

# Reducing Methane Emissions From Global Gas

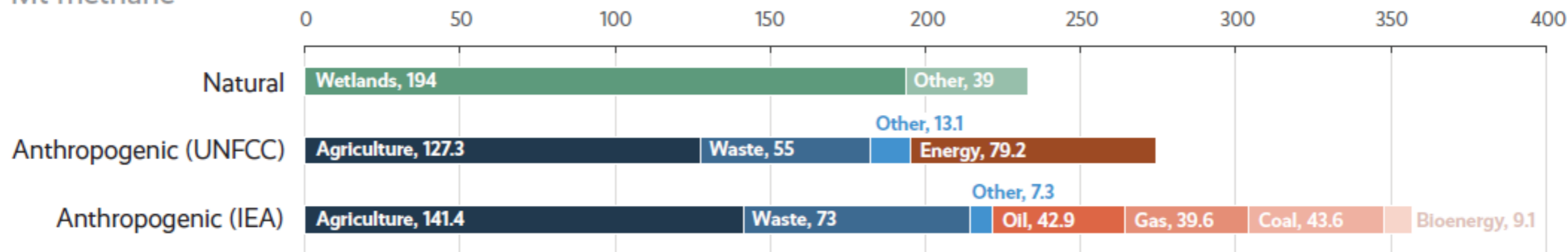
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# Why methane matters

## Global Methane Emissions: Natural and Anthropogenic

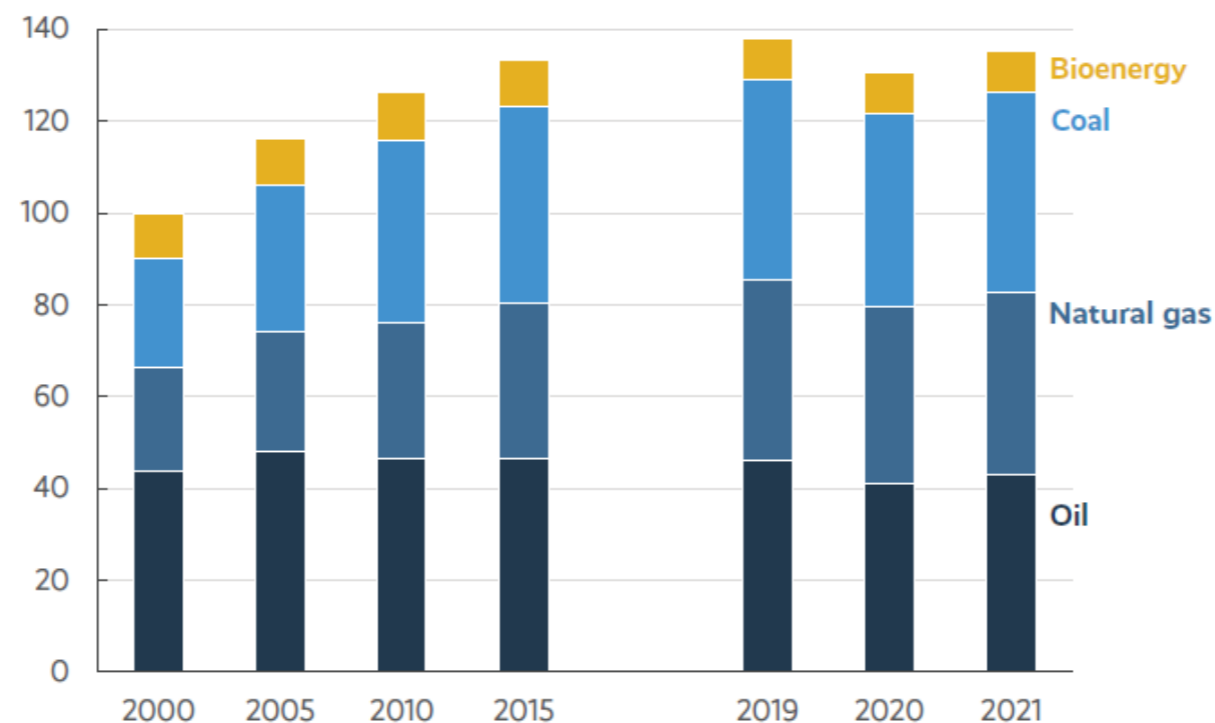
Mt methane



Source: Based on data from "Global Methane Tracker 2022," International Energy Agency, <https://www.iea.org/reports/global-methane-tracker-2022/estimating-methane-emissions>.

