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METHANE: An Opportunity for Asia-Pacific to Lead on Energy and Climate

As governments and companies move to cut emissions, the importance of the Asia-Pacific region comes into focus

Cutting Methane Emissions:
The Key to Meeting Energy Demand and Reducing Warming

Asia-Pacific countries have become a key driver of the natural gas market. By 2050, the region is expected to account for nearly 60% of global natural gas demand growth. Already, Japan, South Korea, and China account for 50% of the world's liquified natural gas (LNG) trade.

This growing demand comes as the world has been thrust into a new energy crisis. Meanwhile, scientists tell us we have precious little time to reduce climate emissions at the scale needed to prevent irreversible consequences of climate change.

Methane emissions from the oil and gas supply chain in Asia-Pacific's energy-producing nations are enough to cover 35% of Japan's residential and commercial gas demand.

These twin crises must be addressed together, and reducing global emissions of methane – a powerful climate pollutant and the main ingredient of natural gas – has emerged as a powerful solution. That puts Asia-Pacific countries and energy companies at the center of this global opportunity.

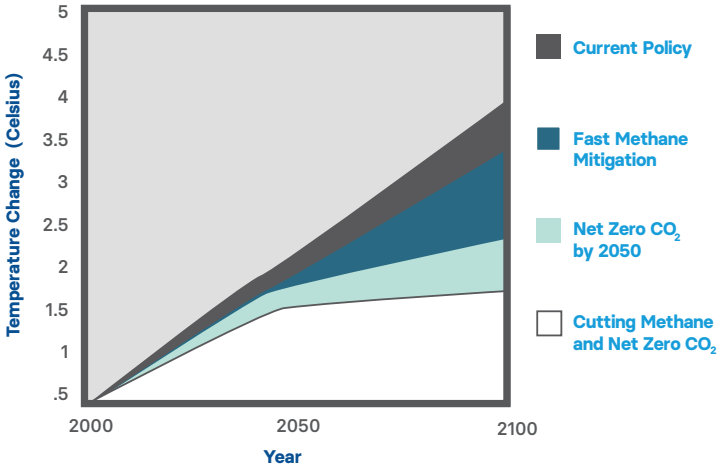
Methane emissions from the oil and gas supply chain in Asia-Pacific's energy-producing nations are enough to cover 35% of Japan's residential and commercial gas demand. Globally, the fossil fuel industry emits enough unburned methane every year to meet the gas demand of the entire European power sector.

In addition to a wasted energy resource, methane is also a powerful short-lived climate pollutant. Emissions from fossil fuel operations and other sectors are responsible for more than 25% of current warming. Methane pollution from the oil and gas industry threatens to undermine any climate benefit of switching from coal to natural gas.

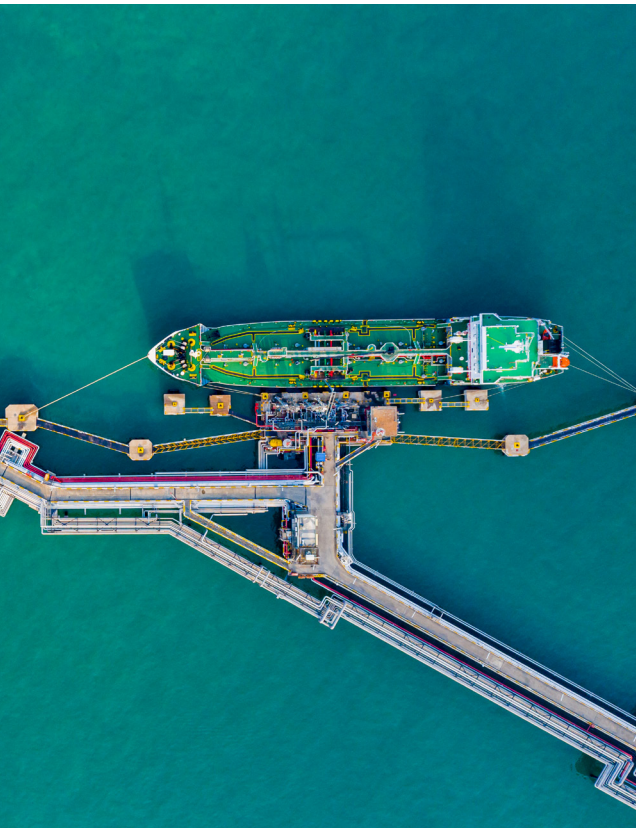
Countries around the world increasingly recognize that reducing methane emissions is the most effective way to slow warming this decade, even as we accelerate efforts to decarbonize the economy, and that the oil and gas industry is the quickest, easiest, and lowest-cost place to start. Moreover, it would directly benefit a tight global gas market by increasing available gas supply.

