

A decorative banner with a red top edge and a white bottom edge. The central part of the banner is a curved image showing blue gas flames on the left, a green field with a tree in the middle, and white wind turbines on the right.

# **Gas-fired Generation and Influence on Demand, Storage and Pipeline Operations**

Canada's Energy Future: 2008 Workshop

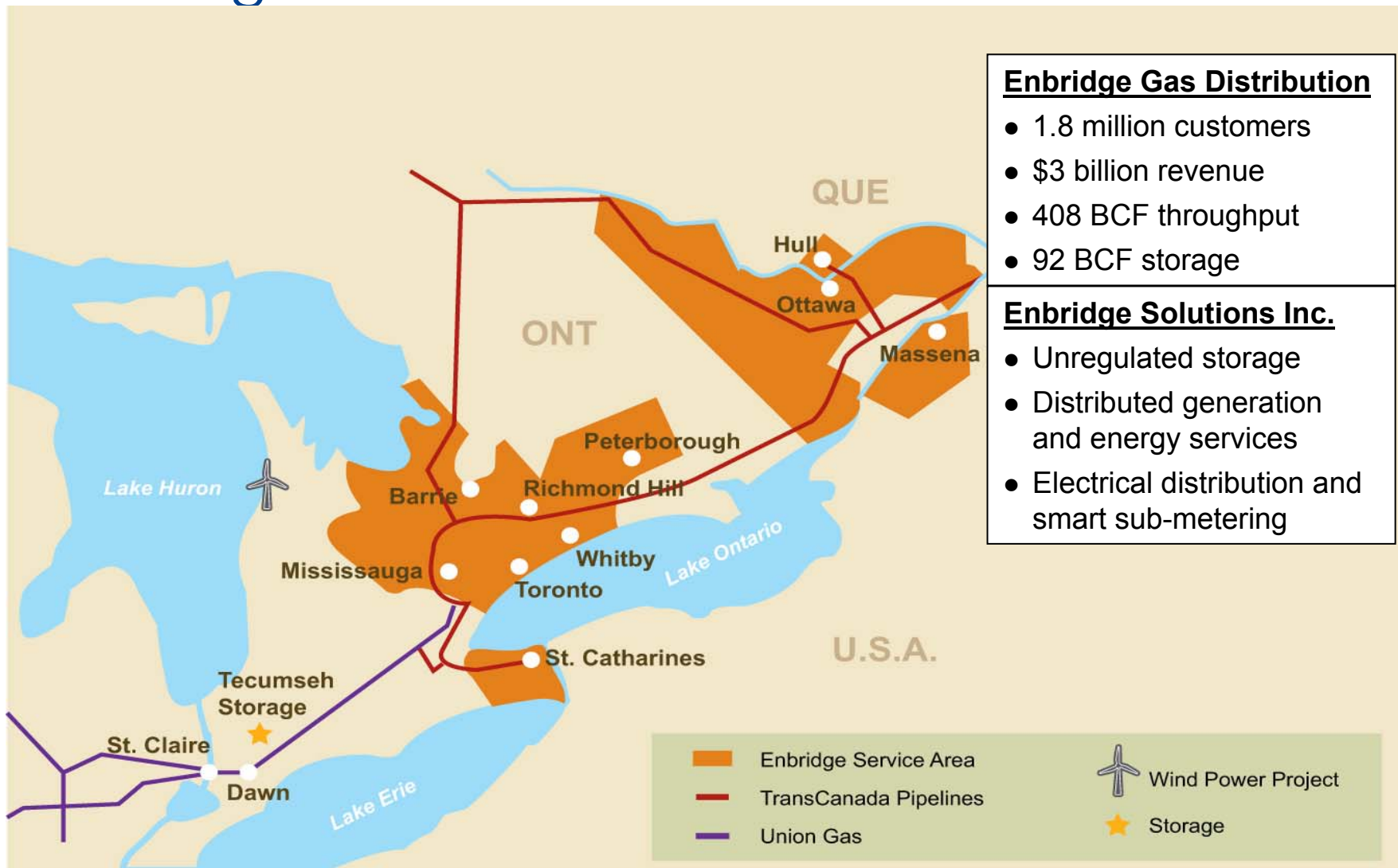
Ottawa, January 22, 2008

Malini Giridhar, Enbridge Gas Distribution

