KUALA LUMPUR 2012 WORLD GAS CONFERENCE

25th world gas conference

"Gas: Sustaining Future Global Growth"

Management of Fugitive Emissions at Above-Ground Natural Gas Transmission, Storage and Distribution Facilities

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Presentation Outline

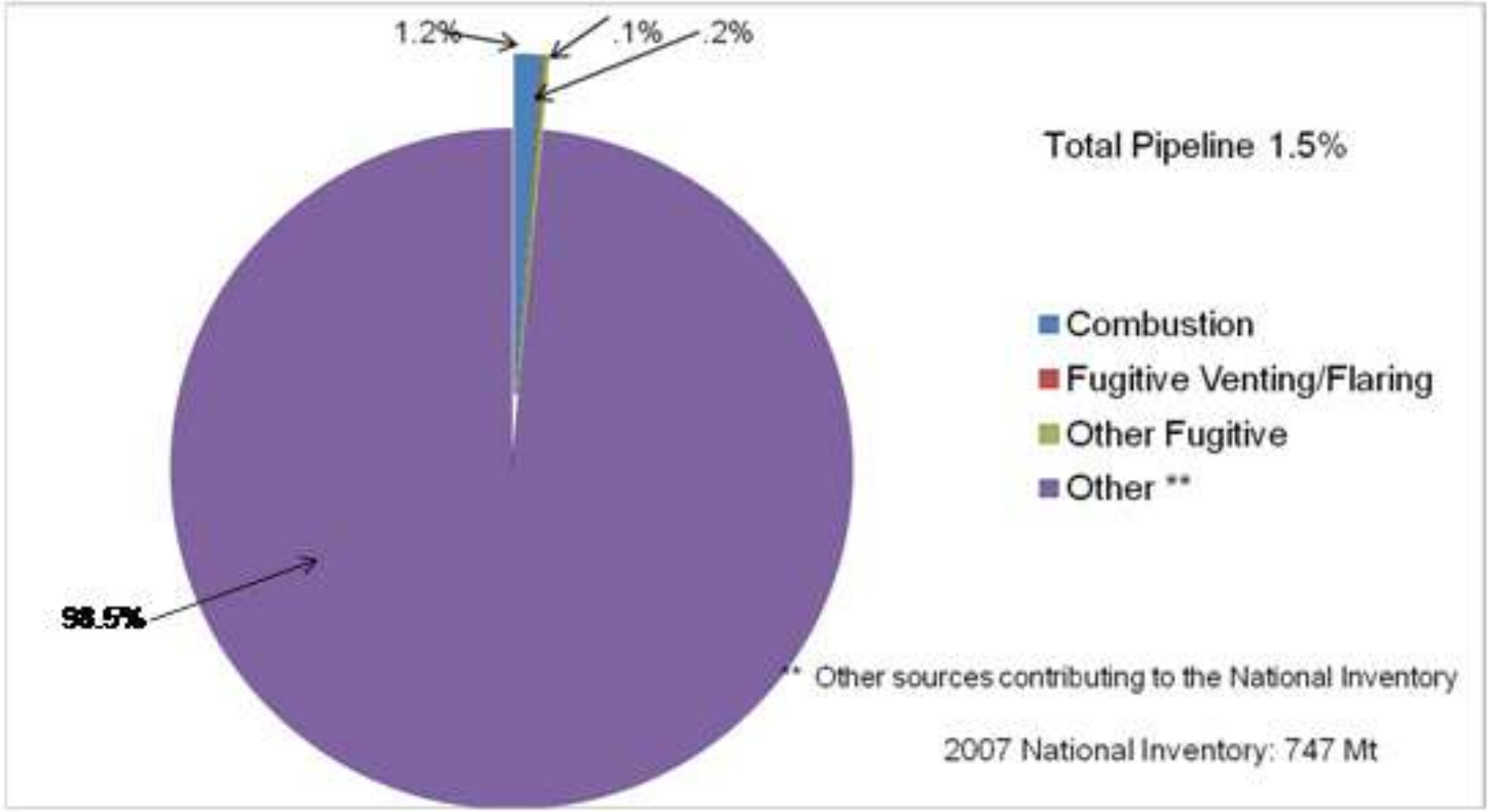
- The Need to Manage Fugitive Emissions
- The Canadian Natural Gas Industry's Response
- Developing an Industry Guidance for Managing Fugitive Emissions
- Outline of the Industry Guidance Document
- Conclusions
- Questions?

