REDUCING METHANE EMISSIONS FROM OIL AND GAS OPERATIONS

STATES AND REGIONS
ACTION GUIDE

THE °CLIMATE GROUP

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CONTENTS

EXECUTIVE SUMMARY

State and regional governments in the Under2 Coalition are taking action to address methane emissions from the oil and gas industry. Methane is a short-lived climate pollutant (SLCP) with a powerful warming effect and the oil and gas industry is a major contributor to global methane emissions.

There are a range of solutions available to reduce methane emissions and many of these are cost-effective for both companies and for the economy overall. Despite this, implementation of these solutions is voluntary in most jurisdictions, and so methane emissions continue to rise. Governments need to act so that mitigation solutions are implemented quickly and on a wide scale, ensuring climate goals are met and health and economic benefits are realized.

Through the Under2 Coalition Methane Project – a forum for state and regional governments from around the world to share effective ways to reduce methane emissions – governments have been learning about the latest policy solutions for addressing methane emissions from oil and gas operations.

During the project, Under2 Coalition governments explored both proven and emerging approaches to measuring and reducing methane emissions through a series of webinars and case studies. Participants also engaged with industry experts and connected with global methane initiatives.

This Action Guide draws on both the work of the project and other examples of government strategy, showcasing policy actions that state and regional governments are implementing in their jurisdictions. It is designed to serve as a tool for policymakers looking for successful state-level examples of curbing methane emissions.

GOVERNMENTS NEED TO ACT SO THAT MITIGATION SOLUTIONS ARE IMPLEMENTED QUICKLY AND ON A WIDE SCALE, ENSURING CLIMATE GOALS ARE MET AND HEALTH AND ECONOMIC BENEFITS ARE REALIZED.

WHY GOVERNMENTS SHOULD TAKE ACTION ON METHANE FROM OIL AND GAS

REDUCING METHANE WILL HELP ACHIEVE CLIMATE GOALS

Methane, a short-lived climate pollutant (SLCP), has a powerful warming effect. Over a 20-year timespan, it has more than 80 times the climate warming impact of carbon dioxide. Action on methane and other SLCPs will help achieve the climate goals outlined in the Paris Agreement, alongside strong action to reduce carbon dioxide emissions.

According to the Intergovernmental Panel on Climate Change (IPCC), reducing SLCPs can contribute significantly to limiting warming to 1.5°C above pre-industrial levels in the short term. Recent research also shows that more methane is being released than previously thought. In the United States, for example, new estimates of methane emissions are approximately 60% greater than previous estimates by the U.S. Environmental Protection Agency. Targeting methane can significantly limit the amount of warming expected over the next few decades.

THE OIL AND GAS INDUSTRY IS A KEY SOURCE OF METHANE

The oil and gas industry is a major contributor to global methane emissions. In 2017, the industry released around 80 million tonnes of emissions, equal to 6% of global greenhouse gas emissions from the energy sector. The sector is estimated to contribute to around 25% of global methane emissions. These emissions come from leaks and routine venting during the production, processing and transportation of natural gas as well as from oil operations.

REDUCING METHANE BENEFITS HEALTH

Reducing methane emissions from the oil and gas industry has benefits for health and air quality. In addition to methane emissions, oil and gas operations also release volatile organic compounds (VOCs) and other pollutants such as benzene, formaldehyde and acetaldehyde. VOCs are recognized as hazardous air pollutants, are potentially carcinogenic and are known to cause other serious negative health impacts. VOCs are precursors to the formation of ground-level ozone, a dangerous air pollutant that causes harm to the respiratory system.

