
Long-Term Energy Plan Update – Fuels

Premier's Office Briefing
May 17, 2017

Purpose

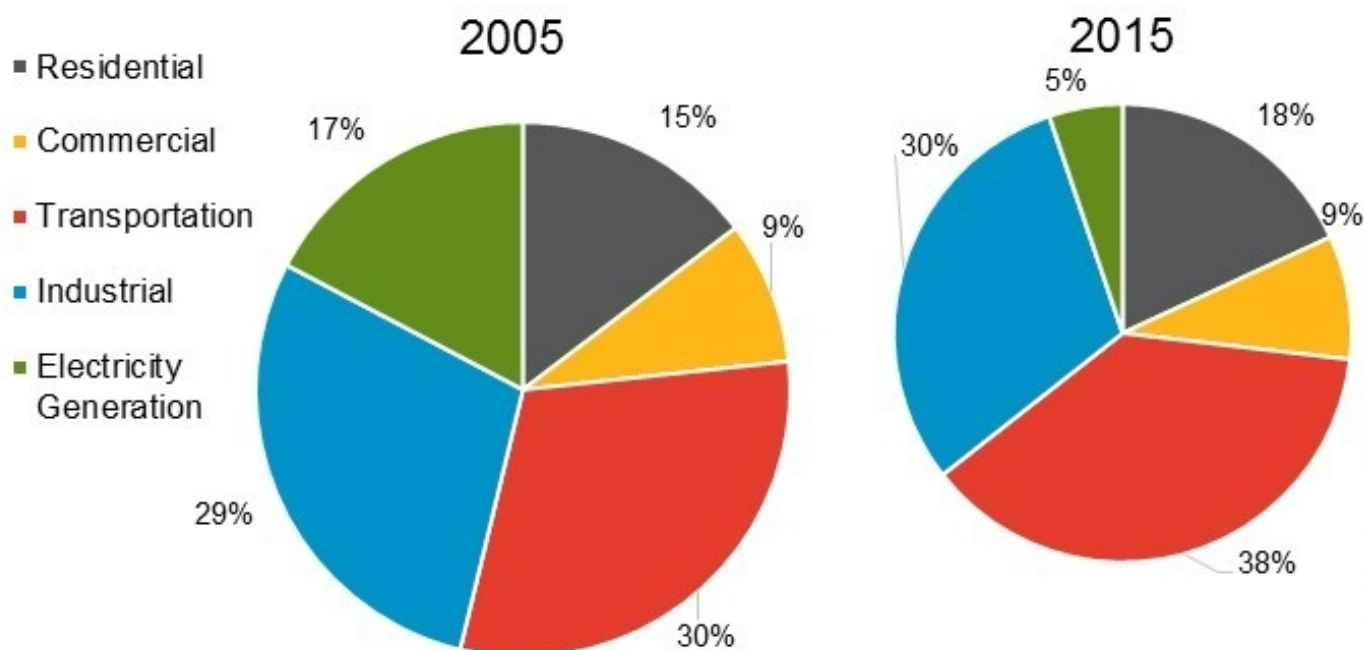
- The Ministry of Energy is continuing to develop the next Long-Term Energy Plan (LTEP), which will include references to fuel within an Ontario context.
 - The 2017 LTEP provides an opportunity to highlight that Ontario will seek to maximize the value of existing fuels infrastructure while reducing greenhouse gas (GHG) emissions through integrated energy solutions (e.g., renewable fuels, etc.).
- This presentation provides an update on the fuels sector content in the LTEP:
 1. Feedback on Fuels From LTEP Consultations
 2. Scope of Fuels Sector in LTEP
 3. LTEP Fuels Narrative:
 - a. Introduce renewable natural gas (RNG) into the natural gas supply;
 - b. Increased use of lower-carbon fuels in the transportation sector; and
 - c. Make strategic use of fuels to support electrification.

