

# TransCanada Case Study: Emissions Management System

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# Agenda



- How does TransCanada track and manage its emissions?
  - Development of an Emissions Management Strategy
  - Creation of an Air Emissions Database
  - Emissions Management Practices
  - Continual Investment in R&D
  
- Quantifying Business Decisions
  - The Implementation of effective Practices and Procedures

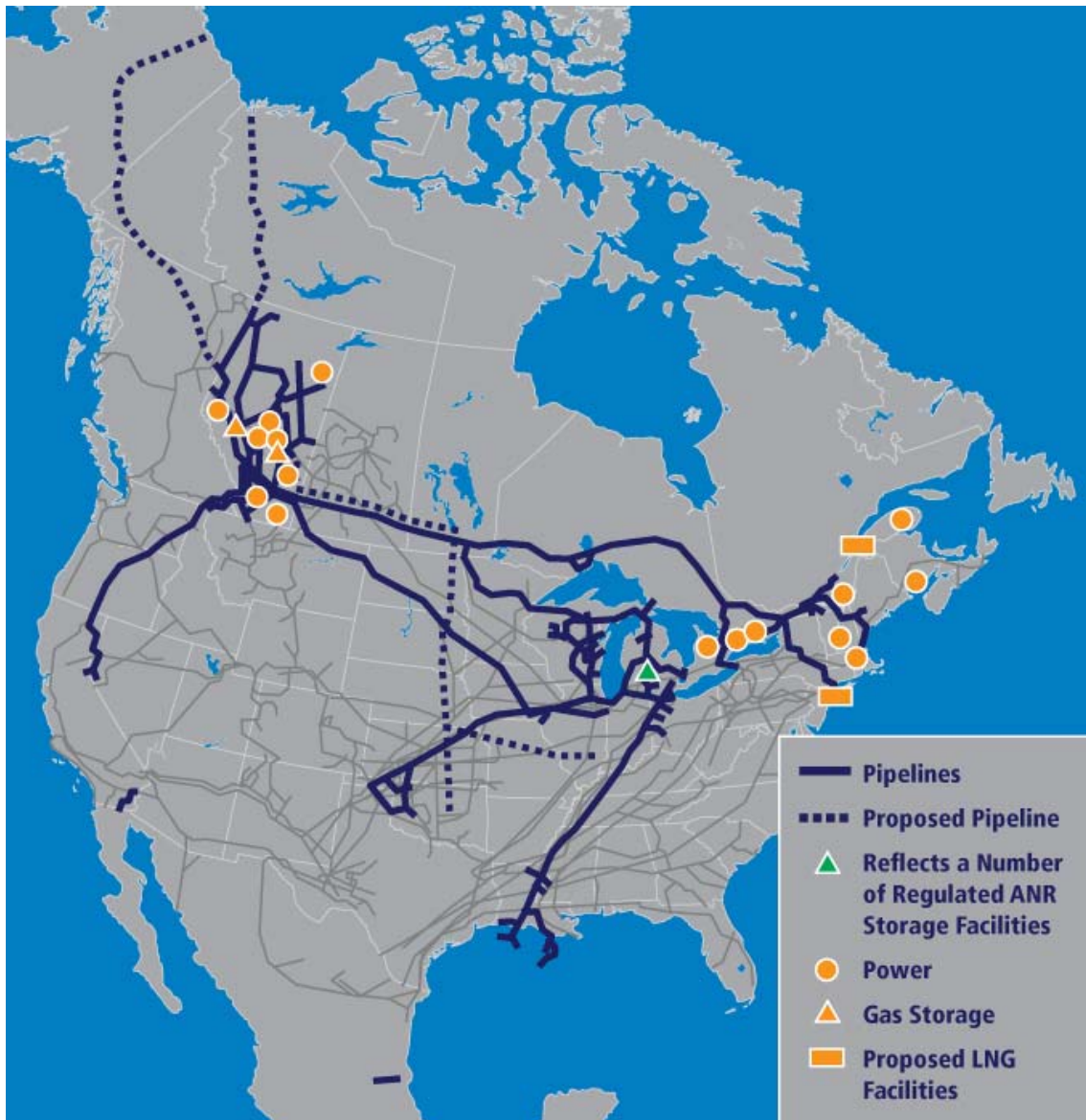
# TransCanada



- Leading North American company in natural gas transmission and power generation
- \$25.9 Billion in pipe and power assets (\$Cdn at December 31, 2006)
- 2007 named as a member of the *Global 100 Most Sustainable Companies* in the world
- Skilled, expert, energetic people with strong technical knowledge
- Strong financial position to capture opportunities going into the future



