



Methane to Markets

**Overview of the Oil & Gas Subcommittee of
Methane to Markets and linkages with
APP Cleaner Fossil Energy Task Force**

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Seoul, South Korea

Overview

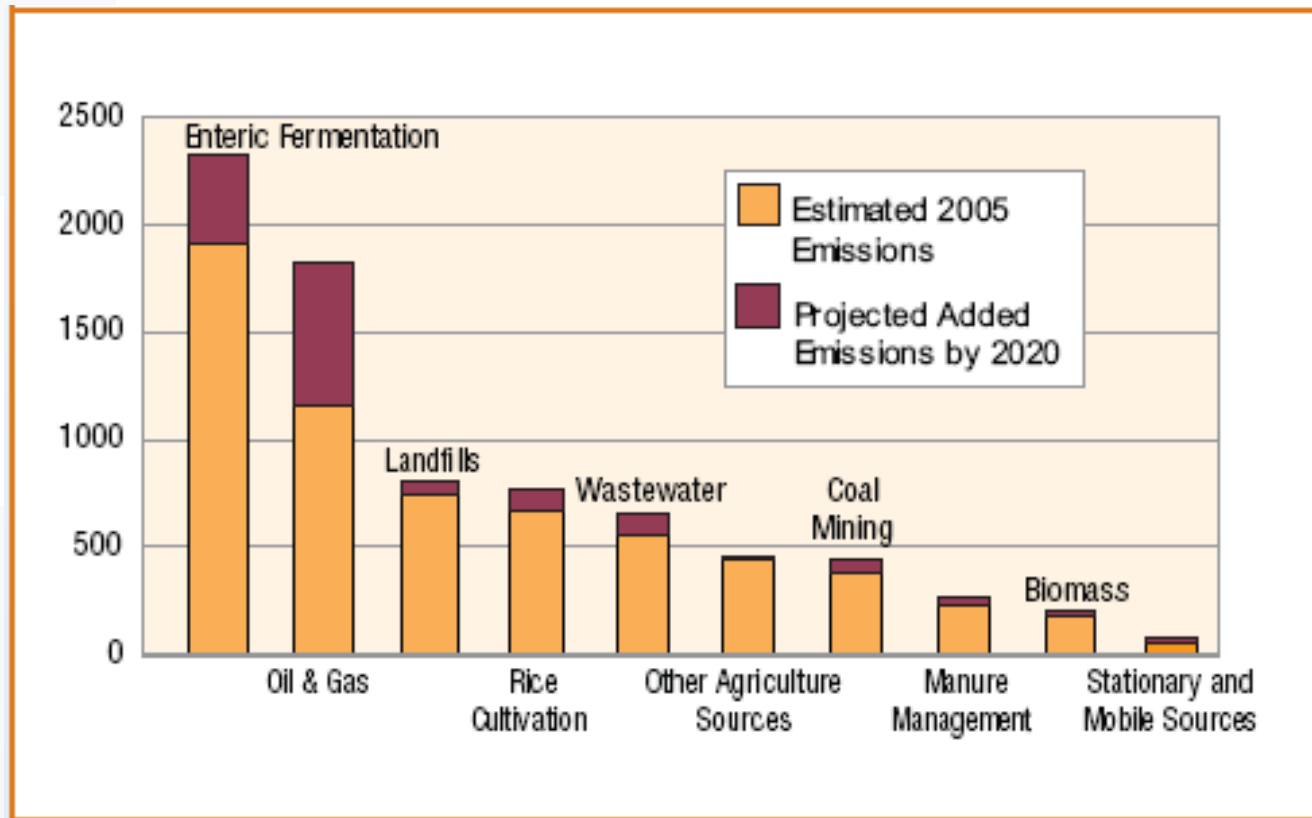
- **Background information**
- **Global Opportunities and Co-benefits**
- **Methane to Markets and the Oil & Gas Subcommittee**
- **Linkages with APP and the CFETF**
- **Examples of Canada-US Project Collaboration**
- **Next Steps**