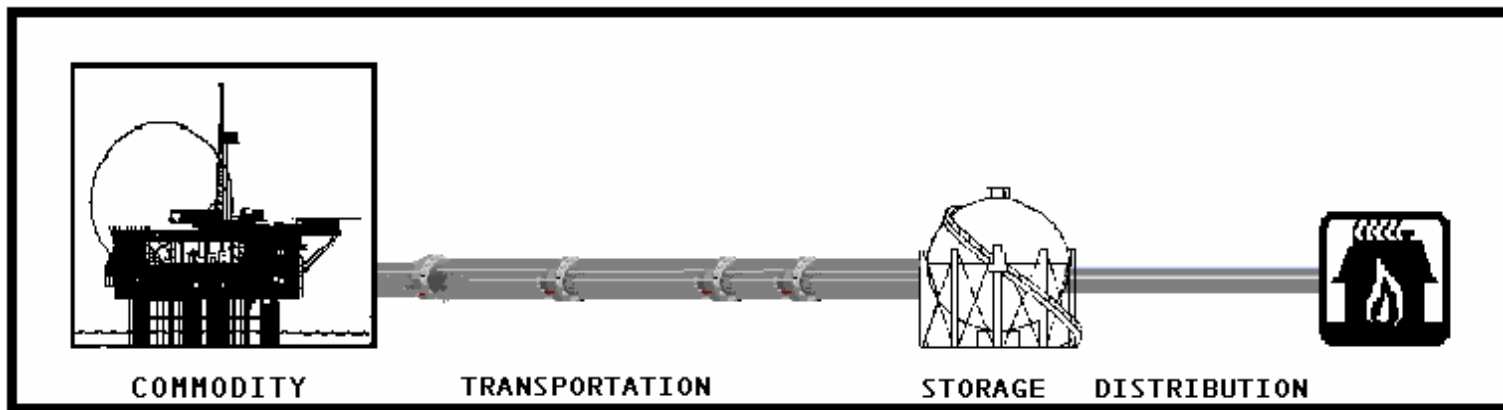
# Agenda

- **Section 1 Gas Industry in Ontario**
- **Section 2 Gas Fired Generation (GFG) in Ontario**
  - **Gas Demand Outlook**
  - **Supply, Storage and Pipelines**
  - **Enbridge's Perspective**
- **Section 3 Traditional Gas Markets in Ontario**
  - **Gas Demand Outlook**
  - **Supply, Storage and Pipelines**
  - **Enbridge's Perspective**
- **Section 4 Conclusions**
- **Section 5 Q&A**