# Quality assets and proposed projects

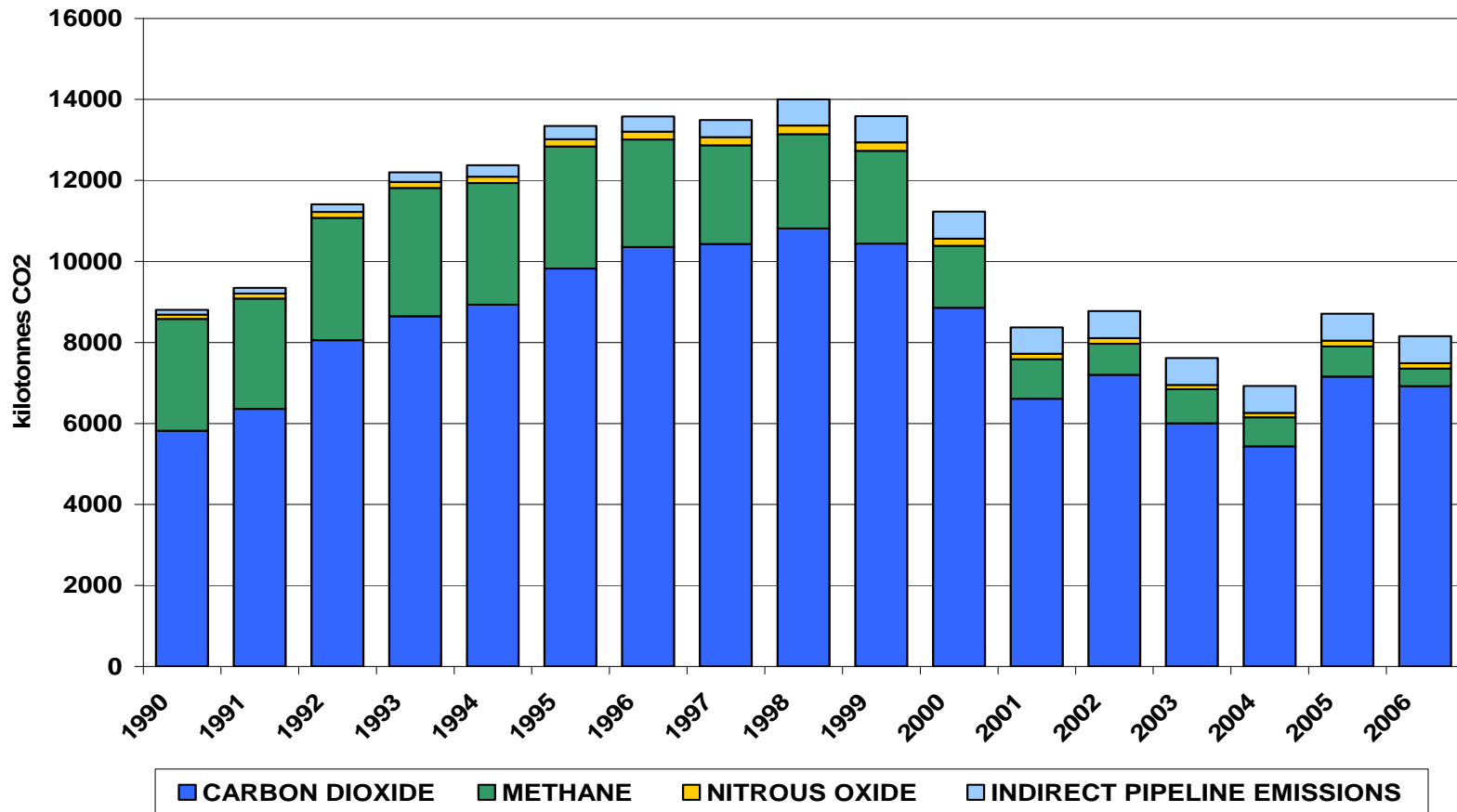


- approx. 59,000 km (36,500 miles) of wholly owned pipeline
  - transports 15 billion cubic feet/day (Bcf/d) from virtually all major supply basins on the continent
- 2,969 km of proposed oil pipeline, capable of transporting 435,000 barrels per day
- 16 power facilities with 7,700 megawatts of power generation
- two proposed liquefied natural gas facilities
  - 1.5 Bcf/d

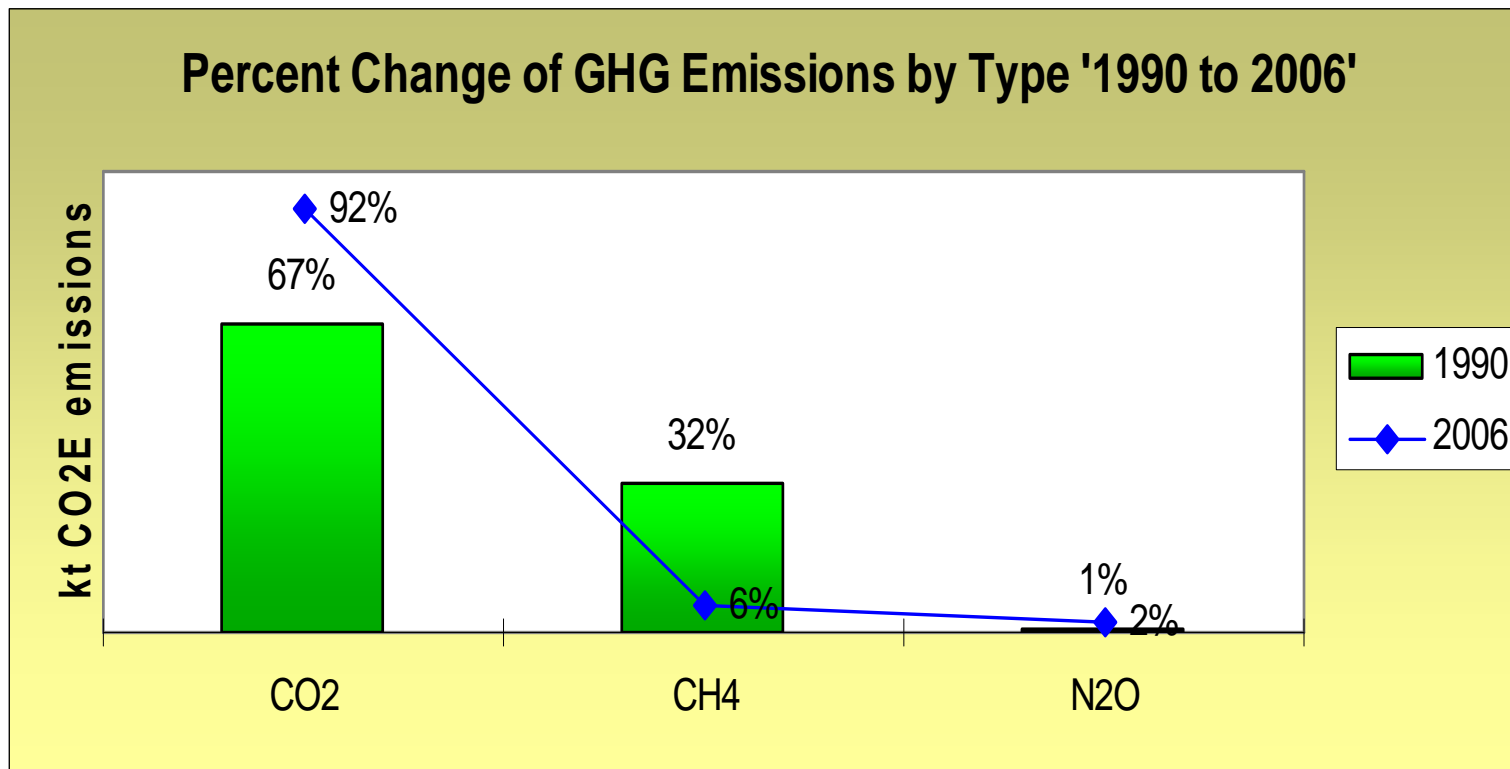
# GHG emissions from pipeline operations and methane reduction