Importance of Addressing Methane Emissions

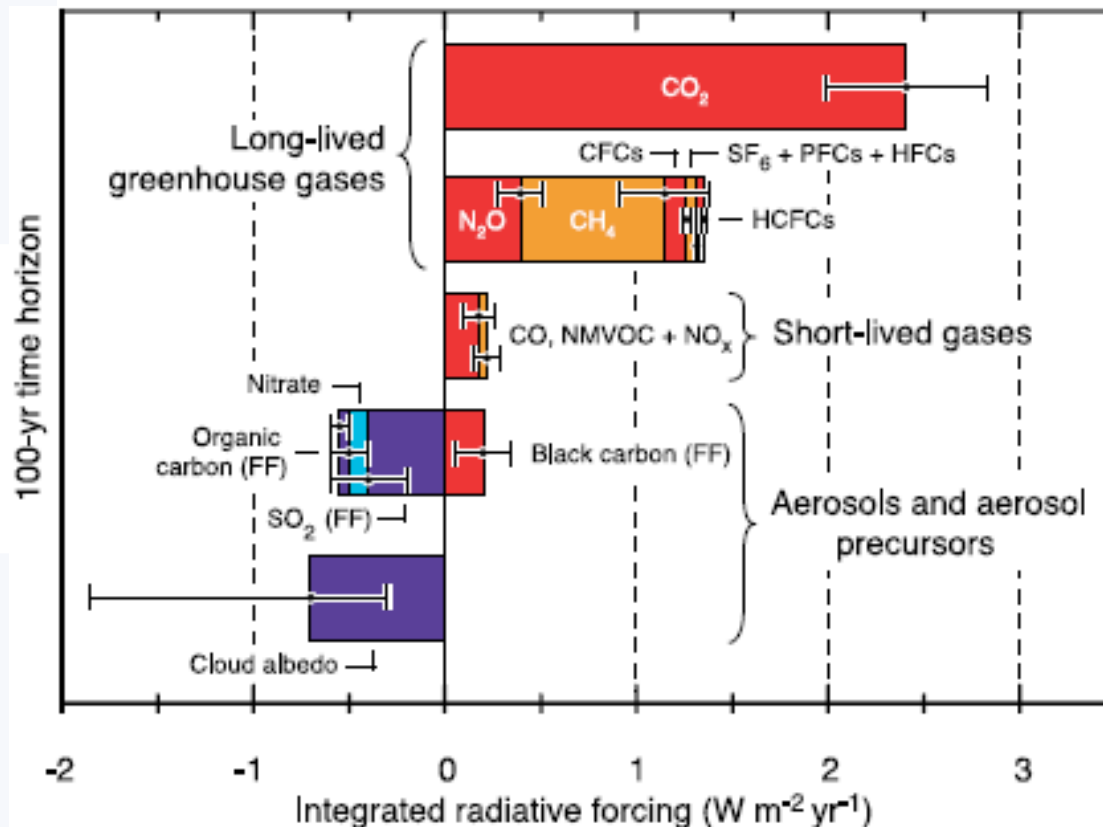
- One of the 6 GHG substances covered by the United Nations Framework Convention on Climate Change (UNFCCC)
- IPCC GWP twenty five times that of CO₂
- Often highly cost effective to control or reduce
- Growing global recognition that CH₄ management complements climate change policy objectives

