
Future of Energy in Ontario

October 5, 2017

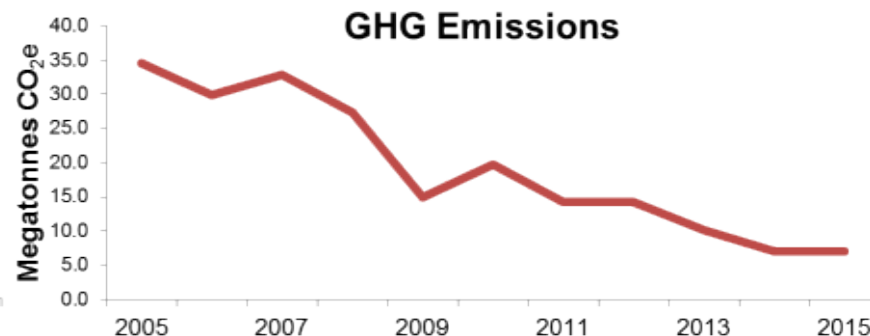
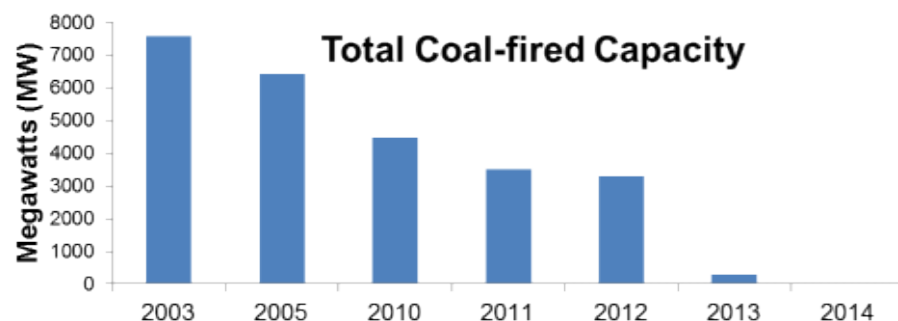
44th Annual Engineering Insurance Conference

Current Energy situation in Ontario

- Ontario's electricity system has undergone significant transformation in the last decade.
 - Increased conservation efforts and changes in the province's economy have seen demand (both peak and total) declining.
 - The supply situation has changed as well: coal-fired generation has been retired and replaced by non-carbon emitting and natural gas-fired generation.
- Combined with investments in conservation and transmission:
 - The reliability concerns of a decade ago have been addressed.
 - Greenhouse gas emissions in Ontario's electricity sector have been reduced by more than 80%.
- Since 2003, nearly \$50 billion has been invested in the electricity system.

Current Energy situation in Ontario

- The phase-out of coal-fired electricity generation represented the single largest greenhouse gas emissions reduction initiative in North America.
 - In 2003, coal-fired generation provided 25% of Ontario's electricity.

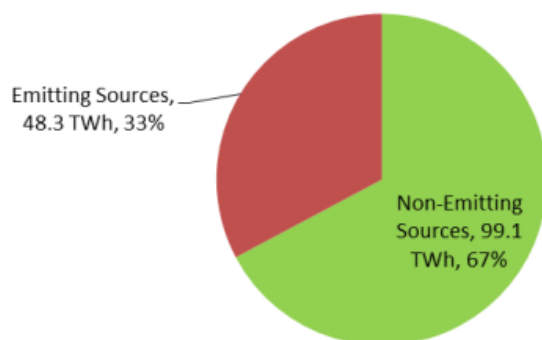


Source: IESO

Current Energy situation in Ontario

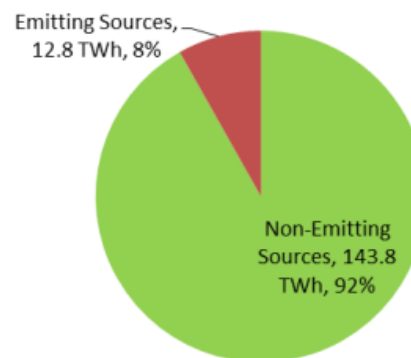
- Due to shut-down of all coal-fired generation and contracting of renewables, there has been a significant shift in Ontario's generation mix.
 - In 2003, emitting sources made up one-third of the province's generation mix.
 - In 2016, 92% of all generation came from non-emitting sources (nuclear, hydro, wind, solar, etc.), with only 8% coming from emitting sources.

