

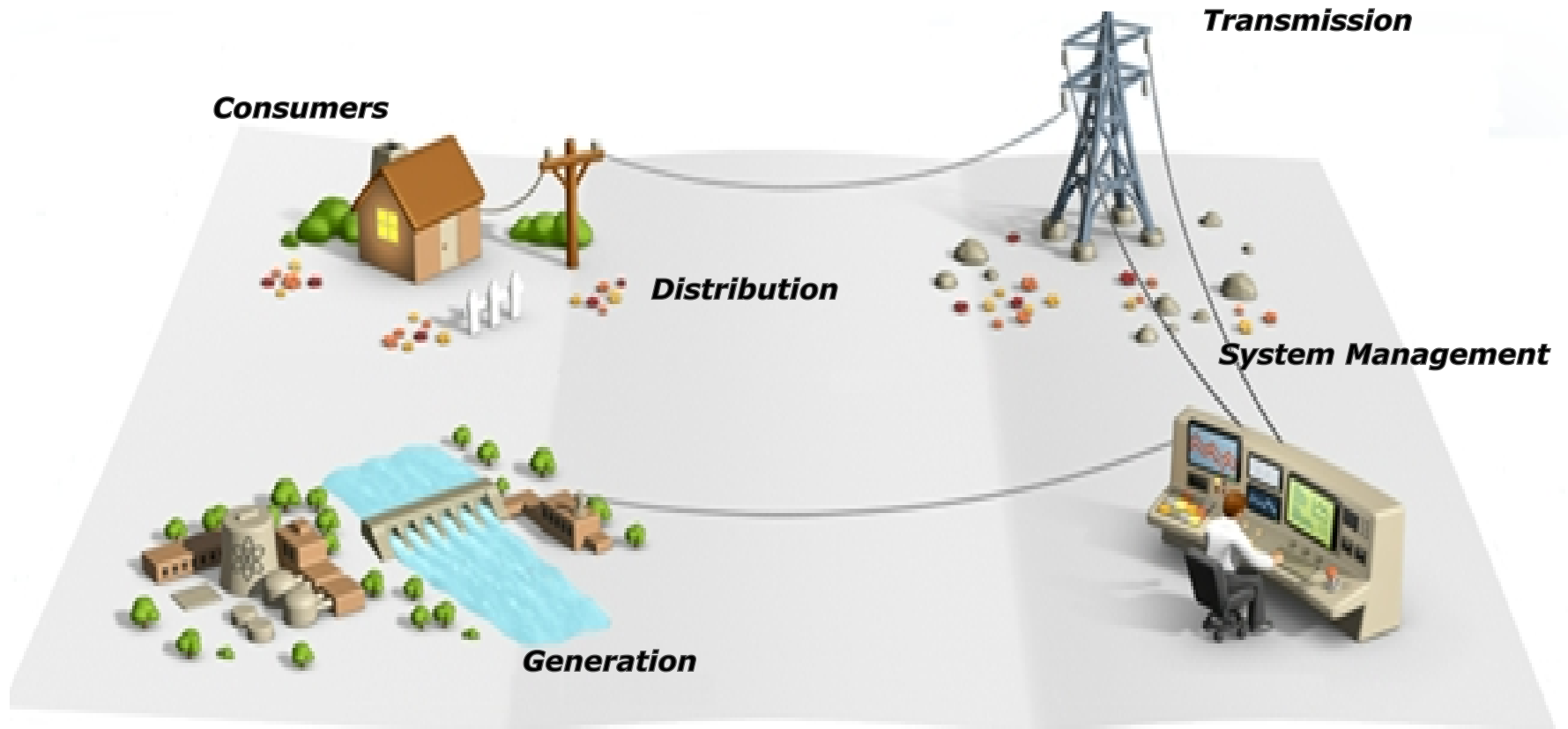
Energy in Ontario

Queen's University

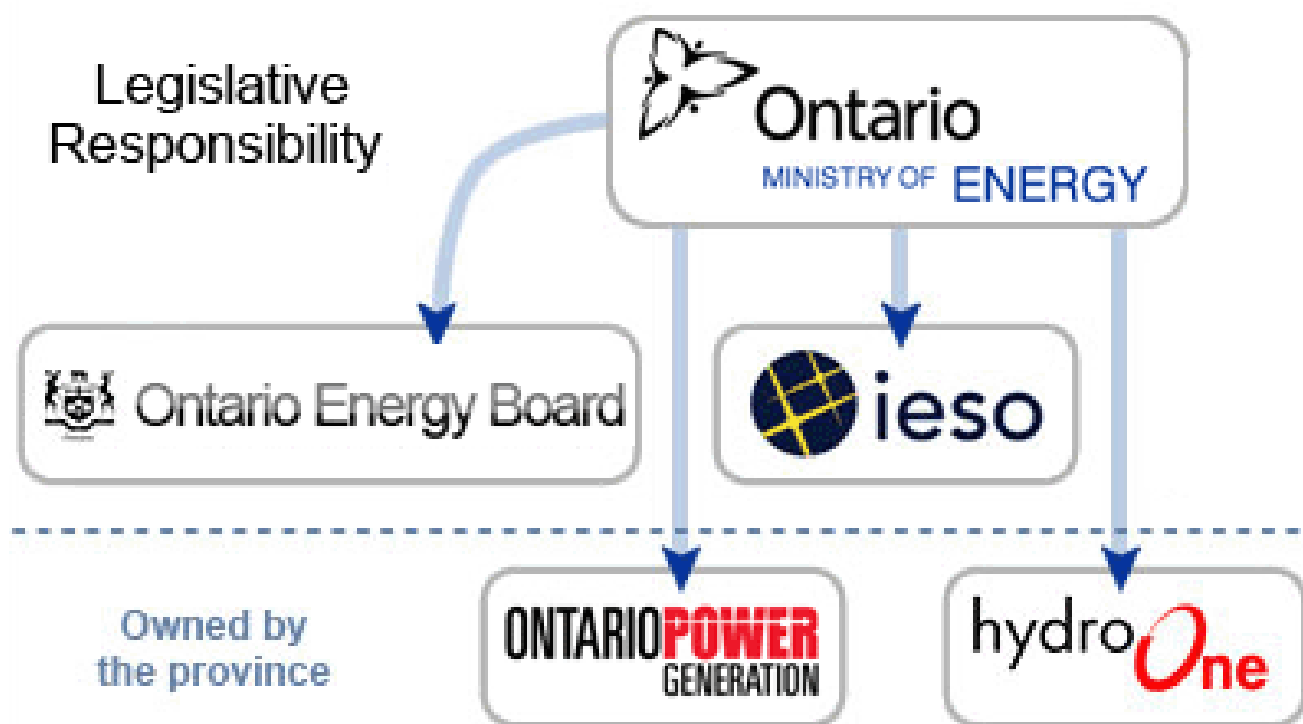
May 17, 2018

Sector Overview

Ontario's Electricity System



Industry Key Players – Agencies and Corporations



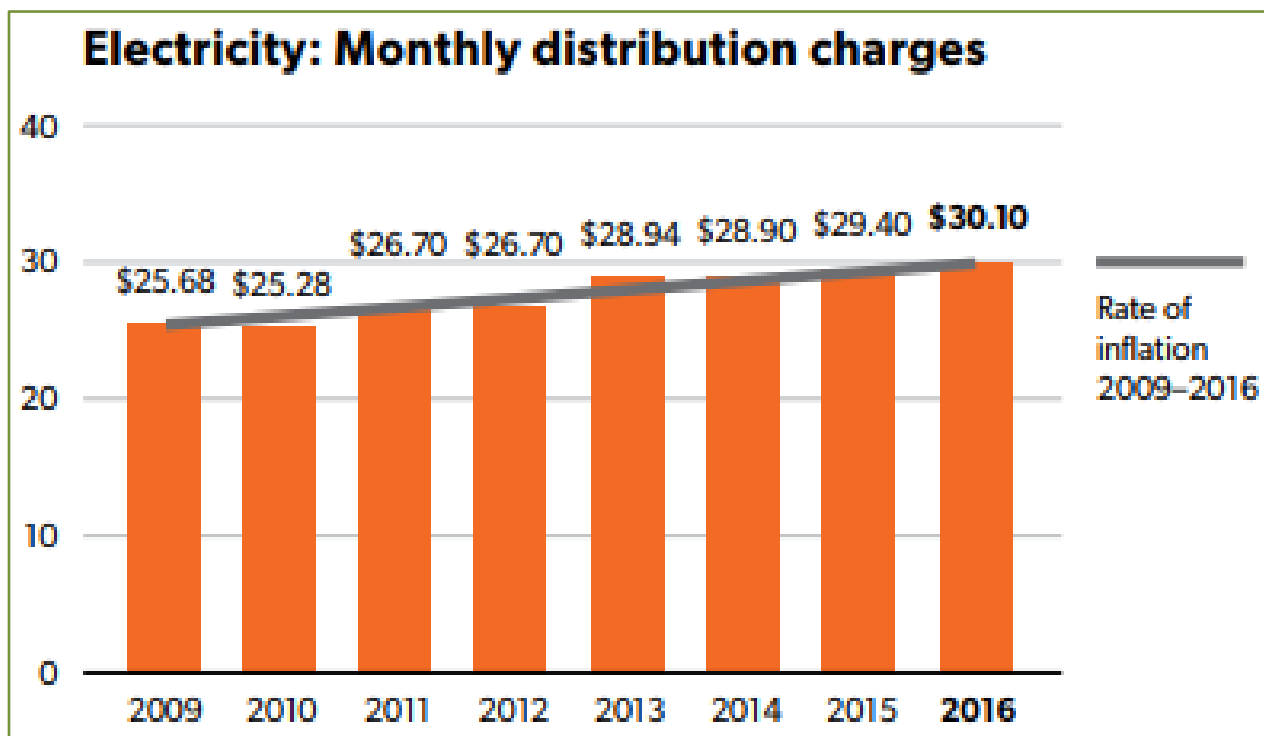
Through privatization, government's stake in Hydro One has been reduced to approximately 47.4%. (Jan 2018)

Ontario Energy Board (OEB)



ONTARIO
ENERGY
BOARD

Key Facts	
Chair and CEO	Rosemarie Leclair
Full-time Employees	192 (2018/19 Budget)
Operating Budget	\$43.1 millions