Projected Methane Increase through 2020

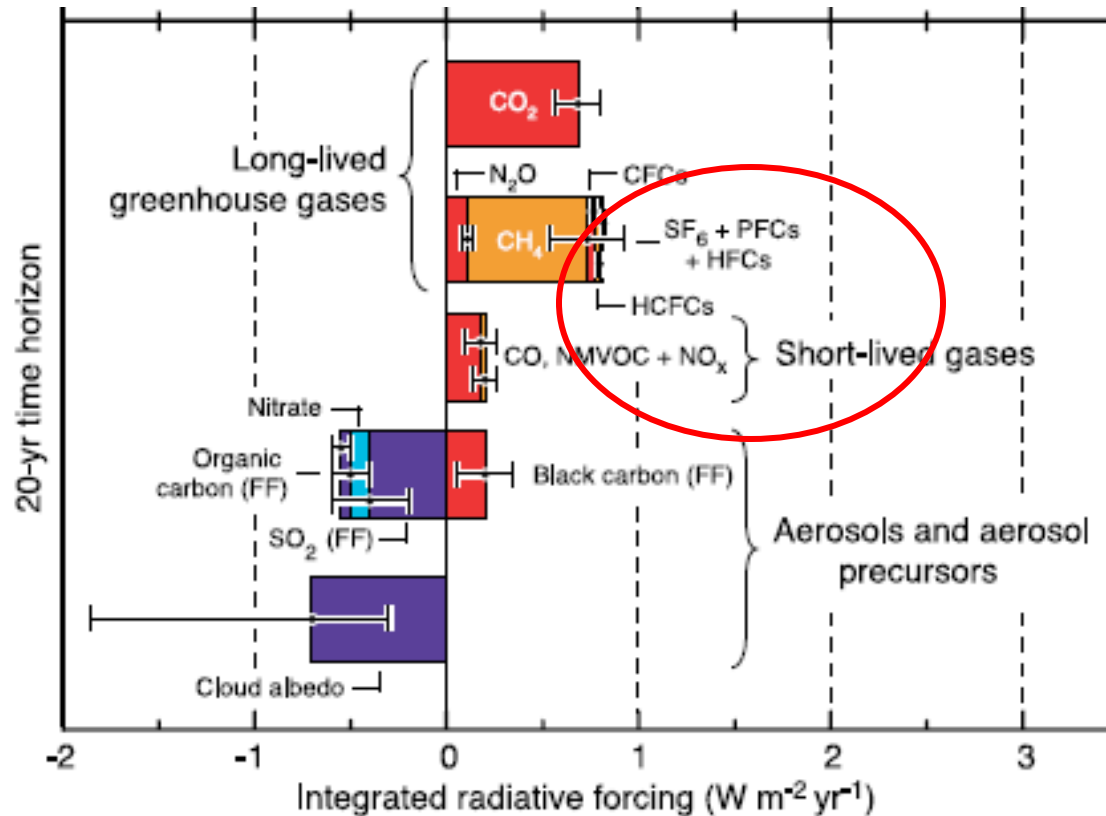
Global anthropogenic methane emissions are projected to increase by 23 percent to 7,904MMTCO₂E by 2020



Integrated Radiative Forcing for Year 2000 Global Emissions - 100-year Time Horizon



Integrated Radiative Forcing for Year 2000 Global Emissions – 20 Year Time Horizon



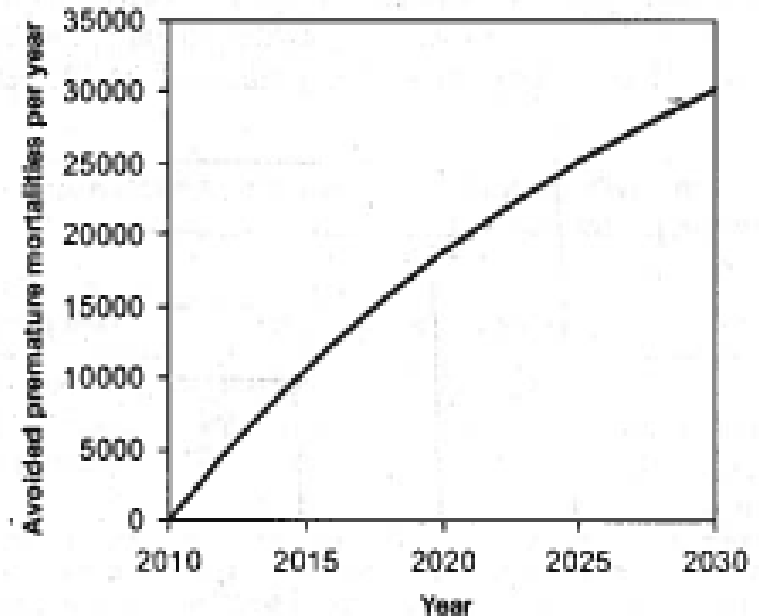
Methane has a much larger impact , almost EQUAL TO CO₂, when considered over a 20 year time horizon