**2003 Total Generation
By Emitting and Non-Emitting Sources (TWh)**



Total Generation: 147.4 TWh

**2016 Total Generation
By Emitting and Non-Emitting Sources (TWh)**



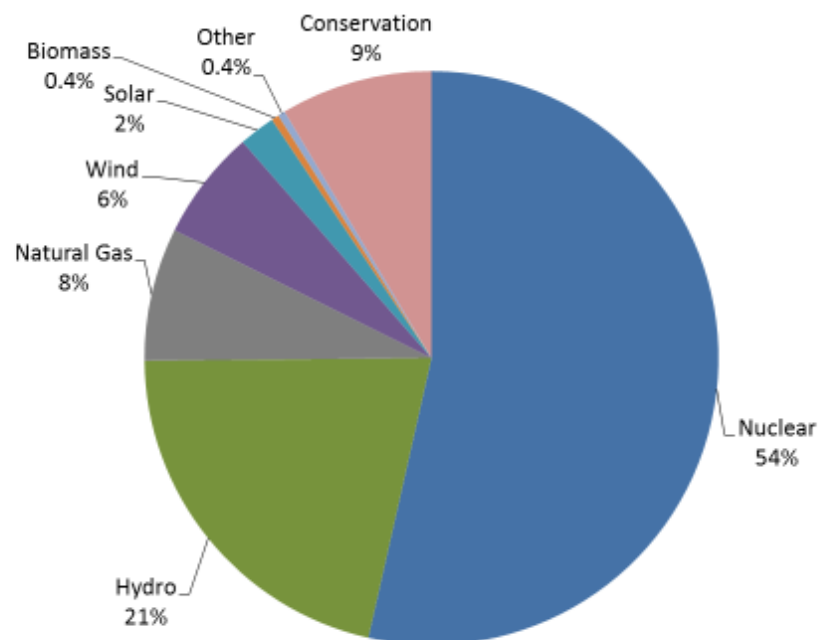
Total Generation: 156.6 TWh

Source: IESO

Current Energy situation in Ontario

- In 2016, Ontario produced more than 50% of its electricity from nuclear, with renewable resources providing about 30% and emitting generation providing less than 10%. Conservation reduced energy consumption by about 9%.

Source	Electricity Generation and Conservation (TWh)
Nuclear	91.7
Hydro	36.5
Natural Gas	12.8
Wind	10.7
Solar	3.5
Biomass	0.7
Other	0.7
Conservation	14.7
Total	171.3



Current Energy Policy in Ontario

- Ontario's Fair Hydro Plan (OFHP)
 - In recent years, electricity costs have increased due to investments made to decarbonize and modernize the province's electricity infrastructure.
 - The OFHP was developed to relieve the cost pressures caused by these system improvements.
 - The OFHP reduces electricity bills by an average of 25% for residential consumers, and will hold any increases to the rate of inflation for four years.

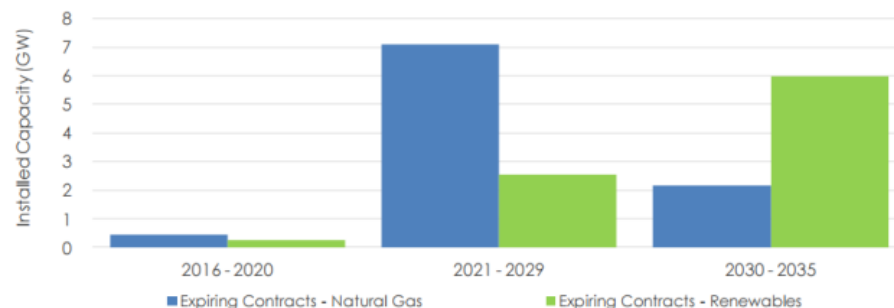
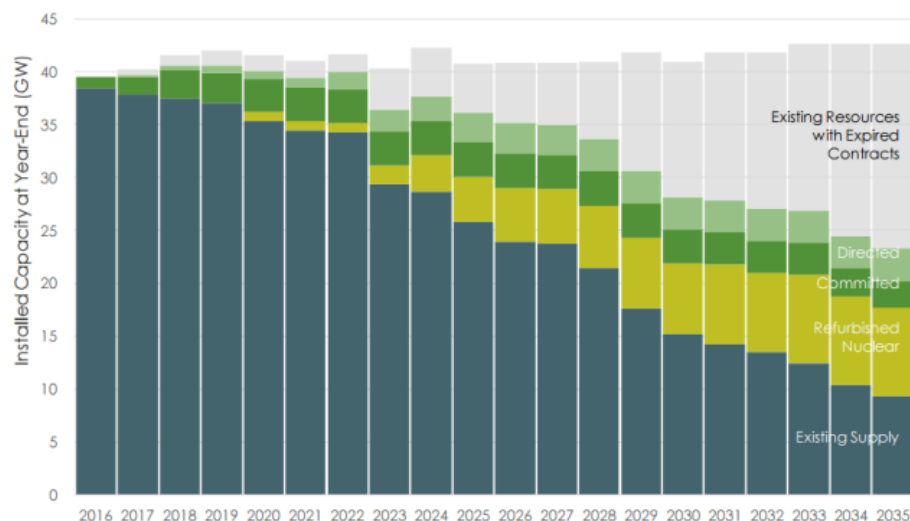
- Climate Change Action Plan (CCAP)
 - In June 2016, the government released its CCAP, which includes a number of policy objectives to encourage reductions in the use of fossil fuels in Ontario.
 - On January 1, 2017, the Province implemented a cap and trade program. This is a flexible, market-based program that will be a cornerstone in Ontario's fight against climate change.