## TransCanada Pipeline Greenhouse Gas Emissions Breakdown



# TransCanada Emission's Profile

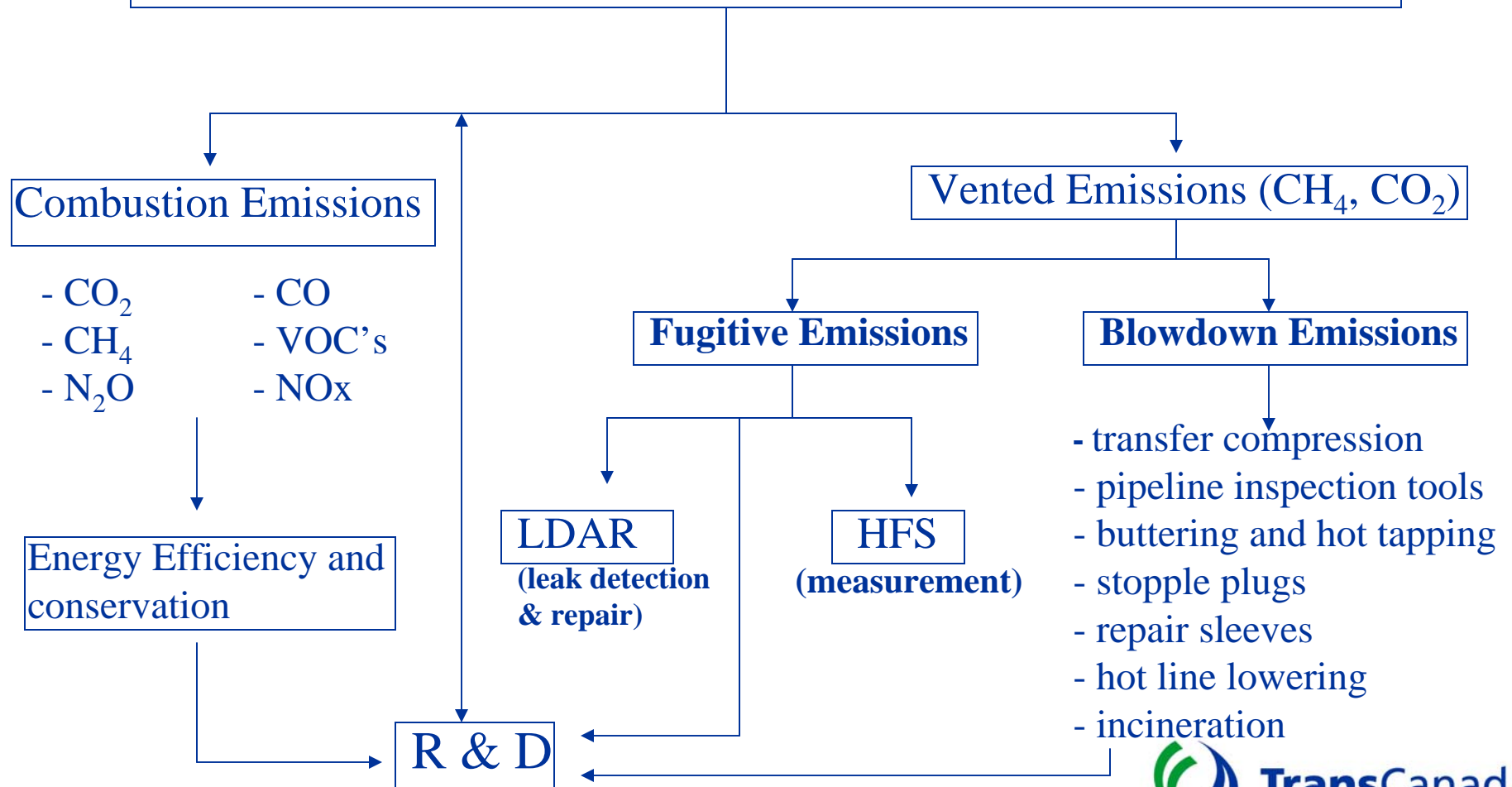


- Decrease in methane emissions is due to effective leak detection and repair program (LDAR).

