



Ontario Electricity Sector Overview



January 2017

Purpose / Context

- ▶ This deck provides an overview of Ontario's electricity sector by looking at the components of a typical household electricity bill.
- ▶ The electricity bill covers
 - ▶ the commodity cost for generation
 - Generators include Ontario Power Generation (OPG – wholly-owned by the Province, producing about half the electricity in Ontario), Bruce Power, and other private sector generators
 - ▶ delivery (transmission, distribution)
 - Hydro One transmits (high voltage wires) almost all electricity in Ontario, whereas local distribution on lower voltage wires is provided by about 70 local distribution companies (LDCs)
 - ▶ regulatory costs
 - E.g., to cover wholesale market service charges provided by the Independent Electricity System Operator (IESO) as well as Rural or Remote Rate Protection (RRRP) for eligible consumers, and the Ontario Electricity Support Program (OESP)
 - ▶ the Debt Retirement Charge (DRC)
 - Paid to the Ontario Electricity Financial Corporation



Electricity Cost Overview: Sample Electricity Bill

- ▶ The sample residential bill below illustrates the costs incurred by electricity consumers in Ontario. Further discussion of the bill components is provided on the slides that follow.

SAMPLE MONTHLY RESIDENTIAL BILL		
1	Electricity	
	Off-Peak @ 8.700 ¢/kWh	42.41
	Mid-Peak @ 13.200 ¢/kWh	16.83
	On-Peak @ 18.00 ¢/kWh	24.30
2	Delivery	53.94
3	Regulatory	4.92
	Debt Retirement Charge (DRC)	0.00
	Total Electricity Charges	\$142.40
	Tax	18.51
	Subtotal	\$160.91
	Ontario Rebate for Electricity Consumers	(-11.39)
	Total Amount	\$149.52

Electricity commodity costs for generation

Includes costs for **transmission** (high voltage wires from generating stations to large loads) and **distribution** (lower voltage wires delivering locally to retail consumers served by a distributor (e.g., Toronto Hydro))

E.g., to cover costs to administer the wholesale electricity system and maintain reliability of the provincial grid

Used to help service & pay down the debt and other liabilities of the former Ontario Hydro. The government has removed the DRC cost from residential users' electricity bills as of January 1, 2016.

13% HST (5% federal + 8% provincial)

Starting January 1, 2017, the government will provide a rebate on electricity costs of an amount equal to the provincial portion of HST to eligible residential, small business and farm consumers.

Based on Ontario Energy Board (OEB) Bill Calculator for a Toronto Hydro residential user of 750 kWh per month

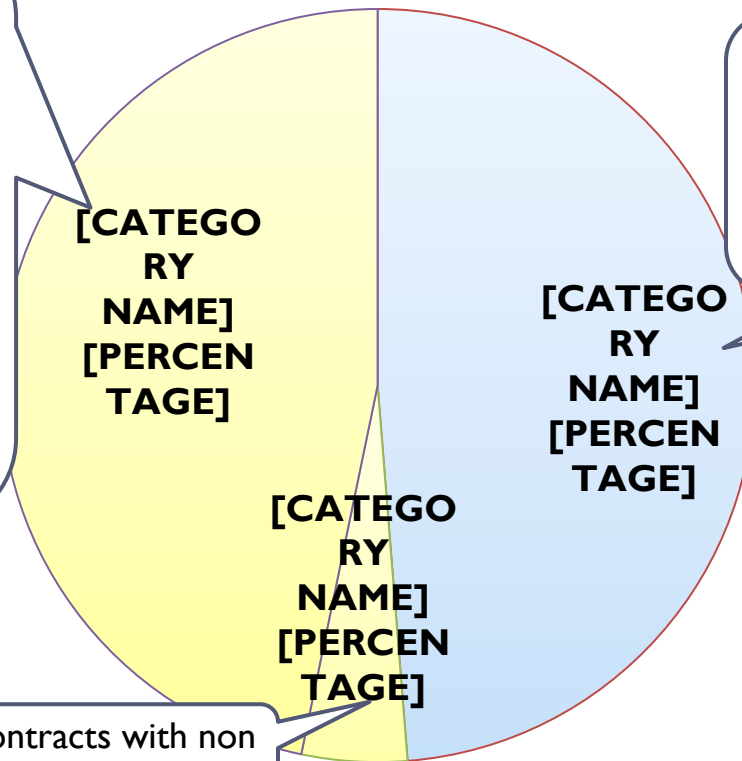
I Ontario's Hybrid Electricity Market

- ▶ The cost of electricity generation is a blend of regulated and contracted prices.