Temperature Projections Under Various Emission Reduction Policies

Data Source: Sun et al 2022; temperature change is relative to pre-industrial levels



Methane:
What You Need to Know



Methane has 80X more warming impact than CO_2

for the first 20 years it's in the atmosphere

Methane is short-lived — but powerful

significant emission reductions can slow warming now, while unabated methane emissions can negate any climate benefit of coal-to-gas fuel-switching

25% of human-caused methane is emitted by the oil + gas industry

and occurs across the supply chain, not just where oil and gas are produced

Leaked methane is lost energy

that could be captured and used to generate electricity and heat homes

Reducing methane emissions can relieve market pressure

and accelerate climate progress

Climate change is already a shared challenge for Asia-Pacific countries. Reducing oil and gas methane is a shared opportunity that benefits all countries.

Reducing Methane

Minimizing the methane emissions associated with the Asia-Pacific region's gas supplies is vital to decarbonization efforts.

The Key to Energy Security

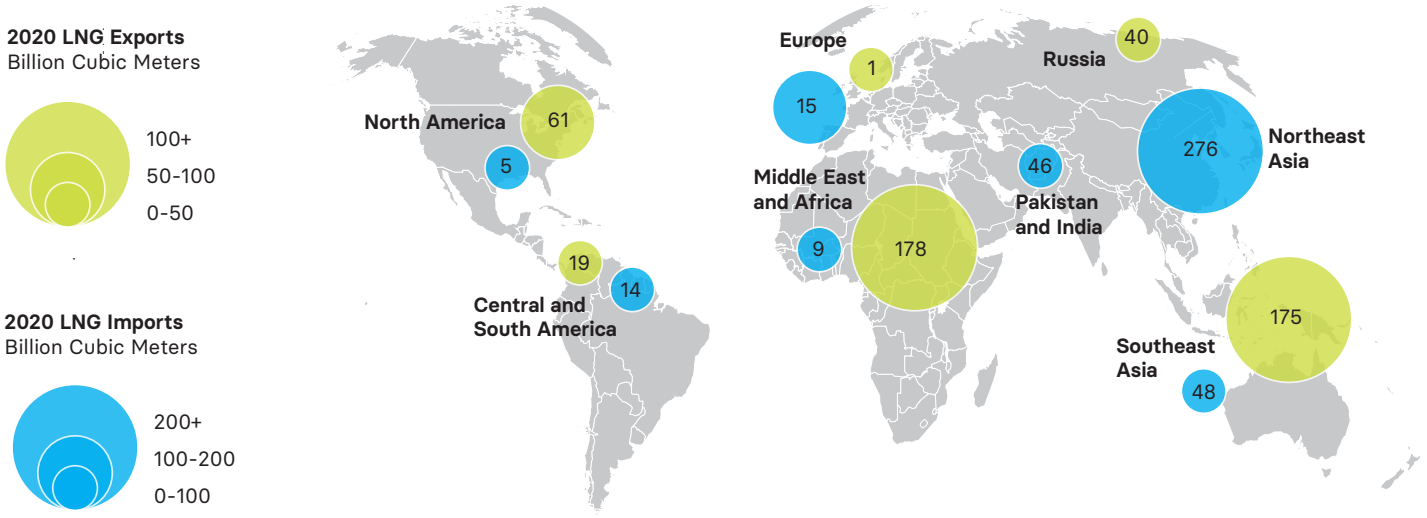
An authoritative series of peer-reviewed scientific studies organized by Environmental Defense Fund (EDF) and others demonstrated that oil and gas methane emissions have been widely and dramatically understated. According to the International Energy Agency (IEA), actual emissions from fossil fuels are at least 70% higher than government or official emissions inventories estimate.