## Global Methane Emissions: Energy

Mt methane



Source: Based on data from "Global Methane Tracker 2022," International Energy Agency, <https://www.iea.org/reports/global-methane-tracker-2022/estimating-methane-emissions>.

# Invisible foe

Methane is odorless and colorless. Finding leaks requires special equipment and monitoring.

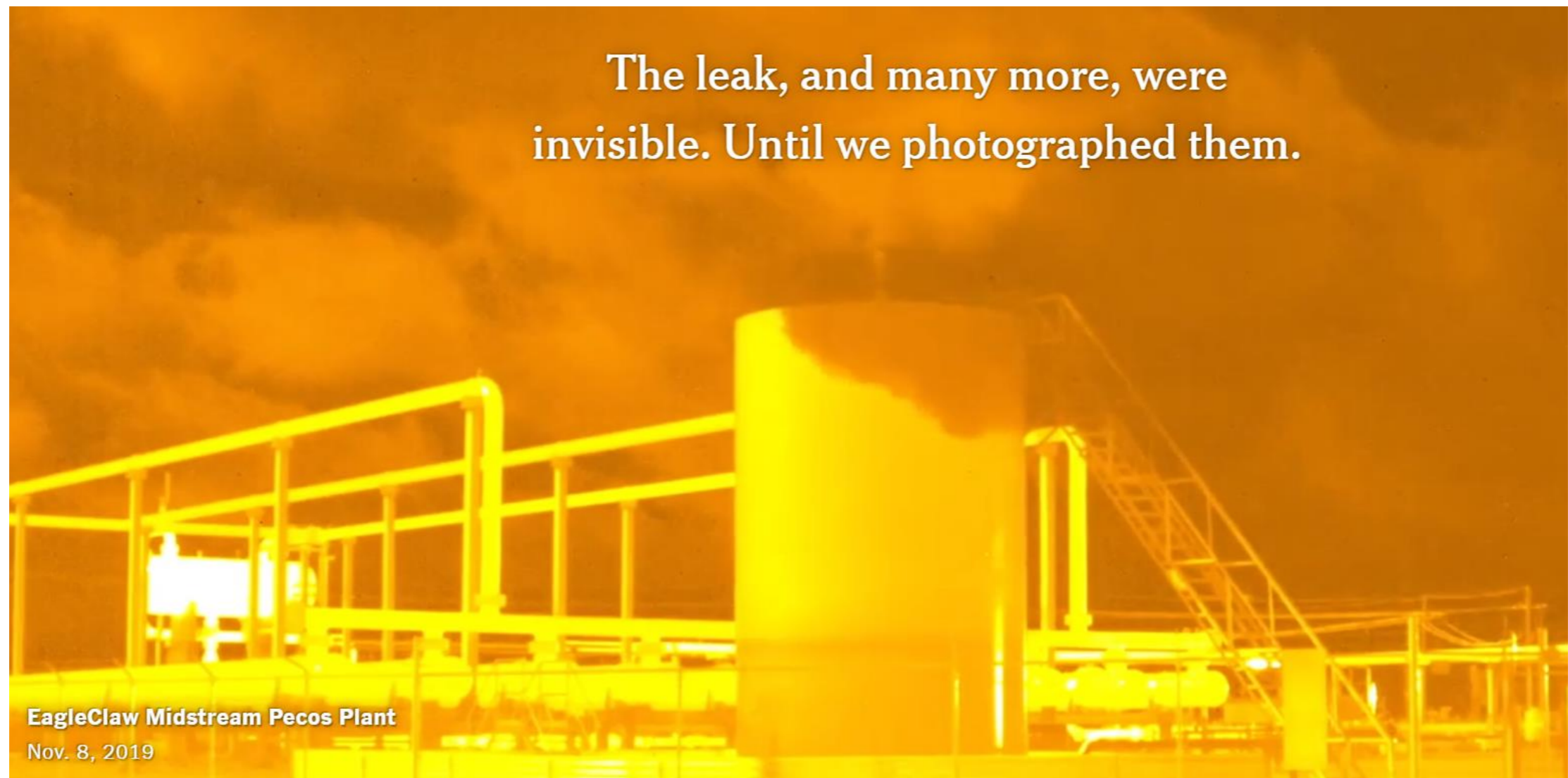


Image source: New York Times, "It's a Vast, Invisible Climate Menace. We Made it Visible,"  
<https://www.nytimes.com/interactive/2019/12/12/climate/texas-methane-super-emitters.html>.