REDUCING SLCPS CAN CONTRIBUTE SIGNIFICANTLY TO LIMITING WARMING TO

1.5°C

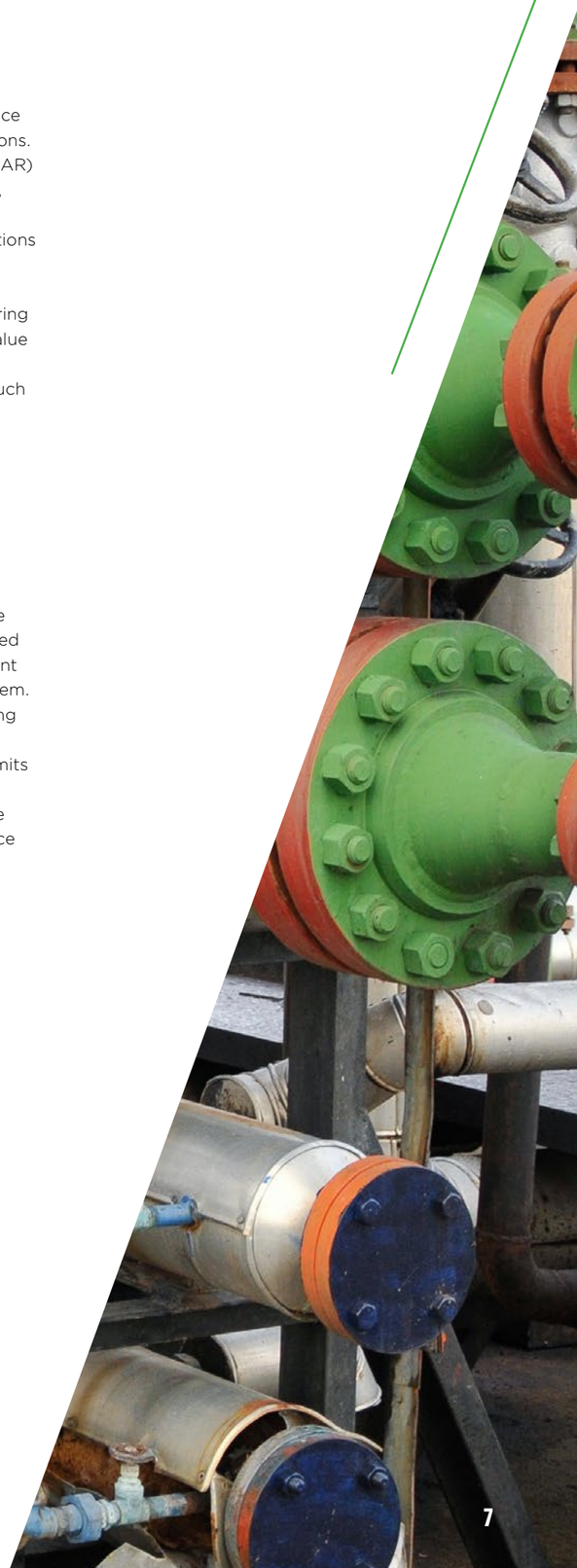
COST-EFFECTIVE SOLUTIONS ARE AVAILABLE

There are already solutions available to reduce methane emissions from oil and gas operations. These include: leak detection and repair (LDAR) programs, utilizing best practice equipment, technologies and operating techniques, and methane capture and utilization. These solutions are not only readily available, many are also cost-effective for companies and for the economy overall. Reducing leaks and capturing gas that can be sold represents an added value for oil and gas companies and reducing gas losses can create economy-wide benefits, such as lower prices for customers.

FAST ACTION IS REQUIRED

Governments need to act so that mitigation solutions are implemented quickly and on a large scale in order to meet climate goals and realize health and economic benefits. Despite the availability of solutions, methane emissions continue to grow due to a sustained rise in global oil and gas demand and inherent barriers to abatement in the oil and gas system. Although some industry leaders are achieving reductions through their own efforts, for others this area is not a priority. There are limits to what can be achieved through voluntary actions, and government policies can ensure that all companies are taking action to reduce emissions. According to the International Energy Agency, policies and regulations will be essential to achieve the 75% emissions reduction by 2030 needed to meet UN Sustainable Development Goals.

TARGETING METHANE CAN SIGNIFICANTLY LIMIT THE AMOUNT OF WARMING EXPECTED OVER THE NEXT FEW DECADES.