The Need to Manage Fugitive Emissions

- Methane is a relatively potent Green House Gas (GHG).
- Environment Canada considering a Code of Practice to Control Fugitive Emissions of Air Contaminants for Oil and Gas sectors.
- Provincial Government of Ontario considering the implementation of a carbon cap and trade system.
- The natural gas industry in Canada supports need to effectively manage GHG emissions.

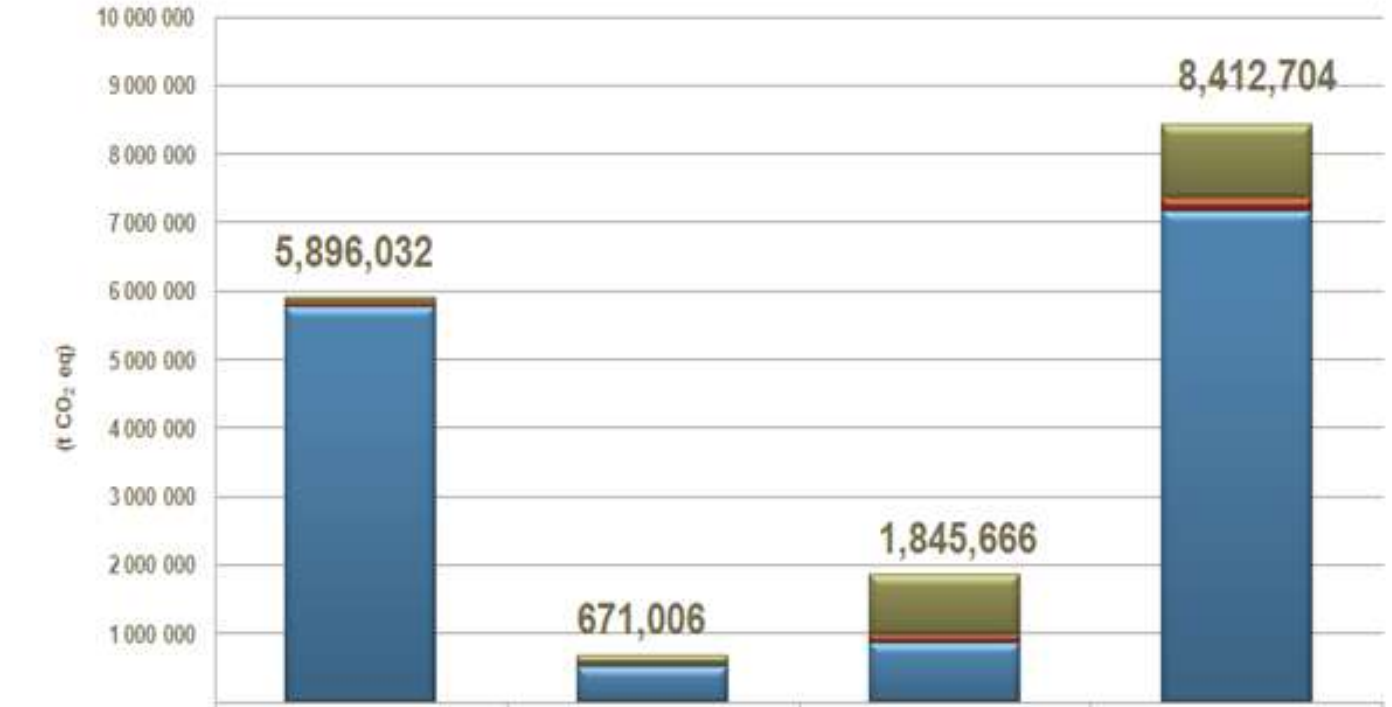
The Need to Manage Fugitive Emissions