# Technology and markets enabling progress

**Oil and gas methane emissions have been underestimated** for many years. “Bottom-up” estimates fail to account for “super-emitter” wells and leave aside smaller or marginal wells.

**New methane detection technologies** are emerging fast:

- Ground-based monitoring
- Airplane and drone surveys: can cover wide areas
- Satellite technology: enables wide sweeps

There is a **big push from regulators in the United States and the European Union** on cutting methane emissions.

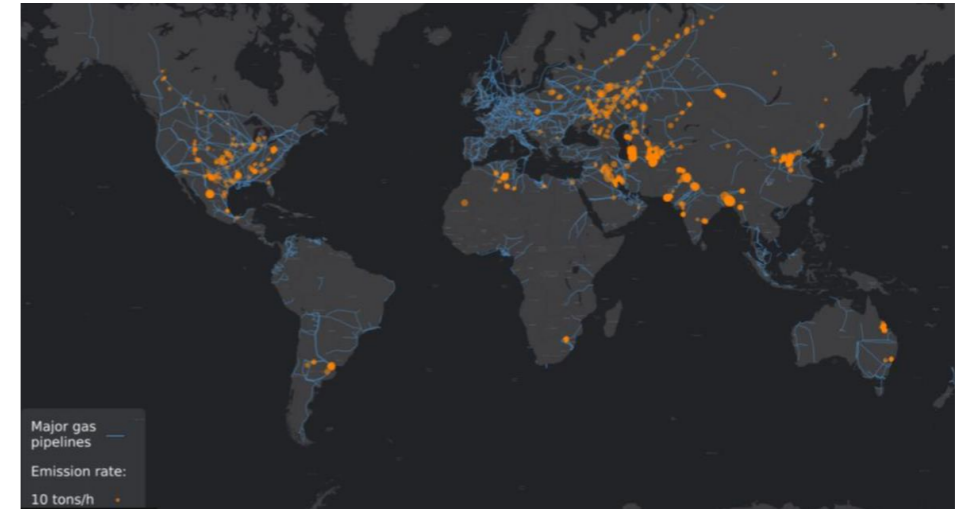


Image source: <https://www.bbc.com/news/science-environment-60203683>. Data from Carbom Mapper.



# How will the methane push affect global LNG?

## Significant progress on methane last year:

- Global Methane Pledge: 112 countries
- Proposed U.S. Environmental Protection Agency (EPA) methane standards
- Proposed European Union (EU) methane legislation



Image source: Kevin Lamarque, Reuters.  
<https://www.pbs.org/newshour/science/the-new-global-methane-pledge-can-buy-time-while-the-world-drastically-reduces-fossil-fuel-use>.

## What does this mean for global LNG?

- Will demand develop for cleaner gas?
- What momentum beyond the U.S. and EU?

# LNG players are a diverse bunch

**State gas and power utilities, NOCs, supermajors, and trading houses** have different ownership structures, market roles, and stakeholders.

**Their climate and methane commitments** are highly variable.



Leading Process Technology, Equipment, EPC, and Infrastructure Providers




## Creditworthy Counterparties



# CSIS research: survey of global LNG players

From November 2021 to March 2022, **CSIS interviewed companies, regulatory agencies and financial institutions**, to ask how much they are focusing on methane issues.

3	U.S. LNG exporters
3	Japanese trading houses
2	Large Japanese gas buyers
2	Commodity trading houses
2	Supermajors
1	Australian LNG exporter
1	SE Asian LNG exporter
3	SE Asian government agencies
2	Leading LNG consultancies
2	Price reporting agencies
1	Export credit agencies


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MAY 2022

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Policy, Markets, and Ecosystems

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### Executive Summary

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- Because methane is a potent but short-lived climate pollutant, cutting methane emissions is one of the most powerful levers to slow the pace of global warming in the next decade.
- Proposed rules and legislation in the United States and the European Union would require oil and gas companies to enhance their methane monitoring, address leaks, and limit venting and flaring.
- Methane detection technology is rapidly improving, with an array of ground-based detection, drone- and airplane-based surveys, and satellite technology able to pinpoint methane emissions.
- Rapid technological developments make it challenging to design regulations that encourage operators to adopt the best possible detection technology without being overly prescriptive.
- Most action on reducing methane emissions will take place on the supply side, but it is important to analyze how demand for "differentiated" or cleaner gas will develop.

