity Takeaways

Engaging with portfolio suppliers on lower MI cargoes is key for MI reductions and better accuracy

- Korea's LNG contract data demonstrates a **range of MIs across geographic supply with mostly larger contract sizes across key suppliers, including portfolio sellers.**
- **Korea's LNG market has traditionally been highly centralized**, with KOGAS, Korea's largest LNG importer, favoring long-term contracts.
- Compared to Japan's Kpler data, Korea's LNG contract data **suggests growing exposure to portfolio suppliers.**

Korea Kpler Contract Methane Intensity



Source: Kpler, OCI+

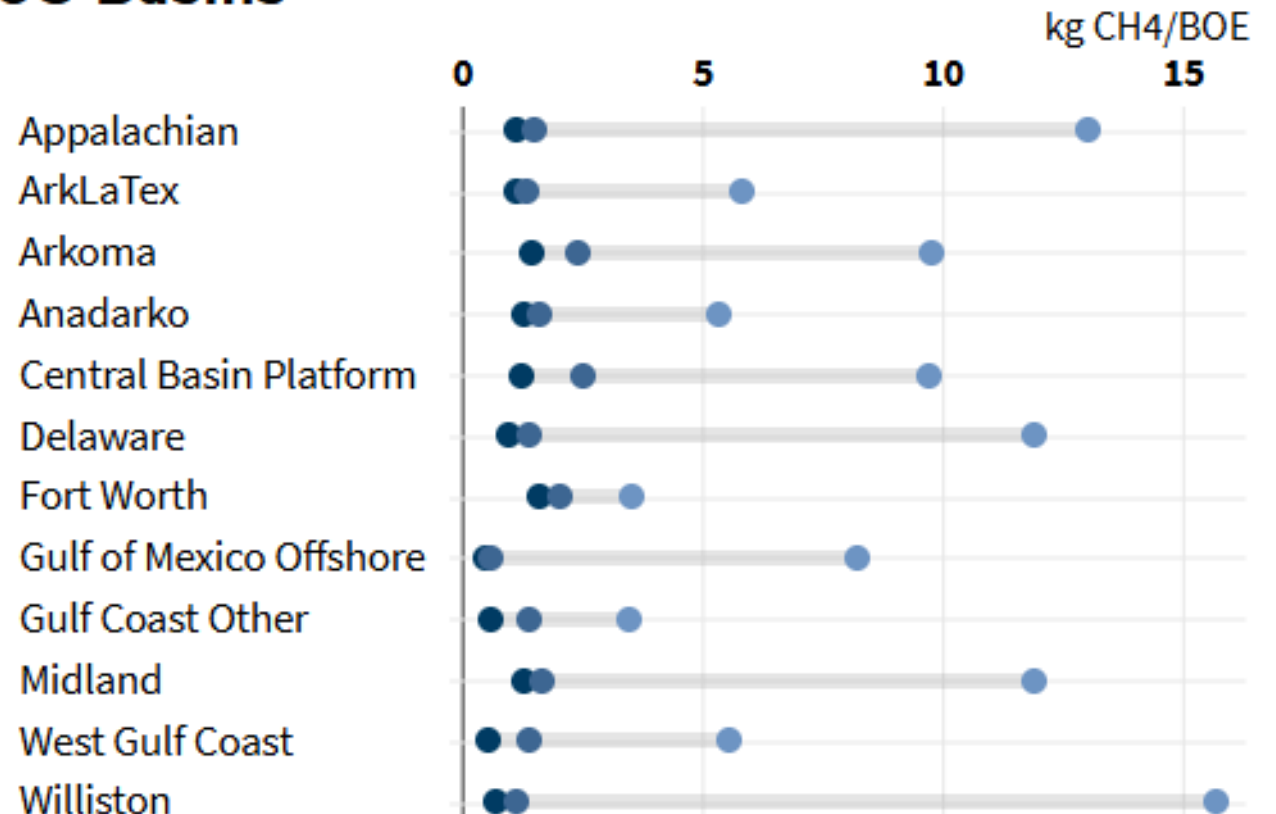
*Other includes portfolio supplier contracts sourcing LNG from multiple terminals, as well as contracts linked to LNG terminals in Russia

Deep Dive: US LNG Supply MI Variability

Using average methane intensities can hide high methane intensity risks in a basin or region

- Methane emissions intensity can vary greatly between and within basins; differences in methane intensity between assets can be up to 10x.
- The within-basin variation is especially pronounced in the United States, a growing source of supply for Japan and Korea.
- Buyers should request producer-specific, asset-level MIs where possible.
- Buyers can prioritize contracts with certified assets (e.g. **MiQ**) to reduce the MI of their supply and uncertainty in data quality compared to basin level averages.