2007 Pipeline Sector GHG Emissions as a Percent of Canada's National Inventory (megatonnes CO2e)



The Need to Manage Fugitive Emissions

2009 GHG Emissions Summary by Pipeline Segment and Emission Source Category

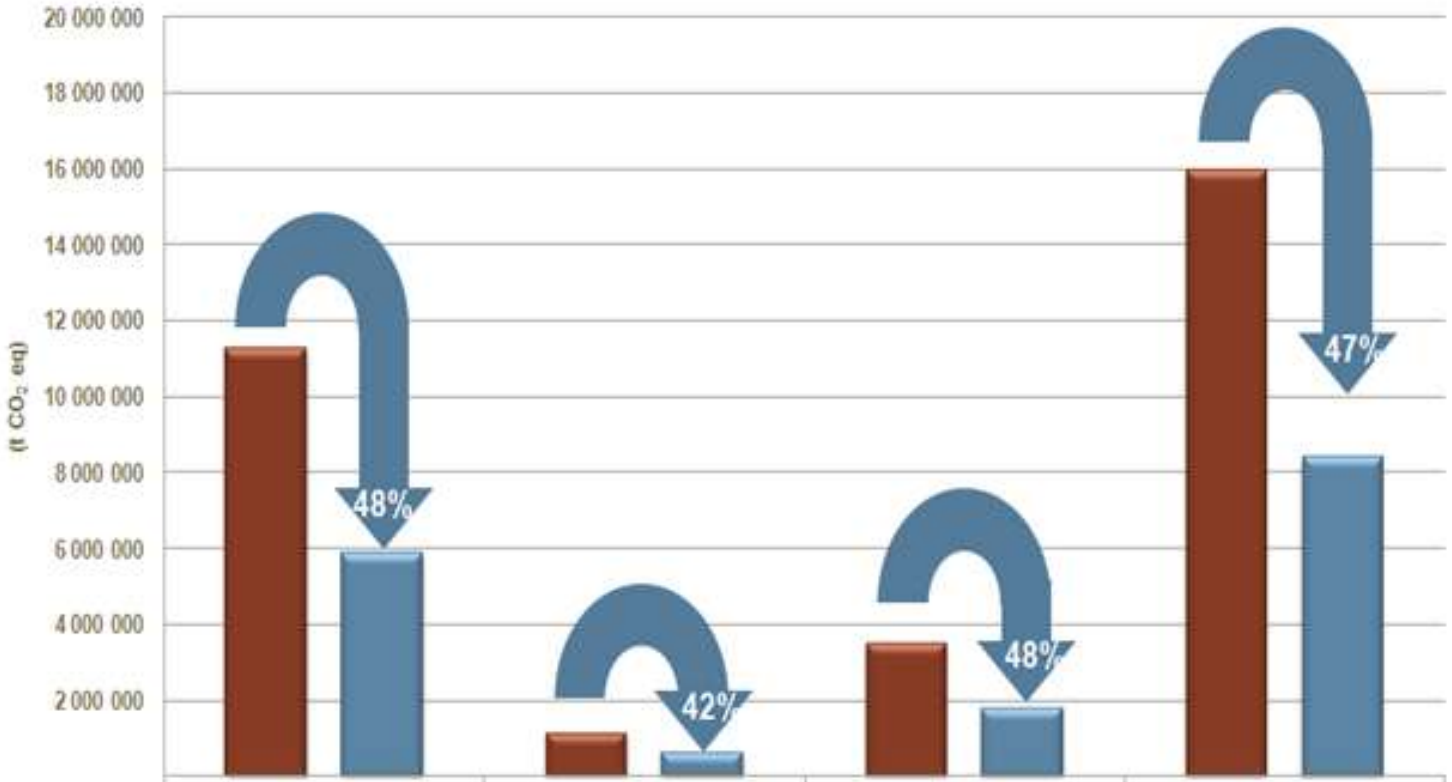


	Stationary Combustion	Venting & Flaring	Fugitives	Total
Distribution	59 725	127 737	861 075	1 048 537
LNG Storage	3 354	9 019	4 977	17 350
Geological Storage	58 222	11 914	115 426	185 562
Transmission	5 774 731	522 336	864 188	7 161 255

