



# Greenhouse Gas Issues: Fugitive Emissions from Pipelines

*Sept 15, 2009*

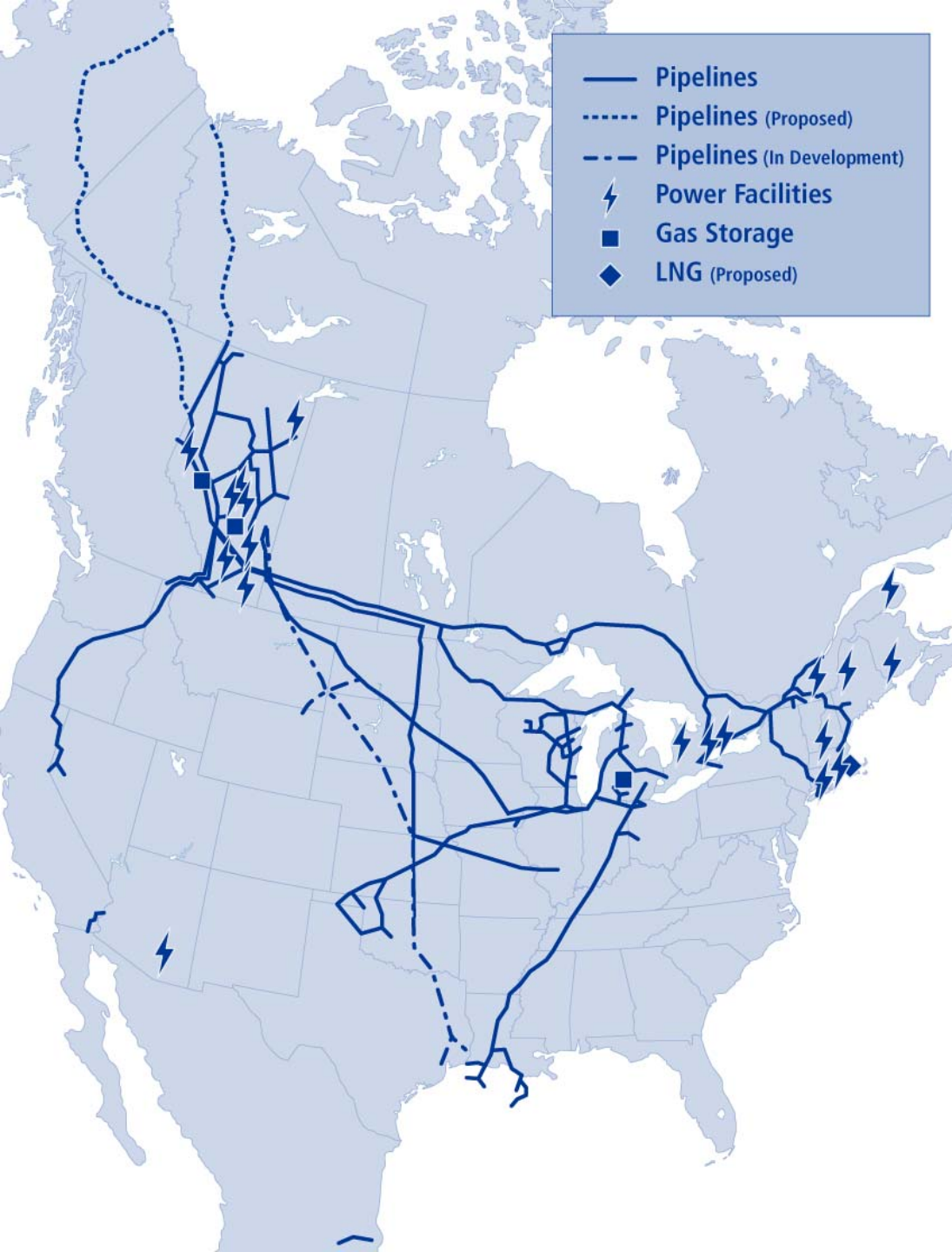
*Jim Cormack*

# Agenda



- How does TransCanada track and manage its emissions
  - Development of an Emissions Management Strategy
  - Emissions Management Practices
  
