Ontario

MINISTRY OF
ENERGY

The Future of Energy in Ontario and the Long-Term Energy Plan

Ontario Ministry of Energy

October 27th, 2016
PowerLogic Users Group (PLUG) Conference

Presentation Outline

1. Ontario's Energy Sector
2. 2013 Long-Term Energy Plan (2013 LTEP)
3. Energy Conservation in Ontario
4. Conservation Initiatives
5. Ontario's Electricity Prices
6. New Rate Mitigation Initiatives
7. Long-Term Energy Plan 2017 – How to get involved

1. Ontario's Energy Sector

Ontario's Key Energy Sector Players

Ontario Ministry of Energy

- Provides overall policy direction and targets.
- Sets legislation and provides government leadership through programs & initiatives.

ieso

- Balances the supply, demand and flow of electricity and plans the electricity system for the short and long term.
- Operates the wholesale electricity market
- Coordinates province-wide electricity conservation efforts

Ontario Energy Board

- Independently regulates Ontario's electricity and natural gas sectors in the public interest
- Holds open hearings to allow stakeholders to comment on various applications needing approval.

Local Distribution Companies (LDCs) & Gas Utilities

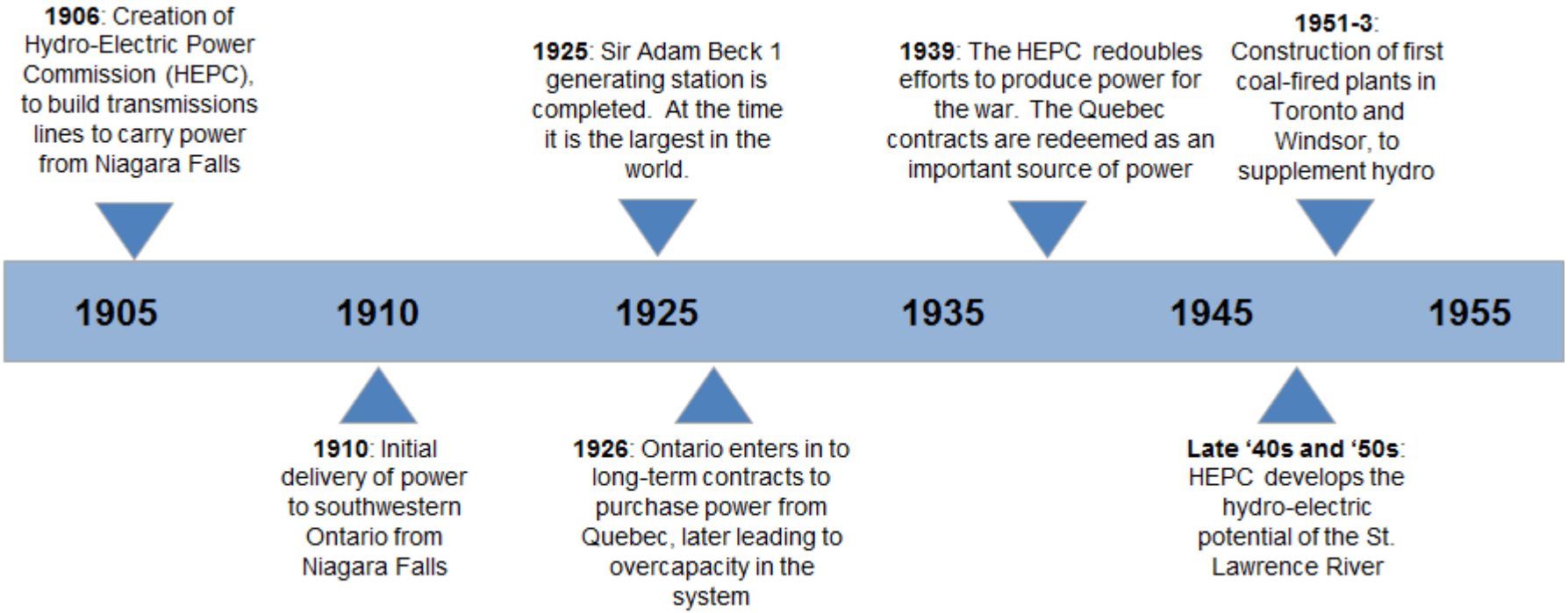
- The "face" of the sector, interfacing with customers
- Delivering energy to customers
- Developing and delivering conservation programs to customers.

Electricity Generators

- Own and operate generation assets, and generate Ontario's electricity.
- Ontario Power Generation (OPG), Bruce Power, TransCanada, Northland Power and Brookfield are some of the large generation companies operating in Ontario.