Leaked methane gas is lost energy. Supplier and buyer countries could go a long way in addressing the global energy security crisis by working to end the methane waste caused by unnecessary venting, burning, or leaks of natural gas.

Importantly, reducing oil and gas methane is technically feasible, economically efficient, and environmentally effective. IEA analyses show that Asia-Pacific oil and gas operators can use current technologies to cut methane emissions 70% by 2030, and that two-thirds of these cuts are achievable at no net cost.

Liquified Natural Gas Trade Flows

Data Source: BP Statistical Review of World Energy 2021



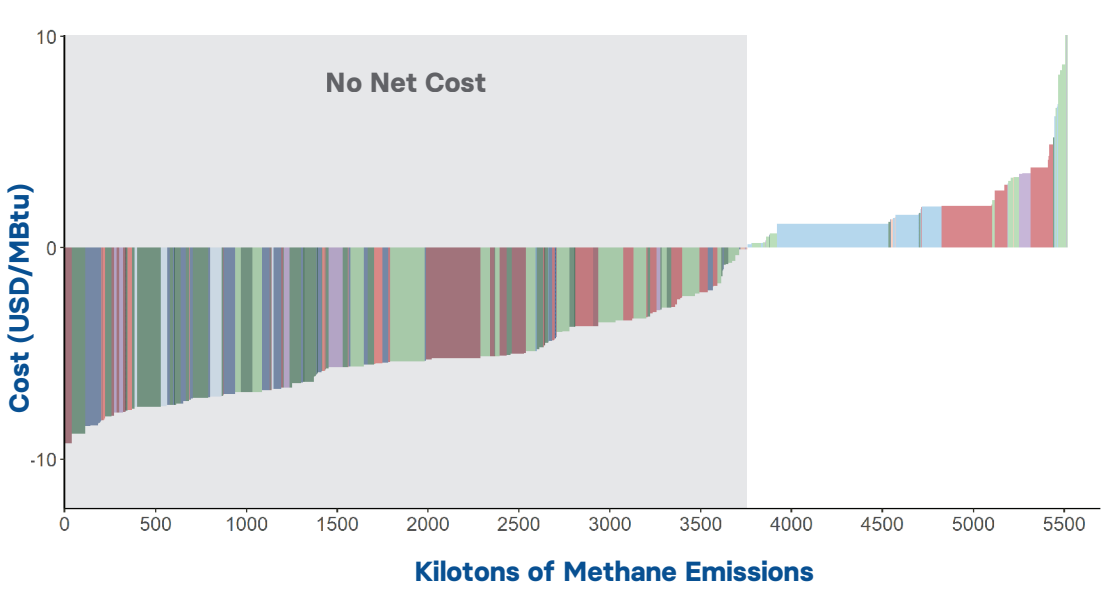
Central to Global Climate Efforts

Moving quickly to curtail methane emissions now will reduce peak global warming. The Intergovernmental Panel on Climate Change (IPCC) concluded that sustained methane reductions are essential to meet the targets of the Paris Agreement and has directly called for global methane emissions to be cut 34% by 2030 and in half by 2050.

Minimizing the methane emissions associated with the Asia-Pacific region's gas supplies is vital to decarbonization efforts. Asia-Pacific nations currently account for 43% of global methane emissions and 10% of oil and gas methane – a number expected to climb as natural gas demand rises.

Oil and Gas Methane Abatement Potential and Cost for Asia-Pacific Countries

Data Source: IEA Methane Tracker 2022



Replace Existing Devices
- Early replacement of devices
- Replace compressor seal or rod
- Replace pumps
- Replace with electric motor
- Replace with instrument air systems

Install New Devices
- Blowdown capture
- Install flares
- Install plunger
- Vapor recovery units

Leak Detection and Repair (LDAR)
- Downstream LDAR
- Upstream LDAR

Other
- Other

Reducing Methane

Existing technology can affordably identify and reduce methane emissions throughout the world's energy supply chain.