- Fugitive Emission Management
  - Field Practices
  - Measurement, Calculations, Estimations
  
- Quantifying Business Decisions
  - Drivers
  - Dependencies

# TransCanada Corporation (TSX/NYSE: TRP)



## Gas Pipelines

- 59,000 km wholly owned
- 7,800 km partially owned
- 250 Bcf of regulated natural gas storage capacity
- Average volume of 15 Bcf/d

## Oil Pipelines

- Keystone 1.1 million Bbl/d
- Expandable to 1.5 million Bbl/d

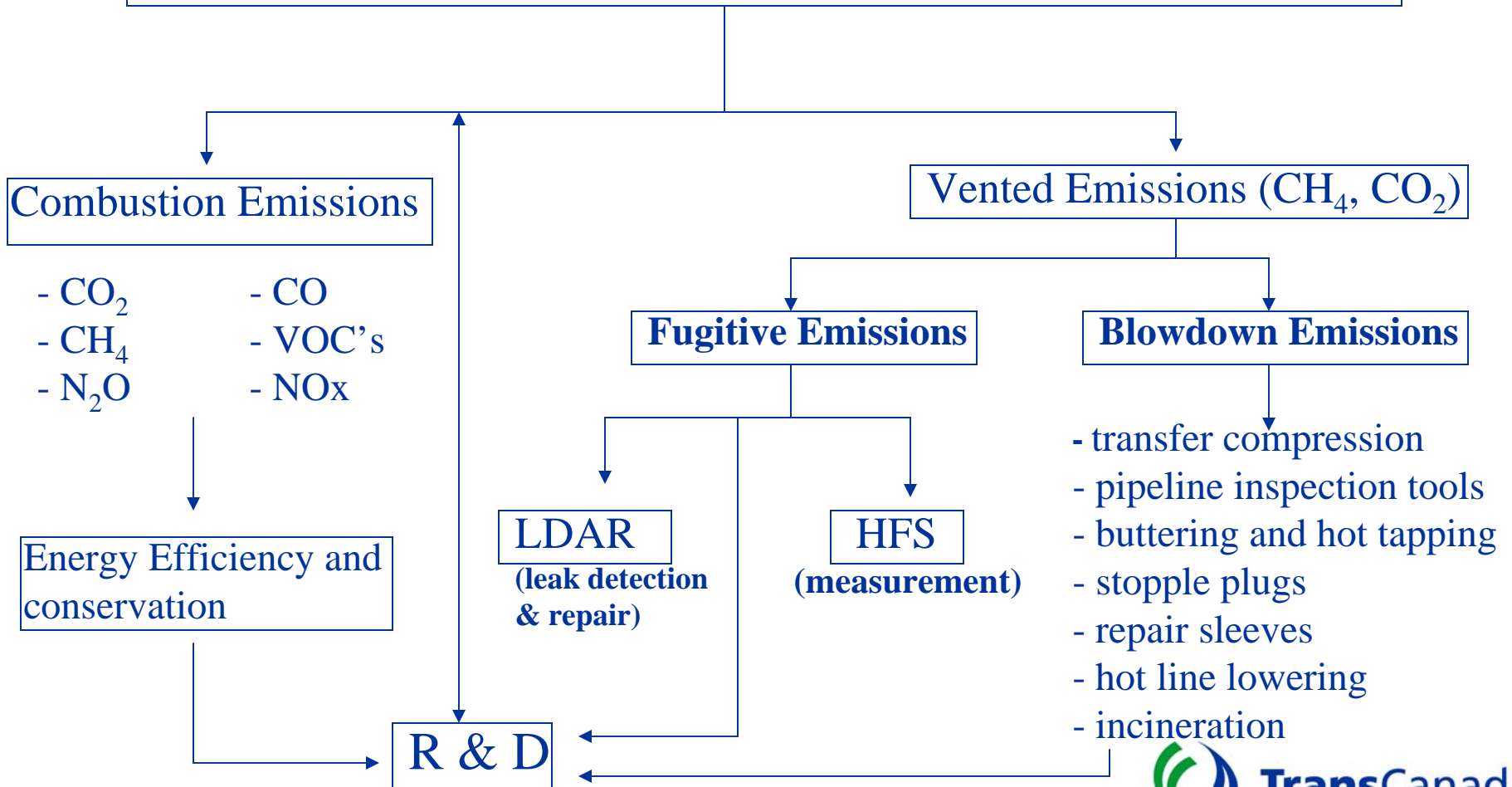
## Energy

- 19 power plants, 10,900 MW
- Diversified portfolio, primarily low-cost, base-load generation
- 120 Bcf of non-regulated natural gas storage capacity

# EMS - Emissions Management System



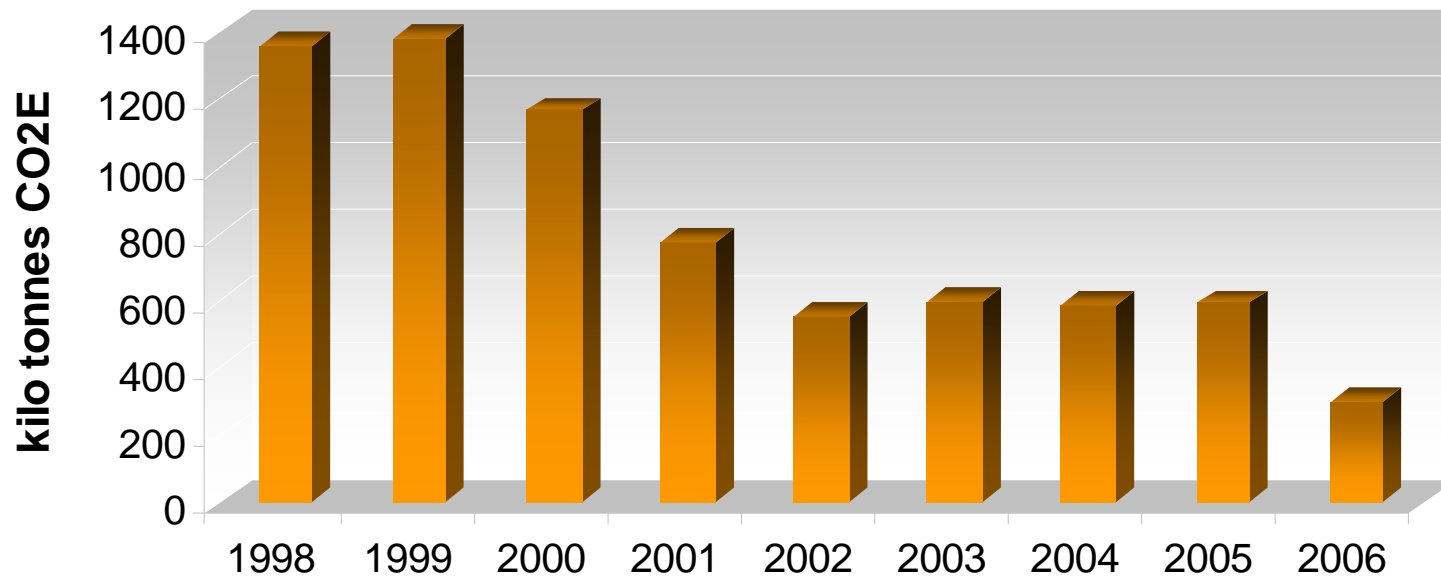
## TransCanada Emissions Management System