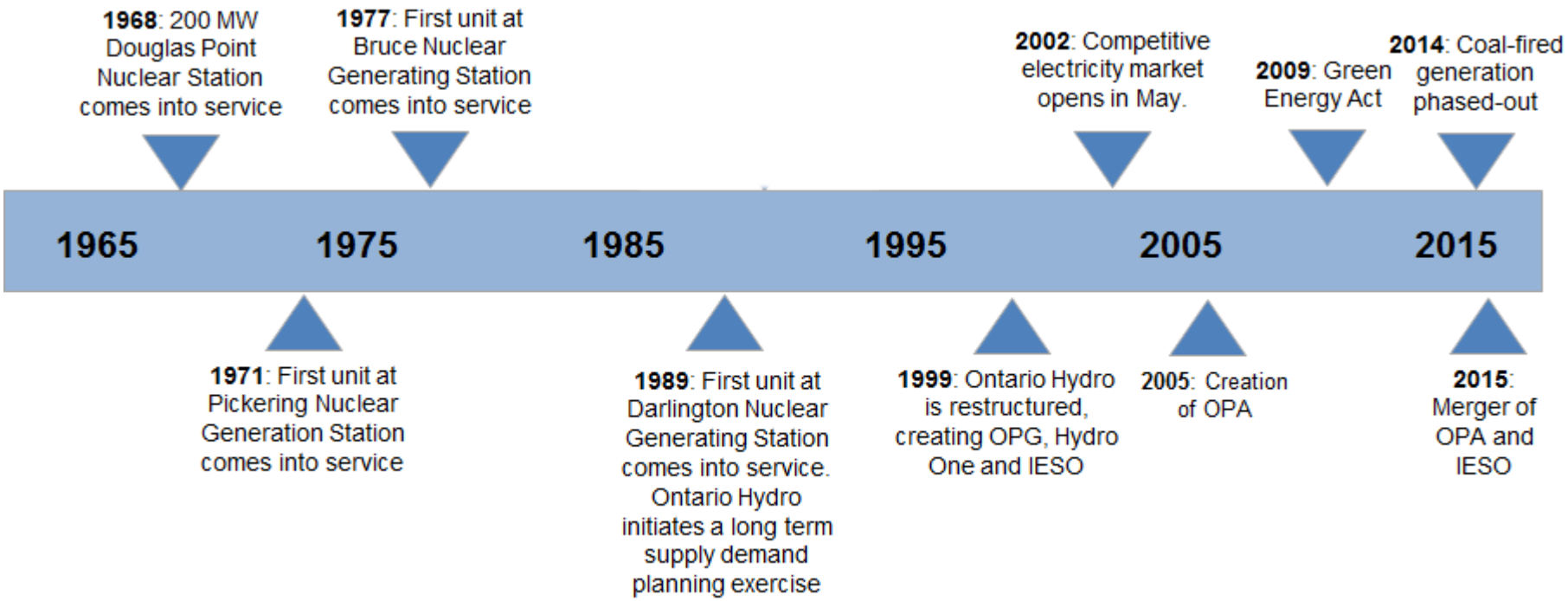
100+ Years of Electricity – 1905 to 2015

- Niagara Falls provided electricity to Ontarians for the first half of the century.
- Next, the province constructed hydroelectric generators on the St. Lawrence river.
- In the 1950s, the addition of coal-fired plants helped meet increasing demand.



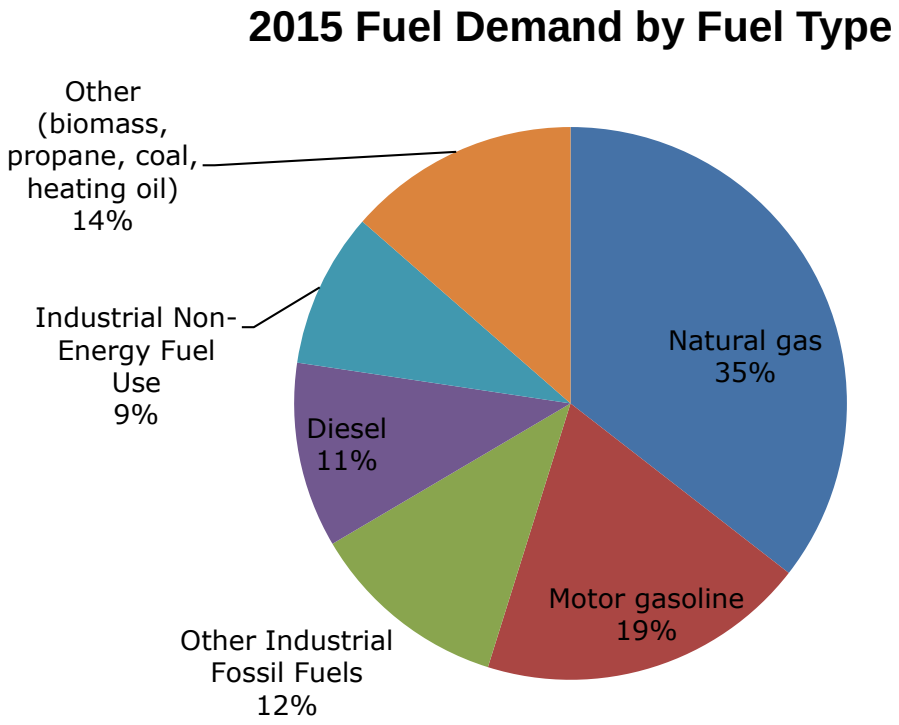
100+ Years of Electricity – 1905 to 2015

- Nuclear power began to play an important role in the electricity mix beginning in the 1970s.
- The transition to renewables accelerated in 2009 with the Green Energy Act.
- Ontario eliminated coal as a source of electricity generation in 2014.