Context – Ontario's Fuels Sector

- Fuels are an important component of the province's economy, critical for households, businesses and industry. Ontario consumers use fuels for various energy and non-energy purposes, ranging from space and water heating and cooking, to transportation, industrial processes (i.e., feedstock) and electricity generation.
- Extensive natural gas infrastructure is in place in Ontario (i.e., approximately 75% of homes are heated with natural gas in Ontario). The infrastructure includes significant storage and capacity to meet peak heating demands.
 - Areas not served by natural gas can be heated with electricity or other fuels like propane, heating oil and wood.
- Almost all of Ontario's transportation needs are currently met by petroleum fuels.
- Cap and trade covers conventional fuels (e.g., natural gas, gasoline, diesel, propane, heating oil, etc.) with fuel suppliers (e.g., natural gas distributors, refiners, importers, etc.) being obligated parties. The Climate Change Action Plan (CCAP) announced several initiatives impacting the conventional fuels sector (e.g., enhanced electrification, renewable fuels standard, renewable natural gas, etc.).
- To support the development of LTEP, a Fuels Technical Report (FTR) was produced that examined the supply and demand for fuels (e.g., gasoline, natural gas, oil, propane, alternative fuels).
 - The FTR considered residential, commercial, transportation and industrial fuel use, including industrial non-energy fuel use as a process input (e.g., feedstock for chemicals / plastics) and heating.
 - Future outlooks from 2016 to 2035 were built using shared assumptions with the Independent Electricity System Operator's (IESO) technical report on the electricity system, the Ontario Planning Outlook (OPO). Some FTR outlooks considered fuels-only initiatives (e.g., in transportation) not considered by the IESO.

Context – Fuels Energy Demand by Sector 2005 and 2015

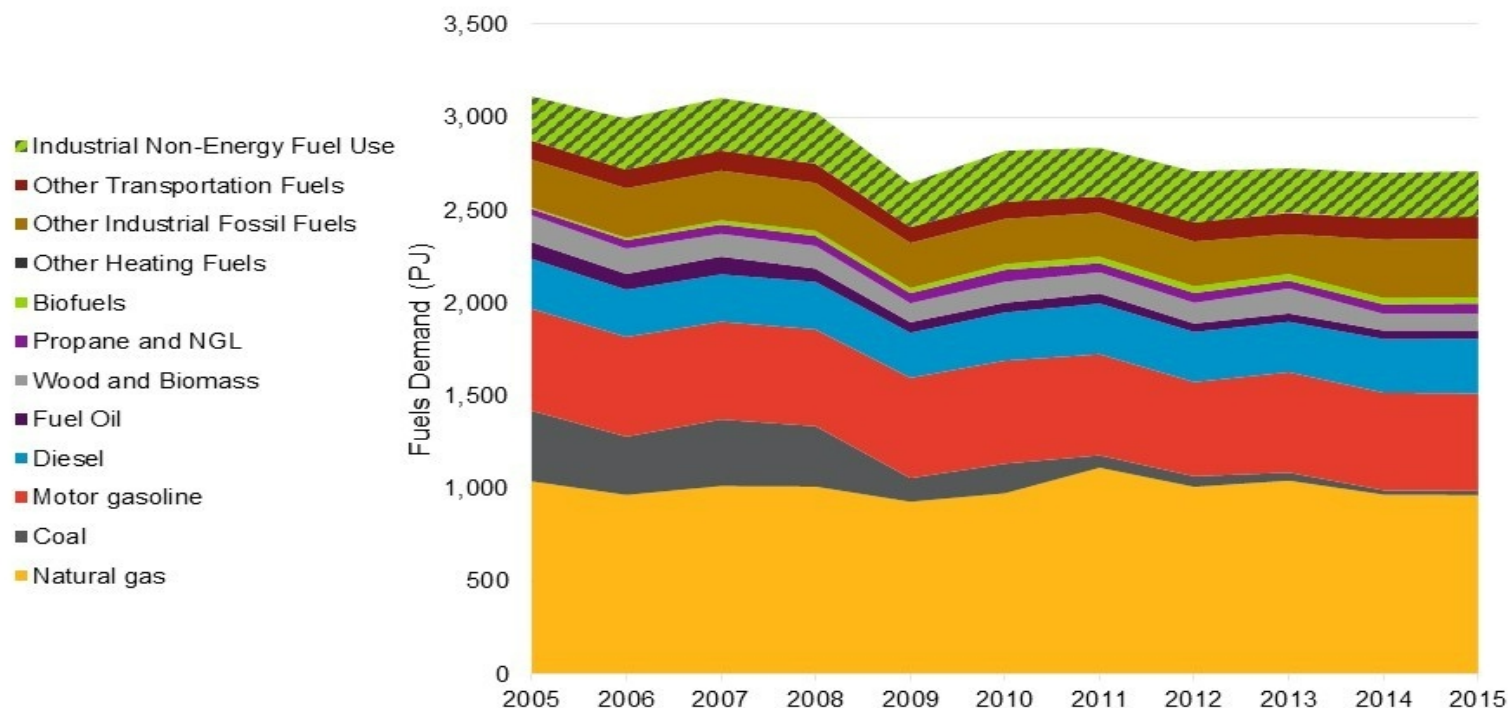
- Since 2005, sectoral shares of fuels energy demand have changed.
 - The most significant change is the amount of fuels energy used for electricity generation, which has declined by three-quarters relative to 2005.
 - The residential and transportation sectors have both experienced modest growth in fuels, and the commercial and industrial sectors have experienced a small decline in fuels use.