# Fugitive Emissions



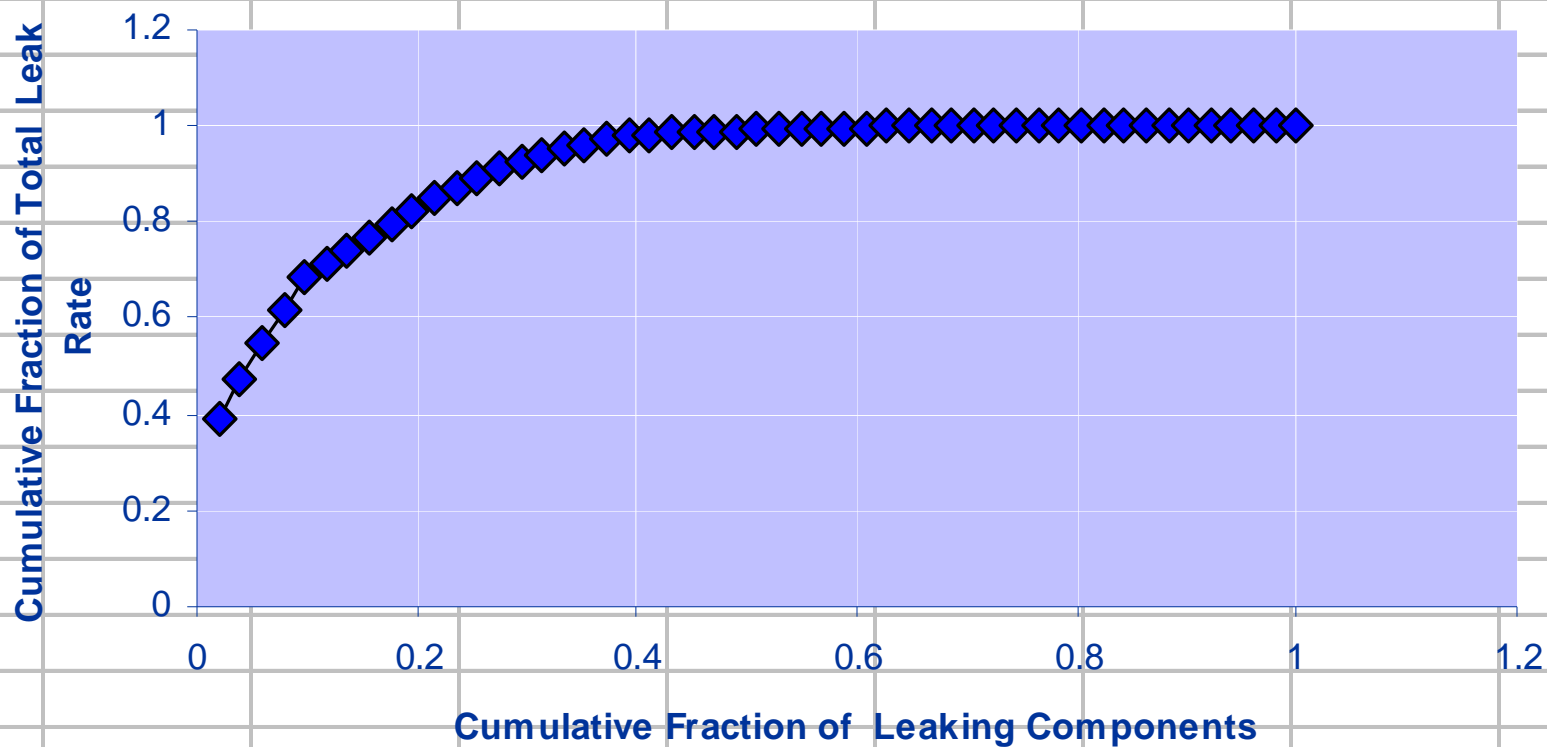
## Fugitive Emissions (ktCO<sub>2</sub>E)



# Where do fugitives come from?



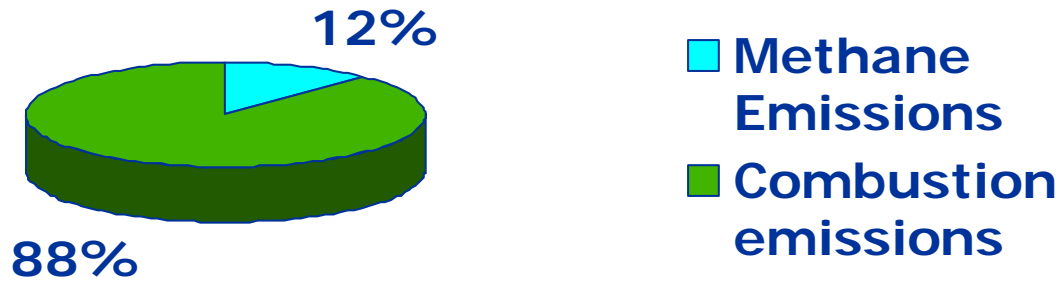
## Sample Field Measurement Data Analysis