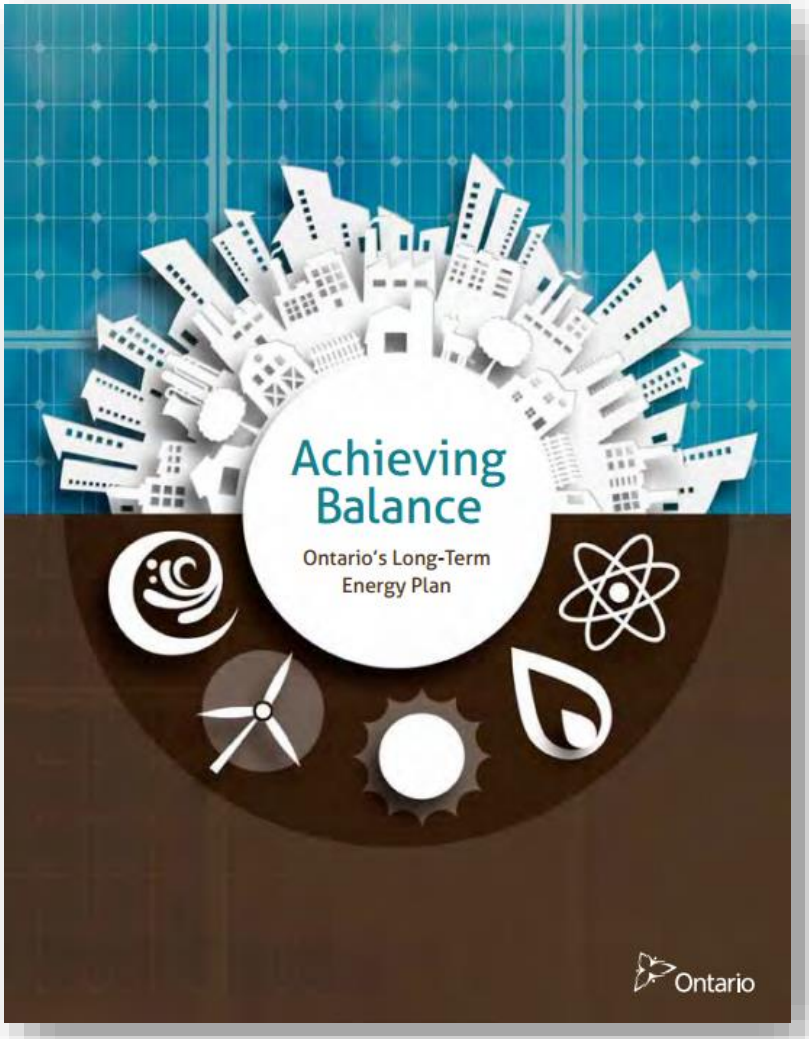
Fuels Sector

- Fuels such as natural gas, gasoline, diesel, propane and biofuels supply three quarters of the province's primary energy use. These fuels are delivered across Ontario through a variety of distribution networks.



2. 2013 Long-Term Energy Plan (2013 LTEP)

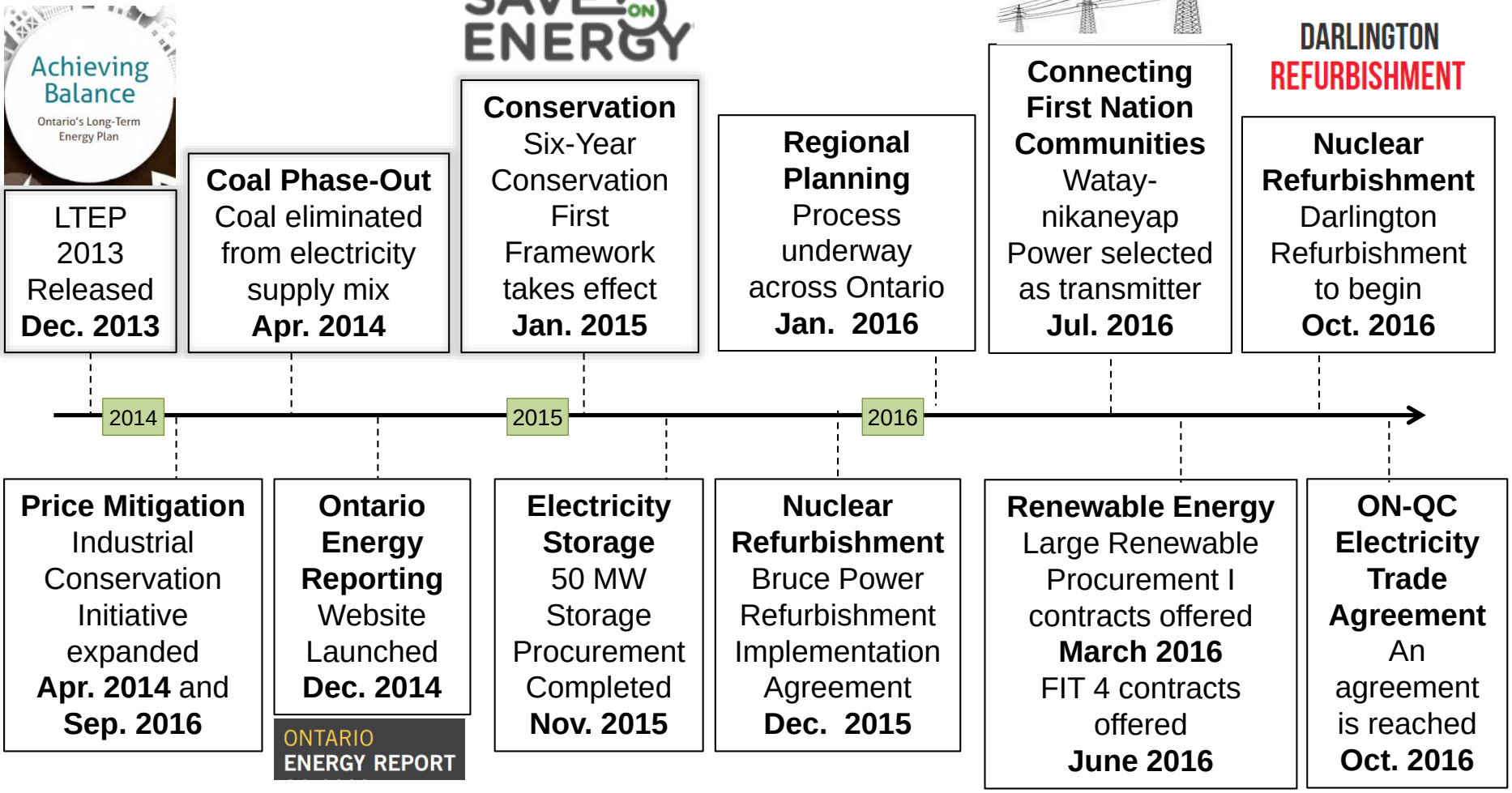
2013 Long-Term Energy Plan – Puts *Conservation First*