# EMS - Emissions Management System



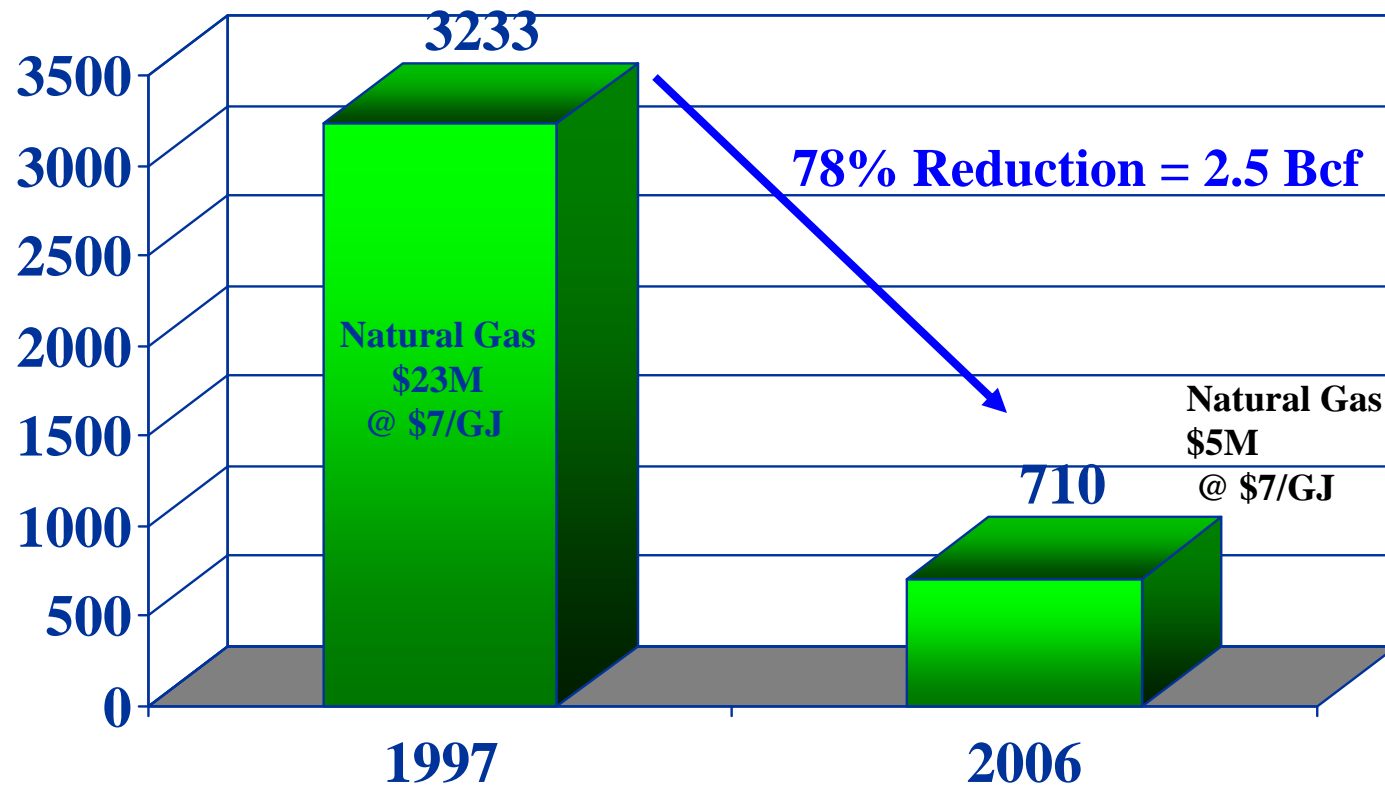
## TransCanada Emissions Management System



# Methane (Fugitive) Emissions Management: *Program Successes*



## Fugitive Emissions in million ft<sup>3</sup> CH<sub>4</sub>





# 2006 CCME Pollution Prevention Award



*TransCanada's Fugitive Emissions Management Program is Recipient of 2006 CCME Award*