# Enbridge in Ontario

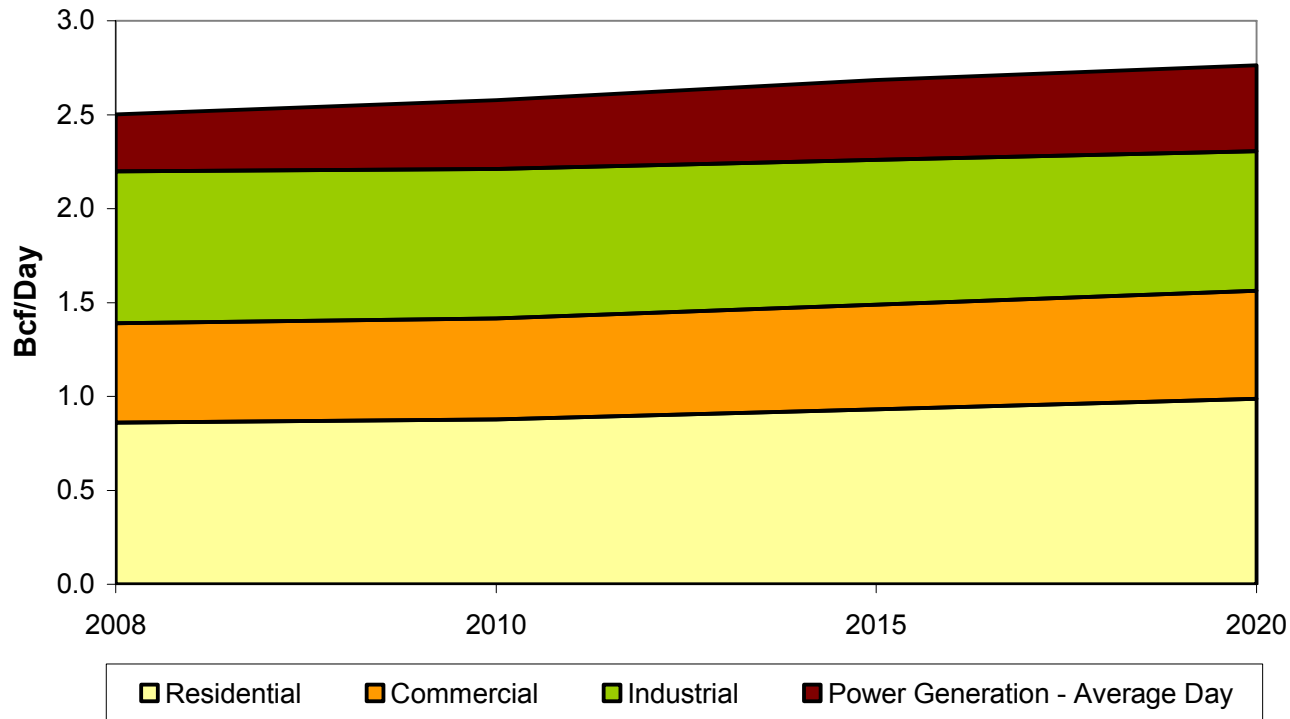


# Services offered by Enbridge



Service Name	Characteristics
Commodity	~ 40% of customers make their own arrangements
Transportation	~ 30% of customers make their own arrangements
Storage & Balancing	Used by all customers
Distribution	Used by all customers

# Ontario Gas Demand Forecast by Sector



- GFG sector is driving demand growth
- Growth in traditional sectors is limited by conservation, warming trends and demand destruction in industrial markets

# The Supply Mix Directive Underpinning Forecast GFG Demand

The Ontario Government's Supply Mix Directive for Electricity:

“Maintain the ability to use natural gas capacity at peak times and pursue high efficiency and high value use of the fuel”

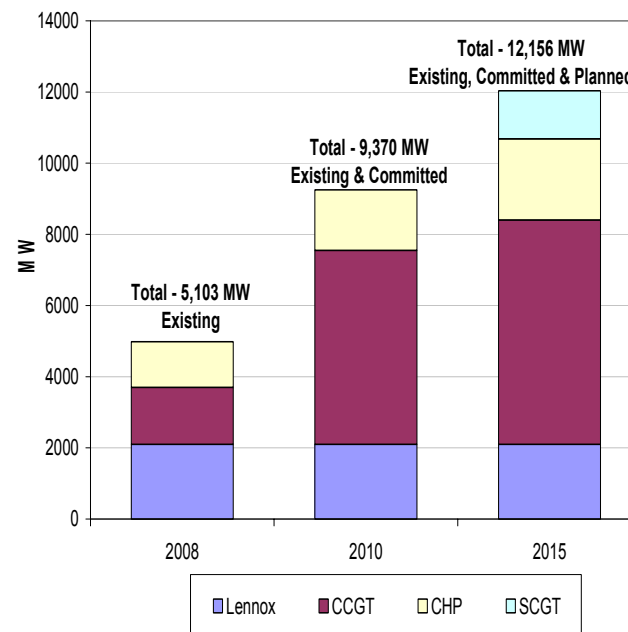
Terms	OPA interpretations
Peak times	14% of the hours with the highest demand
High Efficiency	Cogeneration (CHP) and combined cycle
High Value	Lower cost, enhanced flexibility, avoided transmission facilities, shorter lead times, local reliability and voltage support and enhanced environmental performance

# GFG Additions and Attributes

- Government committed to 4267 MW of GFG by 2010
- Planned GFG ~2700 MW by 2015
- GFG Installed Capacity as a proportion of total forecast to double
- GFG Energy Production as a proportion of total forecast to increase by 33%
- GFG gas demand forecast to grow less than growth in installed capacity