STATE AND REGIONAL GOVERNMENT LEADERSHIP ON METHANE EMISSIONS

State and regional governments have a role to play in ensuring the oil and gas industry reduces methane emissions. Through government regulatory powers, best practice can be turned into standard practice in areas such as air quality and industry emission standards.

Compared to national governments, states and regions have more opportunities to be innovative, agile and reactive in their policy approach while also being instrumental in supporting the development of new and more efficient technologies.

Where national or local district governments have existing regulations, state and regional governments can strengthen or complement these while also addressing any gaps.

State and regional governments can also take action through non-regulatory means, such as investing in research, providing tax incentives and improving their own reporting requirements or transparency measures.

In The Climate Group and CDP's Global States and Regions Annual Disclosure 2019, 50 governments reported that they measure SLCPs and 21 have assessed the environmental impact of SLCPs. A further 12 governments have conducted an economic assessment of mitigation measures and 22 have a region-wide SLCP reduction plan.

THE UNDER2 COALITION METHANE PROJECT

The Under2 Coalition Methane Project is a forum for state and regional governments around the world to share effective ways to reduce methane emissions.

Supported by the Pisces Foundation, the project aims to demonstrate the feasibility of action on SLCPs at the subnational level, showcase new technologies and share ways in which state and regional governments can support global initiatives and take additional action to reduce emissions. A number of organizations, including the Climate and Clean Air Coalition (CCAC) of the United Nations Environment Program and the Clean Air Task Force (CATF), have provided expertize to support the delivery of the project.

Forty states and regions (including a number from outside of the Under2 Coalition) participated in and benefited from a series of webinars where leading governments and experts shared their experiences.

The project connected participants to global initiatives and experts, including: The Climate & Clean Air Coalition's Oil & Gas Methane Partnership, Clean Air Task Force (CATF), The World Bank's Zero Routine Flaring Initiative, International Petroleum Industry Environmental Conservation Association (IPIECA), Methane Emissions Leadership Alliance (MELA), Environment Defence Fund (EDF), Carbon Limits Nigeria and Society for Petroleum Engineers (SPE).

POLICY OPTIONS TO REDUCE METHANE EMISSIONS

CASE STUDY

CALIFORNIA'S CRUDE OIL AND NATURAL GAS EMISSIONS STANDARDS

In 2016, California's oil and gas sector emitted about 3.3 million metric tons of methane gas. To tackle this challenge, California adopted the Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities in March 2017.

The regulation includes comprehensive specifications for leak detection and repair. It provides for the inspection of components such as valves, flanges and connectors currently not covered by local air district rules. It also specifies standards and timeframes for the repair of any detected leaks.

Overall, the regulation is anticipated to result in over 1.4 million metric tons of methane emission reductions per year when fully implemented in 2021, which is more than a 40% reduction from 2016 levels.

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01 REGULATE METHANE LEAK DETECTION AND REPAIR PROGRAMS

A significant proportion of methane emissions are from spontaneous, unintended leaks from oil and gas facility components.

Leak detection and repair (LDAR) programs are a system of procedures for finding and repairing leaks and are a core part of the solution for addressing oil and gas methane emissions.

Governments can regulate for LDAR programs by specifying how surveys should be carried out, providing timeframes for repairing any detected leaks and requiring robust record keeping. Best practice programs have regular surveys that comprehensively cover all potential sources of leaks.

Governments can also carry out research and data collection to gain an understanding on leak distribution in their jurisdiction, enabling them to tailor the LDAR programmes appropriately. LDAR programs are generally a cost-effective method for addressing methane emissions and form a key part of policy response.

Recent research suggests that a small percentage of sites contribute to the majority of emissions. As new technologies develop, there is an opportunity to carry out frequent inspections to find these large sources quickly using technologies such as satellites, aircraft monitoring and on-site sensors. Governments should consider how new technologies could be incorporated into their LDAR regulations.