Canadian Natural Gas Transmission and Distribution Companies
2009 Greenhouse Gas Inventory

The Need to Manage Fugitive Emissions

Comparison of 2000 and 2009 GHG Emissions by Emissions Source Category



	Stationary Combustion	Venting & Flaring	Fugitives	Total
2000	11 296 970	1 153 384	3 526 348	15 976 702
2009	5 896 032	671 006	1 845 666	8 412 704

Canadian Natural Gas Transmission and Distribution Companies
2009 Greenhouse Gas Inventory

The Canadian Natural Gas Industry's Response

- The industry feels it has been doing a good job of managing fugitive emissions.

- Legislated codes of practice will not necessarily be effective.
  - Prescribed reduction targets may not be realistic in a growing industry.
  - Challenges in accurately measuring fugitive emissions suggests they should not be included in cap and trade systems.

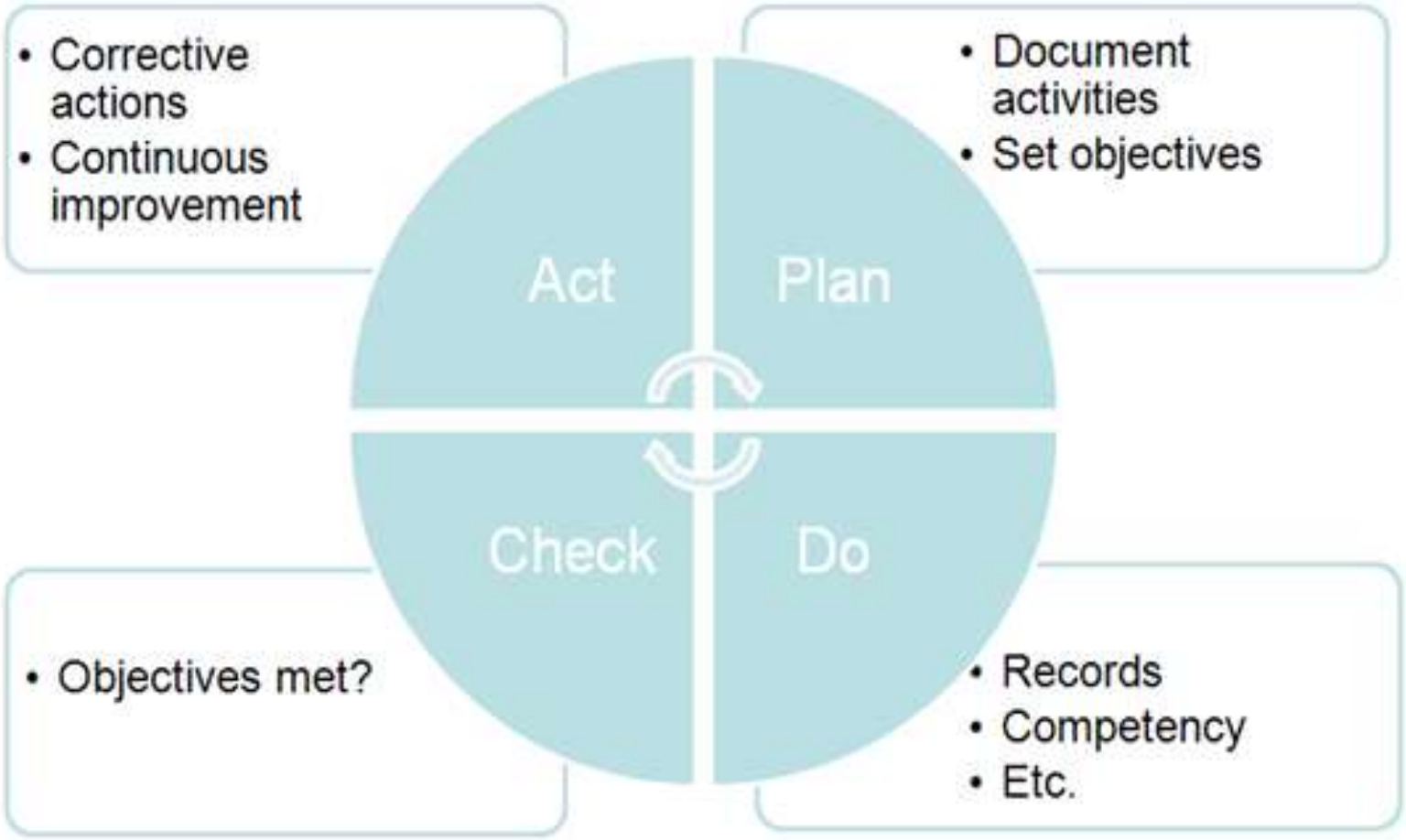
- Industry standards in Canada increasingly based on "management system approaches".

