



CLEAN AIR
TASK FORCE

CoMAT tool - Methane emissions and mitigation estimations

6th TFTEI Annual Meeting

23.October.2020



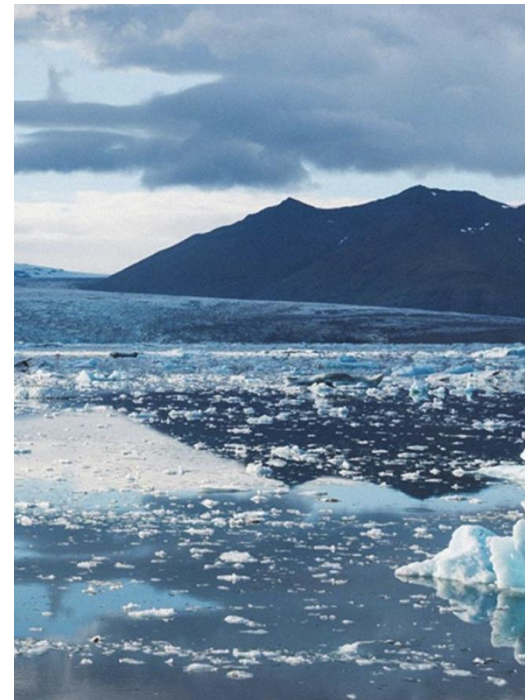
Clean Air Task Force
Super Pollutants

About CATF

CATF pushes the change in technologies and policies needed to get to a zero-emissions, high-energy planet at an affordable cost.

We are climate and energy experts – scientists, engineers, MBAs, policy experts, lawyers, and communications professionals focused on:

- Technology innovation
- Policy advocacy
- Thought leadership



CATF Focus Areas



Advanced Energy Systems

Provide the world with a vision of practical, resilient pathways to a zero carbon energy system.



Advanced Nuclear Energy

Create a normal global research and development, commercial, regulatory, and social ecosystem in which nuclear technology can flourish in order to decarbonize global energy production.



Bioenergy

Redirect the production and use of bioenergy so that it contributes to—rather than undermines—decarbonization and climate stability.



Decarbonized Fossil Energy

Accelerate the adoption of carbon capture technologies to prevent CO2 emissions from power generation and industrial sources.



Power Plants

Ensure the adoption of U.S. emission standards on U.S. fossil power plants to zero out U.S. power sector carbon emissions by 2050.



Super Pollutants

Catalyze deep, global reductions in methane and black carbon emissions to help stave off the risk of irreversible changes to our climate.