The governments of California (U.S.) and British Columbia (Canada) feature LDAR programs in their regulations. British Columbia also released a new guideline on the management of fugitive emissions to support LDAR requirements.

Beyond the Under2 Coalition, Colorado is another leading example of state action to curb methane emissions. Colorado first introduced regulations in 2014, including requirements to find and fix methane leaks.

02 LIMIT ROUTINE NATURAL GAS FLARING AND VENTING

Flaring is the burning of gas which arises as a by-product in the production of crude oil, coal or bitumen.

Flaring can be carried out routinely, to dispose of gases that are either unusable or uneconomic to recover. It can also be carried out for safety reasons. According to the IEA, around 140 bcm (billion cubic meters) of gas was flared in 2017, equivalent to Africa's total gas consumption.

Venting is the direct release of gas into the atmosphere and occurs during a number of points in oil and gas production processes.

Flaring and venting should be reduced or eliminated where possible and governments can set limits as well as standards for efficiency. Governments can also ensure that as much gas is captured and utilized as possible.

Outside of the Under2 Coalition, North Dakota is an example of a state-level government that has regulated gas flaring. North Dakota's policy was established in 2014, requiring companies to file a gas capture plan with their drilling permits and put flaring limits in place.

At the national level, the Government of Nigeria has faced a significant challenge in dealing with gas flaring and provides some examples of policy approaches to mitigate it.

CASE STUDY

REDUCING GAS FLARING IN NIGERIA

Nigeria is one of the world's largest producers of oil and natural gas and has faced a significant challenge to reduce the amount of gas flaring taking place. It has made significant progress, with a 70% reduction in flaring between 2000 and 2018, but the proportion of flared gas remains high.

In 2016, the Government of Nigeria introduced the Nigerian Gas Flare Commercialization Program (NGFCP). The objective of the NGFCP is to eliminate gas flaring through technically and commercially sustainable gas utilization projects developed by competent third-party investors. In order to provide a legal framework to the implementation of NGFCP, the Government of Nigeria approved the Flare Gas (Prevention of Waste and Pollution) Regulations 2018.

The regulation aims to achieve the following in the short to medium term:

- **reduce flaring by 20 billion cubic meters per year irrespective of the 2018 regulation**
- **provide access to Liquefied Petroleum Gas (LPG) for six million households**
- **generate 2.5 GW of power from new and existing Independent Power Producers (IPPs)**
- **benefit Niger Delta communities through reduced flaring and economic development.**

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03 PROVIDE SPECIFICATIONS FOR EQUIPMENT AND PROCESSES

Methane emissions can be reduced by ensuring that the equipment and processes used in oil and gas operations are running efficiently, using no-emitting or low-emitting equipment where possible.

Governments can set standards to ensure that equipment is upgraded to lower emitting options, that it is running efficiently, and that regular replacement of worn parts is occurring.

Both California and British Columbia's regulations provide specific rules for various equipment and processes. For example, California's regulations specify that any continuous bleed pneumatic devices and pumps must be changed to 'no bleed' devices which emit no gas. British Columbia has set rules for natural gas compressors and how they can be operated, including specifying a maximum rate of emissions.

04 SET TARGETS OR LIMITS FOR METHANE EMISSIONS

Governments can act by setting short-term targets or limits as part of their policy response which urge immediate action and provide companies with clear expectations.

Targets and limits can also be used in the private sector to drive innovation.

When targets for a specific sector are incorporated within a broader greenhouse gas (GHG) emissions reduction plan, the credibility of such expectations is strengthened, and companies can trust that the policies will remain in place in the long-term. Target-setting is most effective when paired with regulations that facilitate achieving the goals, such as emissions tracking programs and leak detection and repair (LDAR) programs.

For example, the governments of British Columbia and Massachusetts have both set short-term methane emission reduction targets or limits as part of their overall GHG emissions reduction goals. In British Columbia, the province is aiming for a 45% reduction in methane emissions from upstream natural gas production by 2025. Massachusetts imposed annually-declining methane emissions limits for natural gas distribution operators, which are consistent with the state's GHG emissions reduction goals.