Range of Upstream Methane Intensities in US Basins



Source: OCI+

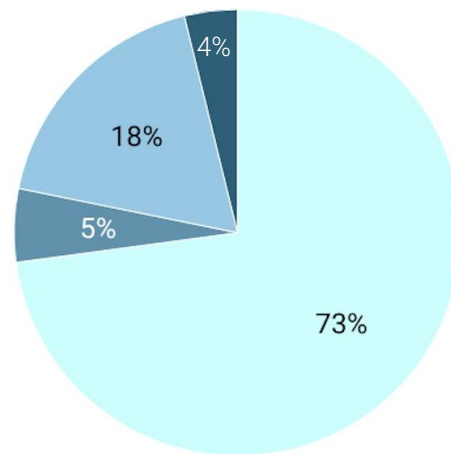
Deep Dive: Australia Pairs LNG Scale with Low MI

Australia offers a low-MI supply option, but diversification priorities may limit future upside

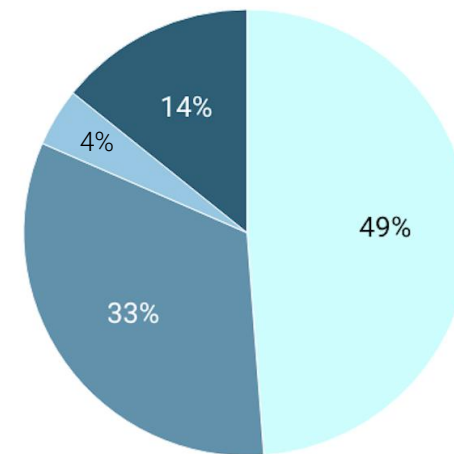
- **Australia is the largest LNG supplier to Japan and Korea.**
- **Australia has relatively low upstream MI**, mainly due to gas-focused upstream mix and large offshore gas resources.
- **For Japan and Korea, supply comes from a few regions with similar MI values**, helping keep MI variation within Australia limited (see right).
- **Further growth in Australian LNG imports may be constrained as Japan and Korea seek to diversify** beyond an Oceania-dominated portfolio.

Japan and Korea LNG imports from Australia by region

- Western Australia, Upstream MI: 0.72 kg CH₄/BOE
- Queensland, Upstream MI: 0.82 kg CH₄/BOE
- Northern Territory, Upstream MI: 0.62 kg CH₄/BOE
- Others, Upstream MI: 0.71 kg CH₄/BOE*



Japan (39% of total imports)
Australian imports in 2024 (mtpa):
26.36



Korea (26% of total imports)
Australian imports in 2024 (mtpa):
12.09

* Other Australian LNG volumes are estimated using the country-level weighted-average MI.
Source: OCI+; [Australian Gas and LNG Tracker](#), IEEFA

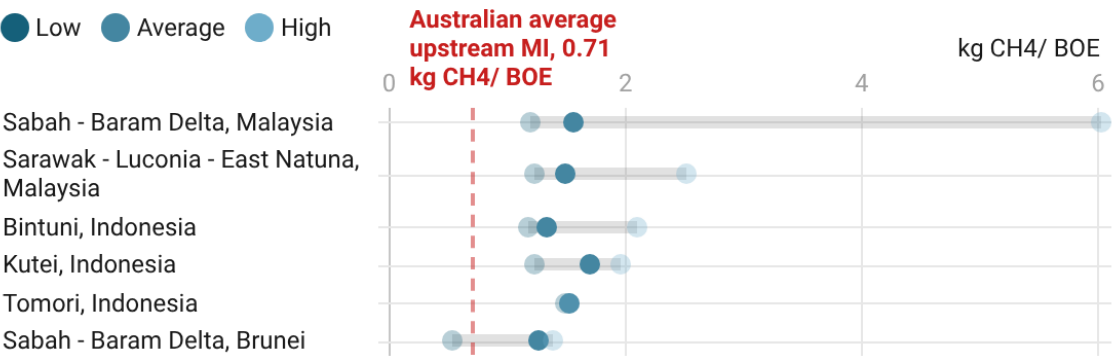
Deep Dive: SEA Has High-Impact Mitigation Potential

CLEAN engagement offers a path to improve methane performance

- **Southeast Asia is the second-largest LNG supply region for Japan and Korea**, with supplies from seven LNG projects across Malaysia, Indonesia, and Brunei.
- **Through CLEAN, JOGMEC has collaborated with NOCs and IOCs in the region to improve methane performance**, often with Petronas as a leading partner.
- **These CLEAN-coordinated efforts show buyer engagement is practical and scalable**, helping suppliers improve methane transparency, test mitigation technologies, and strengthen methane performance.