The Canadian Natural Gas Industry's Response

- Growing consensus among regulators that management systems needed to achieve goals and effectively manage risks.
- Canadian gas industry believes Asset Management provides effective framework for managing fugitive emissions.
- The industry wants to demonstrate that it is capable and committed to effectively managing fugitive emissions without the need for prescriptive legislation or incentive mechanisms.

Developing an Industry Guidance

Management Systems Approach



Developing an Industry Guidance

- Overall aim of Industry Guidance is to provide practical guidance to operators for developing customized approaches to managing fugitive emissions at individual natural gas facilities.

- Approach must be adaptable as program objectives change and as new technology or methods are adopted.

- Approach must be results oriented.
  - Requires operators to determine how they intend to meet objectives.
  - Requires performance measurement to track progress.

Outline of Industry Guidance Document

- The document specifies the key elements for effective management of fugitive emissions:
  - The application of appropriate technology and standards.
  - The implementation of management systems.
  - Corporate commitment.

- The document recognizes that different management approaches are required for transmission versus storage versus distribution sectors:
  - Odourized gas in distribution systems allows for easier detection.
  - There are more high-leak-potential components in transmission and storage systems.
  - Distribution systems leak less but lack economies of scale for implementing leak management programs.

Outline of Industry Guidance Document

- The document outlines the key elements of a Fugitive Emissions Management Plan to ensure effective and verifiable management of fugitive emissions:
  - Endorsed by senior management.
  - Documents baseline emissions or leak management performance.
  - Establishes the scope of the program.
  - Sets clear performance targets and ongoing performance monitoring requirements.
  - Identifies critical areas and component categories to focus on.
  - Specifies quality control and quality assurance measures.
  - Outlines responsibilities of management, operations and maintenance personnel and contractors.

Outline of Industry Guidance Document

- The document also outlines:
  - A system for managing all leak monitoring and repair records.
  - The typical key sources of fugitive equipment leaks.
  - Important considerations and constraints.
  - Improved operating practices.
  - Relevant technologies for the detection, measurement and control of fugitive emissions.

Outline of Industry Guidance Document

- The document describes an effective leak management program as follows:
  - PLAN - Companies shall define and document the activities they undertake on their systems for leak detection, investigation and repair. Planning shall also include the setting of performance objectives.
  - DO - Companies shall ensure that defined activities are implemented in accordance with company requirements.
  - CHECK - Companies shall review their leak management program to ensure that objectives are met.
  - ACT- Companies shall take action to correct areas where objectives may not be met. In addition, companies shall review their entire leak management program to identify opportunities for continuous improvement.

Conclusions

- The guidance document is intended to:
  - Provide companies with an improved understanding of fugitive emissions and impacts.
  - Provide companies the ability to adapt to changes in technologies, methods, business drivers or other areas.
  - Support the alignment of environmental risk management with safety, integrity, security and other business risks.
  - Facilitate a dialogue with regulators by requiring documented objectives and measured performance.

- The guidance document has been presented to government authorities to positively influence the development of potential government policies, codes of practice and regulations governing fugitive emissions in Canada.

Questions?