CASE STUDY

CAPPING METHANE EMISSIONS FROM NATURAL GAS DISTRIBUTION INFRASTRUCTURE IN MASSACHUSETTS

Natural gas is the main source of electricity in Massachusetts, contributing to around two-thirds of total electricity generation. The gas supplies come via pipelines from other states as well as by ship and this aging natural gas infrastructure is prone to leaks.

To address this issue, in 2017 the Massachusetts Department of Environmental Protection (MassDEP) introduced *310 CMR 7.73 Reducing Methane Emissions from Natural Gas Distribution Mains and Services*. The regulation sets annually-declining emissions limits on Massachusetts' gas operators for 2018, 2019, and 2020. It also requires gas operators to report the total miles and materials of their pipelines.

Massachusetts' implementation of methane regulations for gas operators benefits from top-down legislative support, including a state-wide GHG emissions reduction goal outlined in the Global Warming Solutions Act. Under this Act, the Executive Office of Energy and Environmental Affairs is required to set economy-wide greenhouse gas emission reduction goals consistent with a 10-25% decline in emissions below 1990 levels by 2020, at least an 80% decline by 2050, and 2030 and 2040 limits that enable achieving the 2050 limit. The regulation also benefited from the inclusion of a stakeholder engagement process prior to implementation.

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05 SUPPORT THE DEVELOPMENT AND USE OF NEW TECHNOLOGIES

New technologies are constantly being developed to improve the detection, monitoring and mitigation of methane emissions.

Beyond investing in technological innovation, governments can conduct periodic reviews of their regulations to account for changes in technology. In the case of Massachusetts, the regulation that imposed methane emissions limits for a 3-year period also includes a review process at the end of the period to assess whether amendments are required in light of technological advancements.

Governments can also encourage a standard practice of stakeholder engagement during the drafting stage of policies. By consistently engaging with companies, NGOs, and individuals and creating a channel for them to submit their input, governments can stay up-to-date on the latest technology and research in order to shape a policy and ensure its success. Stakeholder engagement also opens opportunities for collaborations and partnerships.

For example, the state of California through the California Energy Commission is partnering with NASA and the California Air Resources Board (CARB) to develop a state-wide inventory of methane point sources — highly concentrated methane releases from single sources — by using a specialized airborne sensor. The high-quality, real-time data from the survey will inform the development of a more robust methane emission mitigation plan for the state and help California achieve its climate goals.

In British Columbia, the provincial government joined with various stakeholder organizations and companies to launch the Methane Emissions Research Collaborative (MERC) and coordinate research on ways to reduce methane emissions.

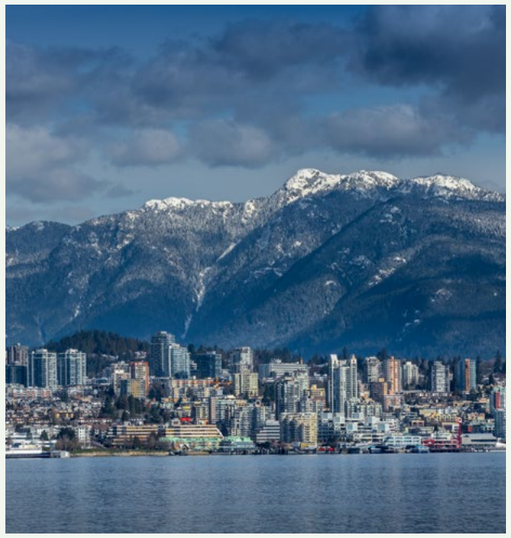
CASE STUDY

TACKLING METHANE EMISSIONS FROM THE OIL AND GAS SECTOR IN BRITISH COLUMBIA

British Columbia (BC) has a methane emission reduction target of 45% by 2025 from upstream natural gas production and a commitment to investing in infrastructure to power natural gas projects with clean electricity. The methane emissions reduction target was reaffirmed in the CleanBC Plan in December 2018.