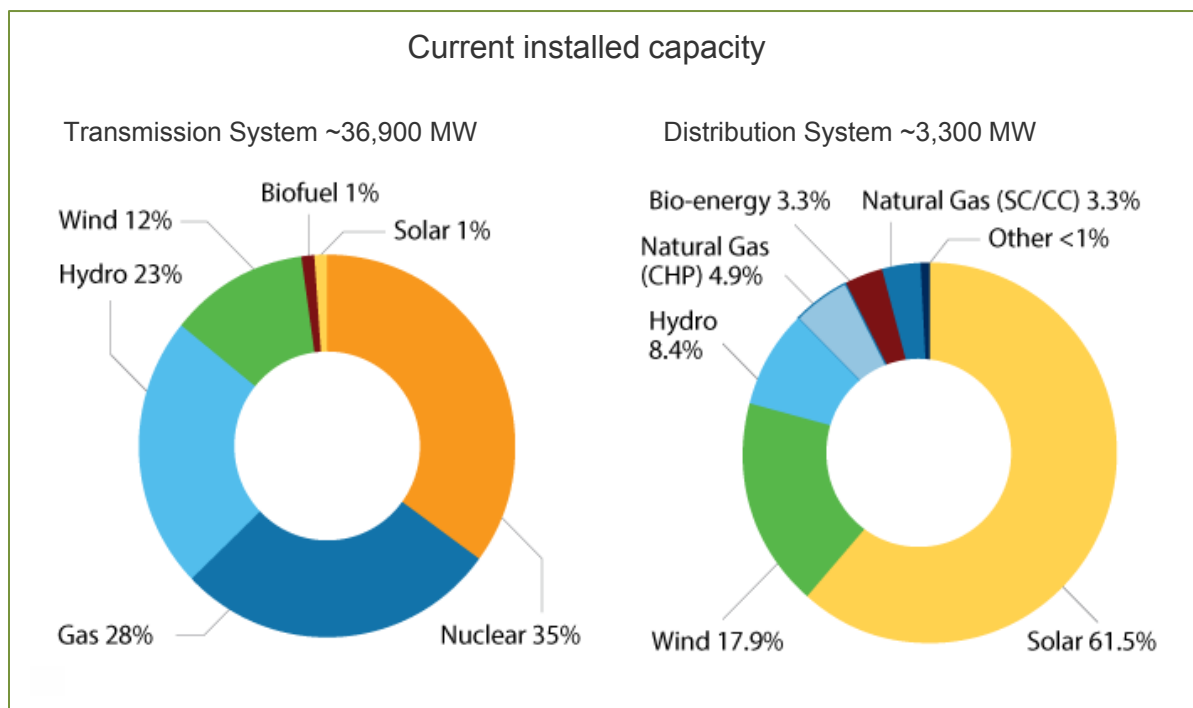


Source: OEB 2016-2017 Annual Report

Independent System Electricity Operator (IESO)



Key Facts	
Chair of Board	Tim O'Neill
CEO	Peter Gregg
Full Time Employees	712 (2017 year end)
Expense Budget	~\$191 million (2017)