**CCME**

Canadian Council  
of Ministers  
of the Environment

Le Conseil canadien  
des ministres  
de l'environnement



# Air Emissions Database System



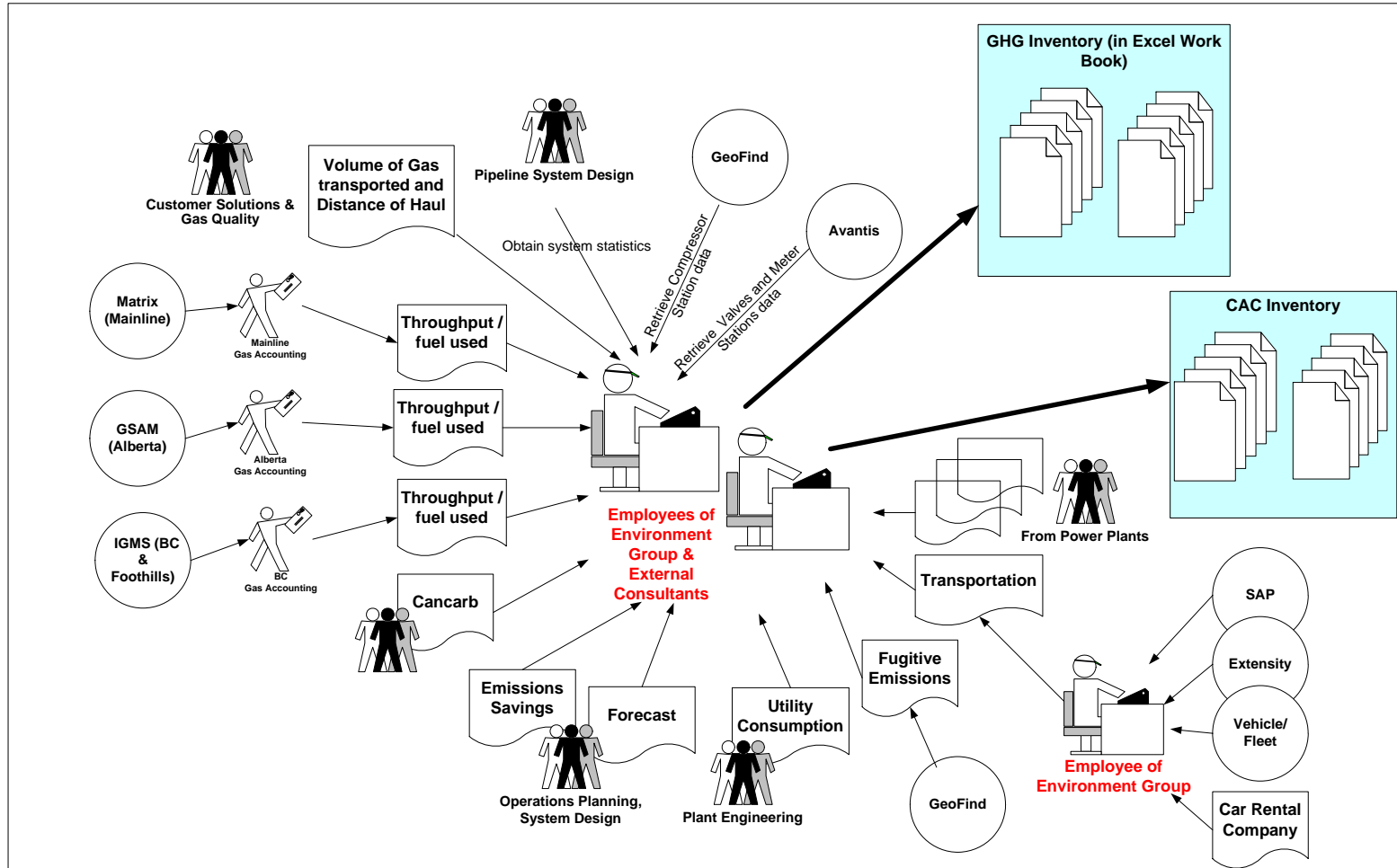
Allows TransCanada to:

- Develop confidence in handling complex issues
- Effectively and Efficiently manage incoming emissions data
- Retrieve and Store information easily
- Reduce wait times for data
- Assumptions made can be stated and defended clearly

