



**Ontario Federation of Agriculture**

**Ontario AgriCentre**

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## **LTEP Policy for Natural Gas and Electricity**

Ontario's upcoming review of the Long Term Energy Plan (LTEP) provides an opportunity to create energy policy focused on energy diversity. Access to natural gas is a strategic competitive necessity for the economic development of rural Ontario.

Policy decisions with electricity *and* natural gas will best meet the needs of agricultural industries severely hampered by energy costs. Only a diversified plan will ensure the necessary types of energy are available to properly support economic development while also ensuring we have the tools to reach emission targets in vital sectors including transportation and energy intensive industry.

Affordable natural gas offers a significant competitive advantage to Ontario commercial and industrial customers and is vital to maintaining and growing these businesses, especially in light of the Climate Change Action Plan (CCAP). As an abundant, affordable fuel, we need to leverage the strategic advantage Ontario natural gas provides compared to our international competitors.

Rural homeowners and farm businesses need a combination of many fuel solutions to best meet their needs. Geothermal installations, CNG, micro-CHP, CHP and Distributed Energy Hubs for small rural communities can all be tailored to meet rural farm and community needs. Renewable Natural Gas injection will also be necessary to fulfill green energy needs; land-fill gas, municipal organ waste, agricultural feedstock for biogas and lumber waste must also be part of the rural solution. Conventional and renewable natural gas are the clear place to start.

## **Micro-Combined Heat & Power (m-CHP) Options for Rural Homes**

A residential 5 kW m-CHP unit using natural gas will generate 120 kWh per day of electricity, while also generating 15,000 Btus of heat per hour.

A rural Ontario homeowner uses about 1,200 kWh per month of electricity and about 10 million Btu of natural gas heating. That means the 5kW m-CHP unit has the potential to provide enough electricity for 3 homes and enough heat for one. With an electricity bill for 1,200 kWh per month at \$0.12 per kWh, the homeowner saves \$1,728 per year (\$144 monthly).

Under Net Metering programs, utilities compensate alternative energy generating customers for excess unused electricity. The m-CHP generates 3,600 kWh of electricity that feeds directly to the utility grid, then the customer draws down 1,200 kWh back from the grid and through their net metering agreement, the monthly excess of 2,400 kWh would credit \$288 back to the



customer's utility bill. The homeowner could feasibly generate their entire years' worth of electricity in four months, while using the utility grid as free energy storage.

The difficulty for homeowners is the upfront costs of about \$550 per kWh or \$66,000. Rural farm businesses with higher electricity consumption properly matched to micro-CHP generation can see the payback in about ten years. With larger units, the payback is significantly higher.

## Farm Business Conversion to Natural Gas and CHP

The electricity cost for a 55 cow dairy operation using 9,000 kWh each month at 12 cents /kWh is \$13,500. A 15 kW CHP unit could reduce energy costs by over \$9,000 using conventional natural gas, and result in higher savings if biogas was introduced to fuel the unit.

Energy produced from natural gas is currently less than half the cost of propane and one quarter the cost of electricity. For a 9,000 hog barn using natural gas instead of propane or electricity, the savings are from \$7,000 to \$15,000. Again, converting from electricity and installing a natural gas Co-Gen can save up to \$18,000 in annual energy costs.

## Rural Hydro Delivery Charges

The average Hydro One R2 customer pays almost \$60 per month more than their urban counterpart in distribution charges. This works out to \$234 Million per year. Every four years, these 332,000 R2 customers pay \$1 Billion more for distribution than HydroOne's urban service customers.

Hydro One 2016 Forecast Delivery Costs			
	Urban Res. U1	Rural Medium R1	Rural Low R2
Number of Customers	211,691	439,437	331,826
Total kWh	2,016,183,097 kWh	5,030,042,034 kWh	4,804,609,666 kWh
Monthly kWh per Customer	783 kWh	941 kWh	1,190 kWh
Monthly Fixed Distribution Charge	\$22.86	\$30.88	\$43.32*
Distribution volume charge ¢/kWh	1.60 ¢/kWh	2.98 ¢/kWh	4.27 ¢/kWh
Average Monthly Volume Charge	\$12.52	\$28.04	\$50.82
<b>Average Total monthly Fixed + Volume Distribution Charge</b>	<b>\$35.38</b>	<b>\$58.92</b>	<b>\$94.14</b>
Additional Monthly R2 Delivery cost			<b>\$19,498,095.76</b>
Additional Annual R2 Delivery cost			<b>\$233,977,149.00</b>

\* This figure has already been reduced by the RRRP credit of \$31.50

## Natural Gas Fuel Savings over other Conventional Fuels

For the typical rural homeowner with a spouse and two children living in a three bedroom house can save about \$4,400 by switching from electricity to natural gas. Switching from fuel oil would save about \$2,500 per year, and switching from propane would save almost \$2,000 each year.