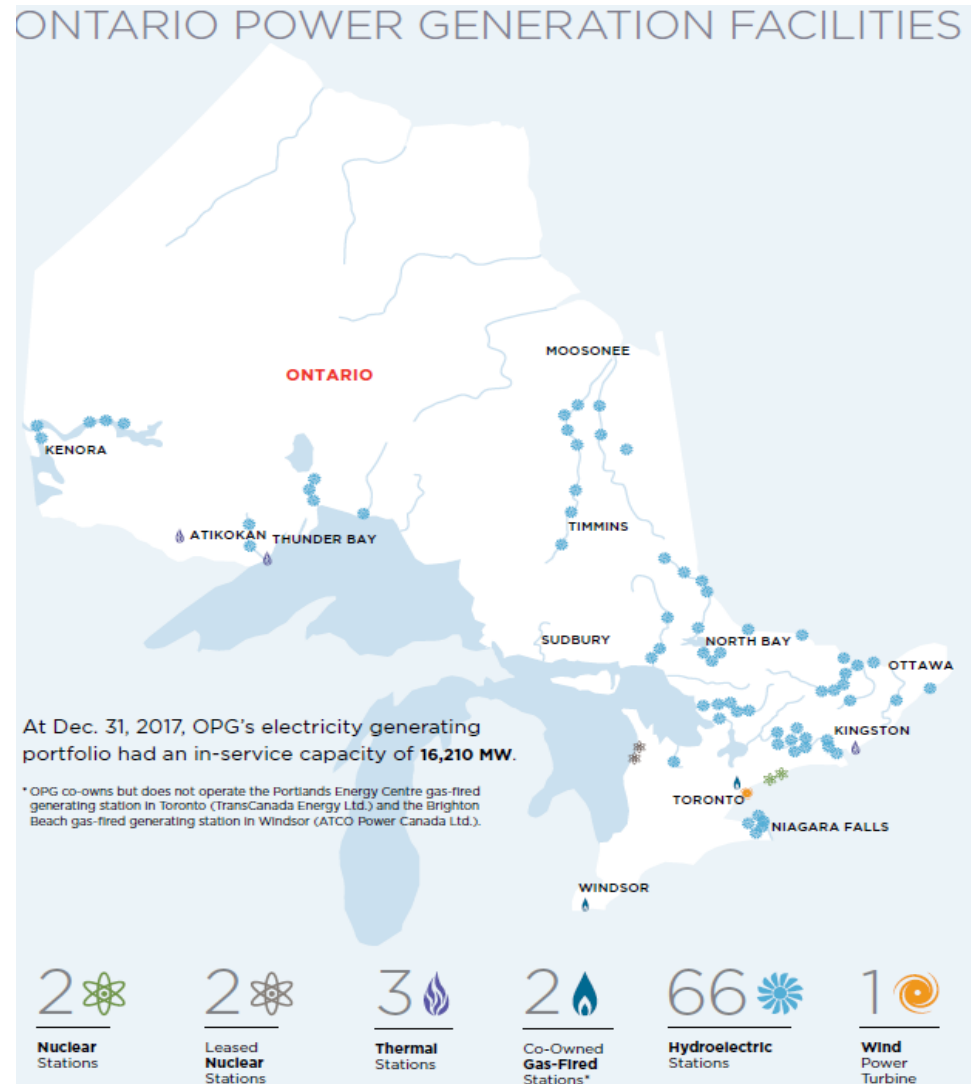


Source: IESO 18 Month Outlook, April 2018 to September 2019

Ontario Power Generation (OPG)

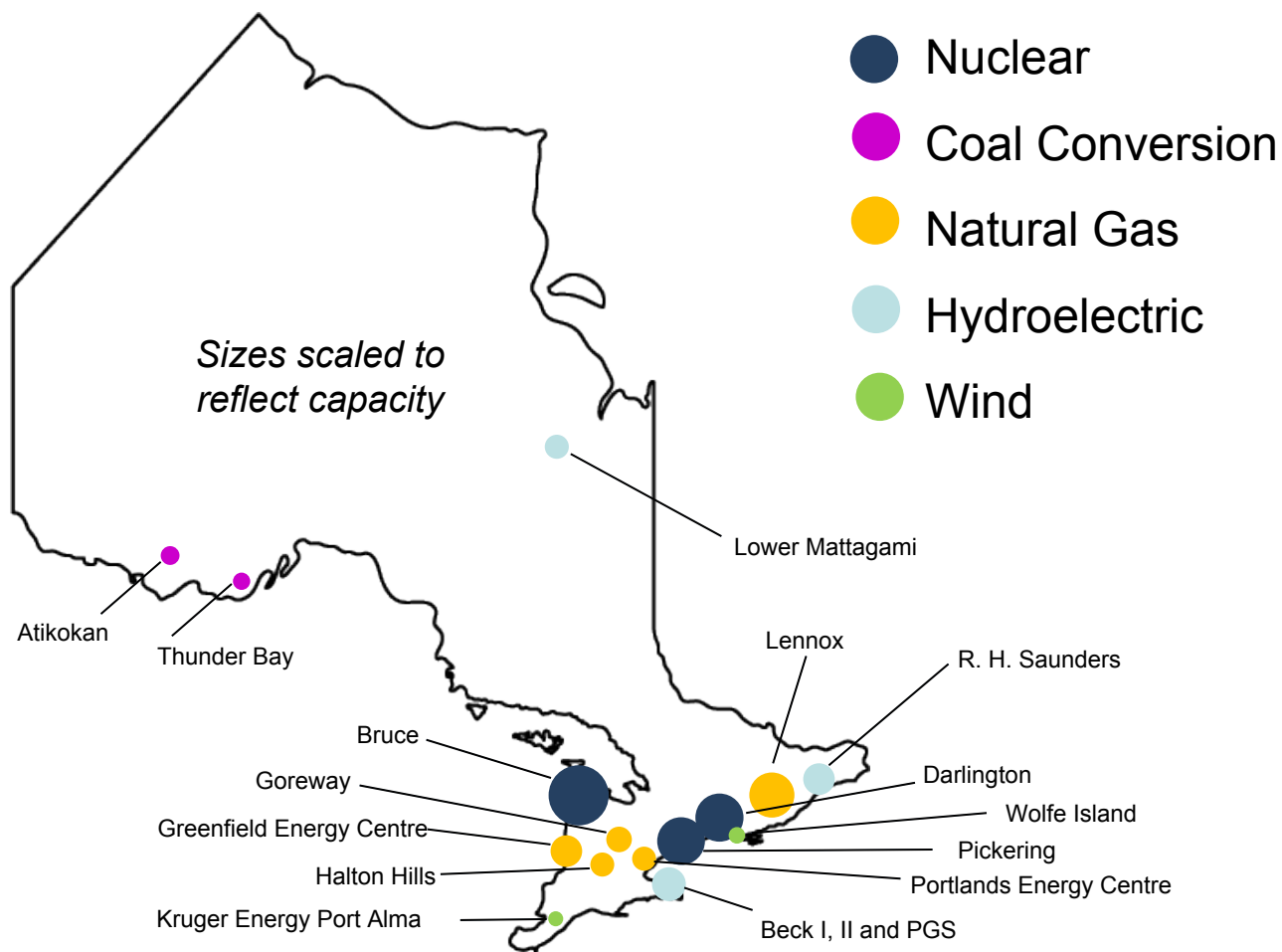
ONTARIOPOWER GENERATION

- OPG is the **largest electricity generator** in the province.
- The company is leading one of Canada's largest infrastructure projects, **the refurbishment of Darlington Nuclear Station.**
- The company is **100% owned by the Government of Ontario.**