GFG Attributes	2008	2010	2015
GFG Installed Capacity / Total	16%	23%	29%
GFG Energy Production / Total	9%	10%	12%
Utilization Factor			
Combined Cycle	20%	9%	17%
Single Cycle	0%	0%	2%
CHP	42%	43%	41%
Existing NUG	77%	77%	77%

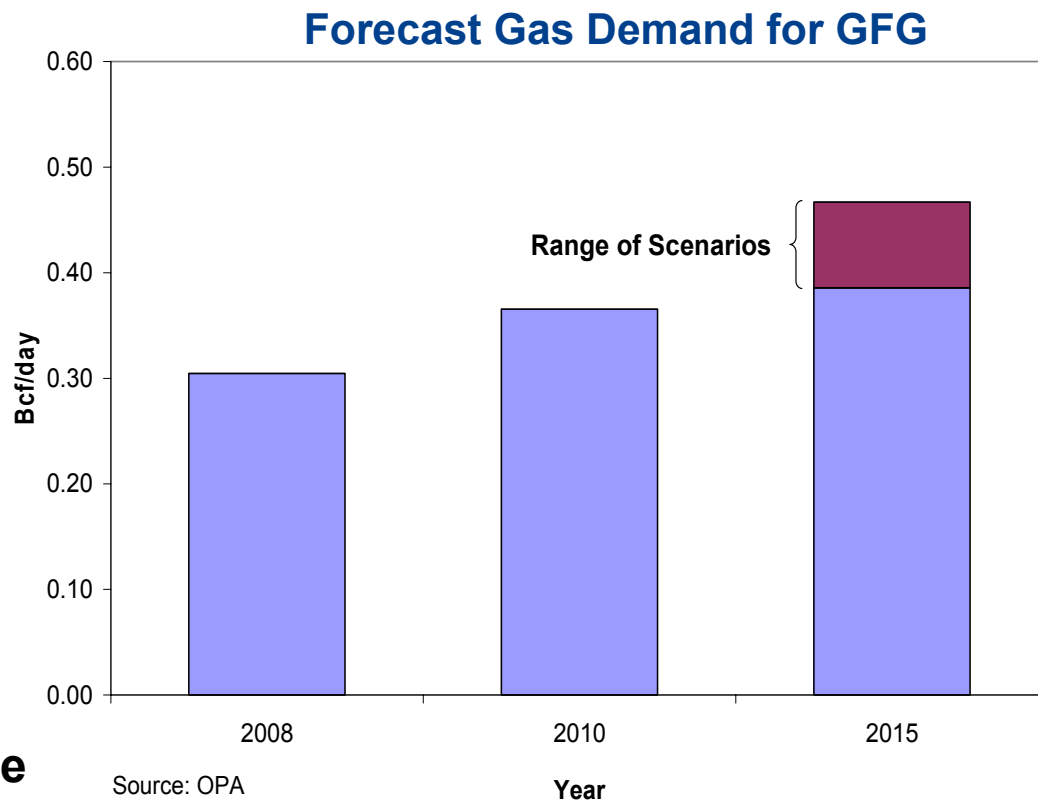
**Growth in Installed Capacity – 2008 -2015**