Global Opportunities

- An estimated 100 billion cubic meters of natural gas is vented or lost through fugitive emissions from the oil and gas sector world wide each year
- As methane is 25 times as potent a greenhouse gas as CO₂, these emissions add more than 1000 MM tons of CO₂ Equivalent to the atmosphere annually
 - Global flaring in the oil and gas sector results in 400 MM tons of CO₂ to the atmosphere annually
- It is estimated that over 30% of these emissions could be captured at a profit and therefore **billions** of dollars are **lost** annually
- While in some cases, market and infrastructure barriers exist, technologies do exist today to detect, measure, capture and use vented or fugitive methane emissions.

Air Quality Co-benefits

- Methane contributes to background ground-level ozone levels by:
 - Serving as an ozone precursor
 - Increasing summer afternoon temperatures through climate change
- Evidence confirms that reducing methane emissions reduces mortalities associated with air pollution!



Avoided global mortalities based on a 65 Mt/yr reduction in methane emissions starting in 2010 (West et al, 2006)

Methane to Markets and the Oil & Gas Subcommittee

- M2M was launched November 2004 to reduce global methane emissions in order to, among other things:
 - reduce emissions of greenhouse gases
 - improve air quality

- The purpose of Oil and Gas Subcommittee activities is to **locate** and **promote** methane emissions **reduction** and **utilization projects** in the global oil and gas sector”
 - Note – not new oil and gas field development

- The partnerships has 27 member states which include some Kyoto signatories and some APP members

Methane to Markets Oil & Gas Subcommittee

US EPA Contributions and Accomplishments under Methane to Markets

- Funded over \$6 million in oil and gas sector methane emissions identification, measurement, project feasibility and reduction technology/practice identification

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- 28 projects
- 38 MMTCO₂ in projected reductions

Methane to Markets Oil & Gas Subcommittee

Canadian Contributions and Accomplishments Under Methane to Markets

- Canada supports M2M oil and gas objectives through activity of the *Upstream Petroleum Air Issues Research Initiative (UPAIRI) Program*

- Oil and Gas Subcommittee

- Direct & indirect funding in excess of \$1.6 million since 2004-05
- UPAIRI collaborates in domestic & international research projects

Canadian Contributions (cont'd)

- UPAIRI develops technologies & science based methodologies to verifiably reduce energy and emissions intensities from UOG activity
 - Significant methodology gaps currently limit broad inclusion of UOG GHG emissions reduction in existing or emerging domestic or international Cap & Trade mechanisms
 - Technologies to provide ongoing monitoring for third party verification of reduced emissions are also lacking

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Canadian Contributions (cont'd)

- UPAIRI domestic and international results to date indicate significant jurisdictional opportunities to:
 - Reduce average energy intensity by:
 - 15% for fuel gas consumption
 - 9% for electricity demands
 - Reduce average fugitive emissions by:
 - 70% for CH₄ from equipment leaks
- Results can vary dramatically between individual facilities

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M2M Linkages with APP and the CFETF

CFETF Theme 5 Highlights

- Quantify jurisdictional CH₄ emissions
- Quantify GHG impact and economic opportunity
- Engage oil and gas industry to improve awareness of emission reduction opportunities
- Through **Case Studies**, develop recognition that CH₄ emissions reduction must be core to:
 - Policy objectives
 - Business activity