Hydro One – add visuals

Ontario Electricity System - Large Generating Stations



Ontario Electricity System - Transmission Network



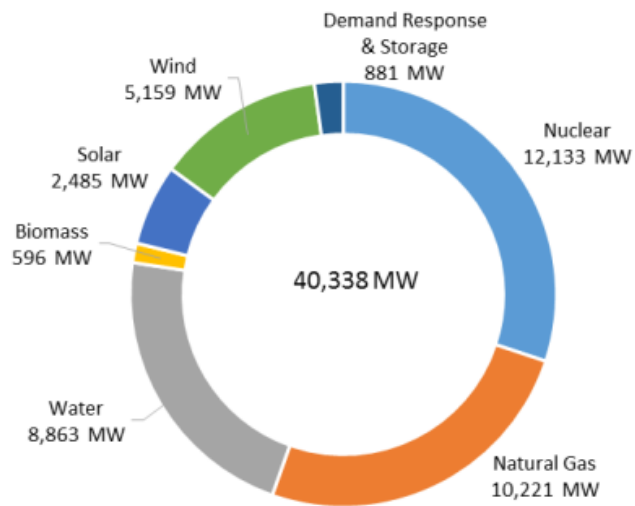
Ontario Electricity System - Transmission Network (cont'd)



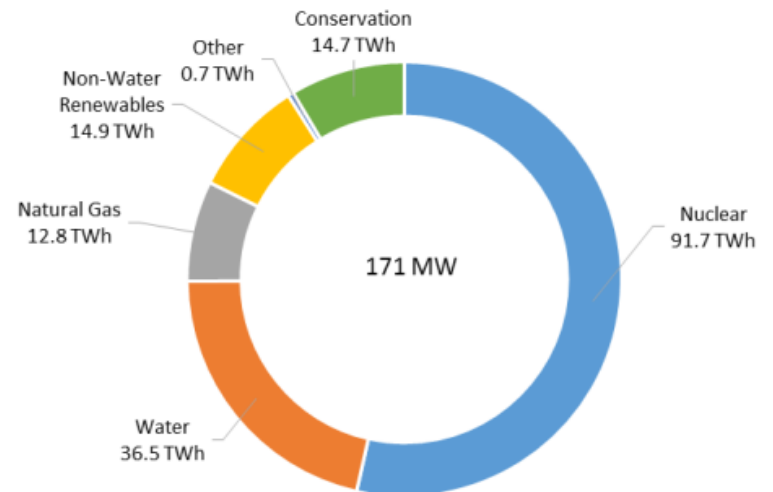
Energy Supply & Demand

Generation Types

Total Generation Capacity, 2017 (MW)