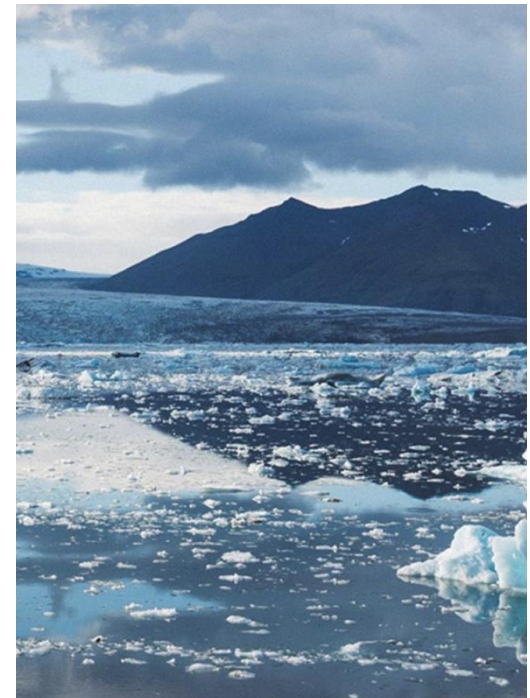
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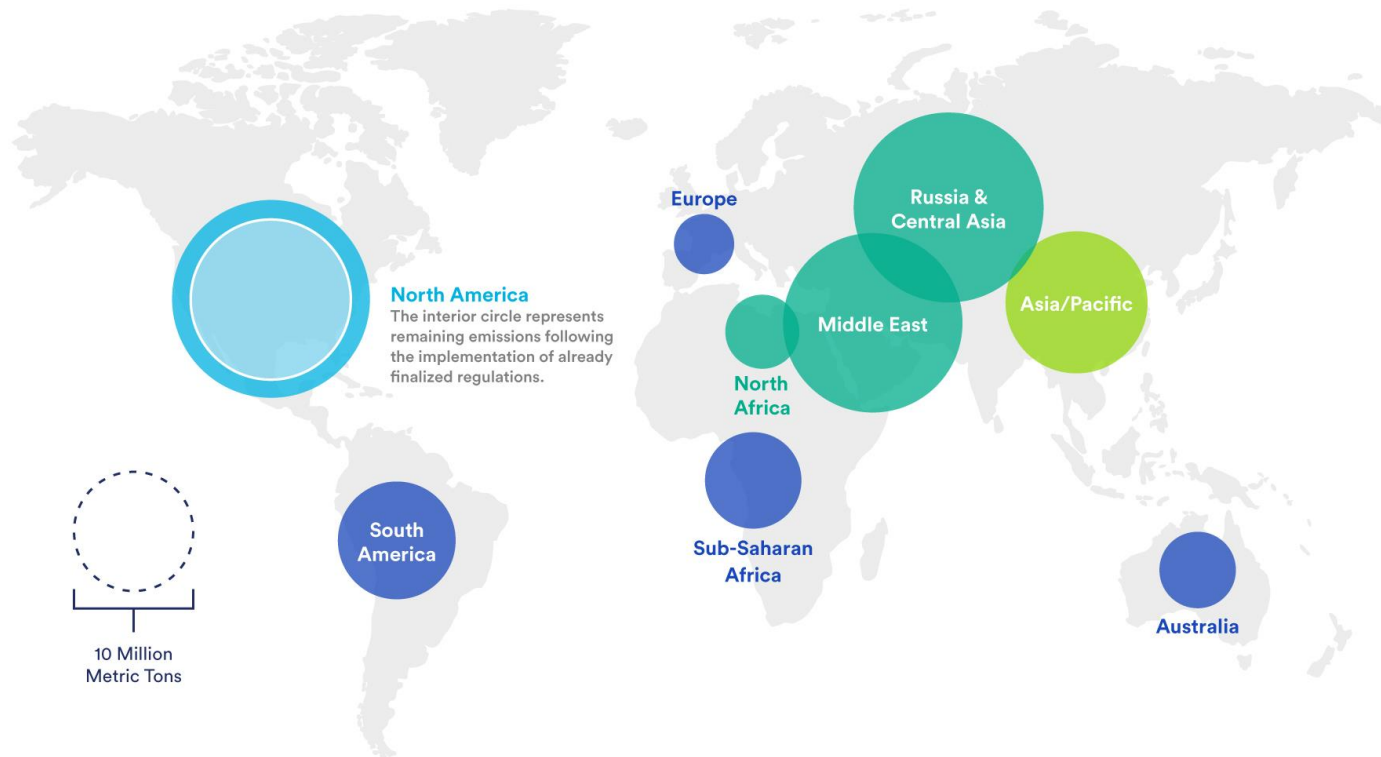
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CATF's work on **Super Pollutants** began in 2002. We advocate for CH₄ and BC emissions reductions in the U.S. and internationally by supporting scientific research, promoting policy initiatives, encouraging the development of financial incentives for pollution controls, and championing and defending standards that can dramatically reduce emissions.