# Key themes on methane and global LNG

**Emissions intensity is not yet a big factor.**

Companies focusing on their own operational emissions.

**Asian buyers: coal to gas switching is already a climate win.**

Divided views on “carbon-neutral” LNG: solution or fad?

**Bigger long-term threats to LNG than CH<sub>4</sub> intensity.**

Financial backers not yet pushing hard.

*“Market demand is not there yet for differentiated gas. Price and commercial terms are paramount.”*  
– LNG marketer

*“Most investors still believe that LNG provides net climate benefits to the world and will for a long time to come.”*  
– U.S. LNG exporter



# Key themes on methane and global LNG

**For Asian utilities, there are bigger levers to cut methane than LNG.**

Some are looking to hydrogen, not cleaner gas, to meet net-zero goals.

**Impact of the Global Methane Pledge is uncertain.**

Data providers have an important role to play

**Familiarity with methane detection technology varies**

Cleaner gas is a big potential advantage for U.S. LNG.

*“Carbon-neutral LNG and lower-emissions LNG are happening in spite of governments, not because of government drivers.”*

*– LNG consultant*

*“It is necessary to improve the detection, accuracy, and cost [of methane detection technology] to make these services more accessible.”*

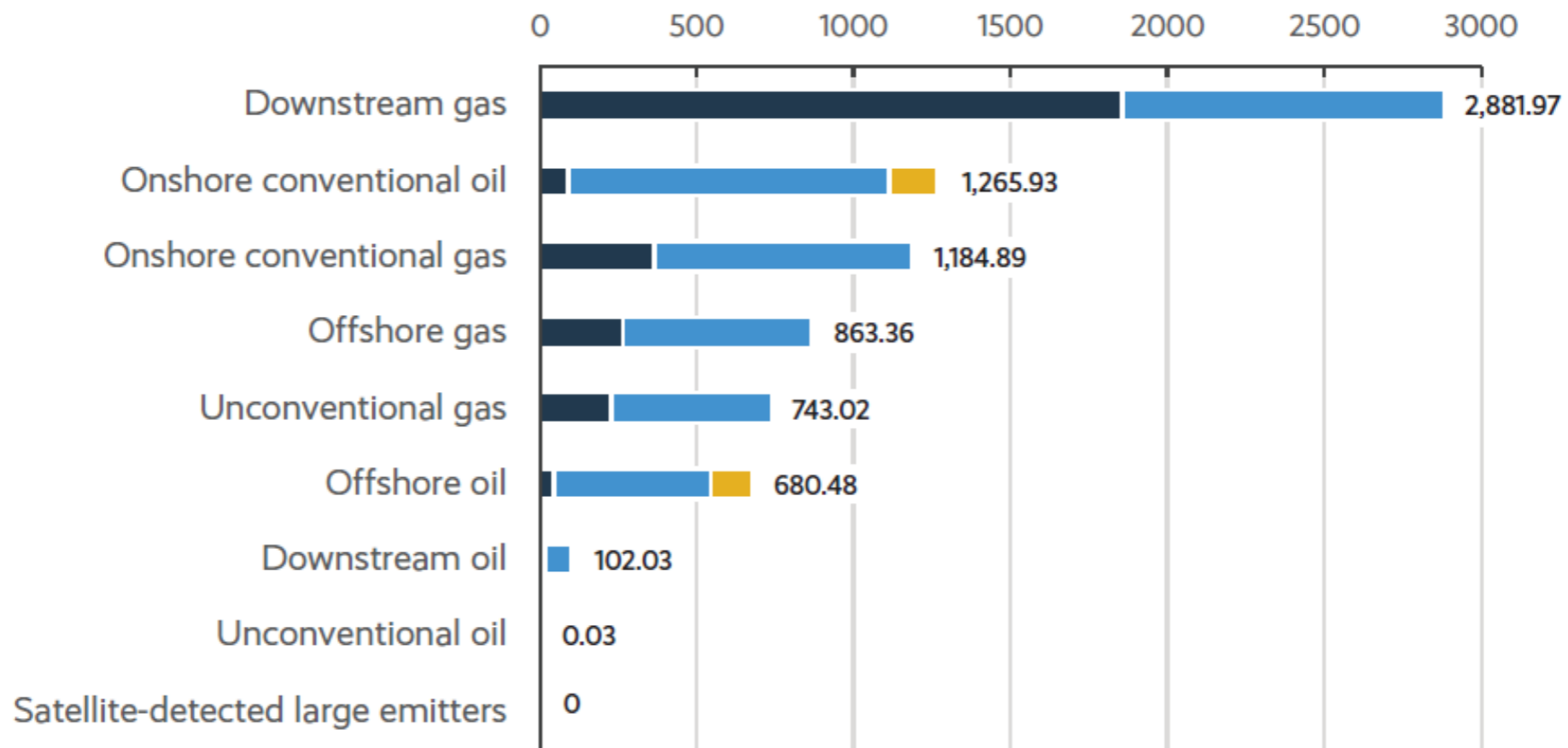
*– Japanese LNG buyer*

# Downstream emissions are key challenge in Asia

## Asia Pacific: Methane Emissions from Oil and Gas, 2020

Mt methane

■ Fugitive ■ Vented ■ Incomplete flaring



Source: Based on data from "Methane Tracker Database," International Energy Agency, <https://www.iea.org/reports/global-methane-tracker-2022/estimating-methane-emissions>.

# How to cut methane emissions from global LNG

Each individual player in global LNG—seller, buyer, bank, or regulator—interacts with many others.

To make progress, we should take an **ecosystem approach** and focus on the **interactions** of these players and their **influence** in each country or region.

<b>Upstream producers</b>	<ul style="list-style-type: none"> <li>• Better monitoring, reporting, and verification (MRV)</li> <li>• Stronger leak detection and repair (LDAR)</li> </ul>
<b>LNG exporters</b>	<ul style="list-style-type: none"> <li>• Offer differentiated gas and invest in life-cycle emissions analysis</li> <li>• Tollers: press upstream producers for better emissions data</li> </ul>