2015 Effective Price
≈ 10.14 ¢/kWh*

IESO contracts include feed-in-tariff (FIT) renewable energy projects, “early mover” contracts, new gas-fired and cogeneration projects, and Bruce Power.

Range based on 2015 Bruce Prices (6.490 cents/kWh) and FIT/microFIT Version 3 Solar PV (Rooftop) ≤ 10kW (29.4 cents/kWh) published on September 17, 2015.



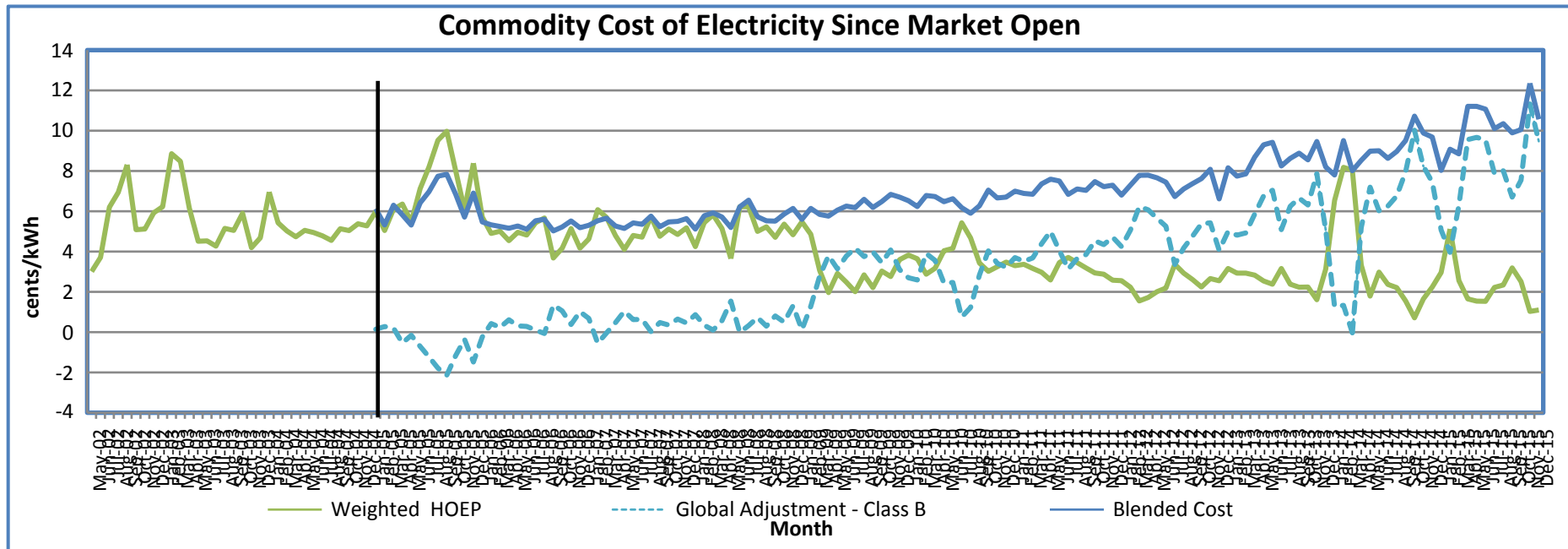
Electricity generated from OPG's nuclear and regulated hydro generation assets receive regulated prices set by the Ontario Energy Board.

Represents OEFC contracts with non-utility generators (NUGs).