PROJECTED 2040 METHANE EMISSIONS

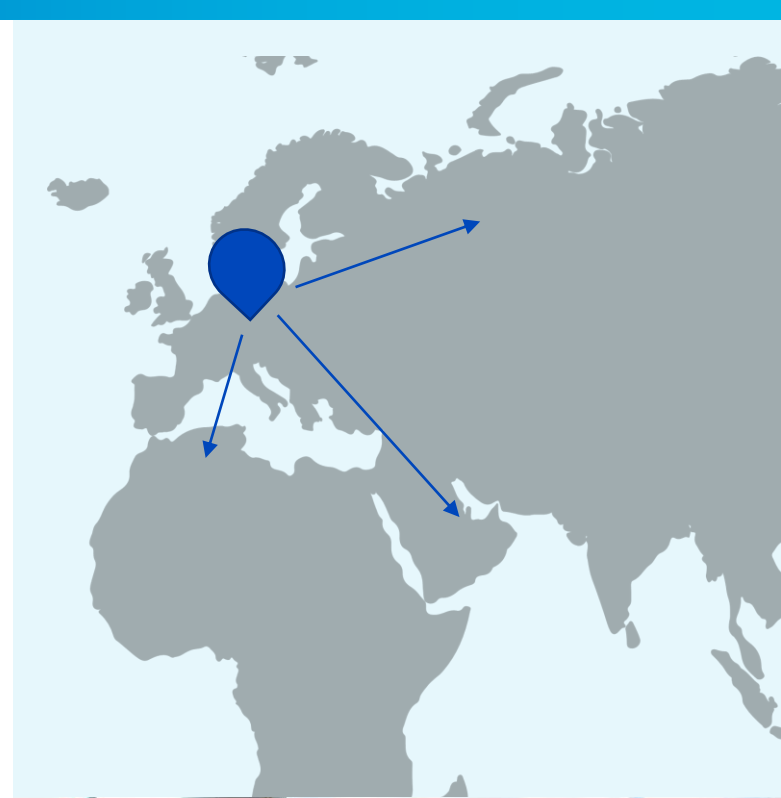


CATF'S STRATEGIES FOR REDUCING EMISSIONS

- Defend & Implement Current Regulations
- Set the Stage for Deeper Reductions
- Advance New Regulations
- Inform EU Import Standards
- Engage Companies Directly

CATF expanding to Europe

- On October 14th, the European Commission finalized the E.U.'s Methane Strategy, which sets the stage for legislation to rein in CH₄ emissions from oil & gas and other sectors.
- Europe is one of the world's highest emitter of CH₄ and the **largest importer of oil and gas**.
- Europe could cut its domestic CH₄ footprint dramatically and also put pressure on its oil and gas suppliers - Russia, Norway, Algeria, Qatar, and others – to curb their emissions.
 - By 2030, the standards could reduce >5 million metric tons of CH₄ annually, the near-term equivalent of at least 120 coal-fired power plants.



CATF's strategy in Europe

CATF brings together a team of experts within our organization and from our extensive global network of collaborators in civil society, industry, and government.

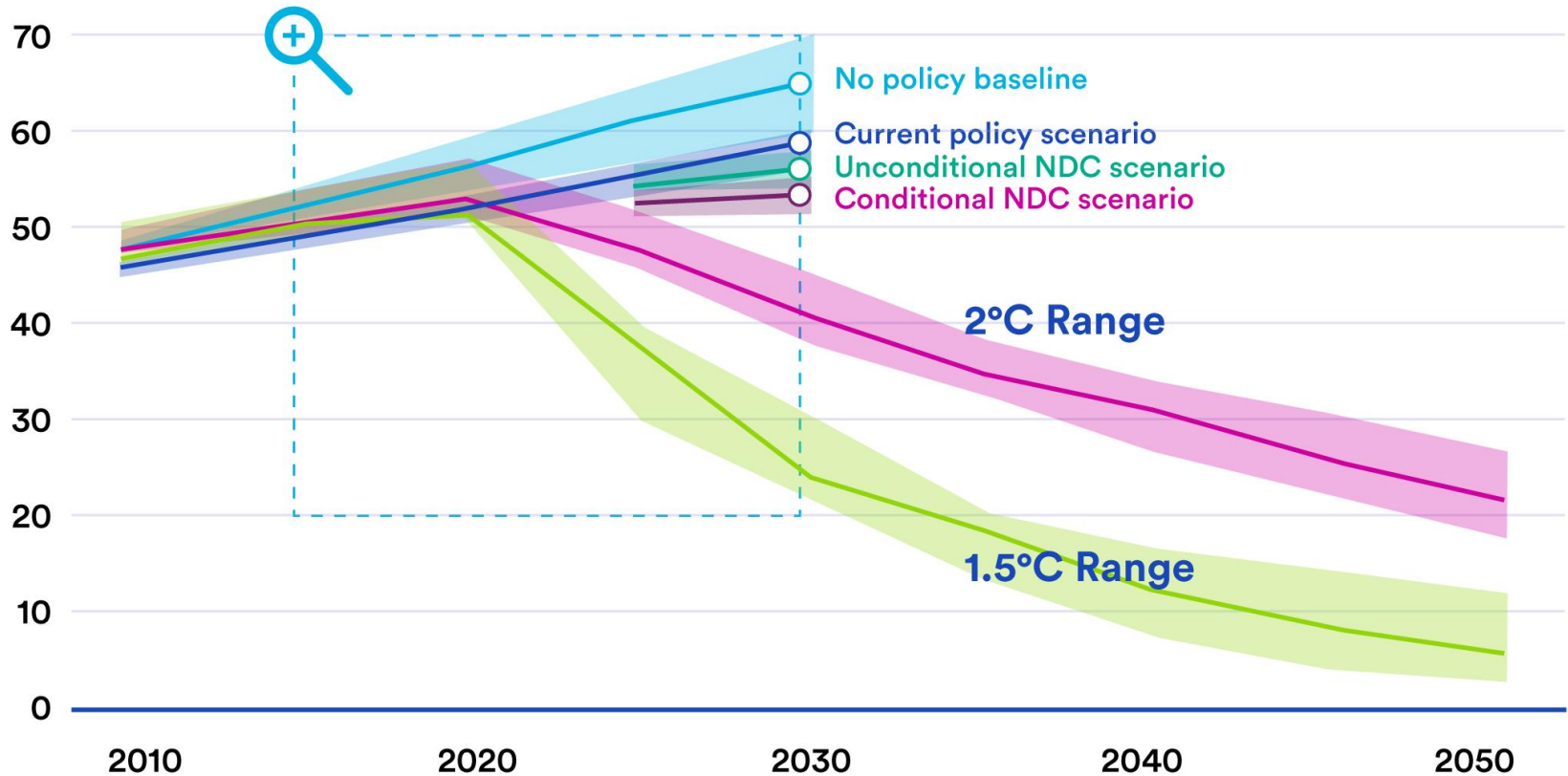
Our team specializes in policy development and advocacy, media, diplomacy, research and technology, and boasts decades of experience and a proven record of success. In Europe, CATF will pursue:

- **Direct policy assistance to EU regulators**—Working with DG Energy, MEPs, member state governments, as well as civil society, CATF will build capacity on the issue and understanding of the solutions and share tools for estimating emissions and comparing policy options.
- **Making the invisible visible**—With a new OGI camera, CATF will partner with local organizations to spotlight the domestic emissions issue and demonstrate the importance of Europe leading by example as it embarks on developing import standards.
- **Diplomacy**—CATF will leverage our connections in leading jurisdictions (California, Canada, and Mexico) to help assure European regulators that robust standards are feasible, to overcome legal and technical hurdles to those standards, and to provide support for the EU playing a vocal role in the growing global demand for swift methane emissions reductions.
- **Research and technology**—In consultation with local partners, our team will develop key health and pollution impact studies.

Why methane emissions?

We are nowhere near on track to meet climate targets

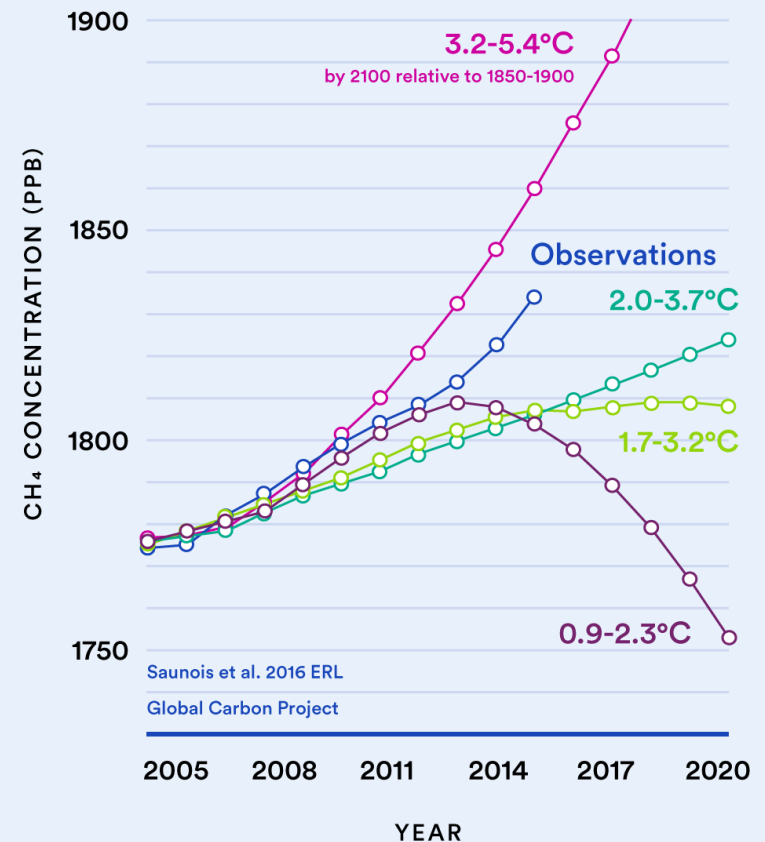
Ultimately replacement or decarbonization of the current fossil fuel infrastructure will take many decades.



Source: "Emissions Gap Report 2018," United Nations Environment Programme.

For example, CH₄ levels are rising more quickly than anticipated under Paris Agreement and if meeting its goals may not be possible, even under very optimistic CO₂ scenarios.