- Ontario's last Long-Term Energy Plan (2013 LTEP) was released on December 2, 2013.
- The plan set out direction for the energy sector including conservation, generation, transmission/distribution, oil/gas, Indigenous participation, and regional planning.
- The plan identified five principles that guide energy decisions:
  - Cost effectiveness;
  - Reliability;
  - Clean energy;
  - Community engagement; and
  - An emphasis on conservation and demand management
- The plan was informed by the most comprehensive engagement process the Ministry of Energy has ever undertaken.

Key 2013 LTEP Achievements

- Progress on initiatives identified in 2013 LTEP include:



3. Energy Conservation in Ontario

Conservation and Energy Efficiency Success

- Ontario has built up significant program delivery capacity and contributed to the creation of a culture of conservation in the province:
  - Ontario was the first jurisdiction in Canada to set energy efficiency standards for products and equipment, and has been setting them for over 25 years.
  - Enbridge Gas Distribution and Union Gas have been delivering natural gas energy efficiency programs across the province for over 20 years.
  - The Independent Electricity System Operator (previously the Ontario Power Authority) has been delivering electricity conservation programs since 2005, with electricity utilities taking on increasing responsibility for program delivery.

Building a Culture of Conservation

Pre-2011 Conservation
- Centralized program design with fragmented delivery
- Multiple brands and program names
- Foundation for province-wide conservation efforts

2011-2014 Framework
- Centralized program design
- One key delivery channel (LDCs)
- saveONenergy cohesive message

2015-2020 Conservation First
- Decentralized LDC-led program design
- Regional collaboration and gas integration
- Holistic deeper solutions
- Greater transparency

Conservation and Energy Efficiency Success

- From 2005 to 2014, Ontarians conserved:
  - 9.9 TWh of electricity - enough to power the cities of Ottawa and Windsor combined in 2014.
  - 3,628 MW of peak demand – equivalent to the peak demand of Mississauga, Brampton and Ottawa combined in 2014.
- From 2000 to 2014, Ontarians also conserved:
  - 2,578 million cubic meters of natural gas from natural gas efficiency programs alone – equivalent to the natural gas used by 1.1 million homes in a year.
- Conservation requires a sustained commitment to achieve persistent savings over the long term.

*Between 2005 and 2014, electricity conservation programs, and changes to building codes and product standards, resulted in **1.5 megatonnes of greenhouse gas (GHG) emission reductions in 2014**, equivalent to taking 350,000 cars off the road in that year.*

4. Conservation Initiatives

Conservation Initiatives

- The Ministry of Energy and its agencies are working to achieve the 2013 LTEP commitment to put “Conservation First” through a range of complementary initiatives:

  I. Conservation First Framework
     a. SaveONenergy Business
     b. Industrial Accelerator Program
  II. Green Button
  III. Demand Response
  IV. Net Metering
  V. Industrial Conservation Initiative

I. Conservation First Framework

- The **Conservation First Framework (2015 to 2020)**, overseen by the IESO, provides the funding, guidelines and certainty needed for electricity utilities to deliver programs to their customers.

- Expected to achieve 7 TWh of savings and assist the province in achieving its long-term conservation target. In addition, the Industrial Accelerator Program (IAP) is expected to achieve 1.7 TWh of savings from transmission-connected industrial/commercial customers.

- The Framework:
  - Gives utilities responsibility for program development and flexibility over which programs they offer.
  - Increases the rigour of program cost-effectiveness requirements.
  - Encourages coordination and integration of electricity and natural gas programs.

- About $3 billion from the electricity ratepayer base is budgeted to be spent on the Framework and IAP programs between 2015 and 2020.

SAVE ON ENERGY
POWER WHAT'S NEXT

RETROFIT PROGRAM Incentives for Lighting

Ia. saveONenergy for Business

- A sample of electricity conservation programs currently available to business consumers.

saveONenergy™ FOR BUSINESS

AUDIT FUNDING — GET UP TO 50%

Receive up to 50% of the cost of an energy audit to identify opportunities for energy efficiency upgrades and eligible incentives.

RETROFIT PROGRAM — GET UP TO 50%

Receive up to 50% of project costs for upgrading old or inefficient equipment.

PROCESS AND SYSTEMS — GET UP TO 70%

Receive up to $50,000 for engineering studies and up to 70% of capital costs for energy efficiency upgrades.

SMALL BUSINESS LIGHTING — GET UP TO $1500

Qualifying businesses can receive up to $1,500 in new energy efficient lighting.

Ib. Industrial Accelerator Program (IAP)

- The IAP assists eligible transmission-connected companies to fast track capital investment in major energy conservation projects.

- It is an incentive program designed specifically for transmission-connected facilities across Ontario. Tailored to support energy-efficient capital investments, the four programs that fall under the IAP banner include:
  - Retrofit;
  - Process & Systems (including Small Capital Projects);
  - High Performance New Construction; and
  - Energy Managers.