	Malaysia	Indonesia	Brunei
Liquefaction capacity (mtpa)	32.0	24.9	7.2
LNG terminals	3	3	1
Japan imports in 2025 (mtpa)	9.6	3.8	2.7
Korea imports in 2025 (mtpa)	8.0	2.1	0.9
Key operators and JV sponsors	Petronas	BP, Pertamina, Mitsubishi, INPEX, KOGAS	Shell, Mitsubishi
Upstream methane intensity (kg CH ₄ / BOE)	1.5	1.3	1.3

Range of Upstream Methane Intensities in SEA Basins



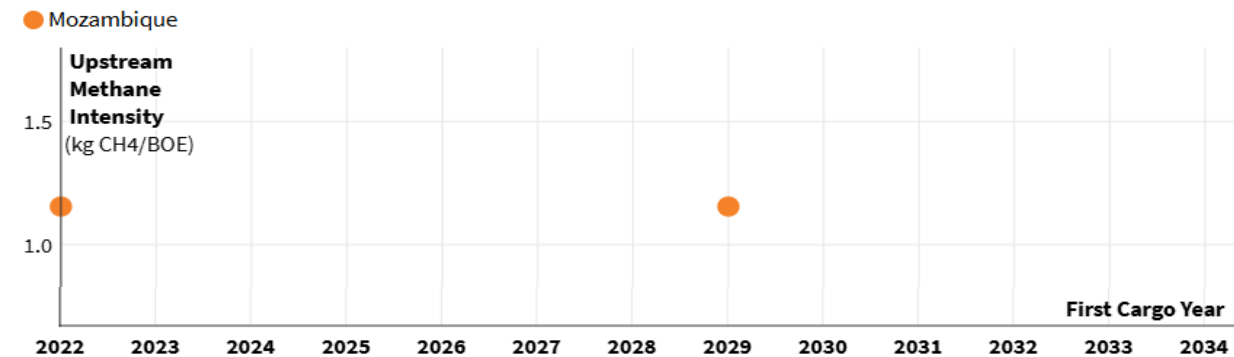
Source: GIIGNL Annual Report 2026, GIIGNL; OCI+

Deep Dive: New and Emerging Oil and Gas Producers

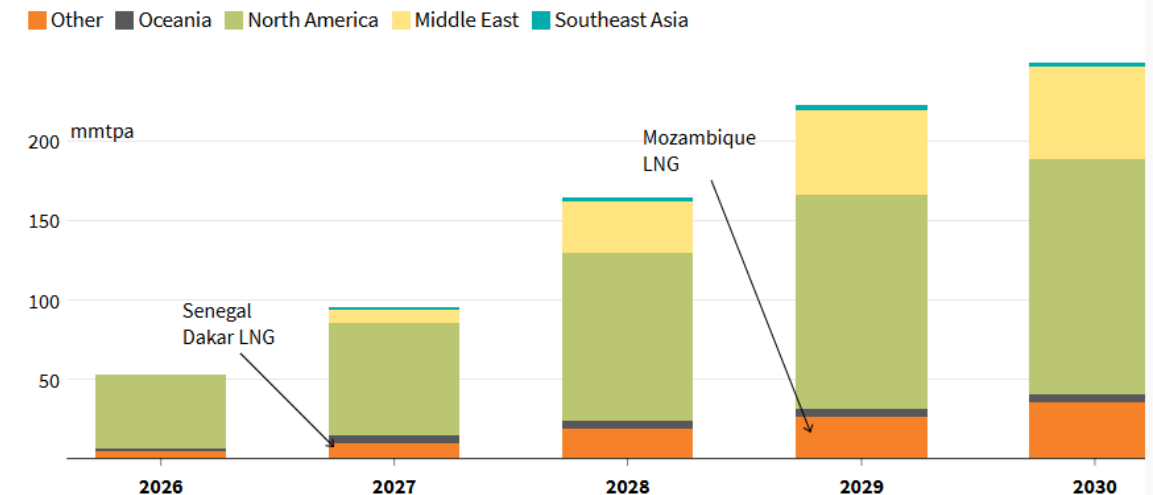
Buyers can play important role in supporting capacity building and data quality standard efforts

- Large LNG buyers often look to diversify supply across a range of geographies.
- There are a significant number of new LNG facilities planned to come online in the next five years across a range of geographies, including in countries that are new or emerging oil and gas producers like Mozambique and Senegal.
- Clear demand signals from buyers for methane emissions transparency can support better emissions data quality and help embed stronger methane practices before new LNG supply scales.