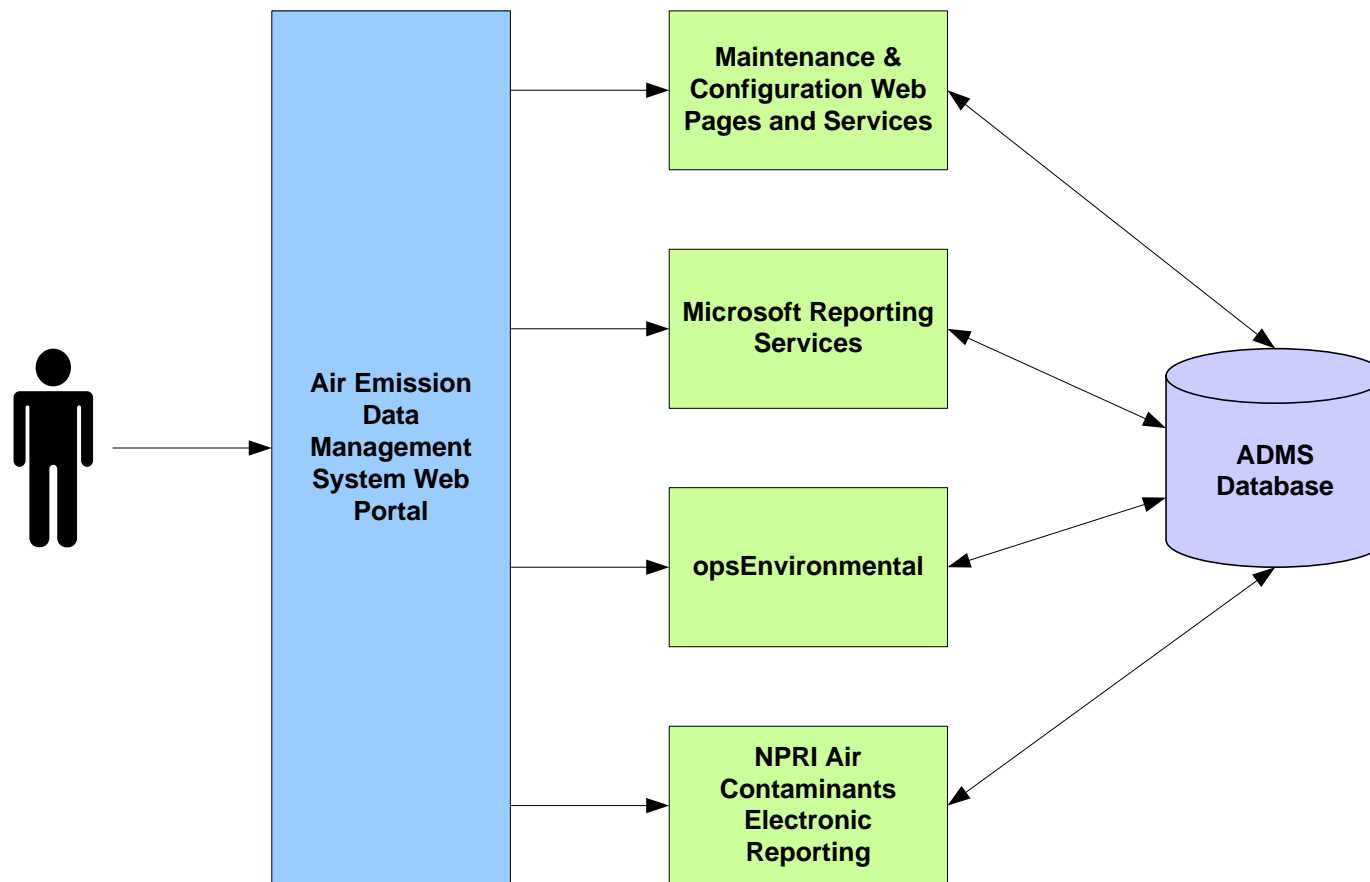
# Emissions Data Management Before



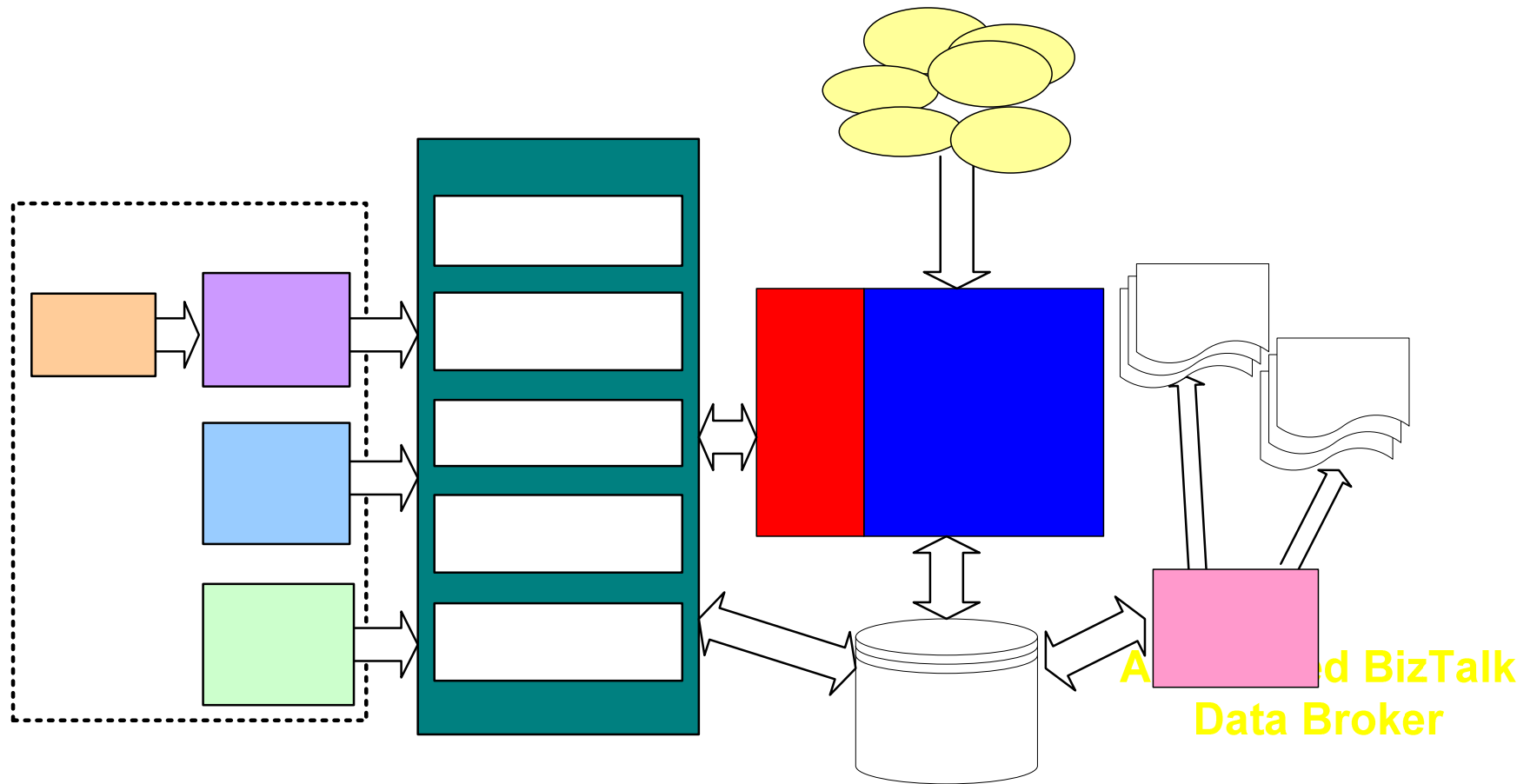
## Current State Of GHG & CAC Inventory Tracking