Ib. Industrial Accelerator Program: Case Study

"It all comes down to cash flow. Since 2010, we've completed nine energy projects and two more projects will be completed by the end of this year. We run a portfolio of energy projects simultaneously, and by the time the final project in the portfolio needs cash, the first project is generating electricity savings that can be used for financing. This staggered approach to energy management contributes to our cash flow position and has the full support of our finance team." Ian Shaw, Manager of Energy Management, ArcelorMittal Dofasco

- **ArcelorMittal Dofasco** is a steel and mining company, with 119 million tonnes of annual production capacity and 245,000 employees across 60 countries.
  - Energy accounts for 20 to 25 per cent of the cost of a finished steel coil and is the second-largest input cost after raw materials.
- Since 2011, the company has achieved 125,000 megawatt-hours in recurring annual energy savings and reduced electricity costs by more than $10 million annually due to IAP projects.
  - They have more projects underway that are projected to deliver an additional 290,000 megawatt-hours of savings by 2020.
- To meet the financial challenge ArcelorMittal Dofasco has utilized IESO Industrial Accelerator program. The program is a "key enabler" in advancing energy objectives, Smith says.

Sources: IESO

II. Green Button

- The 2013 Long-Term Energy Plan (2013 LTEP) promoted Green Button as a way to give consumers access to their electricity consumption data in a standardized format across all electricity utilities. Green Button can be extended to natural gas and water utility data as well.
- The 2016 Climate Change Action Plan (CCAP) committed to expand the Green Button program province-wide to help conserve energy and water.
- The **"Green Button"** standard can empower residential, commercial, institutional and industrial customers to access (i.e., Green Button "Download My Data") and share (i.e., Green Button "Connect My Data") their electricity, natural gas and water utility data (consumption, billing, and generation) in an electronic, standardized and secure way.
- When customers share their data with developers they can use innovative software applications that allow them to view and manage their usage and bills.

Figure 28: The Green Button Initiative

- The Ministry is taking into account stakeholder feedback received through consultations in Spring/Summer 2016, as well as pilot and cost-benefit analysis results and experience in other jurisdictions as it moves forward with making recommendations on implementing Green Button.

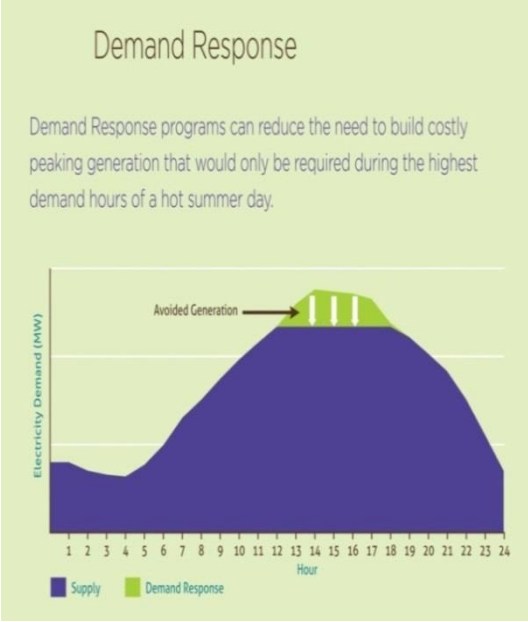
II. Green Button: Case Study

“Event Assist will help Budweiser Gardens better understand hydro usage by the size, type and configuration of each event, this has the capability of changing the way we cook events in the future not only for our building but within the industry. Working with the team at London Hydro has shown me what a truly professional organization they are from top to bottom” Gary Turrell, Director of Operations, Budweiser Gardens

- Budweiser Gardens, located in London, is the largest sports-entertainment center in southwestern Ontario. It is home to the London Knights and hosts many other musicians, theater groups and performers.
- Challenge:
  - Accurately predicting future event energy costs, creating a self-service interface with variables that they can input on a per event basis and providing a cost-effective tool.
- Solution:
  - London Hydro collaborated with Western university to create Event Assist, a predictive model for electricity costs based on specific parameters for an event.

III. Demand Response

- Demand Response (DR) initiatives provide price or financial incentives to consumers to shift or reduce their electricity usage away from peak periods.
- 2013 LTEP committed to using DR to meet 10% of peak demand by 2025, equivalent to ~2,400MW under forecast conditions*.
- Annual DR auctions replace the practice of multi-year contracting for DR. Under the former OPA, DR resources were procured through the DR3 program for typically five-year contract periods.
- DR auction participation is open to resources with peak load greater than 1 MW (e.g. industrial consumers, aggregators etc.)
- IESO held its first DR auction in December 2015, procuring ~400 MW each for the summer commitment period (May 2016 to October 2016) and the winter commitment period (November 2016 to April 2017).
- Through a competitive Request for Proposal process, in 2015, IESO also procured ~60 MW of DR pilot projects. The objective of the pilot projects is to learn more about DR operational capabilities.
- Commercial and Industrial participants include: Pulp and paper, steal industry, etc.



***Note:** Target includes contribution from time of use rates, dispatchable load, Industrial Conservation Initiative (ICI) and IESO DR auction projects.

V. Ontario's Net Metering Program

- Ontario has had a Net Metering Regulation in place since 2005, which requires all LDCs to offer net metering to customers on request.
  - Electricity exported to the grid is valued at retail rates (for residential customers, currently Tiered Pricing) and credited to the customer's electricity bill.
  - Bill credits can be carried forward for up to 11 months at which point they are reset to zero.
- Currently, a customer is eligible to net meter if:
  - Electricity is primarily for customer's own use.
  - Electricity is from a renewable system <500 kilowatts (kW).
  - Electricity is conveyed directly to onsite load.
- Uptake of net metering has been relatively limited since the launch of the FIT programs in 2009:
  - In 2015, 2 megawatt (MW) of net metering capacity was installed, for a total of 9 MW in the province.
  - About 80% of projects are solar PV.