** Includes Hourly Ontario Electricity Price (HOEP) and Global Adjustment Class B rates. Year-end average market clearing price was 2.36 cents/kWh. Total 2015 GA Payments (Class A and B) was \$9.96 Billion and total Ontario production, 153.7 TWh. Including year-end market clearing price, of 2.36 cents/kWh, total 2015 effective price including Class A and B is 10.14 cents/kWh.*

I Unpacking The Blended Cost

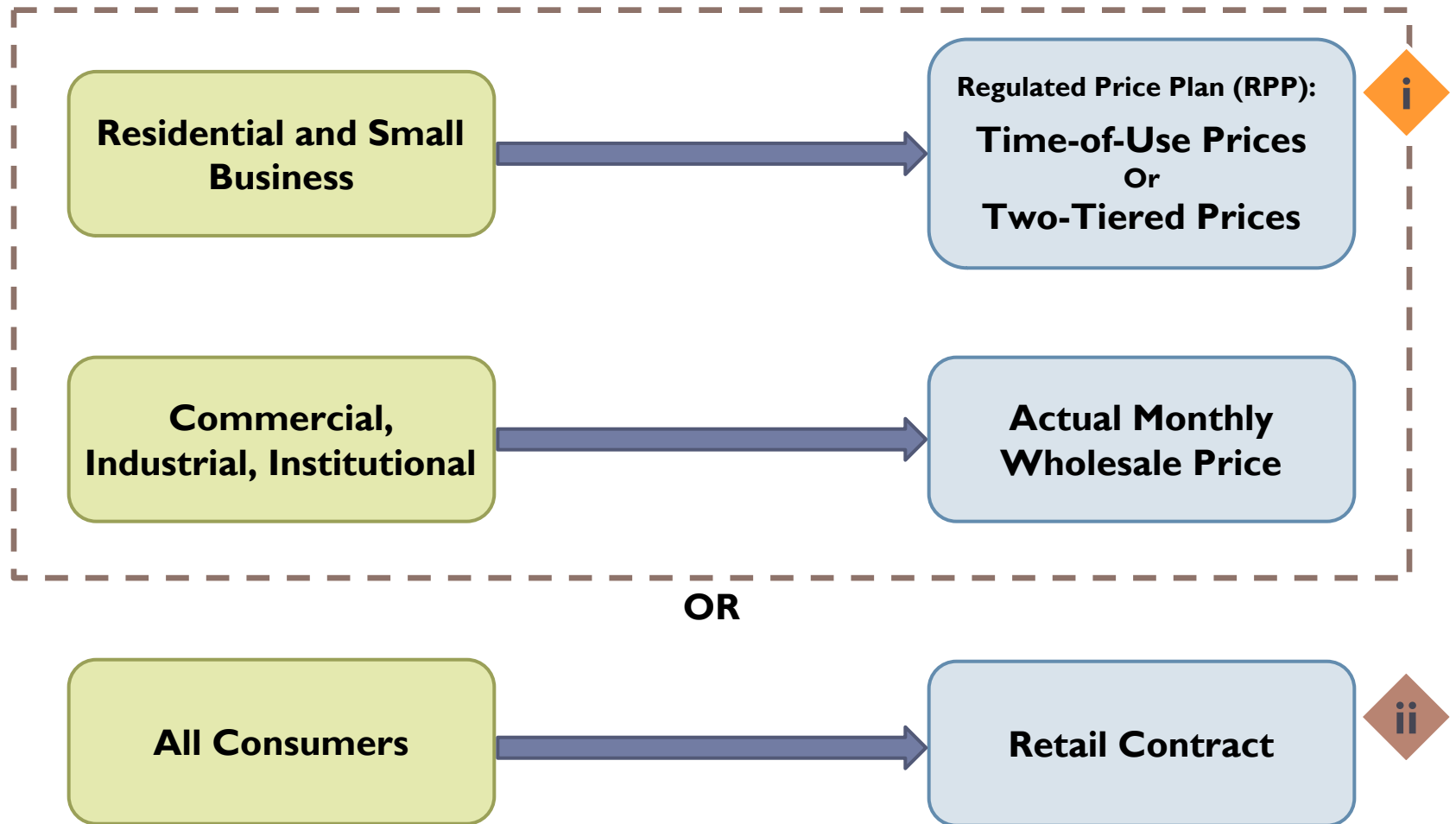
- ▶ The vast majority of electricity generation in Ontario now either receives a contract or regulated price.
- ▶ The blended wholesale cost of electricity is comprised of the hourly market price plus a global adjustment (GA), which reflects the difference between contract / regulated prices for generators and the market price.
 - ▶ The chart below illustrates how over time the GA has made up more and more of the total commodity cost ("blended cost") of electricity charged to consumers given low market prices.