See Handout

Theme 5 Complementary M2M Oil & Gas Activity - Overview

- **Quantify Partner Country Methane Emissions**
- **Quantify Overall Greenhouse Gas Effect and Value**
 - EPA has developed macro-level inventory information on all M2M countries, including all APP countries
 - EPA has developed company-specific methane emissions inventory information for large oil and gas operations in APP countries such as China and India
- **Develop Recognition that Leak Prevention and Mitigation should be Core Business**
- **Develop Ways and Means for Partner Countries to Share Information**
 - Funding from the US EPA has facilitated collaborative M2M projects to quantify CH₄ emissions in 12 countries including China and India
 - EPA has published over 80 technologies and practices in five languages and expands based on partner input
 - EPA hosts over eight major technology transfer workshops world-wide each year

Theme 5 Complementary M2M Oil & Gas Activity - Overview

- **Quantify GHG impact and economic opportunity**
 - All M2M oil and gas project results are reported in terms of:
 - GHG mass emissions magnitudes in CO₂e
 - Reducible magnitude of CO₂e GHG emissions
 - Monetized value of Natural Gas
- **Engage oil and gas industry to improve awareness of emission reduction opportunities**
 - The M2M Project Network membership is global in scope and consists of:
 - Oil and gas producers
 - Technology developers
 - Service providers
 - Carbon credit & project financiers

Theme 5 Complementary M2M Oil & Gas Activity

- **Through Case Studies, develop recognition that CH₄ emissions reduction must be core to:**
 - Policy objectives
 - Business activity

- **The US EPA and Canada have collaborated internationally under M2M since 2007 to develop detailed Case Studies in:**
 - Mexico with PEMEX
 - China with CNPC

Case Study

Canada & US EPA Project Collaboration

Mexico Project Summary

- With US EPA funding, since 2005 Canadian & US specialists have been evaluating representative PEMEX facilities for energy and methane emissions intensity reduction opportunities.
- Sufficient PEMEX greenhouse gas reduction data from these reports led to the Mexican government announcement of a 13 MMT CO₂e near term annual reduction objective for PEMEX
- With EPA M2M Funding, PEMEX is currently developing:
 - A GHG emissions inventory
 - Detailed marginal methane abatement curves for all emission sources at major oil and gas facilities

Case Study

Canada & US EPA Project Collaboration

China Project Summary

- In 2007, the China NDRC announced it would legislate energy and emissions intensity reduction targets for the Chinese energy sector
- With US EPA and Canadian funding, Canadian and U.S. specialists evaluated five representative CNPC facilities for energy and methane emissions intensity reduction opportunities. Additional field work at other facilities is scheduled to take place in Spring of 2009
- A project is currently underway to engage with CNPC staff, to develop pre-engineering studies of 2007-08 field data to identify opportunities for CDM projects
- US EPA, Canada and CNPC are also collaborating to develop corporate and technical guidance to institutionalize the M2M derived knowledge

Project Based Conclusions

- Methane emissions reductions are a highly effective near term opportunity to reduce GHG emissions to complement medium & long term CCS objectives
- Uptake of existing, and ongoing development of new Methane to Markets-based solutions can help oil and gas companies put climate change policy into immediate and measureable global action
- Awareness of implementable Methane to Markets solutions can also support effective development of “achievable GHG emissions reduction policy”
- **The Methane to Markets Oil and Gas Subcommittee and EPA stands ready to partner with APP to further these projects and begin new ones that further both M2M and APP goals.**

Next Steps

- Canada and US EPA will host the next M2M Oil and Gas Subcommittee Meeting in Lake Louise, Alberta, Canada in September 2009
- Immediately following the M2M Oil and Gas Subcommittee Meeting, Canada will host a M2M workshop highlighting global project activity
 - Invitation is extended to all CFETF members
- Methane to Markets Partnership Expo and Steering Committee Meeting – April 2010 in India
- In support of APP objectives, Canada intends to collaborate actively with the M2M Oil and Gas Subcommittee to explore and evaluate additional project opportunities and projects to reduce methane emissions