# Air Emission Data Management System User Experience



# Air Emission Data Management System Logical Design and Interfaces



TC Internal Systems

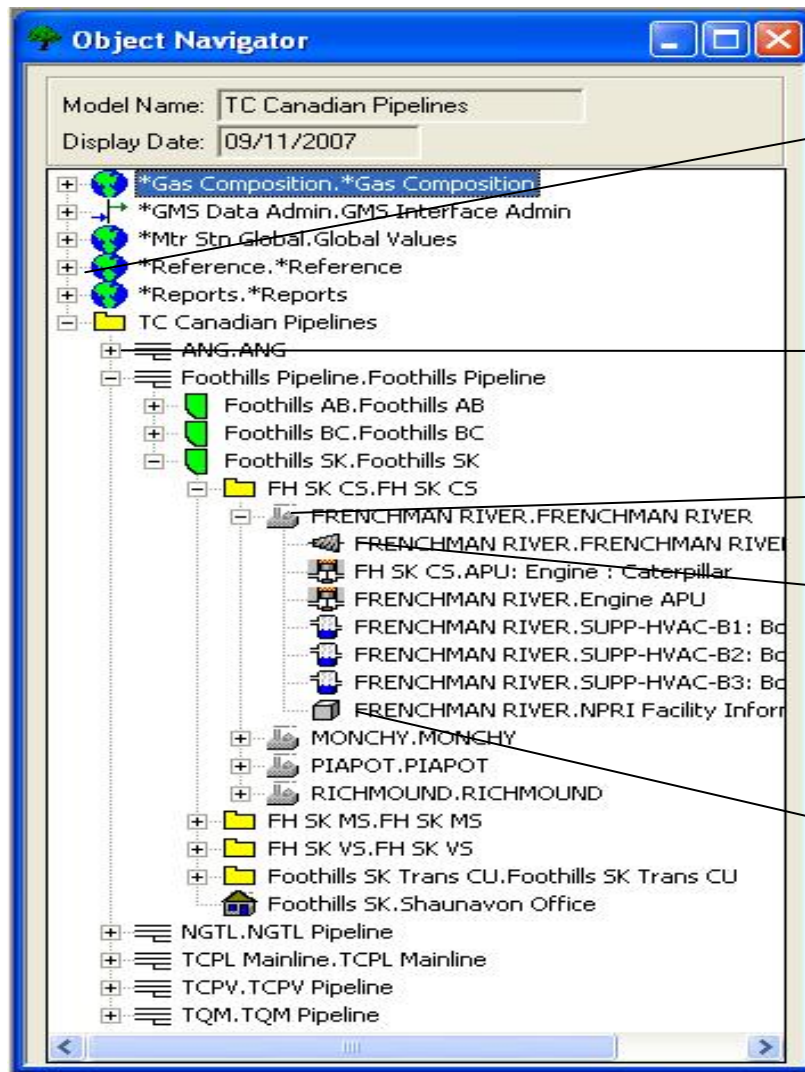
Facility Subscriber  
Web Service  
 **TransCanada**

**Avantis**  
(Pipe Equipment  
Boiler, ADU)

**GeoFind**  
(Pipe Facility - C/S,  
MCS, etc)

Fuel Consumption Subscriber  
Web Service

# Air Emission Data Management System opsE Pipeline Hierarchy



Global libraries, such as \*Reference and \*Reports are included in all facility models.

This is a pipeline system.

This is a compressor station.

This is a compressor unit.

This is the NPRI Facility Information for Frenchman River compressor station.

## Emissions Management Team



A group of experienced people from many departments of the company that regularly reviews progress and sets targets and goals

- Uses reports to review progress
- Efficient decisions can be made
- Information is transparent and consistent
- Assumptions are clear upfront

# Blowdown Emissions Management



## Control Methods and Technologies Used

- Scheduling Practices
- Operational Adjustments
- Transfer (Pull-down) Compressors
- Buttered Stubs
- Hot Tapping
- Hot Line Lowering
- Sleeves
- Stopples





# Supersonic Gas Injector



- Developed for capturing very low pressure vent gases and re-injection into a high pressure gas stream without the use of rotating machinery
- Savings
  - 4 million ft<sup>3</sup>/yr of gas savings from one compressor
  - Natural gas worth \$28,000/yr/unit @\$7/GJ
  - GHG emissions
  - Zero operating cost