I Global Adjustment Mechanism

- ▶ As mentioned on the previous slide, the difference in contract and regulated prices for generators versus the market clearing price is charged or credited to consumers through the GA mechanism.
 - ▶ Contract and regulated prices are set prospectively from which generators are to recover their costs of supply (marginal variable costs and fixed costs for capacity).
 - ▶ The market clearing price reflects the marginal cost of electricity based on variable costs of the price-setting generator (affected by, e.g., the supply-demand balance and the variable cost of supply such as the cost of fuel / natural gas).
 - ▶ Most consumers are “Class B” consumers where the GA amount is calculated monthly as a fixed cents/kWh charge.
 - ▶ As of January 1, 2011 electricity consumers directly connected to the IESO's electricity grid with an average peak demand over 5 MW (“Class A” consumers) pay a portion of the monthly GA total based on the percent they contribute to Ontario’s five highest demand peaks in the previous year.
 - ▶ This change, called the Industrial Conservation Initiative (ICI), provides an incentive for conservation during peak periods of demand in order to reduce the need for costly investments in peaking generation resources and/or imports of electricity from other jurisdictions.
 - ▶ In 2015, the government expanded the ICI program to include consumers with a peak demand for electricity above 3 MW in the manufacturing, mining, quarrying, oil/gas extraction, greenhouse, refrigerated warehousing and data processing sectors.
 - ▶ As announced in September 2016, Ontario is expanding the ICI to include customers with monthly peak demand greater than 1 MW and is also removing sector - specific restrictions, enabling all eligible commercial, institutional and industrial consumers to participate.
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I Several Ways to Pay for Electricity Commodity



Regulated Price Plan (RPP)

- ▶ Residential, small business and other low volume consumers are eligible for the Regulated Price Plan (RPP).
- ▶ RPP prices are set every six months by the Ontario Energy Board (OEB) based on a forecast of electricity supply costs.
 - ▶ The RPP provides stable pricing for low volume consumers.
- ▶ RPP prices also include a credit/charge to return/recover any accumulated difference between forecast and actual supply costs from the prior period.
 - ▶ This ensures that RPP consumer pay the true cost of electricity over time.

I Retail Contract

- ▶ A small number of electricity customers – fewer than 1 in 10 – get their power from an electricity retailer rather than their local utility.
- ▶ RPP consumers may exit the RPP by signing a fixed price contract with an electricity retailer.
- ▶ Retail contracts reduce volatility of market price, for a premium, but all consumers continue to pay the Global Adjustment.
 - ▶ The table below compares the standard supply of electricity (RPP) versus a Retail Contract

cents/kWh	Standard Supply – No Contract	Retail Contract (Sample)
Market/Contract Price	1.69 ¹	4.00 - 6.67 ²
Global Adjustment	9.09	9.09
Total Commodity Cost	10.78	14.42