New and Emerging Supply in Existing Japan Contracts



Planned LNG Capacity Additions



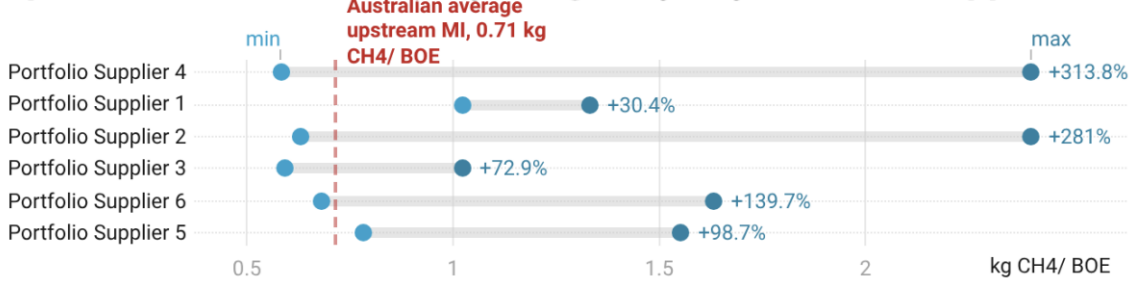
Source: Kpler, OCI+, IEA

Deep Dive: Portfolio Players in a Global LNG Market

Portfolio contracts add flexibility and diversification, but widen MI variation and complicate tracing

- **Portfolio suppliers are increasingly important for Japan and Korea LNG buyers**, offering flexibility and diversification while increasing geographic MI variability and limiting feedgas traceability.
- **Traceability is harder as origins shift over time.** Buyers seeking low-MI LNG (e.g. EU) need cargo-level origin and asset-specific MI from portfolio suppliers.
- While programs like OGMP 2.0 help assess company-level methane data quality, **scores do not necessarily represent cargo-level data quality** when portfolio firms do not own or disclose underlying assets.
- **Buyers should pair flexibility from portfolio supply with stronger transparency requirements to ensure decision-useful MI data.**

Upstream Methane Intensity Ranges by Key Portfolio Suppliers



Note: Min, max, and range reflect selected assets in which each supplier holds equity stakes. Offtake-only assets and broader portfolio volumes are excluded due to data availability limits.

Portfolio contracts can shift from multi-origin to project-backed supply

Year	Volumes (mtpa)	Buyer	Supplier	Origin
2013 - *	1	Korean Buyer	Portfolio Supplier 2	Nigeria, Russia (Terminal R)
* - 2038 (originally 2035)	3.64	Korean Buyer	Portfolio Supplier 2	Australia (Terminal Z)
2014 - 2031	2	Korean Buyer	Portfolio Supplier 4	Australia (Terminal J)**, Nigeria, Norway, Egypt

Note: * Portfolio supplier 2 initially supplied 1 mtpa from its global portfolio, including Nigeria and Russia, before shifting primarily to Terminal Z once it started up, for 3.64 MTPA over 20 years.
** Portfolio supplier 4 initially supplied LNG from its global portfolio, including Nigeria, Norway, and Egypt, before Terminal J became a major potential source of contracted volumes once it started up.

Methane Intensity is Key to LNG Supply Differentiation

Buyers can compare MI across supplier contracts and incentivize methane reductions today

A BOE-based upstream methane emissions intensity metric is easy to use and simple to convert, driving actionable insights into LNG's upstream MI today.



Easy to Use

This analysis demonstrates the BOE-based emissions intensity can be applied to real life LNG contract data for Korea and Japan using publicly available information.



Simple to Convert

Using conventional conversion factors for BOE-> MJ and g methane-> MJ methane, these values can be easily converted to create %-energy based targets if needed.