In January 2019, the BC Oil and Gas Commission announced new regulations to reduce methane emissions from upstream oil and gas operations to meet or exceed federal and provincial methane emission reduction targets.

As part of its approach to addressing methane emissions, BC is also working with stakeholders to innovate and advance new technologies. The BC Oil and Gas Methane Emissions Research Collaborative (MERC) is a multi-stakeholder initiative between the province, environmental non-profits, industry, and research organizations. It was established to ensure research efforts improve the province's understanding of methane emissions from the oil and gas sector and ensure new technologies are achieving the outcomes expected from the provincial regulations.



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06 SET REQUIREMENTS FOR MEASURING, RECORD KEEPING AND REPORTING

Robust record keeping and reporting is a critical aspect of reducing methane and enables agencies to monitor progress, manage compliance and inform future policy making.

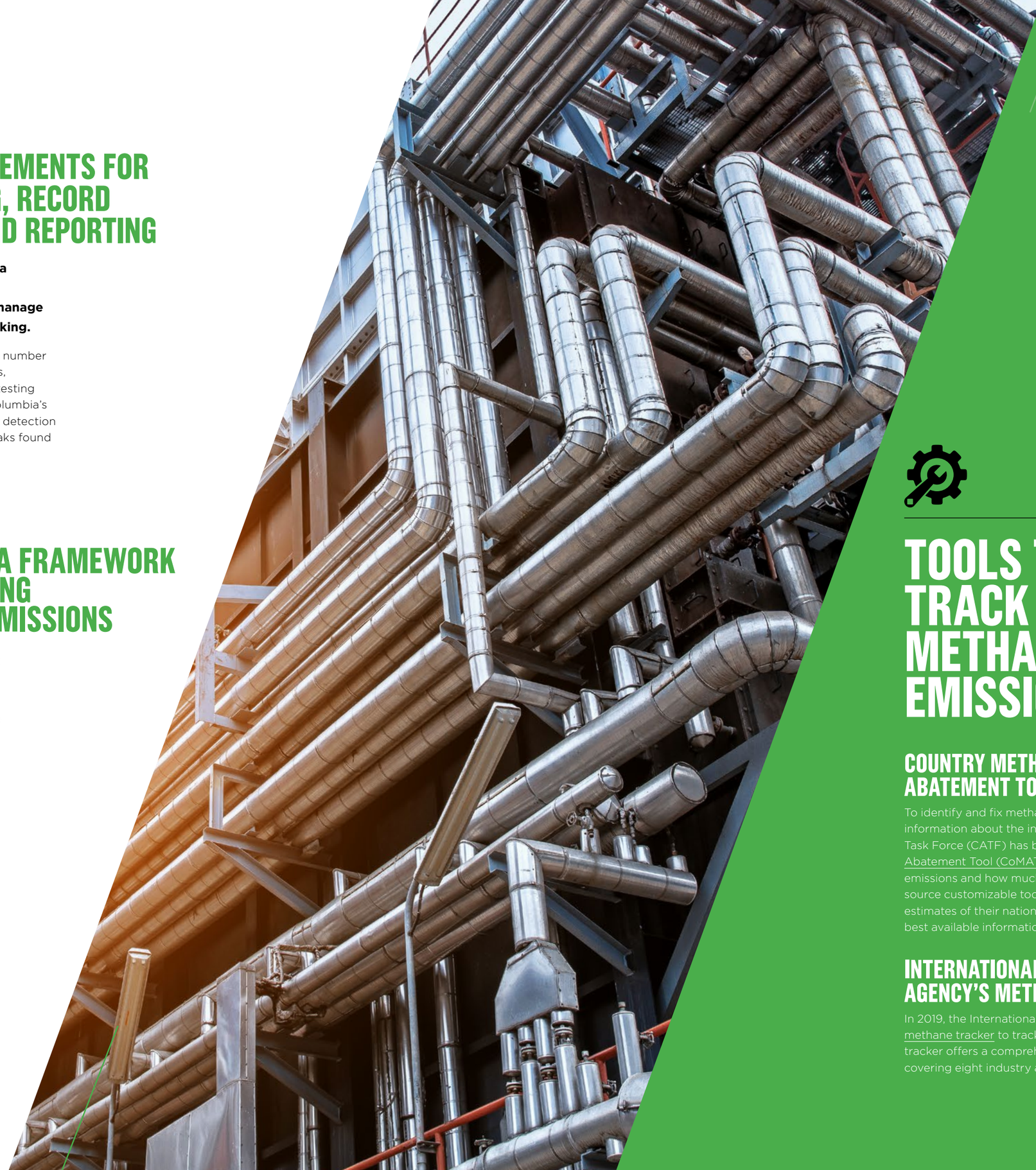
For example, California's regulation outlines a number of record keeping and reporting requirements, including reporting the results of equipment testing and information on emissions rates. British Columbia's regulation requires record keeping for all leak detection and repair surveys, including details of any leaks found and the date of their repair.