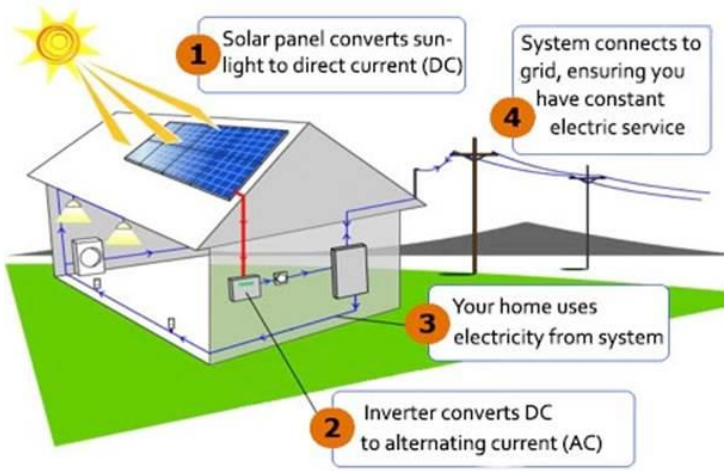


Figure: A typical net metering configuration. Renewable energy is first consumed onsite, and any surplus generation is sent to the grid. The customer draws from the grid when their onsite needs are not met by the renewable system.

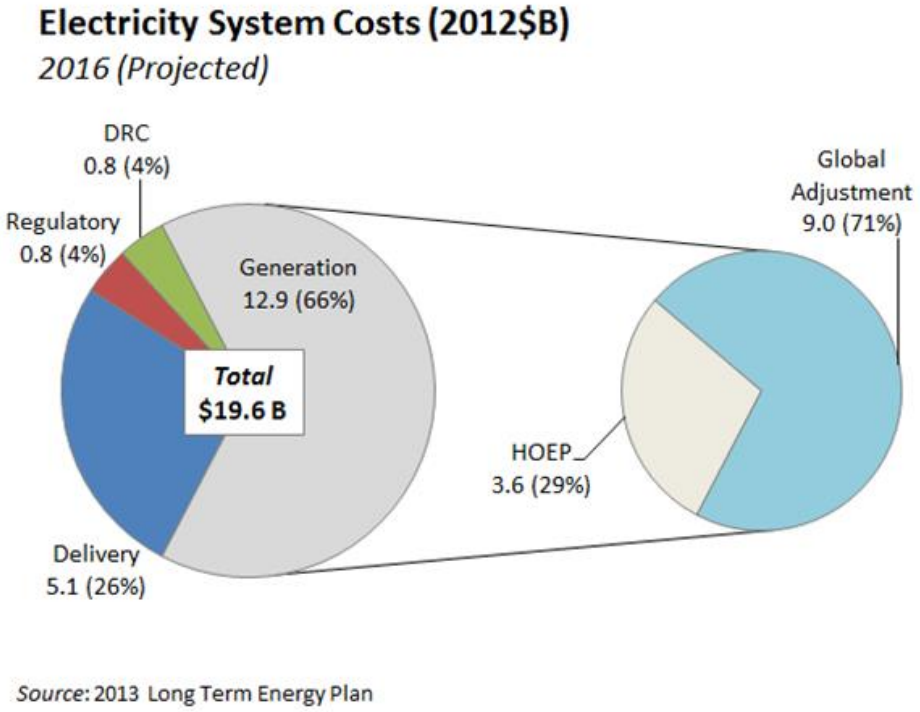
V. Updates to Ontario's Net Metering Program

- The Ministry is updating Ontario's net metering program to support customer choice in generating renewable energy, align with value to the electricity system and enable innovative technologies and customer-utility relationships.
- The Ministry posted proposed amendments to the 2005 Net Metering Regulation (O. Reg. 541/05) on the Environmental Registry for public comment from August 19 to October 3, 2016.
- The proposed regulatory amendments would broaden eligibility to the program and make other small updates responding to feedback from existing participants.
- The amendments, if approved, are proposed to be in force by July 1, 2017.
- In addition, the Ministry is exploring additional program elements requiring further study/consultation:
    - A cost-benefit analysis of enabling time-of-use billing for net metered customers.
    - Consultations on Community Net Metering and Third-Party Ownership.
    - Examining the need for any changes to consumer protection measures and renewable energy approvals.

5. Electricity Pricing in Ontario

Ontario Electricity System Operates on a "Full Cost Recovery Basis"

- In Ontario, the costs associated with providing electricity service to consumers are recovered as they are incurred.
  - For example, Regulated Price Plan (RPP) time-of-use prices for residential and other low volume consumers are set to recover the cost of generation.
- Global Adjustment charges are recovered from both Class A and Class B consumers.
- Total system costs in 2016, excluding HST, are projected to be approximately $21 billion (2016$). These costs are recovered from about 5 million consumers.
- Generation costs (i.e., commodity cost of electricity) represent roughly two-thirds of the total cost of electricity service in Ontario.