Source: 2016 Fuels Technical Report

Context – Fuels Demand in Ontario by Fuel Type 2005 to 2015

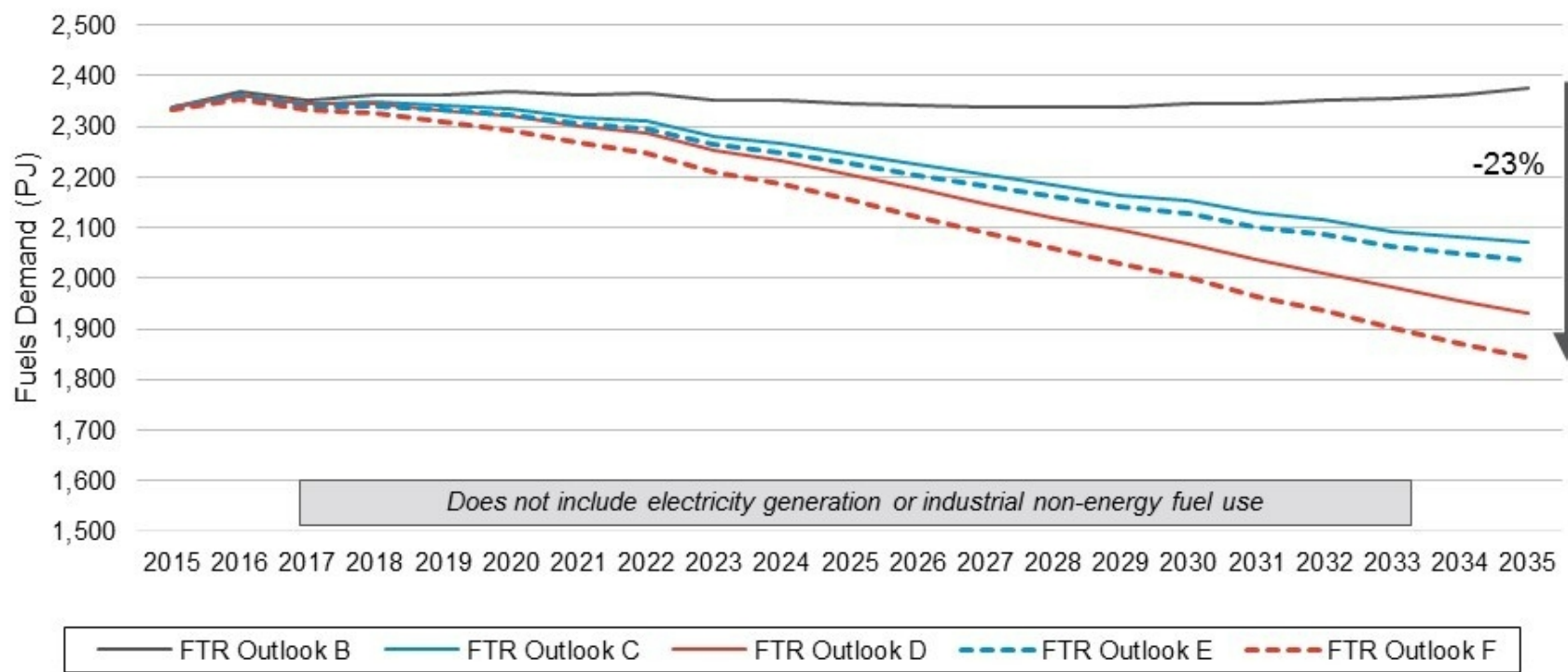
- The Ontario fuels sector is comprised of numerous different fuel types with a variety of diverse applications.
 - Although a small number of fuels (i.e., natural gas, gasoline and diesel) account for the majority of fuels energy use in the province, many more fuels also exist to service quasi-niche needs.
 - Propane, wood and biomass, kerosene, aviation fuel, biofuels, petroleum coke and others all serve a variety of end-uses in the residential, commercial, industrial and transportation sectors.