07 ESTABLISH A FRAMEWORK FOR REDUCING METHANE EMISSIONS

Governments can establish a framework or plan for reducing methane emissions which will help align policy approaches across different regulations and provide context for action.

They offer a clear signal to industry and, by working with stakeholders during the development, can help achieve buy-in for future policy making.

For example, the state of New York has developed a plan outlining actions to reduce methane across three sectors: oil and gas, landfills, and agriculture. The plan identifies ongoing work and directs new actions to reduce emissions.



TOOLS TO TRACK METHANE EMISSIONS

COUNTRY METHANE ABATEMENT TOOL (COMAT)

To identify and fix methane leaks even when there is limited information about the industry and its current emissions, Clean Air Task Force (CATF) has built a new tool called the Country Methane Abatement Tool (CoMAT) to help estimate a country's oil and gas emissions and how much they can be reduced. CoMAT is a 100% open source customizable tool that lets users develop initial and refined estimates of their nation's emissions and reduction potential using the best available information.

INTERNATIONAL ENERGY AGENCY'S METHANE TRACKER

In 2019, the International Energy Agency launched a new online methane tracker to track oil and gas-related sources of methane. The tracker offers a comprehensive global picture of methane emissions, covering eight industry areas across more than seventy countries.

GLOBAL INITIATIVES ADDRESSING METHANE EMISSIONS FROM OIL AND GAS

There are a number of global and regional initiatives that are working to reduce methane emissions. These initiatives play an important role by sharing knowledge on emissions reduction technologies and global best practice, driving innovation and research, convening stakeholders, and monitoring methane emissions. State and regional governments can draw on the resources, expertize and networks of these initiatives and use them in the policy making process.

CLIMATE AND CLEAN AIR COALITION'S OIL & GAS METHANE PARTNERSHIP (OGMP)

The OGMP is a voluntary, public-private initiative aimed at minimizing methane emissions from global oil and gas upstream operations. It is designed to facilitate Partner companies' efforts to minimize their methane emissions from the largest potential sources and to help ensure that today's leading practices for methane management become standard practices over time. The OGMP is an initiative of the Climate and Clean Air Coalition (CCAC) of the United Nations Environment Program.

THE METHANE GUIDING PRINCIPLES

The Methane Guiding Principles is a voluntary, international multi-stakeholder partnership between industry and non-industry organizations with a focus on priority areas for action across the natural gas supply chain, from production to the final consumer.

ZERO ROUTINE FLARING BY 2030 INITIATIVE

Launched by the World Bank and the United Nations in 2015, the Zero Routine Flaring by 2030 initiative brings together governments, oil companies and development institutions who agree to cooperate to eliminate routine flaring no later than 2030.