Global Adjustment

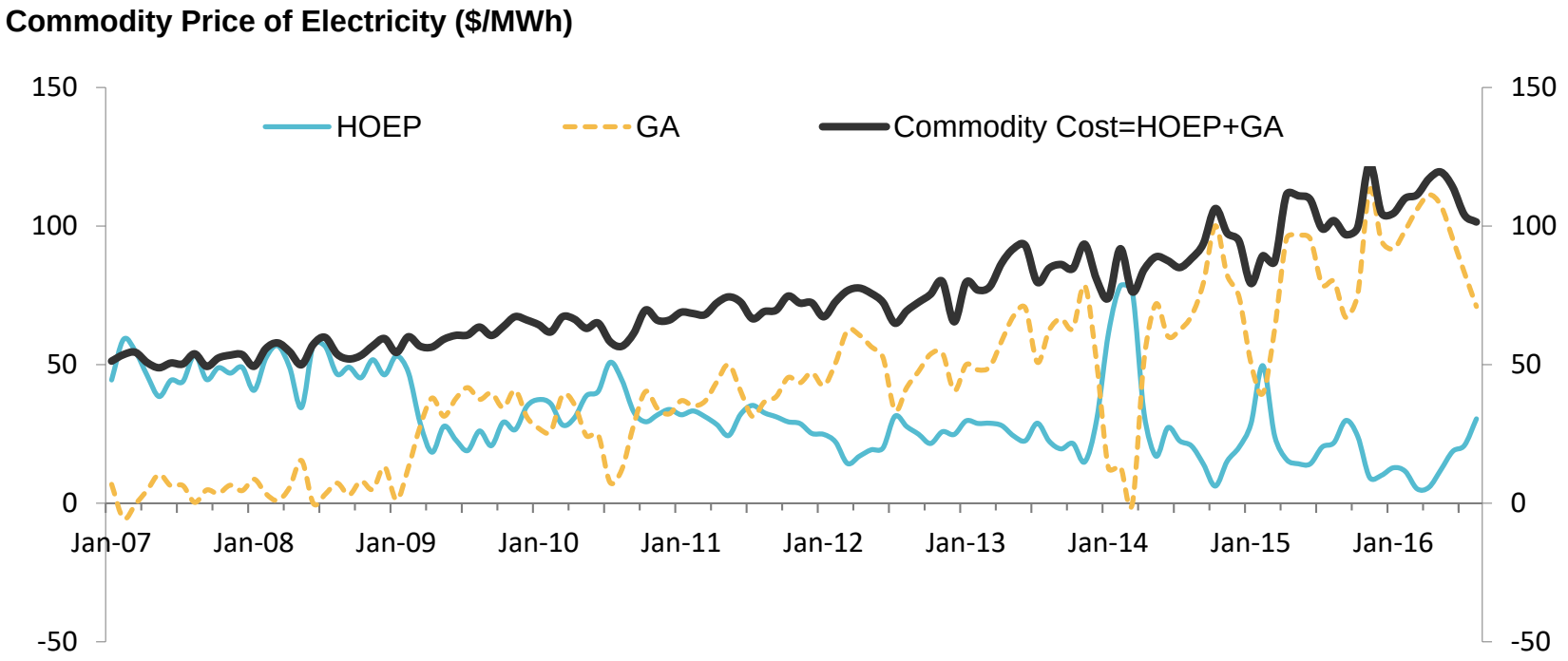
- In 2005, Ontario introduced GA as part of the shift to centralized generation procurement, which in turn was implemented to ensure key government objectives could be achieved (e.g., restore system reliability, enable coal phase-out, etc.).
  - GA provides long-term revenue certainty for generators and their lenders (i.e., banks and other financial institutions).
  - At the time this certainty was especially important — the recent 2000-2001 California energy crisis had dampened investor confidence.
  - GA supported investment in new generation in the province that otherwise would likely not have taken place.

- Costs that go into GA include:
  - IESO Clean Energy Supply contracts (natural gas), renewable and FIT supply contracts (wind, solar, etc.) and Bruce Power contract;
  - Regulated payments for Ontario Power Generation nuclear and hydroelectric plants (rates determined by Ontario Energy Board);
  - Costs of IESO conservation programs; and
  - Non-Utility Generators under contract to the Ontario Electricity Financial Corporation (OEFC).

- In 2015, GA represented $10 billion, or roughly half of the total cost to provide electricity service in Ontario.

Commodity Cost of Electricity Recovered by GA and HOEP

- The figure below illustrates the inverse relationship between the Hourly Ontario Energy Price (HOEP) and Global Adjustment (GA), and how both comprise the “effective price” of electricity.



6. New Rate Mitigation Initiatives – Industrial Conservation Initiative

New Rate Mitigation Initiatives – Overview

- In September 2016, Ontario announced a number of initiatives beyond those contemplated in the 2013 LTEP, including:

  - Legislation that will provide an eight per cent rebate to five million electricity consumers, such as Residential consumers; multi-unit residential buildings and other facilities used as residential rental units such as long-term care homes and school residences; small businesses; and farms.

  - The Rural or Remote Rate Protection (RRRP) program reduces electricity delivery costs for approximately 330,000 customers located in rural areas.

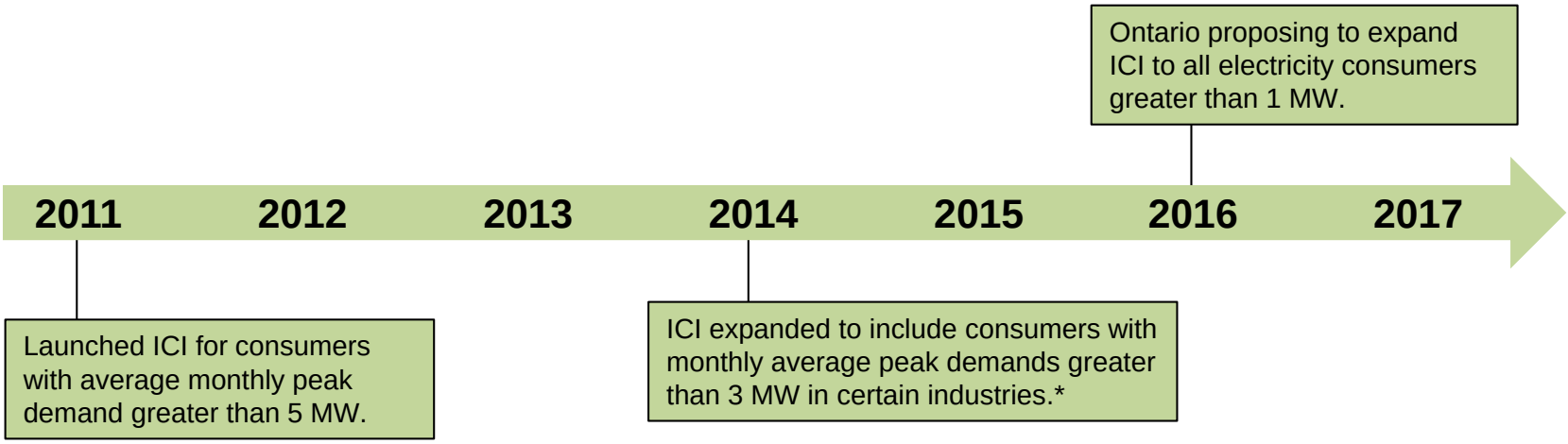
  - Ontario is proposing to expand eligibility for the Industrial Conservation Initiative (ICI). ICI would be expanded to include all sectors and so that all electricity consumers over 1 MW would be eligible.