Driving Actionable Insights

Using this metric, buyers can understand MI variations across regions and suppliers, identify priority engagement areas, align methane transparency efforts with leading initiatives like CLEAN and EU MER, and drive real methane emissions mitigation in their supply chains.

Appendix

Company MI Profile: JERA

LNG terminal	Region	Contract Size	Upstream Methane Intensity	Geographic Representativeness
LNG Canada	North America	1.2	0.87	1
Gorgon	Oceania	2.88	0.68	1
Cameron (Liqu.)	North America	0.8	1.44	2
Wheatstone	Oceania	0.7	0.59	1
Qalhat	Middle East	0.8	1.00	1
Ras Laffan	Middle East	0.7	0.79	1
Pluto	Oceania	0.5	0.57	1

Weighted Average Methane Intensity **0.82 kgCH₄/BOE**

Company MI Profile: Osaka Gas

LNG terminal	Region	Contract Size	Upstream Methane Intensity	Geographic Representativeness
Gorgon	Oceania	1.56	0.68	1
PNG LNG	Oceania	1.5	1.63	1
NWS	Oceania	1	1.02	1
Ichthys	Oceania	0.8	0.58	1
Sakhalin 2	Other	0.2	0.95	1
Qalhat	Middle East	0.8	1.00	1
Shell as portfolio seller	Other	0.8	0.96	4/5
Freeport	North America	2.2	1.48	2

Weighted Average Methane Intensity **1.13 kgCH₄/BOE**

Company MI Profile: Tokyo Gas

LNG terminal	Region	Contract Size	Upstream Methane Intensity	Geographic Representativeness
Cameron (Liqu.)	North America	0.72	1.44	2
Gorgon	Oceania	1.25	0.68	1
QCLNG	Oceania	1.2	0.78	1
Ichthys	Oceania	1.05	0.58	1
Sakhalin 2	Other	1.1	0.95	1
Petronas LNG Bintulu, Sarwak	Southeast Asia	0.5	1.51	1
Shell as portfolio seller	Other	0.5	0.96	4/5
NWS	Oceania	1.37	1.02	1

Weighted Average Methane Intensity **0.93 kgCH₄/BOE**

Company MI Profile: KOGAS

LNG terminal	Region	Contract Size	Upstream Methane Intensity	Geographic Representativeness
Ras Laffan LNG	Middle East	6.1	0.79	1
BP as portfolio seller	North America	1.58	1.48	4/5
Prelude FLNG	Oceania	0.36	0.63	1
Shell as portfolio seller	Oceania	3.64	0.63	4/5
Sabine Pass LNG	North America	3.5	1.55	2
TotalEnergies as portfolio seller	Other	2	1.12	4/5
MLNG	Southeast Asia	2	1.51	1
Sakhalin-2 LNG	Other	1.5	0.95	1
PT Donggi-Senoro LNG	Southeast Asia	0.7	1.53	1

Weighted Average Methane Intensity **1.07 kgCH₄/BOE**

Summary Table Korean LNG Supply

LNG terminal	Region	Contract Size	Upstream Methane Intensity	Year Last Contract Ends	Geographic Representativeness
Ras Laffan LNG	Middle East	6.10	0.79	2044	1
Sabine Pass LNG	North America	3.90	1.55	2046	2
Corpus Christi LNG	North America	0.40	1.55	2045	2
BP as portfolio seller	North America	1.58	1.48	2039	4/5
Prelude FLNG	Oceania	0.36	0.63	2039	1
Shell as portfolio seller	Oceania	3.64	0.63	2038	4/5
Chevron as portfolio seller	Oceania	0.50	0.73		4/5
Sakhalin-2 LNG	Other	1.50	0.95	2028	1
TotalEnergies as portfolio seller	Other	2.60	1.12	2031	4/5
MLNG	Southeast Asia	3.10	1.51	2034	1
Tangguh LNG	Southeast Asia	1.75	1.33	2029	1
PT Donggi-Senoro LNG	Southeast Asia	0.70	1.53	2027	1