<b>National oil companies</b>	<ul style="list-style-type: none"> <li>• As buyers, ask for emissions cargo tags and better emissions accounting</li> <li>• As producers, apply better LDAR</li> </ul>
<b>Gas and power utilities</b>	<ul style="list-style-type: none"> <li>• Exercise market power: prioritize low-emissions gas</li> <li>• Fix leaks at storage tanks and pipelines</li> </ul>
<b>Regulators</b>	<ul style="list-style-type: none"> <li>• Enact stringent rules for upstream producers</li> </ul>
<b>Banks and export credit agencies (ECAs)</b>	<ul style="list-style-type: none"> <li>• Commercial banks: prioritize emissions intensity as a lending risk factor</li> <li>• ECAs: examine methane emissions intensity in assessing projects</li> </ul>

# Risk factors in commercial LNG decisions

Buyers might prefer gas with lower methane intensity—but this is part of a **complicated matrix of risk factors** they consider over a 15-year plus time horizon for projects.

Will gas supply be reliable?

Are the sponsors credible and committed?

Is there stakeholder buy-in?

Is there a supportive ecosystem?

Is the project commercially viable?

# Where might methane intensity fit in?

Buyers and sellers negotiate over many contract parameters.

- Volume
- Price
- Duration
- Delivery terms
- Destination flexibility and other commercial terms

Typical gas sale and purchase (SPA) agreements cover gas quality, but as an operational issue—for example to account for extra processing to strip out ethane and butane. This can add or subtract value.

**Methane intensity could become one of the criteria** that buyers consider in decisions about what gas to buy and under what terms. It could become a negotiable term between buyers and sellers, if cleaner gas fetches a premium.

# Takeaways and points for discussion

- Policy drivers and market drivers for differentiated (cleaner) gas may not spread from one country/region to another.
- Market innovations in gas and LNG take time (e.g., destination flexibility, pricing).
- LNG project sponsors, buyers, and lenders consider an array of risk factors—which over time could include methane intensity.
- Gas quality is an operational issue, methane intensity is not.
- LNG lenders (public and private) have varying concerns over sustainability and emissions intensity.
- The gas and LNG ecosystem is diverse. The levers of influence on state utilities, NOCs, financial institutions, etc. will vary.