Source: OPA

# GFG Average Gas Demand Ranges (2008 -2015)

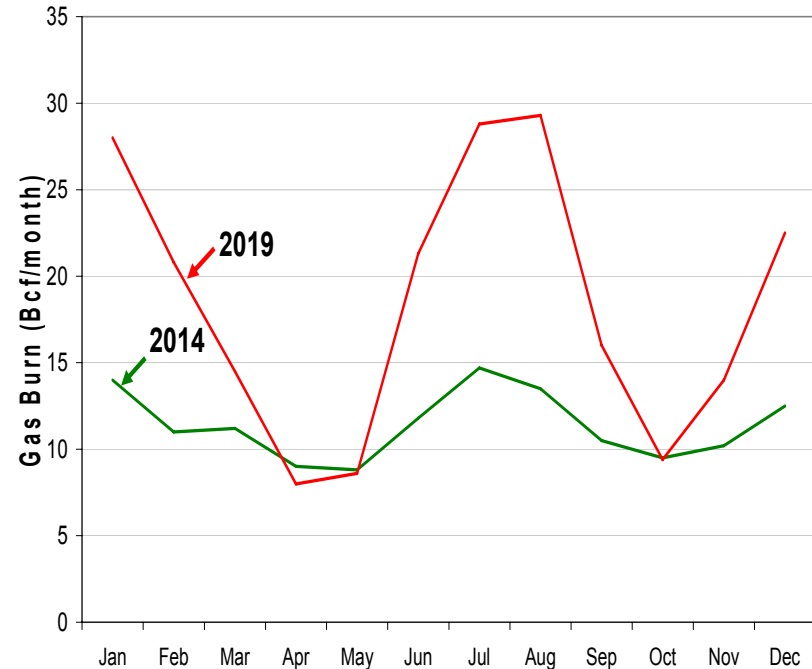
- Long term demand impacted by other sources of supply (conservation, nuclear, and renewable)
- Demand forecast to grow by up to 0.2 Bcf/d from 2008
- Volume growth represents
  - ~8% of total demand in Ontario
  - ~4% of total flows into Ontario
- Peak Day flows expected to be higher



# Seasonality of Natural Gas Consumption in Ontario (2014–19)

- **Summer peaks likely to exceed winter peaks**
- **Seasonal peaks forecast to grow after coal is decommissioned in 2014**
- **Seasonal profile impacted by other sources of supply (conservation, nuclear, and renewable)**

**Forecast Seasonal Gas Burn**



Source: OPA Scenario 1A

# Differences In Service Requirements Between GFG And Traditional Markets

	<b>Power Generation</b>	<b>Traditional Markets</b>
<b>Supply</b>	Mostly Dawn based	Western Canada, Chicago and Dawn
<b>Transport</b>	Short haul	Long Haul and Short Haul
<b>Storage</b>	Daily balancing	Seasonal Balancing
<b>Demand Driver</b>	IESO requirements	Weather/Industrial demand
<b>Scheduling</b>	Frequent Intraday changes Reservation of capacity	Day ahead with few intraday changes

# Adequate Supply Response - Service and Infrastructure Enhancements for GFG

<b>Delivery Points</b>	<b>Dawn</b>	<b>Parkway</b>	<b>City Gate</b>	<b>Generator</b>
<b>Service Enhancements</b>	<ul style="list-style-type: none"> <li>• High Deliverability (HD) Storage</li> </ul>	Union Short Notice Transport and Balancing	TCPL Short Notice Transport and Balancing	EGD Balancing and Distribution
<b>Infrastructure Enhancements (2007-2009)</b>	<ul style="list-style-type: none"> <li>• Vector 0.3 Bcf/d</li> <li>• TCPL Rockies gas &amp; Michigan storage</li> <li>• Enbridge HD 0.2 Bcf/d</li> <li>• Union HD 0.4 Bcf/d</li> </ul>	Union expansion 1.2 Bcf/d	As needed	As needed

# Ongoing Issues for Resolution...

- **LGIC petition against OEB's Decision on deregulating new storage services**
- **Access to competitive upstream services**
  - **Short notice services are provided to the delivery point specific to the individual power plant instead of the broad delivery area. Provision of other services to delivery point/area needs to be resolved**
  - **Communication between pipeline operators, IESO and generators**

# Enbridge's Perspectives

- **Ensure regulatory climate encourages adequate infrastructure growth**
- **Establish clear communication protocols between gas industry players, generators and the IESO**
- **Preserve liquid & competitive markets and services**