Current Energy Policy in Ontario

- IESO Market Renewal
 - The IESO has begun a Market Renewal initiative to redesign the province's electricity markets. Market Renewal will enable the province to more efficiently meet demand over the near and longer terms.
 - This undertaking is expected to save up to \$5.2 billion between 2021 and 2030, and forms a key component of the government's plan to bring down the cost of electricity.
 - Market Renewal initiatives include: single-schedule day-ahead market, enhanced real-time unit commitment, more frequent intertie scheduling, and incremental capacity auction.

Future Direction of Ontario's Energy Policy

- The outlooks for electricity demand and supply are stable, but in the early-to-mid 2020s there is expected to be a shortfall in capacity due to nuclear refurbishments and expiring contracts.

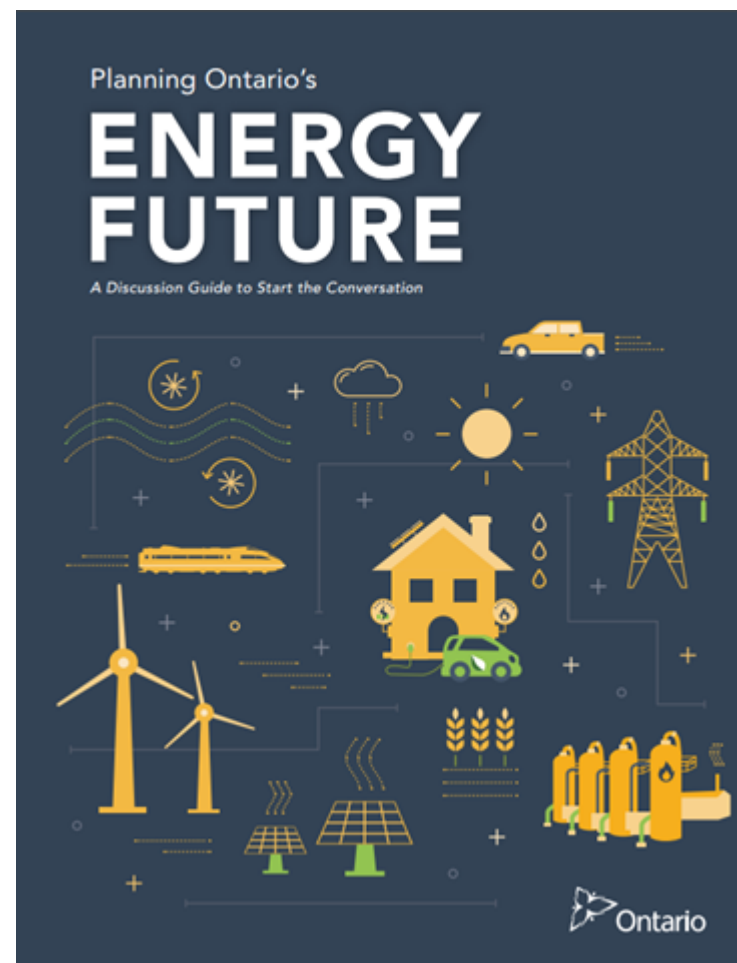


Source: IESO

- Market Renewal will allow existing and new generation facilities to compete in a robust market with clean imports, demand-side initiatives and new emerging technologies.
 - Market Renewal will be aligned with the objectives of Ontario's Climate Change Action Plan, and will be designed to meet system needs, reduce ratepayer costs and reduce GHG emissions.

2017 LTEP

- The 2017 Long-Term Energy Plan (2017 LTEP) will 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.
- The Ministry of Energy consulted and engaged with Ontarians, First Nations and Métis communities and energy stakeholders to get views on the choices that need to be made for Ontario's energy future.