Source: 2016 Fuels Technical Report

Context – Fuels Demand Outlooks

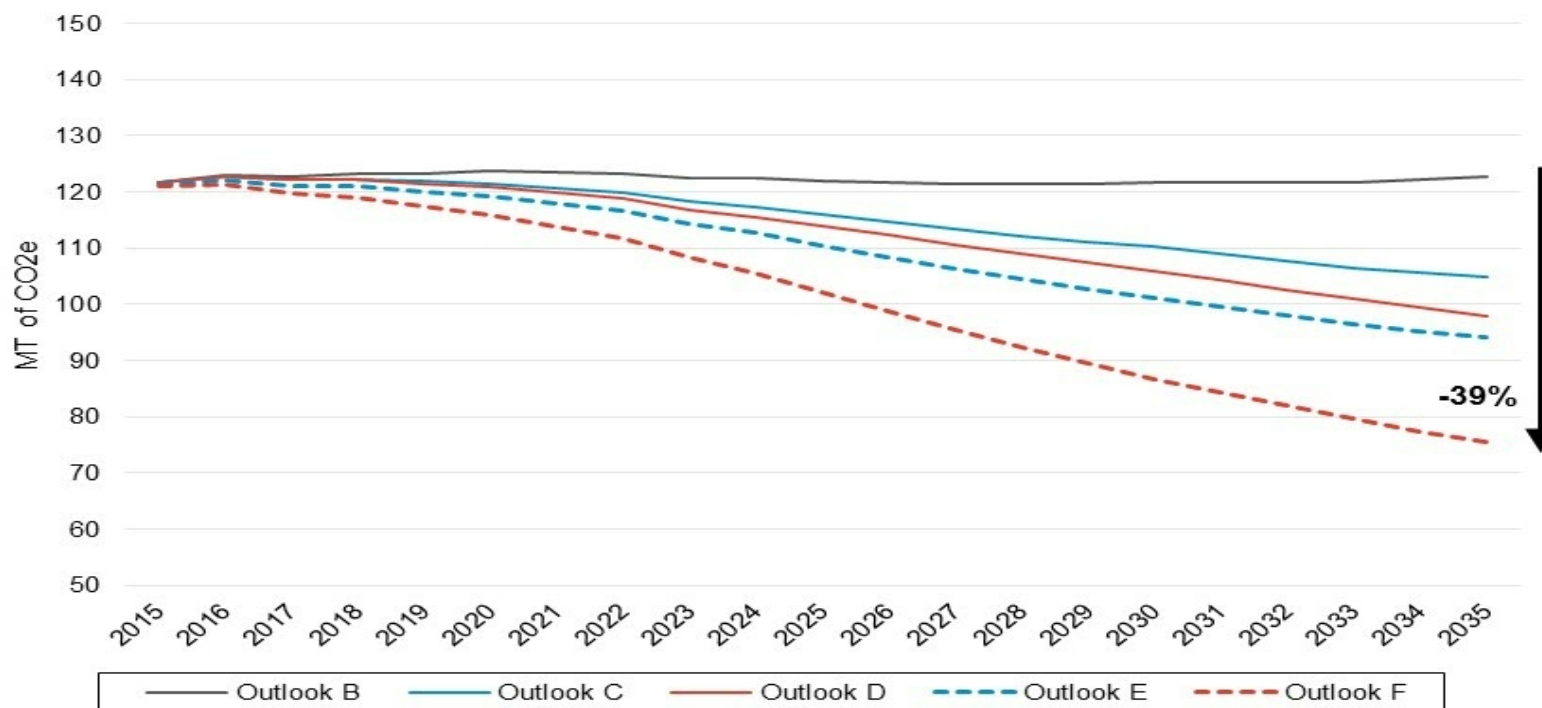
- A range of 5 possible fuels sector outlooks for demand were considered in the FTR.
 - Outlooks B, C and D anticipate actions identified in the CCAP, are consistent with the outlooks presented by IESO in its OPO, and were developed based on a common set of assumptions and data such as on economic activity, demographics, fuel shares, and electrification.
 - Outlooks E and F add fuels-only initiatives not included in the OPO related to natural gas demand-side management (DSM) and lower-carbon fuels in transportation.