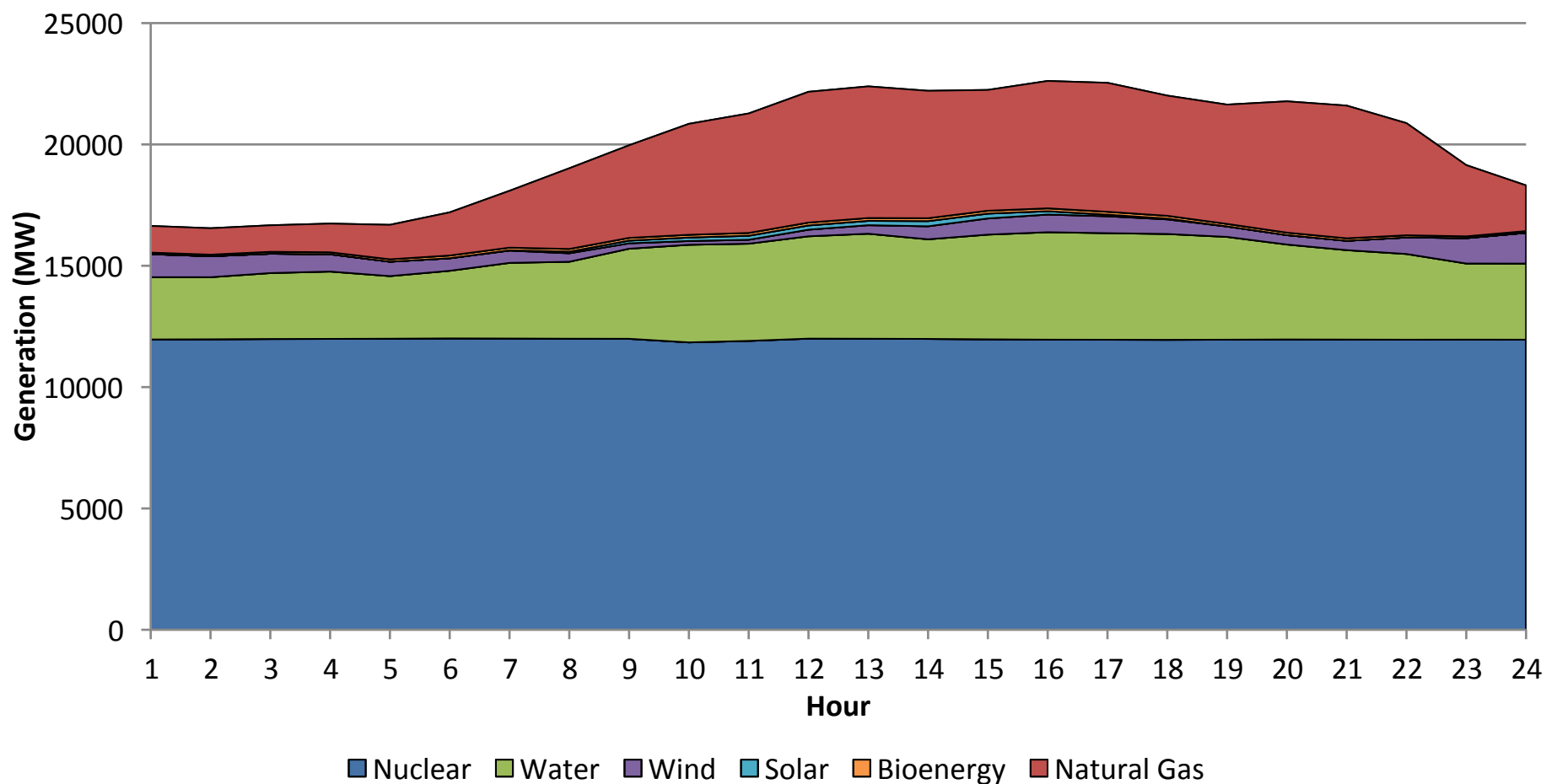


Ontario's Electricity Generation & Conservation, 2016 (TWh)



Source: Independent Electricity System Operator, Ministry of Energy

Electricity Generation On a Hot Summer Day



Transmission-connected generation on September 7, 2016.