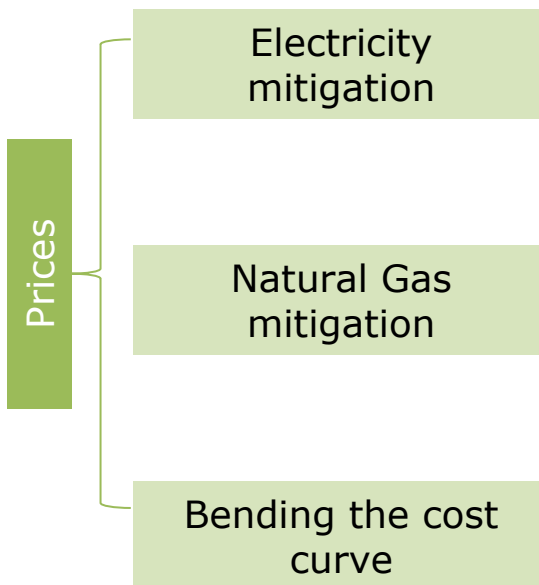
2017 LTEP – Engagement Map

- The Ministry of Energy has held consultations and engagement sessions with Ontarians, First Nations and Métis communities and energy stakeholders across the province.



Produced by Ontario Ministry of Energy, December 2016

What We Heard – Prices



- **Cost Certainty:** Homes/businesses want predictability of costs.
- **Delivery Charge:** Customers not aware what it covers. Unfair that it varies across province.
- **Industrial Competitiveness:** Prices are putting Ontario at a competitive disadvantage in attracting investment. Need more support for all sizes of businesses.
- **LDC Issues:** Customers identifying rising costs; challenge for utilities as they account for ~15% of bill.
- **Support from Tax-Base:** More funding is needed from tax base given supply mix/costs are locked in.
- **Engagement/Communication:** More efforts are needed to explain the different components of bill, why they have gone up and what support programs are available for different customer groups.
- **Utilize Existing Assets:** Government should re-contract with existing supply as contracts expire through competitive price auctions.

What We Heard – Supply (Partial List)



2017 LTEP – Process

- The 2017 LTEP will be developed through the following four stage process:



Phase 1 Technical Reports

Publication of two technical reports on the current state of Ontario's electricity and fuels sectors, each of which also contain 20-year outlooks to guide LTEP engagement and development.



Phase 2 Engagement

The Ministry of Energy is actively seeking feedback from stakeholders and the public through in-person sessions, online tools, and the *Environmental Registry*.



Phase 3 Development

The Ministry of Energy has reviewed feedback collected through the LTEP engagement phase as well as information provided in the technical reports to develop the LTEP.

We are here

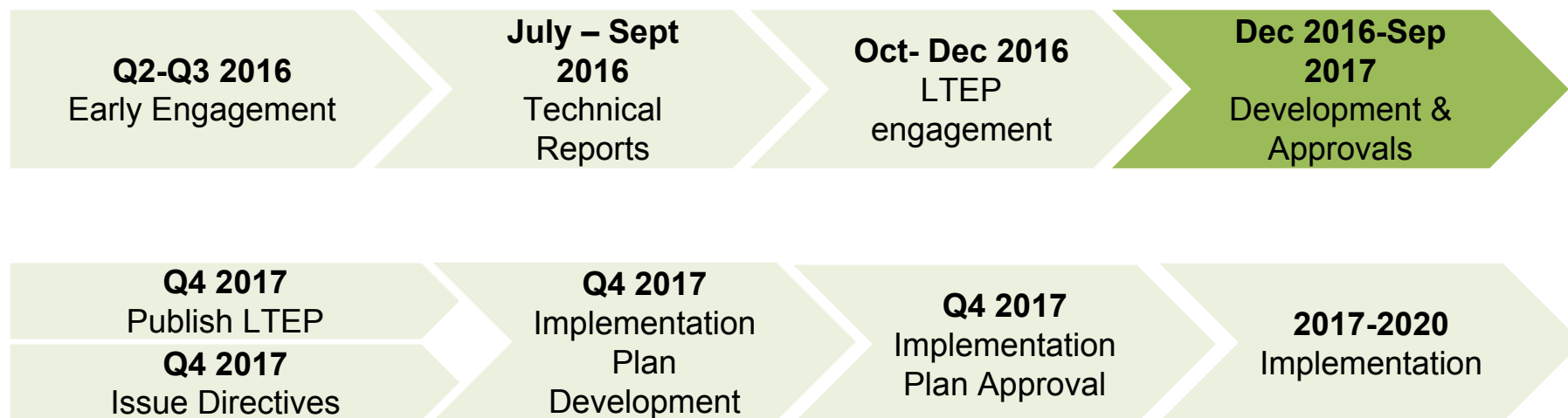


Phase 4 Implementation

The Ministry of Energy's agencies, the Independent Electricity System Operator (IESO) and Ontario Energy Board (OEB) will develop plans for implementing the LTEP's objectives.

2017 LTEP – Timelines

- The Ministry of Energy is developing 2017 LTEP. This process will include:



Questions?

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