Source: 2016 Fuels Technical Report

Context – Fuels Combustion GHG Emissions Outlooks

- Carbon emissions from Ontario's fuels sector are projected to decline significantly under Outlooks C, D, E and F.
 - Emissions reductions observed in Outlooks C and D are driven mainly by the electrification assumed to take place across all sectors.
 - Further emissions reductions identified through Outlooks E and F are the result of incremental natural gas DSM and to the increased use of alternative, less carbon-emitting fuels.



Source: 2016 Fuels Technical Report

1. Feedback on Fuels From LTEP Consultations

Proposed Approach:

- In the development of the “fuels narrative” for the LTEP, the Ministry is guided by the findings outlined in the Fuels Technical Report and the detailed feedback from the LTEP consultation process (i.e., in-person consultation sessions and written submissions).
- During the in-person consultations and in the written submission the topic of fuels came up frequently in the context of the following energy related themes:
 - Supply (e.g., greater role for renewal natural gas (RNG) in the existing gas system, etc.);
 - Delivery (e.g., leverage existing fuels infrastructure, etc.);
 - Conservation (e.g., support for ongoing demand side management programs with respect natural gas, etc.); and
 - Innovation (e.g., consider projects to displace gasoline/diesel with natural gas in the transportation sector, greater use of renewable fuels, etc.); and
 - Price (e.g., need for natural gas expansion in under serviced areas of the province, etc).
- Additional comments related to fuels that came out of the LTEP consultations included:
 - Avoid stranded asset risks (i.e., leverage existing infrastructure);
 - Adopt a staged implementation approach (i.e., allow time for new technologies to develop/mature); and
 - Provide consumers with choice (i.e., ability to choose the technology/systems that best meets their energy needs).

1. Feedback on Fuels From LTEP Consultations (cont'd)

Stakeholder	Feedback / Themes
Public Consultation Sessions	• General: Increase transparency in planning decisions. Consider interests unique to Indigenous communities. • Supply: Must add new considerations for the LTEP including: greenhouse gas abatement and lifecycle costs; alternative technologies; and transportation fuels. • Conservation: Improve energy literacy. Consider social and environmental impacts and strengthen Environmental Assessments. • Delivery: Gaining access to natural gas supply. • Prices: Customer engagement and costs to consumers, including low-income households; and recognize pricing and other challenges as being different between regions.
Canadian Fuels Association	• General: There is no one single solution to reducing greenhouse gas (GHG) emissions, and that to deliver on significant GHG reductions, Ontario needs to carefully consider the cost of abatement measures, energy efficiency improvements and other measures (e.g., driver behaviour, etc.). • Supply: Consider impacts of renewable fuels and impacts on feedstock. Expand pipeline principles to include an evaluation of ongoing domestic demand for products and safety benefits of pipelines in meeting those demands. • Conservation: Broaden to other fuels: Focus on reducing fuel use from freight transportation; driver behaviour and efficiencies in internal combustion engines.
Industrial Gas Users Association (IGUA)	• General: Differentiate between de-carbonization and de-industrialization; and commit to becoming a world leader in low carbon heavy industry. • Supply and Conservation: Highlight the need for a transition phase for energy-intensive-trade exposed industry to decarbonize operations, and provide an energy roadmap that reflects energy infrastructure investment efficiency. • Delivery: Differentiate between rate payer and tax payer obligations; and respect the independence of the energy regulator.
Environmental Defence	• Supply: Re-commit to renewables and support continued development of clean tech sector. Plan to phase out fossil fuels and pledge that any new sources of generation will be non-emitting.