Short-lived pollutants (like CH₄) are a "first aid" to achieve a **near-future reduction of global warming.**



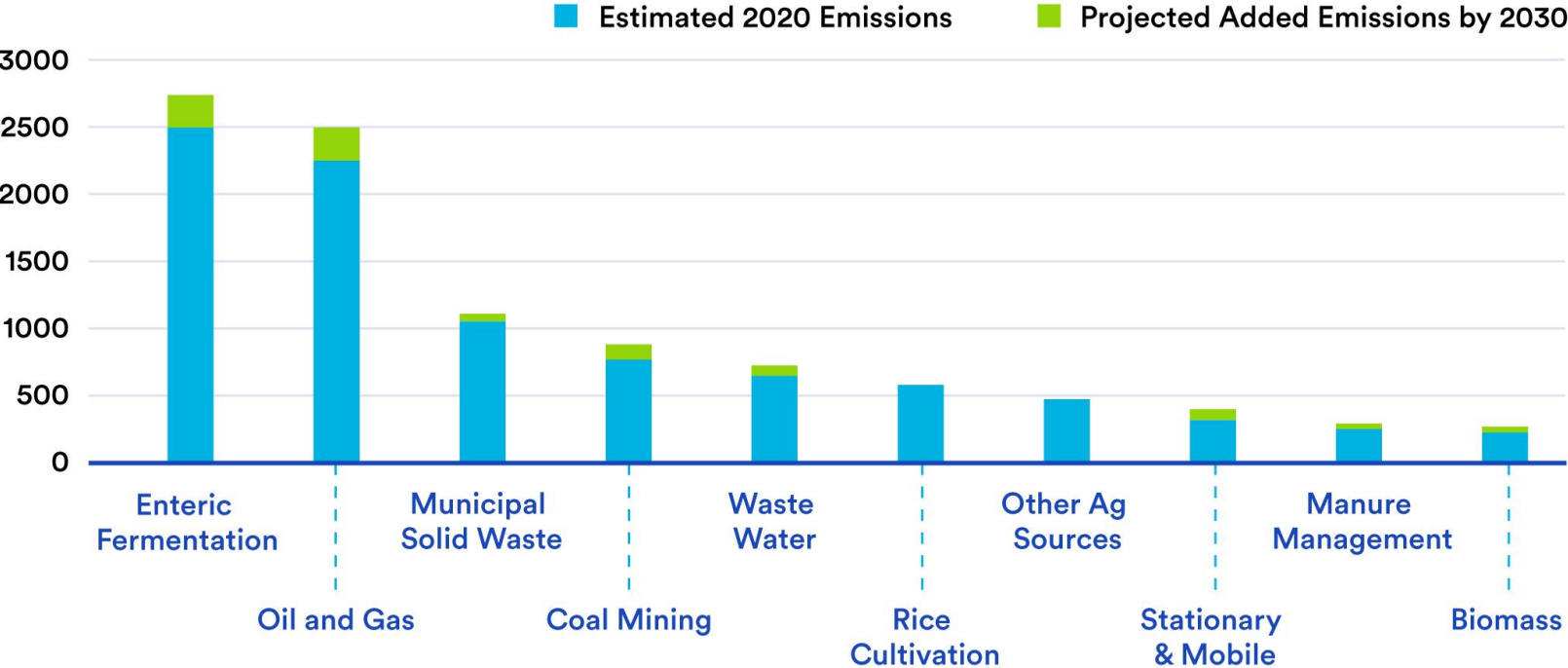
Blue line shows observations. The colored lines show methane levels anticipated under projections developed by IPCC. Observed levels are higher than under all projections except the projection shown in pink, which leads to extreme (4.5°C) temperature rise.

Sources: Saunius et al. 2016 ERL, Global Carbon Project. Observations line extended to reflect NASA measurements.

Oil and gas is a large slice, and the most easily addressable slice, of global methane emissions

Figure 2: Estimated and Projected Global Anthropogenic Methane Emissions by Source, 2020 and 2030

Source: Global Methane Initiative, 2015.



The fixes are low tech!

Frequent leak
detection and repair



Source: Global Methane Initiative, 2015.