The Global Response

Nations around the world are responding. More than 100 countries, including Japan, South Korea, and Malaysia, have joined the Global Methane Pledge – a commitment to reduce human-caused methane emissions at least 30% from 2020 levels by 2030, with the goal of avoiding 0.2˚C of warming by 2050.

The pledge is a critical framework for achieving global methane reductions and a key complement to regionally-led efforts, such as the methane measurement and joint research initiatives in the U.S.-China Glasgow Declaration on Enhancing Climate Action in the 2020s, the work of ten local utilities in the China City Methane Alliance, and Seoul National University's methane research in South Korea.

And there are other signs of progress. The U.S. Environmental Protection Agency is strengthening federal limits on oil and gas methane emissions, and the European Commission is finalizing methane legislation that will tighten emissions standards for its energy sector. Companies including Beijing Gas, BP, CNPC, and Shell have committed to measure, report, and drive down methane emissions individually or through collective initiatives such as the Oil & Gas Climate Initiative (OGCI). More than 70 companies representing half the world's oil and gas production have joined the UN Environment Programme's Oil & Gas Methane Partnership 2.0 (OGMP 2.0), committing to a framework for improving the quality of measurement and reporting.

A Leadership Opportunity for Asia-Pacific

For Asia-Pacific countries to lead on methane, this activity and momentum must continue and expand. Everyone has an important role to play, and collaboration among stakeholders is key to developing and implementing strategies that address the region's shared interests.

- All countries in the region should join Japan, South Korea, Singapore, the Philippines, Indonesia, Malaysia, and Vietnam in signing the Global Methane Pledge
- Energy companies should join OGMP 2.0, adopt ambitious methane reduction targets and stringent measurement frameworks, commit to leak detection and repair programs, and phase out routine venting and flaring
- Energy buyers and sellers should develop a regional collaborative to find methane solutions that increase regional gas supply and reduce regional methane emissions

Asia-Pacific Global Methane Pledge Members

- Fiji
- Indonesia
- Japan
- Malaysia
- Marshall Islands
- Micronesia
- Nauru
- Nepal
- New Zealand
- Niue
- Pakistan
- Palau
- Papua New Guinea
- Samoa
- Singapore
- South Korea
- The Philippines
- Timor-Leste
- Tonga
- Vanuatu
- Vietnam

Asia-Pacific Net Zero Pledges or Policies

- Australia
- Bhutan
- China
- Fiji
- India
- Japan
- Laos
- Malaysia
- Maldives
- Marshall Islands
- Nauru
- New Zealand
- Russian Federation
- Singapore
- South Korea
- Sri Lanka
- Thailand
- Vietnam

The Core Principles
of Methane Mitigation

Technology is ushering in a new wave of emission transparency, from on-site methane detectors and aerial surveys to satellites that can pinpoint emission sources and quantities with unprecedented accuracy. Designing and implementing strategies around core Measurement, Reporting, and Reductions criteria will help Asia-Pacific countries and companies prepare for this shift.

Reducing methane begins with identifying and quantifying emissions and sources.

Measurement

Robust, accurate, and regular methane emission monitoring and measurement programs allow companies to document emission reduction efforts.

Reporting

Independent third-party verification and transparent reporting of methane emission data are essential in establishing reduction plans that regulators, customers, and investors can trust.

Reductions

Methane programs must produce real-world reductions. Producers should set ambitious methane reduction targets, implement action plans to reduce emissions, and report progress with empirical data. Major gas buyers should acknowledge the upstream emissions embedded in gas imports, prioritize the purchase of low methane-intensity gas, and partner with producers to reduce upstream emissions.

Key Methane Emissions Sources for Asia-Pacific's Gas Supply

- Upstream Oil and Gas Production
- Gas Refrigeration and Liquification
- LNG Shipping
- Regasification and Storage

One of the world's leading international nonprofit organizations, Environmental Defense Fund (edf.org) creates transformational environmental solutions based on science and economics. We work on the world's biggest environmental challenges in 28 countries with an integrated agenda across four anchor regions: China, India, Europe, and the United States.

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To learn more about EDF's global methane research and solutions in the Asia-Pacific region, contact Hanling Yang, Senior Director, Energy Transition-Asia, at hyang@edf.org.