Note: Examples represent a selection of ~300 submissions received. ENERGY can provide full submissions upon request

1. Feedback on Fuels From LTEP Consultations (cont'd)

Stakeholder	Feedback / Themes
Enbridge	• Supply: Incentivise fuel switching to compressed and renewable natural gas to reduce emissions. • Conservation: Support natural gas demand side management (DSM) programs as cost effective solutions. • Innovation: Just as the Ministry drove significant investment in electricity sector innovation through the Smart Grid Fund, storage procurements, and the IESO's Conservation and Innovation Fund, natural gas utilities require leadership from the Ministry to ensure they can make comparable forward-thinking investments. Propose a \$1/meter per month innovation levy.
Union Gas	• Supply: Provide funding for compressed natural gas refueling stations, Provide direction to Ontario Energy Board (OEB) to require renewable natural gas in supply portfolio of natural gas utilities. Funding from CCAP for renewable natural gas should be split between development and offsetting rate impacts. • Delivery: Expand natural gas access; combine natural gas for home heating with electrification initiatives to reduce winter peak demand.
City of London	• Supply: LTEP should take a holistic view and consider electricity and fuels. • Conservation: Partner with municipalities to provide energy literacy programs to homeowners and businesses. Broaden programs to include other fuels beyond natural gas. • Delivery: Allow utilities to provide new services (e.g., EV charging, compressed natural gas stations).
Bruce County/ Kincardine / Brockton / Owen Sound / Saugeen Shores	• Delivery: Support for the expansion of natural gas to rural parts of Southern Ontario.

Note: Examples represent a selection of ~300 submissions received. ENERGY can provide full submissions upon request

2. Scope of Fuels Sector in LTEP

Proposed Approach:

- Ontario will seek to maximize the value of existing fuels infrastructure while reducing GHG emissions through adoption of lower-carbon energy solutions. The 2017 LTEP provides an opportunity to highlight these lower-carbon energy solutions.
- The 2017 LTEP to include an overview of the fuels sector and discussion of key opportunities to lower GHG emissions in the natural gas system and transportation sector, and make strategic use of fuels to support electrification.
- Include fuels sector outlooks, based on the FTR, comparable to those concerning the electricity sector.
- Include a cost of carbon price outlook reflecting the range of projections from private sector forecasts.
 - Note: There is a process in place where the Ministry of the Environment and Climate Change (MOECC) and the Ministry of Finance (MOF), with input from ENERGY, develop a forecast that reflects an average of four projections.

Considerations

- Technological, economic and policy shifts can have a significant impact on fuels demand and use. A key challenge going forward will be to maintain flexibility, responsiveness, reliability and robustness while minimizing the environmental impacts of fuels consumption.
- While Ontario has regulatory oversight over some aspects of the fuels sector, there is limited ability to influence price. This reflects Ontario's reliance on external fuels supplies and the competitive, market-based structure of the sector.
- Ontario's fuels sector is a major contributor to GHG emissions in the province (e.g., transportation).
- The forecast cost of carbon will have a major impact on forecast fuel prices.

3a. Introduce RNG into the Natural Gas Supply

Proposed Approach:

- Seek to maximize the value of existing natural gas infrastructure by “greening” the natural gas supply with renewable natural gas (RNG) and similar innovations.

Considerations

- RNG and similar innovations can be produced in Ontario, displacing imported conventional natural gas. Potential income stream for municipalities (landfills), farms and agricultural industries.
- As outlined in CCAP, Ontario intends to introduce a renewable content requirement for natural gas. ENERGY and MOECC are developing a preferred approach to implement RNG in Ontario (e.g., role for the OEB, etc.).
 - Regulatory development 2017; implementation 2018-2020;
 - The OEB is currently developing a framework to address the inclusion of RNG in utilities’ gas supply portfolios; and
 - Ongoing research and consultations will help determine appropriate renewable content requirements with consideration for the availability/cost of RNG supply.
- Natural gas utilities have advocated for “up to 2%” RNG by 2020 for system gas customers (i.e., those customers that buy gas from the utility – representing about 50% of the provincial demand). Longer-term, distributors see potential for 16% RNG content in the natural gas system by 2030.
- RNG supply costs are to be confirmed, but may be over \$10/GJ (gigajoule) more expensive than conventional natural gas (currently priced about \$4/GJ), resulting in a GHG reduction cost of over \$200/tonne. Costs recovered from natural gas ratepayers and are dependent on availability of RNG and content requirement.