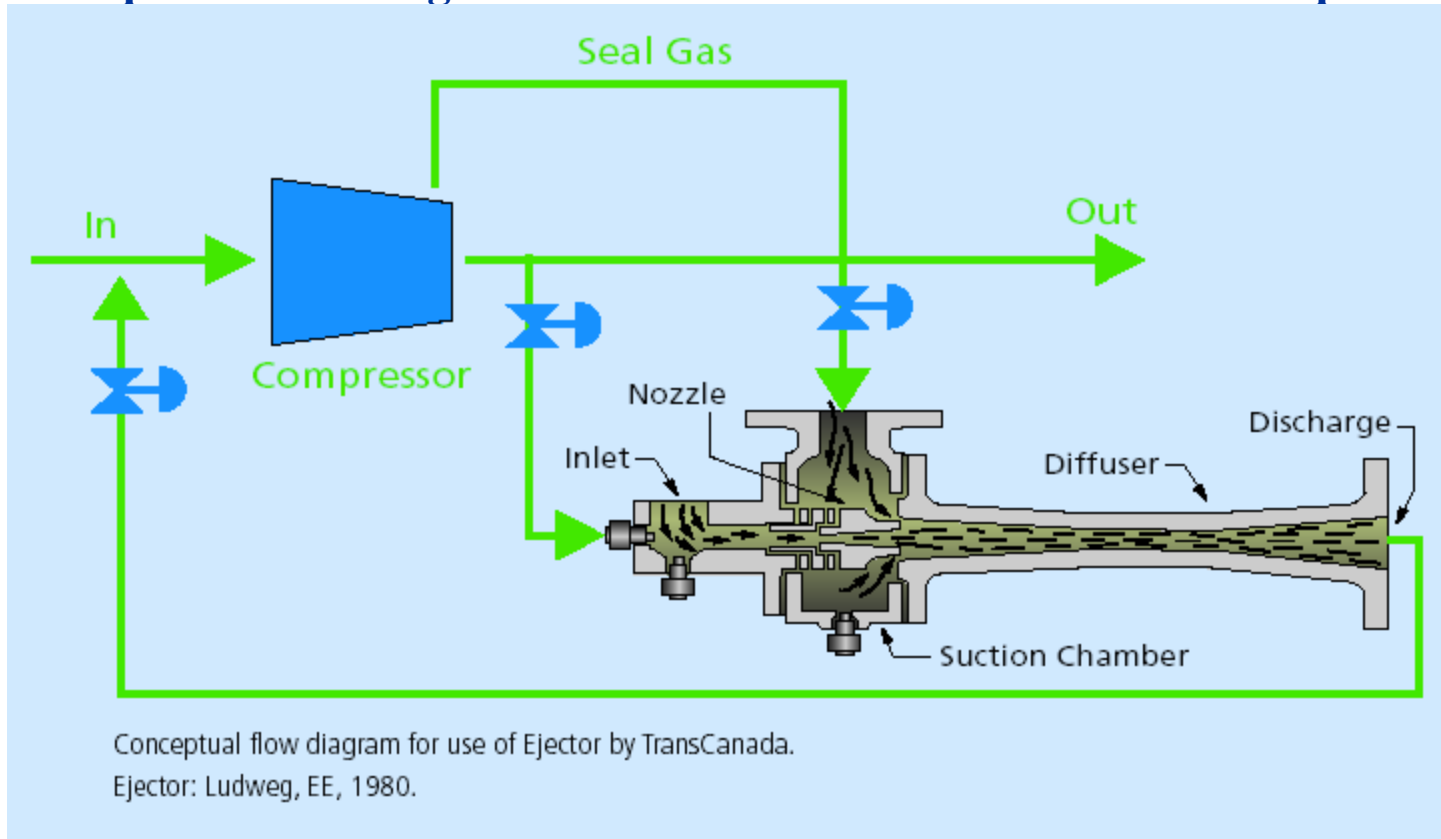


# Gas-Gas Ejector for Dry Gas Seal Leak Capture



## Conceptual Flow Diagram

US & Canadian patent filed



# Global Pipeline Honorable Mention Award



Received at Rio Pipeline 2007 Conference, Rio de Janeiro, Brazil

## Use of Biofiltration for Methane reduction



- A joint venture of TransCanada & University of Calgary
- Methane gas can be oxidized biologically, with the use of methanotrophic bacteria
- Vented CH<sub>4</sub> reduced to CO<sub>2</sub>: 21 times less global warming potential
- Implemented successfully at three sites
- No operating cost except monitoring
- Almost 80% oxidation rate achieved
- Biocell/Biocap/Biofilter research *received 2007 Emerald Award*



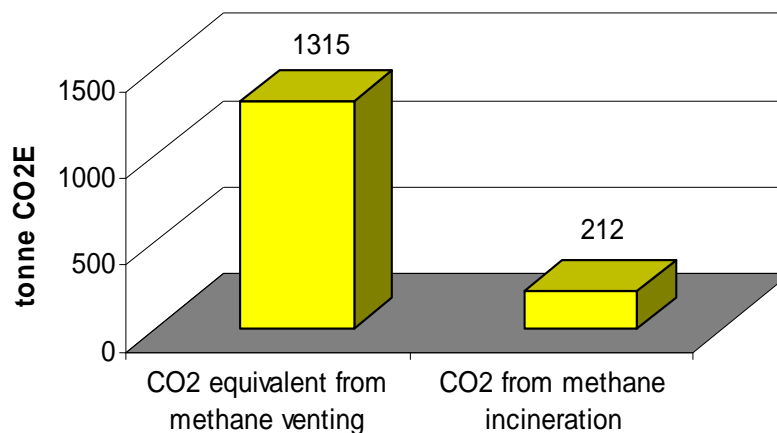
## Use of Incinerator for Blowdowns



- Incineration of blowdown gas instead of venting (after transfer compression)
  - At Caron Compressor Station, Moose Jaw, November 2002



**GHG Emission Comparison with & without Incineration after Transfer Compression**



- Emission savings of 1,100 tCO<sub>2</sub>e
- Worth \$17,000 @\$15/t CO<sub>2</sub>E

## End Results - EMS



- Confidence
  - The ability to quickly and accurately quantify inputs into important business decisions
  - The success of our measurement program can be widely used
  - The success of our Management System can be quantified
  - Internal interest and buy-in is fostered