# Gas Demand Outlook for Traditional Markets

- **Residential Markets**

- ↓ **Annual average use due to efficiency gains  $\geq 2\%$**

- ↑ **Annual demand due to customer additions  $\leq 0.5\%$**

- ↑ **Peak day requirements  $\leq 1\%$**

- ↔ **Weather volatility combined with warming trends**

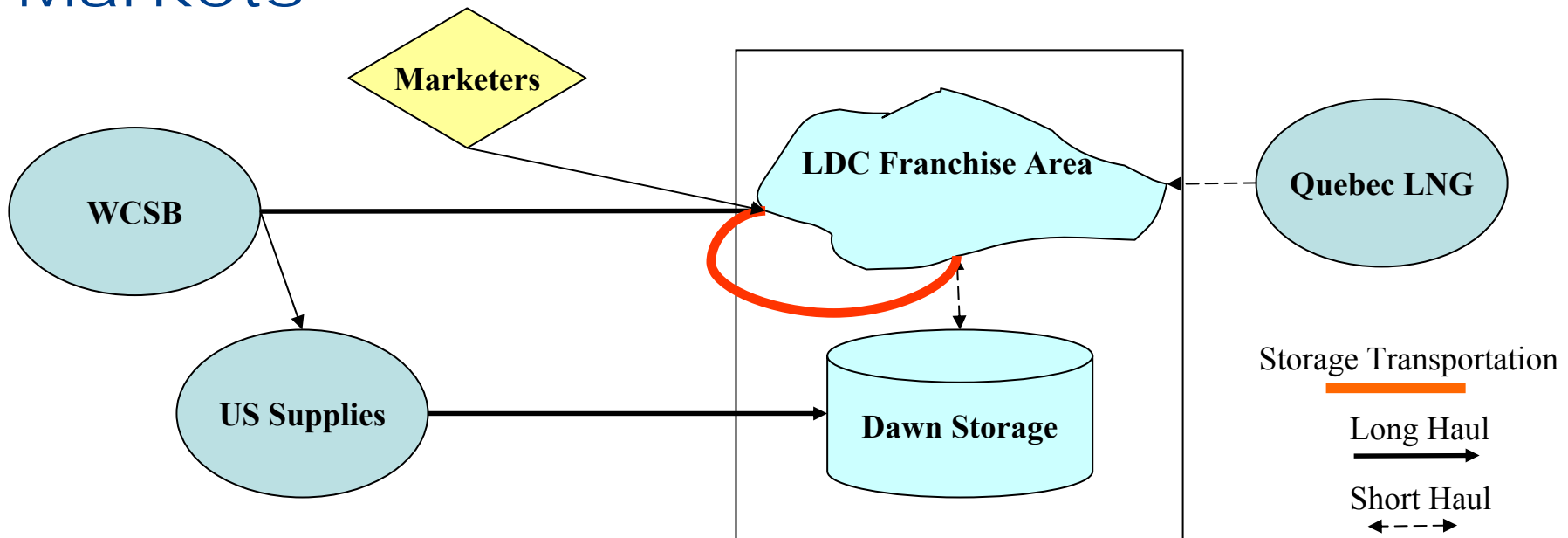
- **Commercial Markets**

- ↔ **Flat demand due to efficiency gains**

- **Industrial Markets**

- ↔ **Demand destruction to date limits future growth**

# Supply Response Model For Traditional Markets



- Changing gas flows and market unbundling create stress on upstream services and assets used by LDC for daily balancing of loads

# Implications of Demand and Supply Changes on LDC's balancing role

Change	Impact	Solution
<b>Conservation</b>	↓ <b>Long haul</b> ↑ <b>Seasonal storage</b> ↑ <b>Short haul transport</b>	↑ <b>Storage</b> ↑ <b>Related transport</b>
<b>Weather volatility</b>	↑ <b>Intraday Balancing Requirements</b>	↑ <b>Intraday scheduling</b>
<b>Shift in long haul transportation contracting practices</b>	↑ <b>Short haul services</b> ↑ <b>Storage transportation</b>	↑ <b>Transport infrastructure</b> ↑ <b>Upstream pipeline and balancing services with greater flexibility</b>

# Enbridge's Perspectives

- **Recognize LDC's role in ensuring cost effective balancing of end use customer**
- **Develop more flexible market area balancing services**
  - **Storage transportation services**
  - **Pipeline balancing services**

# Conclusions

- **Ontario gas industry is well poised to meet the near term demands of GFG and traditional gas markets**
- **Longer term demand and supply changes need further evolution of services**

# Questions?