3b. Increased Use of Lower-Carbon Fuels in Transportation Sector

Proposed Approach:

- Seek to maximize the value of existing transportation fuels infrastructure to help lower GHG emissions by:
 - Increased use of natural gas and/or RNG as a transportation fuel; and
 - Increased blending into conventional transport fuels of ethanol, biomass and other “drop-in” renewable fuels.

Considerations

- Use of natural gas as a transportation fuel will moderately lower GHG emissions, and may provide savings relative to conventional gasoline / diesel (i.e., 15-20% lower). Using RNG would lower emissions further.
 - CCAP committed \$15-20 million to fund an RNG in transportation pilot project in 2017-2018 using methane obtained from agricultural materials or food wastes. OMAFRA has prepared a discussion paper to solicit feedback from industry and the public on a potential demonstration program.
- Opportunities to use other lower-carbon fuels in the existing transportation fuels infrastructure include:
 - Adding of renewable content (e.g., ethanol) as the vehicle fleet turns over and more vehicles are warrantied to use higher ethanol blends;
 - Ontario petroleum refineries adding biomass to the crude oil they process; and
 - Development of drop-in renewable fuels with lower carbon intensity that can use existing pipelines/vehicles.
- MOECC is currently developing a Renewable Fuel Standard (RFS) for gasoline. Environment and Climate Change Canada is also developing a national Clean Fuel Standard (CFS) that will initially focus on transportation fuels.
- Costs to be borne by fleet operators and fuel suppliers may also be passed on to end-use consumers.
 - An RFS for gasoline can be expected to have similar costs to California’s Low Carbon Fuel Standard, with credits currently costing over US\$100 per tonne, resulting in price increases of roughly 30 cents per litre.
 - The cost of lower-carbon fuels versus conventional fuels will become more favourable over time as cap and trade costs increase.

3c. Strategic Use of Fuels to Support Electrification

Proposed Approach:

- Seek to maximize the value of existing fuels infrastructure while reducing GHG emissions by making strategic use of fuels to support electrification. For example:
 - Using both a heat pump and a gas furnace for heating and cooling homes. The heat pump could reduce GHG emissions by providing heat on milder days, while the furnace would avoid excessive peak electricity demands by providing heat on the coldest days.
 - Producing hydrogen from “off-peak” electricity for storage in the natural gas system, which can then be used to provide peak electricity and heating demands.

Considerations

- Potential to use natural gas heating in conjunction with electrification (i.e., heat pumps) would lower GHG emissions, reduce costs for consumers and minimize the need for additional electric infrastructure (i.e., generation, transmission, distribution and at-home modifications).
 - Alternatively propane, heating oil or biomass could be used in conjunction with electrification for areas of the province that do not have access to natural gas.
- CCAP proposed rollout of homeowner electrification programs by 2020 (e.g., geothermal heat pumps, air-source heat pumps, solar thermal, etc.).
- Costs will be borne by end-use consumers. Making strategic use of fuels would provide an opportunity to lower costs relative to full electrification, reducing impacts on the electricity system and homeowners.
 - CCAP allocates funding of \$500-\$600 million to boost the adoption of low-carbon technology in homes. MOECC is leading this initiative.

Next Steps

- Ongoing work on LTEP document with respect to the Fuels narrative.
- Develop implementation strategies for the Fuels narrative. For example:
 - For introducing RNG into the natural gas supply, work with MOECC to consider what are the most appropriate regulatory mechanisms to support the RNG market;
 - For increased use of lower carbon fuels in the transportation sector, continue to work with MOECC on development of provincial fuel standards and coordination with federal government on national fuel standards; and
 - For making strategic use of fuels to support electrification, work with MOECC to consider how government funding programs can be optimized to deliver both GHG reductions and cost savings.