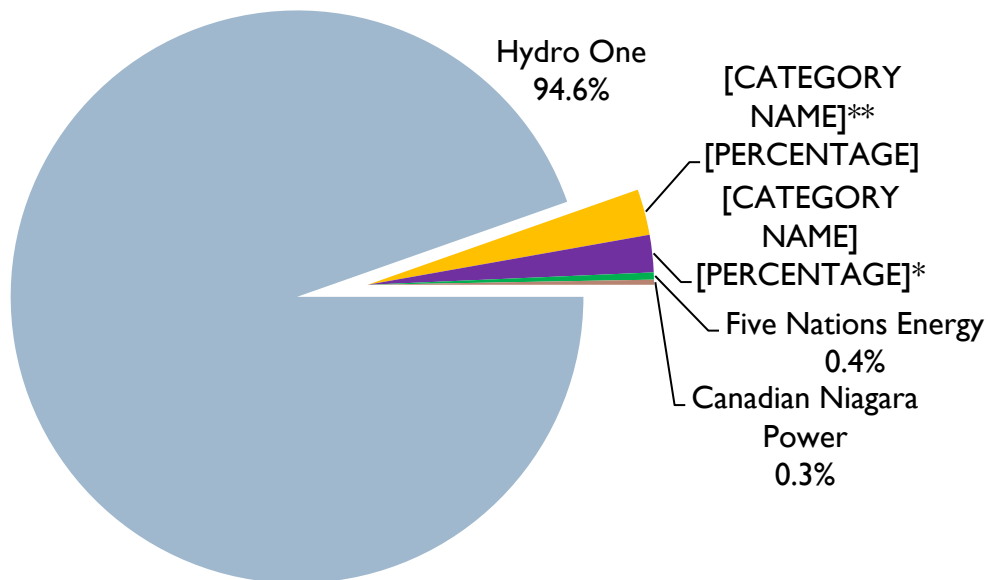
1. Market price reflects Ontario-weighted average as estimated in the May 2016 OEB RPP price report.

2. Retail contract price as at August 2016 for Just Energy's 5-year Predict-a-bill option for \$49.99 dollars/month. Just Energy reserves the right to terminate customers who use more than 15,000 kWh per year during the term; this averages 1,250 kWh per month. Range represents monthly cents per kWh of electricity use from 1,250 kWh to 750 kWh per month.

Note: Customized products may be negotiated for non-residential customers.

2 Delivery - Transmission

- ▶ The transmission component of the Delivery line of the electricity bill funds the operation and maintenance of the high-voltage transmission system that carries electricity from generating stations to local utilities.
- ▶ Transmission companies receive a uniform transmission rate.
- ▶ Pooled revenue is allocated by an OEB formula to the five transmitters in Ontario; an estimated breakdown of the total revenue shares for these companies is provided below.



* B2M LP was formed by Hydro One in 2013 to hold assets associated with Hydro One's Bruce to Milton Transmission Reinforcement Project, an electricity transmission line (Bruce to Milton Line) in southwestern Ontario, from the Bruce Power facility in Kincardine to Hydro One's Milton Switching Station in the Town of Milton. The Chippewas of Nawash First Nation and the Chippewas of Saugeen First Nation, collectively referred to as the Saugeen Ojibway Nation (SON) acquired a 34.2% equity interest in B2M LP in December 2014.

** Hydro One completed acquisition of Great Lakes Power Electricity Transmission business on October 31, 2016.

2 Delivery - Distribution

- ▶ There are about 70 local utilities that deliver electricity directly to homes and businesses in Ontario. The majority of these utilities are municipally owned.
- ▶ Not all consumers are served by distributors (e.g., large industrial consumers that are directly connected to the transmission grid).
- ▶ Rates vary by distributor, with rates set by the OEB, and contain both a fixed and volumetric component. The following table provides sample residential rates:

Distribution Rate Summary *	Service Charge (2016)	Volumetric Rate (2016)	500 kWh Residential Distribution Rate (2016)	800 kWh Residential Distribution Rate (2016)
Oshawa PUC Networks	\$12.66 / month	1.48 ¢/kWh	4.01 ¢/kWh	3.06 ¢/kWh
EnWin Utilities	\$16.20 / month	1.57 ¢/kWh	4.81 ¢/kWh	3.60 ¢/kWh
Toronto Hydro	\$23.49 / month	1.88 ¢/kWh	6.58 ¢/kWh	4.81 ¢/kWh
Atikokan Hydro	\$38.80 / month	1.78 ¢/kWh	9.54 ¢/kWh	6.63 ¢/kWh

* Includes all rate riders (e.g., smart meters and other components)

Note that as part of the Renewed Regulatory Framework in Electricity, the OEB has undertaken consultations and published its policy paper outlining revenue decoupling or shift away from volumetric charges for distribution rates.

3 Regulatory Charges

- ▶ Regulatory charges are determined by the Ontario Energy Board (OEB) and are used to administer the wholesale electricity system and maintain reliability of the provincial grid.
- ▶ The charges below comprise the Regulatory Component of the residential service classification from Toronto Hydro's 2016 rate order.