The estimated annual heating costs for a typical rural home				
Equipment / Appliance	Energy source			
	Natural Gas	Electricity	Propane	Oil <sup>2</sup>
Home Heating	\$1,041	\$4,058	\$2,375	\$2,806
Water Heating	\$226	\$824	\$515	\$686
Dryer	\$34	\$151	\$78	N/A
Range	\$48	\$172	\$109	N/A
<b>Sub Total</b>	<b>\$1,349</b>	<b>\$5,204</b>	<b>\$3,077</b>	<b>\$3,492</b>
<b>HST</b>	<b>\$175</b>	<b>\$677</b>	<b>\$400</b>	<b>\$454</b>
<b>Total Annual Cost</b>	<b>\$1,524</b>	<b>\$5,881</b>	<b>\$3,477</b>	<b>\$3,946</b>

Natural gas savings <sup>1</sup> over	Electricity	Propane	Oil
Switching to natural gas could save	<b>\$4,357</b>	<b>\$1,953</b>	<b>\$2,515</b>
Natural gas saves % over these fuel types	74%	56%	64%
Other fuels are more expensive by this %	286%	128%	176%

### Enbridge Fuel Saving Calculator Comparative

## Conversion Numbers and Annual Savings

We anticipate over \$1 Billion in annual energy savings to reinvest in rural economic development. We have used a target of about 700,000 homes, small businesses, and farms. We expect 62% will convert to natural gas heating. If only 2% use electricity for heat we expect to convert all 14,000 of those customers and 60% of the remaining customers to natural gas evenly split between fuel oil and propane change overs.

Target Customers	By Fuel Type	Overall Conversion	Customer Savings	Total Conversion Savings
700,000	14,000 Electricity	100%	\$4,400	\$61,600,000
	343,000 Fuel Oil	60%	\$2,500	\$514,500,000
	343,000 Propane	60%	\$2,000	\$411,600,000

These savings are significant and translate to much needed reinvestment into rural economies. However the savings alone are not enough to make the necessary Aid-To-Construction needed to bring natural gas access to these thinly populated communities and smaller hamlets.

Upfront capital expenditures to invest in pipeline connections would need to be collateralized with homeowner assets for banks to extend loans. Most individual homeowners are uncomfortable with a Return on Investment (ROI) of over ten years especially considering that many people move residences t every 15 to 20 years. This coupled with converting appliances

that may be relatively new means that many rural customers will not be able to convert to natural gas.

Government stimulus in the form of 0% loans for sufficient time to allow annual savings to pay down Aid-to-Construction and appliance conversion, along with loan and grant programs to stimulate micro-CHP installations will result in a hand up (not a hand out) that our rural farm and rural community residents so rightly deserve.

## Appendix

### Enbridge Fuel Saving Calculator

Central Region: Dufferin, Simcoe, Peel, GTA, York, Durham

<https://www.enbridgegas.com/homes/start-stop-move/why-switch-natural-gas/calculate-savings-calculator.aspx>

Enbridge Fuel Saving Calculator Comparative data: The results are provided as an illustrative tool.

1. Includes applicable taxes

**Natural gas costs are based on OEB 2016-0260** rates effective October 1, 2016.

Calculator used Central Region; Dufferin, Simcoe, Peel, GTA, York, Durham with a single detached home of 2,000- 2,500 feet<sup>2</sup>, built between 1971 and 1980 with 3 bedrooms, 2 bathrooms and 4 occupants.

The heating system conversion is to a natural gas boiler with conventional to mid efficiency assuming 80% efficiency (electric heating systems are rated as 100% efficient) with a programmable thermostat.

The calculator assumes no other electric heaters are used. The 50 gallon water heater assumed 62% efficient for natural gas and propane energy sources, 55% efficient using home heating oil and 95% efficiency for electric water heater rating. Other appliance/equipment efficiency ratings are: Dryer - natural gas: 85%, electric: 100%, Stove - natural gas: 52%, electric: 75%.

**Propane price:** 0.481 \$/L - the latest available delivered price as a time of analysis (May 1, 2016). 20 lb. propane tank price: 38.99 \$/Tank retail price, and all prices per unit exclude the 13% HST and the Ontario Clean Energy Benefit.

**Heating oil price:** 0.861 \$/l - Statistics Canada the latest available delivered price at time of analysis (May 1, 2016).

2. Other appliance conversions are not applicable under Heating Oil scenario.

**Electricity rate:** 0.154 \$/kWh - Toronto Hydro new residential rate effective May 1, 2016. For RRP TOU pricing: 18.0¢/kWh on-peak, 13.2¢ mid-peak, and 8.7¢ off-peak. Other electricity rate components: distribution 1.880¢/kWh, transmission 1.700¢/kWh, wholesale market service rate 0.49¢/kWh. The cost of electricity does not include HST or any fixed charges including the customer charge. All other effective charges were included in the price of electricity.