Summary Table Japanese LNG Supply

LNG Terminal	Region	Contract Size	Upstream Methane Intensity	Year Last Contract Ends	Geographic Representativeness
Ras Laffan	Middle East	1.38	0.79	2030	1
ADNOC Gas	Middle East	0.20	1.04	2030	1
Qalhat	Middle East	2.37	1.00	2034	1
Cove Point	North America	0.80	1.50	2038	1
Freeport	North America	2.33	1.48	2038	2
Cameron (Liqu.)	North America	2.49	1.44	2040	2
LNG Canada	North America	1.20	0.87	2040	1
CP2	North America	1.00	1.48	2048	2
Pluto	Oceania	2.25	0.57	2026	1
Ichthys	Oceania	4.13	0.58	2032	1
NWS	Oceania	3.40	1.02	2033	1
PNG LNG	Oceania	3.30	1.63	2034	1
QCLNG	Oceania	1.60	0.78	2036	1
APLNG	Oceania	1.00	0.78	2037	1
Wheatstone	Oceania	6.15	0.59	2038	1
Gorgon	Oceania	6.69	0.68	2039	1
Darwin	Oceania	0.80	1.55	2044	1
Chevron as portfolio seller	Other	0.10	0.74	2027	4/5
Sakhalin 2	Other	5.30	0.95	2033	1
TotalEnergies as portfolio seller	Other	0.70	1.00	2036	4/5
Shell as portfolio seller	Other	2.20	0.96	2038	4/5
BP as portfolio seller	Other	3.30	1.09	2041	4/5
Mozambique LNG	Other	0.28	1.15	2043	1
DSLNG	Southeast Asia	1.30	1.53	2027	1
Petronas as portfolio selller	Southeast Asia	0.54	1.50	2027	4/5
Petronas LNG Bintulu, Sarwak	Southeast Asia	4.07	1.51	2031	1
Tangguh	Southeast Asia	1.00	1.33	2035	1

Methane Intensity Data Source Comparison

Replication of MiQ Supply Chain Protocol’s data source comparator

Table 1. Matrix of Data Quality indicators for evaluation of quantified emissions (CO2e, or CH4) in a natural gas life cycle inventory per unit process

DQIs	<-- Highest Score Lowest Score -->		
Time-related representativeness	1. <3 yrs	2. <6 yrs	3. <10 yrs
Geographical representativeness	1. Asset-level, asset that is being evaluated	2. Sub-asset level or regional, same geographical region	3. Country-level estimate, if multiple regions are possible
Technological representativeness	1. Quantification methods include measurement-based, facility-specific emission factors, process models or calculations which address all "technologies" within a unit process and a temporally complete range of operating conditions or emission distributions	2. Quantification methods include generic emission factors addressing all "technologies" or emission sources within unit process	3. Quantification methods apply emission category level factors, or are estimated by comparing similar unit processes where more data is available
Completeness	1. A materiality of unit process flow as well as emissions flow is captured by quantification methods (i.e. through temporally complete and/or spatial top-down and bottom-up quantification methods)	2. A materiality of unit process flow and emissions flow is captured through either top-down, or bottom-up quantification methods, or comparable representation through a moderate sampling set	3. A small sampling size of unit process and emissions flow is used to represent larger asset
Reproducibility ⁴ See EPA DQIs: Process Review	1. Third party audit with reasonable assurance ⁵ or peer-reviewed studies	2. Third party audit with limited assurance ⁶ or non-peer reviewed publication (i.e. white paper)	3. Self-reporting or First party audit

OCI+ demonstrates good time, geographical, and completeness scores indicating modeled values are relatively more granular, time-related, and complete than some other publicly available modeled values. While this is less accurate than third party verified measured asset emissions, the data provided is sufficient to provide directional MIs to support buyers in identifying hot spots in their supply chain.

Data Source	Time-related Represent- ativness	Geographical Represent- ativeness	Technological Represent- ativeness	Complete- ness	Reproduc- ibility	DQI
Currently Available Data Sources						
MiQ ¹¹ , MiQ-EO ¹²	1	1	1	1	1	1
EO	1	1	2	2	1	4
Sherwin et al (2024) ¹³ , basin level	1	2	2	1	1	4
OGMP L4 single Asset, UN review	1	1	1	2	3	6
MiQ LNG Shipping Model ⁸	1	1	3	3	1	9
OGMP L3 single Asset, UN review	1	1	2	2	3	12
NETL Model (2019) ¹⁴	2	3	2	2	1	24
MiQ-HW Index (2023) ¹⁵	2	3	2	1	2	24
Rutherford et al (2021) ¹⁰	2	3	2	2	1	24
Alvarez et al (2018) ¹⁶	2	3	2	2	1	24
REET, placeholder values ¹⁷	2	3	2	2	2	48
OCI+ Model ¹⁸	1	2	3	2	3	36
IEA GMT ¹⁹	1	3	3	2	3	54