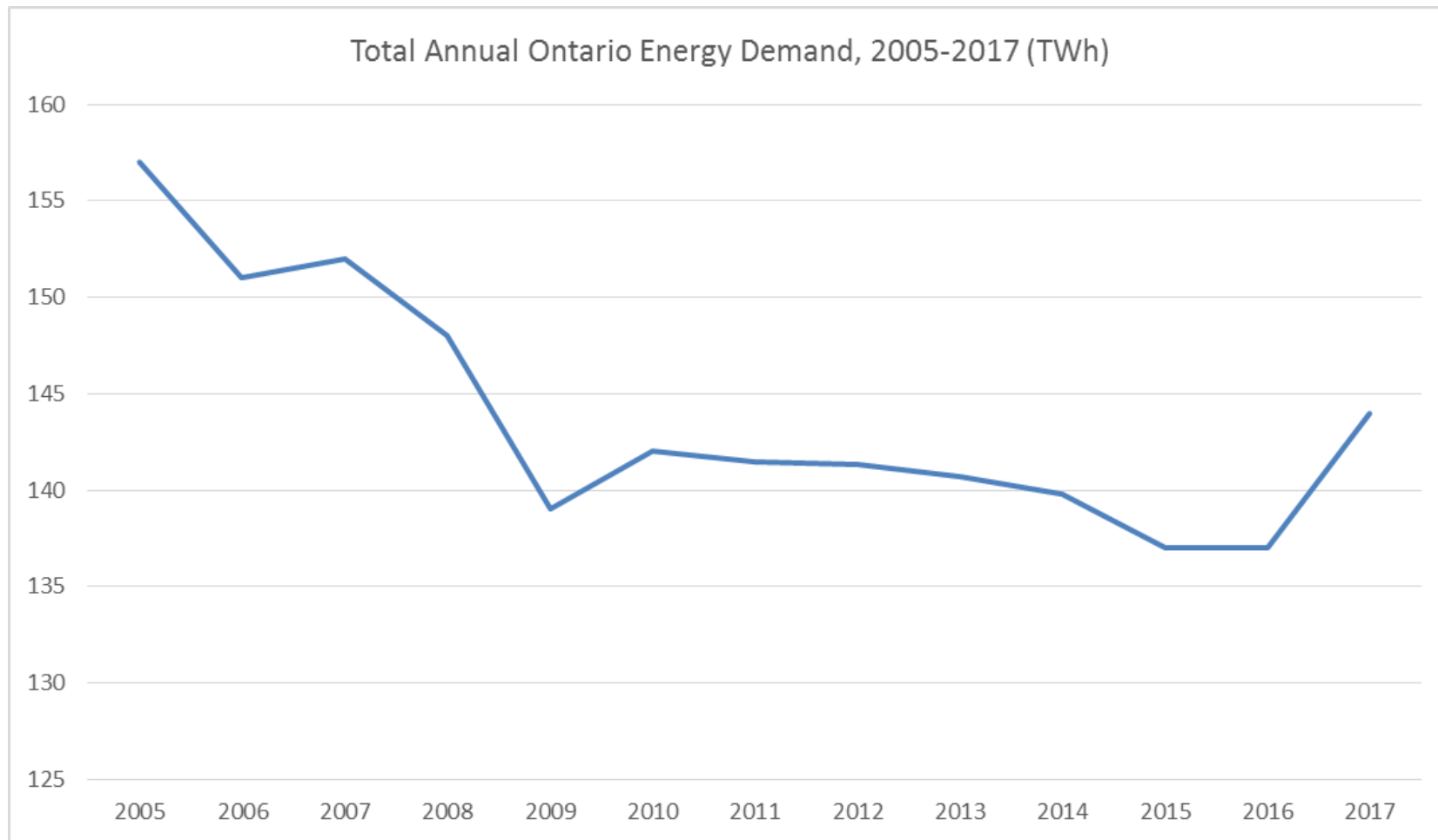
Source: Ministry of Energy

Electricity Demand Through the Day



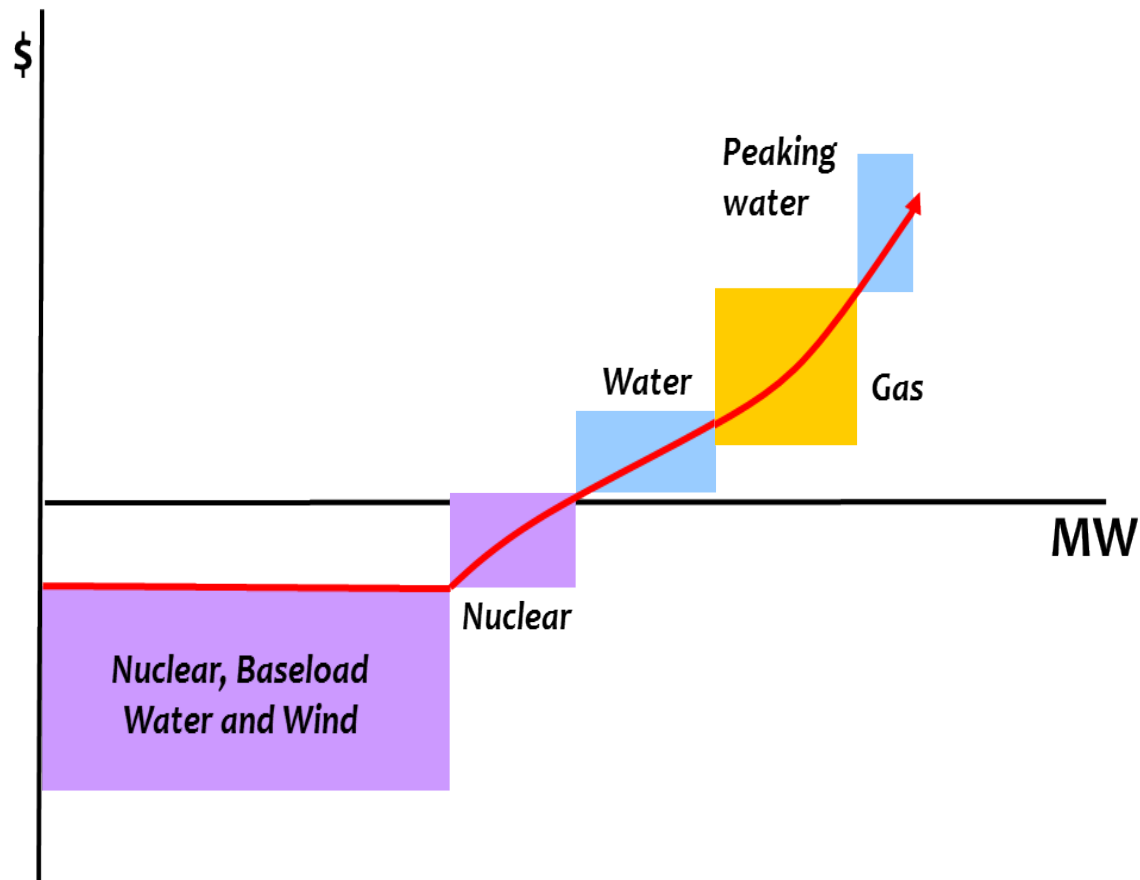
Source: Ministry of Energy

Annual Demand



Source: IESO

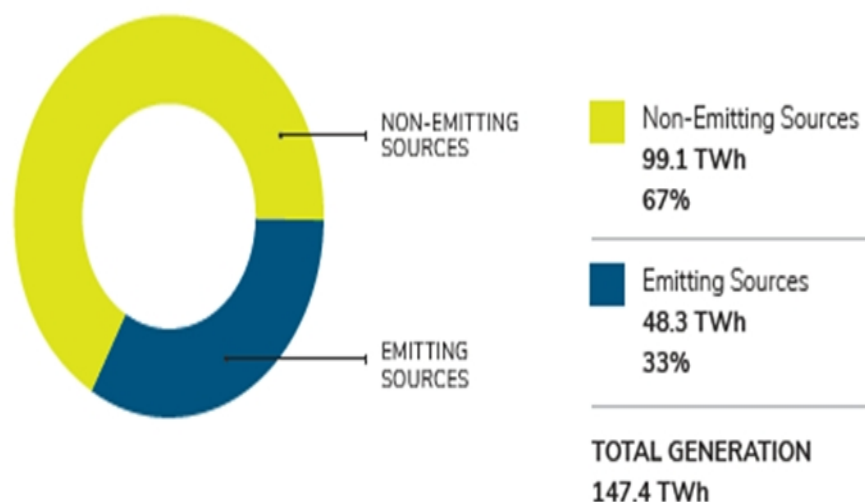
Demand and Supply Balancing



Source: Ministry of Energy