INTERNATIONAL PETROLEUM INDUSTRY ENVIRONMENTAL CONSERVATION ASSOCIATION (IPIECA)

IPIECA is a not for profit association that provides a forum for encouraging continuous improvement in industry performance, involving both the upstream and downstream oil and gas industry. It is also the industry's principal channel of communication with the United Nations. IPIECA develops, shares and promotes good practice and knowledge to help the industry and improve its environmental and social performance.

METHANE EMISSIONS LEADERSHIP ALLIANCE (MELA)

MELA is Canada's most complete source of data, technologies and solution providers that monitor, measure, and reduce methane emissions. Founded in 2016, the Alliance is comprised of companies serving the oil & natural gas production, processing, and transmission sector. The Alliance is a partner to government, industry, and other key stakeholders, focused on building a clean economy and generating new jobs.

GLOBAL GAS FLARING REDUCTION PARTNERSHIP (GGFR) OF THE WORLD BANK

GGFR is a public-private initiative comprising international and national oil companies, national and regional governments and international institutions. GGFR works to increase the use of natural gas associated with oil production by helping to remove technical and regulatory barriers to flaring reduction, conducting research, disseminating best practices and developing country-specific gas flaring reduction programs.

GLOBAL METHANE INITIATIVE (GMI)

GMI is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a clean energy source. The initiative provides technical support to deploy methane-to-energy projects around the world as well as information resources through its extensive online library featuring best practices, technical tools and resources, and more.

CLIMATE AND CLEAN AIR COALITION'S GLOBAL METHANE ALLIANCE

The Global Methane Alliance brings together governments, financing institutions, international organizations and NGOs, and industry to support ambitious methane reduction targets from the oil and gas sector. Countries that join the Alliance commit to include methane reduction targets from the oil and gas sector in their Nationally Determined Contribution, as part of their overall GHG emissions reduction targets.

NEXT STEPS

The Under2 Coalition Methane Project explored policies and technologies to reduce methane emissions and demonstrated that a broad range of stakeholders are committed to taking action. It also highlighted that challenges remain to progressing policy action, and many governments are still in the early stages of developing their approach.

The Climate Group will continue to support state and regional governments to reduce methane emissions through phase two of the Methane Project. The next stage of the project will bring together a committed group of governments for in-depth learning on policy options to reduce emissions.

The Climate Group is also considering action on Short Lived Climate Pollutants more broadly, and how future programs can help state and regional governments make progress and achieve their goals.

CONTACT

Under2 Coalition Methane Project:

Alice Ryan, Policy Manager,
Under2 Coalition, The Climate Group
aryan@theclimategroup.org

Rana Pujari, Program Officer,
South Asia,
The Climate Group
rpujari@theclimategroup.org

Emely Anico, Program Officer,
Under2 Coalition, The Climate Group
eanico@theclimategroup.org

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About the Under2 Coalition

The Under2 Coalition is a global community of state and regional governments committed to ambitious climate action in line with the Paris Agreement.

The coalition brings together more than 220 governments who represent over 1.3 billion people and 43% of the global economy. These governments include signatories to the Under2 Memorandum of Understanding as well as national endorsers and other supporters. There are 118 individual states and regions who have signed the Under2 MOU and are currently active members of the Under2 Coalition.

Signatories commit to keeping global temperature rises to well below 2°C with efforts to reach 1.5°C. Nine states and regions in the coalition have committed to reaching net-zero emissions by 2050 or earlier.

In their position between national and local governments, states and regions are uniquely placed to take innovative climate action and to influence others to do the same.

The Climate Group is the Secretariat to the Under2 Coalition and works with governments across three key workstreams. The Climate Group also works directly with state and regional governments on capacity-building projects to support the implementation of climate policy.

Under2Coalition.org

THE CLIMATE GROUP

2nd Floor, Riverside Building,
County Hall, Belvedere Road,
London SE1 7PB,
United Kingdom

Europe | London | **+44 (0)20 7960 2970**

India | New Delhi | **+91 (0)11 4987 4369**

North America | New York City | **+1 (646) 233 0550**

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