Wholesale Market Service Charge (0.36 ¢/kWh)

- Physical Limitations and Losses
- Energy Reliability
- IESO Administration Fee
- Renewable Connections

Rural or Remote Rate Protection (0.13 ¢/kWh)

- Charge collected by the Independent Electricity System Operator (IESO) to partly offset higher cost of providing service to consumers in rural and remote areas.
- RRRP will be expanded in 2017, increasing the charge.

Ontario Electricity Support Program Charge (OESP) (0.11 ¢/kWh)

- This charge is collected to pay for the costs of the OESP. The program provides eligible low-income customers with a monthly credit on their electricity bills.

Standard Supply Service Charge (\$0.25)

- Covers a portion of a utility's administrative costs to provide electricity to customers that purchase their electricity from the utility, instead of a licensed electricity retailer.

Electricity Price Mitigation Programs

Additional Support for Electricity Consumers

- Programs exist support electricity consumers; funded either by ratepayers or fiscally by the Province.

	Residential	Farm	Business	Industrial	Funded By
Ontario Rebate for Electricity Consumers (OREC) Benefit equal to the 8 per cent, provincial portion of the HST	✓	✓	✓ Small Business		Fiscal
Ontario Electricity Support Program (OESP) A monthly on-bill credit to reduce the bill for low-income consumers	✓ Low-Income				Electricity Ratepayers
Northern Ontario Energy Credit (NOEC) Helps low-income Northern Ontario Residents with higher energy costs they face living in the north.	✓ Low-Income, Northern Ontarian				Fiscal
Ontario Energy and Property Tax Credit (OEPTC) Helps low- to moderate-income individuals with property taxes and sales tax on energy.	✓ Low- to Moderate-Income				Fiscal
Low-Income Energy Assistance Program (LEAP) Emergency financial assistance on qualification; up to \$500 - \$600 for customers experiencing difficulty paying current arrears.	✓ Low-Income, Currently in arrears				Electricity Ratepayers
Rural or Remote Electricity Rate Protection (RRRP) Reduces electricity delivery costs for about 330,000 customers located in rural areas.	✓ Eligible rural Customers				Electricity Ratepayers

Additional Support for Electricity Consumers

- Programs exist support electricity consumers; funded either by ratepayers or fiscally by the Province.

	Residential	Farm	Business	Industrial	Funded By
Industrial Conservation Initiative (ICI) Encourages large industrials to conserve during peak hours, by providing a Global Adjustment charge based on peak demand				✓ Eligible Large Industrial Customers	Electricity Ratepayers
Industrial Electricity Incentive (IEI) Provides price support to incentivize increased industrial production and investment in Ontario.				✓ Eligible Large Industrial Customers	Electricity Ratepayers
Northern Industrial Electricity Rate (NIER) Provides eligible participants in Northern Ontario with a rebate of up to 2 ¢/kWh.				✓ Eligible Large Northern Customers	Fiscal
Conservation Programs (Various) Various programs, e.g., <i>peaksaver</i> Plus, Demand Response.	✓	✓	✓	✓	Electricity Ratepayers



Long-term Energy Plan



2013 Long-Term Energy Plan (LTEP)

- ▶ On December 2, 2013, the government released the 2013 Long-Term Energy Plan (LTEP).
 - ▶ This was an update to the previous LTEP, released in 2010.
- ▶ The 2013 LTEP sets a vision for Ontario's energy future and is designed to balance five core principles:
 1. Cost-effectiveness
 2. Reliability
 3. Clean energy
 4. Community engagement
 5. Conservation and demand management before building new generation
- ▶ The 2013 LTEP forecasts lower electricity prices compared to the previous LTEP, with recent cost containment measures and a continued focus on rate mitigation going forward maximizing value for ratepayers.
- ▶ A Conservation First policy, with conservation being the preferred choice wherever cost-effective, supports the LTEP's focus on rate mitigation and planning flexibility.