Industrial Conservation Initiative (ICI)

- Under ICI, consumers pay Global Adjustment (GA) based on their contribution to peak demand during the five highest demand hours of the previous year. ICI provides a strong incentive for large electricity consumers to shift their electricity consumption to off-peak hours to reduce their bills. Reducing peak system usage improves reliability and lowers total costs.

- When fully implemented, participating industrial customers could find cost savings of up to one-third, depending on their ability to reduce peak electricity consumption. Expanding the ICI program will empower businesses to manage their electricity costs in a way that best supports their growth.

- At the same time, conservation programs delivered by local distribution companies, supported by IESO, will continue to provide significant programs tailored to specific business classes and needs.



* 3-5 MW consumers in the manufacturing, mining, refrigerated warehousing, data processing and greenhouse sectors

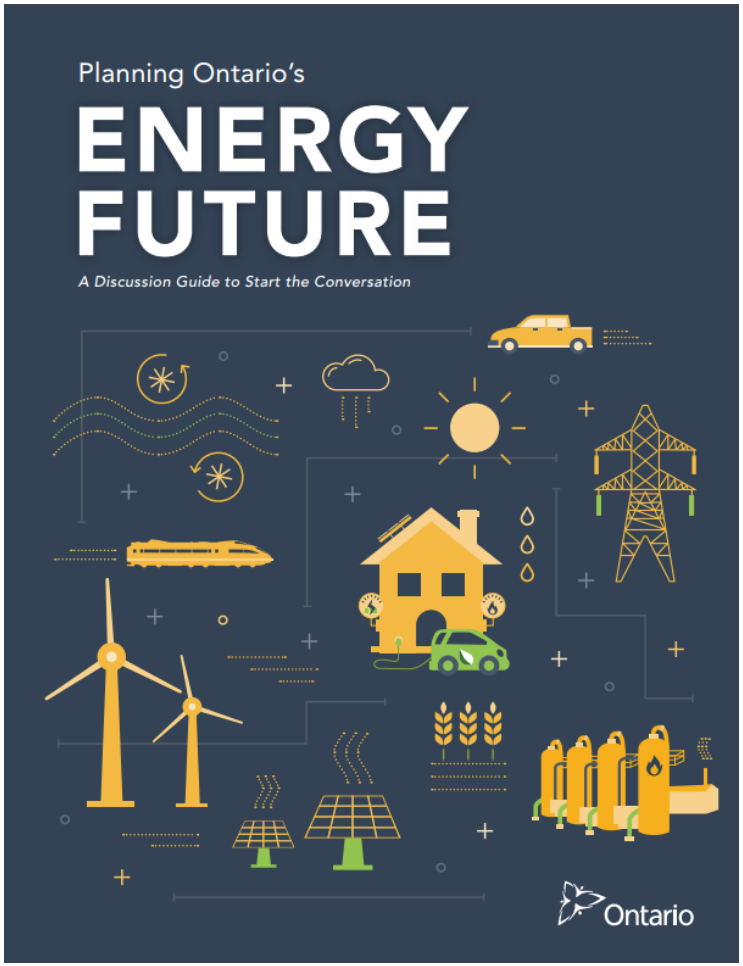
7. Long-Term Energy Plan 2017 – How To Get Involved

LTEP 2017 – How to get involved

- The Ministry of Energy is consulting and engaging with Ontarians, First Nation and Métis communities and energy stakeholders to get views on the choices that need to be made for Ontario's energy future.

- The next LTEP will also expand the discussion of Ontario's energy future by including a comprehensive review of the province's fossil fuels sector and the supply of oil, gasoline and natural gas.

- On October 13, 2016, the Ministry published a discussion guide for 2017 LTEP, titled "Energy Future: A Discussion Guide to Start the Conversation".



LTEP 2017 – How to get involved

How to Participate:

- Read the discussion guide
- Share your feedback online through:
  - our EnergyTalks consultation
  - the Environmental Registry
- Attend one of our in-person consultation sessions

2016 General Consultation Schedule:

- October 24 & 25, Toronto
- October 27, Sudbury
- November 1, Barrie & Kenora
- November 2, Thunder Bay
- November 3, Peterborough
- November 15, Sault St. Marie
- November 16, Timmins
- November 17, St. Catharines
- November 21, Guelph
- November 22, Pembroke
- November 23, Ottawa
- November 24, Kingston
- November 28, Windsor & Kitchener
- November 29, London
- November 30, Missisauga

Visit Ontario.ca/EnergyTalks for addition details.

Tim Christie, P.Eng.
Director, Electricity Policy, Economics and System Planning
Ontario Ministry of Energy
Tim.Christie@ontario.ca
416-325-6708