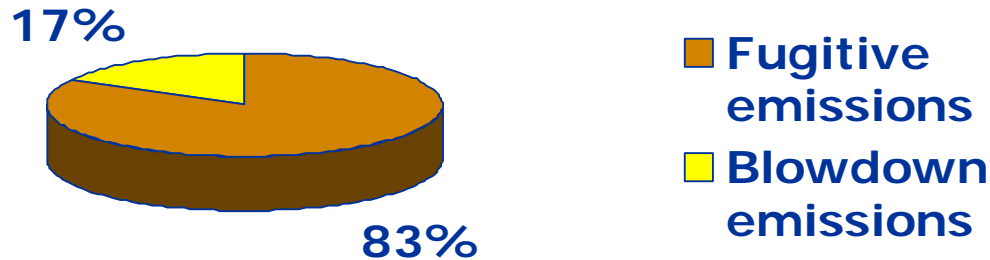
# Methane Emissions Distribution



## Greenhouse Gases



## Methane Emissions



# Key Points for Pipeline facilities in a GHG constrained world



Little scope for emission reductions:

- Combustion emission reductions from existing facilities is extremely expensive
- Existing Facility options are:
  - Pipe vs compression for new projects
  - Efficiency improvements
  - Electrification in isolated instances
  - Reduction in fugitive emissions





A collaboration of Canada's major natural gas transmission and distribution companies

## **Mission**

To provide the Canadian natural gas industry with tools and timely information to optimize environmental performance and promote natural gas as the fuel of choice

## CEPEI Members and Co-Funders



Alliance Pipelines

ATCO Gas

AltaGas Utilities Inc.

ATCO Pipe Lines

Duke Energy Gas Transmission  
Canada

Enbridge Gas Distribution

Gaz Metro, Inc.

Manitoba Hydro

SaskEnergy

Incorporated/TransGas Limited

Terasen Gas

TransCanada Corporation

Union Gas

External Project Co-Funders (e.g., ATCO Power, Environment Canada,  
Guelph Hydro Electric Systems, INGAA, Northland Power, Ontario  
Power Generation, Town of Markham, etc.)

# Climate Change Program Area – The History



Over 30 projects – a shared investment of over \$2.5 million Cdn.

GHG Inventories for 1990, 1995, **2000**, 2002, 2004, and **2005**;

Measurement protocols and studies;

An industry handbook and other tools (e.g., GHG Calc Canadian version);

Emission/activity factor improvement studies;

Uncertainty analyses; and

Audit

# Fugitive Emissions Best Management Practices



- The pipeline industry feels they are proactively managing these emissions in a manner that works
- Development of a guidance document that communicates
  - differences in fugitive sources between transmission and distribution systems
  - allows individual companies and facilities to develop customized approaches based on risk and asset management practices
  - will include a decision tree and rationale for targeting fugitive emissions

# Pipeline Options for GHG Reductions



- Physical
  - Efficiency upgrades (limited)
  - Replace drivers with electric motors
  - Replace compression with pipe
  - Reduce throughput/output
  - Waste Heat recovery/cogeneration
  - Capital stock turnover
  - Carbon Capture & Sequestration
- Contractual
  - Purchase GHG credits/offsets/allocations
  - Invest in “technology”

# Reducing GHGs from Fossil Fuel Use



## Do you understand the scale?

- To displace about 40% of today's energy consumed in the form of fossil fuels would require:

6,700 nuclear plants

3,096,000 large wind turbines

4,954,500,000 solar roof tops (there aren't that many roofs)

220 Three Gorges Dams