2017 LTEP – Ontario Planning Outlook and Fuels Technical Report

Ontario Planning Outlook

- ▶ On September 1, 2016, the IESO released an Ontario Planning Outlook (OPO) report that included a ten-year review (2005 – 2015) and a twenty-year outlook (to 2035) for electricity demand, supply, system costs, conservation and emissions.
 - ▶ The Purpose of the report is to allow all stakeholders a common point of understanding in advancing the consultation and engagement process of LTEP.
 - ▶ The OPO reports that as a result of investments over the past decade, Ontario is in a strong position to meet the range of demands for electricity that could occur.
 - ▶ The OPO considers a range of demand outlooks, including low and flat demands and higher demand that reflects increased electrification associated with policy choices on climate change, and concludes that Ontario's existing, committed and directed resources are sufficient to meet the flat or lower demand outlook.
 - ▶ The higher demand scenario could create a need for additional resources in the mid-2020s.

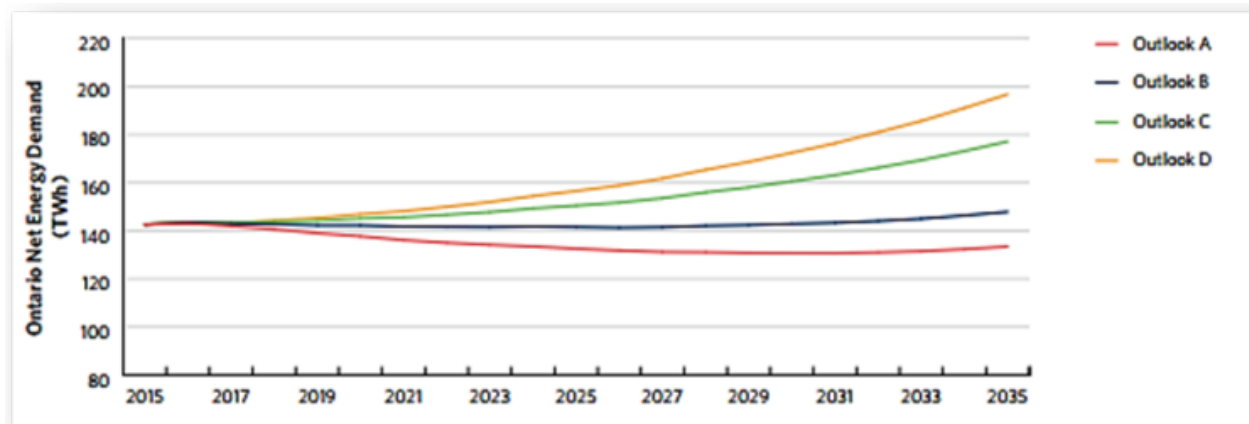
Fuels Technical Report

- ▶ A Fuels Technical Report was also released in September 2016, which includes a review of fuels consumption and a set of 20-year outlooks. Energy states that in all outlooks, supply is expected to provide sufficient quantities of product to meet Ontario's demands for conventional fossil fuels. For outlooks that include demand growth for alternative fuels, new investment in infrastructure and new imports of alternative fuels may be required.

2017 LTEP Update – Demand Forecasts

- ▶ The OPO states that under a flat demand scenario, the total cost of electricity service would continue to average about \$21 billion per year (2016\$) over the next 10 years, and then decrease to approximately \$19 billion per year by 2035.
 - ▶ In higher demand outlooks, the annual cost of electricity service would rise by approximately \$4 billion to \$10 billion by 2035 (2016\$). Unit costs would be within the same range as the flat demand outlook due to associated consumption increases.
- ▶ The OPO projects that electricity sector greenhouse gas (GHG) emissions are expected to continue to decline over the next five years. Beyond this period, emissions will depend on demand and amount of generation supplied by natural gas.
 - ▶ Emissions in the OPO are generally forecast to range from 4 to 6.5 megatonnes (Mt).

Electricity Demand Forecasts from OPO



2017 LTEP – Consultation and Discussion Guide

- ▶ Preliminary schedule includes 16 LTEP consultation sessions at various locations throughout Ontario this fall. Consultation sessions for Indigenous communities would be held in parallel with other sessions.
 - ▶ LTEP consultations would also include public open houses.
- ▶ Stakeholders and Indigenous communities and groups are invited to submit formal submissions through the Environmental Registry.
- ▶ A discussion guide has also been prepared which includes questions on energy policy topics.