Compressors: Capture, control, maintenance, monitoring

Completions: Reduced Emission Completions

Pneumatics: Low Emitting with monitoring or Zero Emitting Models



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CoMAT

CoMAT

(Country Methane Abatement Tool)

CoMAT lets users estimate how much CH₄ pollution they can reduce from their oil and gas industries, *even when they have limited information about the industry and its current emissions.*

Compiling and analyzing the information needed to estimate national emissions is a high barrier for some nations interested in moving policies forward to reduce CH₄ pollution



CoMAT is an easy solution for users to develop emission estimates

With CoMAT is possible to tailor a mitigation program structured around best practices from policies that have been implemented in leading jurisdictions around the world.

CoMAT

CoMAT is 100% open source and 100% customizable

- While CATF will work with countries and other stakeholders using CoMAT, all of the assumptions and calculations in the tool are there for users to see and adjust as they see fit.
- There is no black box, and CoMAT is not intended to give users any pre-packaged “answers.”
- CATF will work with users as they take on the thorny technical questions about their country-specific oil and gas industry and develop a customized mitigation strategy.

Industry Parameters

- E.g. Total Active Gas Wells
- Total Marketed Gas Production

Activity Drivers

- E.g. # Natural Gas Powered Pneumatic Controllers per well
- Production per Gathering Compressor Station

Activity Data

- E.g. Total # of Natural Gas Powered Pneumatic Controllers
- Total # of Gathering Compressor Stations

Emission Factors

- E.g. CH₄ Emissions per Natural Gas Powered Pneumatic Controller
- CH₄ Emissions per Gathering Compressor Station

Emissions

- E.g. CH₄ Emissions from all Natural Gas Powered Pneumatic Controllers
- CH₄ Emissions from all Gathering Compressor Stations

Mitigation

- Abatement percentage or activity data change

User Input

CoMAT preview

		Activity Drivers		
		FINAL VALUE	Auto-populated	Modify here:
units				
Gas Exploration and Production				
Gross onshore gas production	MMcf	324,154	324,154	
Marketed/Dry gas production	MMcf	381,000	381,000	
Total gas wells	wells	4,544	-	
Gas wells with hydraulic fracturing	wells	227	-	
Gas wells without hydraulic fracturing	wells	4,317	-	
Gas wells drilled	wells	500	-	500
Condensate Production	Barrels	2,847,000	2,847,000	
Coalbed natural gas production	MMcf	-	-	
Coalbed methane wells	wells	-	-	
Shallow water gas platforms	platforms	-	-	
Deep water gas platforms	platforms	-	-	
Offshore gas production	MMcf	44,744	44,744	
Gathering and Boosting Stations	stations	50	-	50
Oil Exploration and Production				
Total Oil production	MMbbl	36	36	
Onshore oil production	MMbbl	32	-	
Total oil wells	wells	6,333	6,333	
Oil wells drilled	wells	200	-	

3. Granular emissions estimate



	Emissions (kt)
1 Gas Exploration	0
Well Completions/Workovers	0
Other	0
2 Oil Exploration	1
Well Completions/Workovers	1
Other	0
3 Gas Production	64
Leaks	27
Pneumatics	16
Offshore	5
Other	4
Compressors	3
Exhaust	3
Tanks	2
Liquids Unloading	1
Pipeline Leaks	1
Dehydrators	0
Flaring	0
Well Completions/Workovers	0
Misc Flaring	-
4 Oil Production	40
Leaks	28
Pneumatics	8
Other	1
Tanks	1
Associated Gas Flaring	0
Offshore	0
Associated Gas Venting	0
Compressors	0
Well Completions/Workovers	0
Misc Flaring	-
5 Processing	6
Exhaust	3
Compressors	1
Other	1
Leaks	0
Dehydrators	0
Pneumatics	0
6 Transmission and Storage	9
Exhaust	4
Compressors	3
Leaks	1
Other	1

1. Country specific activity drivers

2. Country specific activity data and emission factors



Make Activity Data adjustments if country specific data is available:

Pneumatic controllers

Percent pneumatic controllers

Zero Bleed (instrument air/electric)
Natural Gas Driven

	Gas Production	Oil Production
Zero Bleed (instrument air/electric)	0%	0%
Natural Gas Driven	100%	100%

High Bleed

Intermittent Bleed

Low Bleed

Percent of natural gas driven pneumatic controllers

High Bleed	10%	10%
Intermittent Bleed	55%	46%
Low Bleed	35%	44%

Where are we going...

CATF plans to work closely with in-country government officials, experts, and stakeholders at every step of this process: finding and vetting appropriate data inputs for the tool, adjusting default assumptions in the tool, and advising on the design of the country's abatement strategy.

CoMAT will help countries rapidly move forward with strong oil and gas methane reduction policies.



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