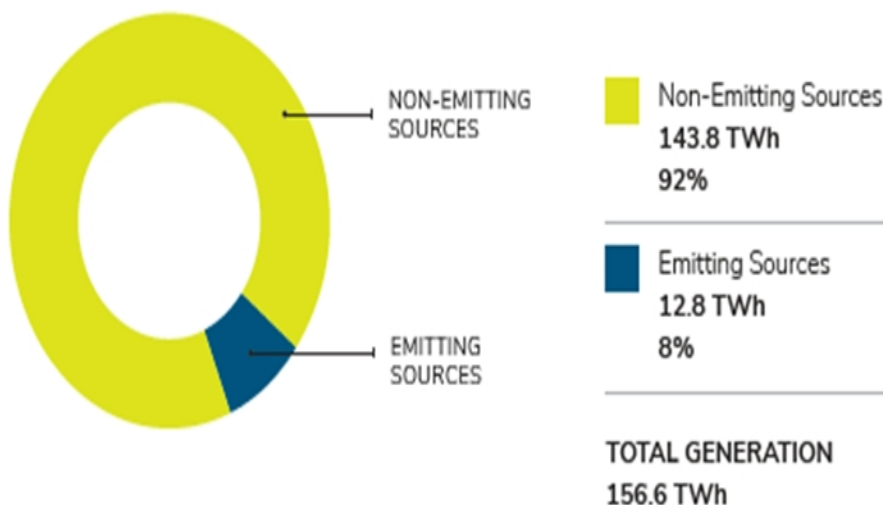
Total Generation by Emitting and Non-Emitting Sources

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



Source: IESO

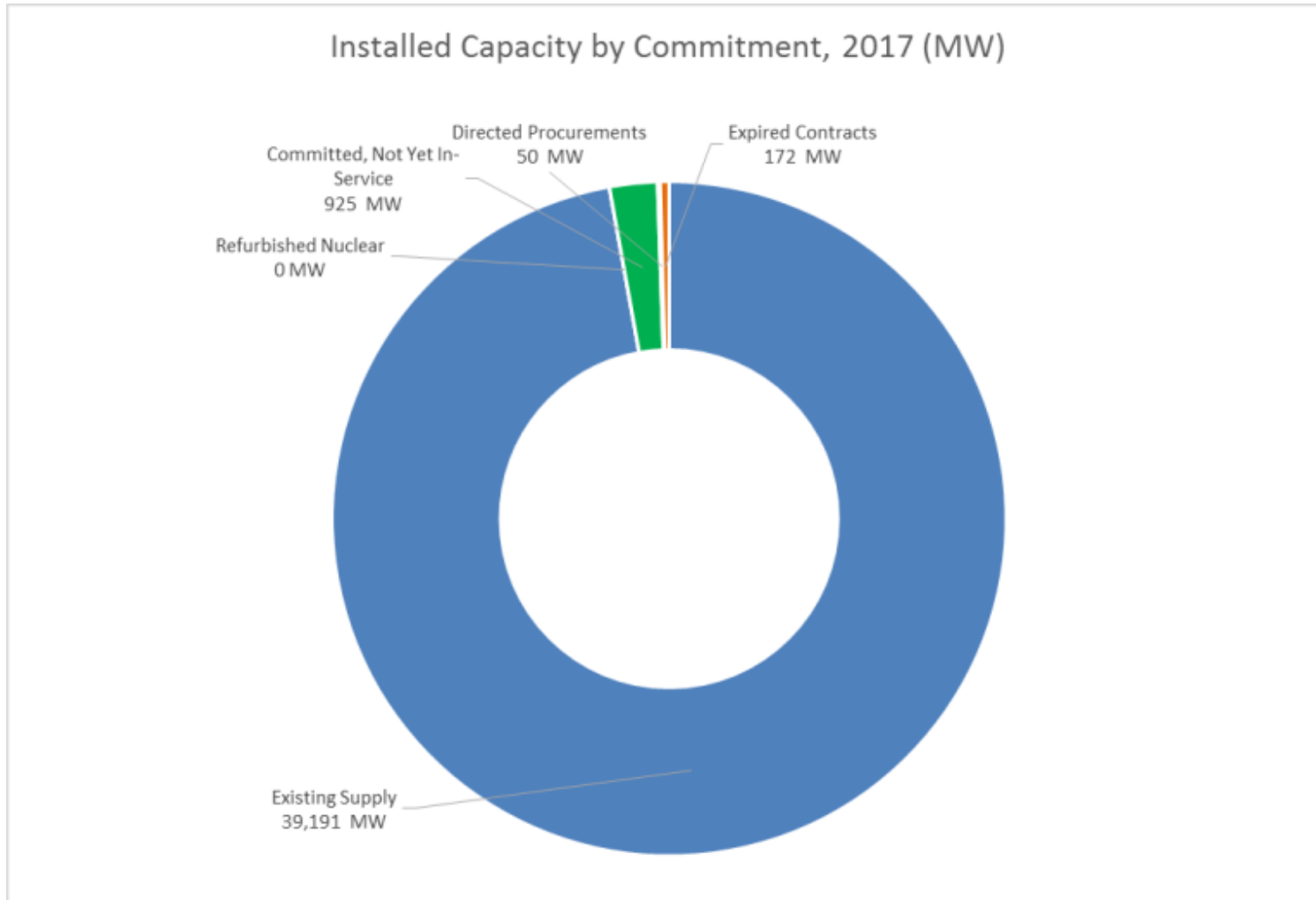
2016 Total Generation By Emitting and Non-Emitting Sources (TWh)



Source: IESO

Source: LTEP Pg. 19, Fig. 1 & 2

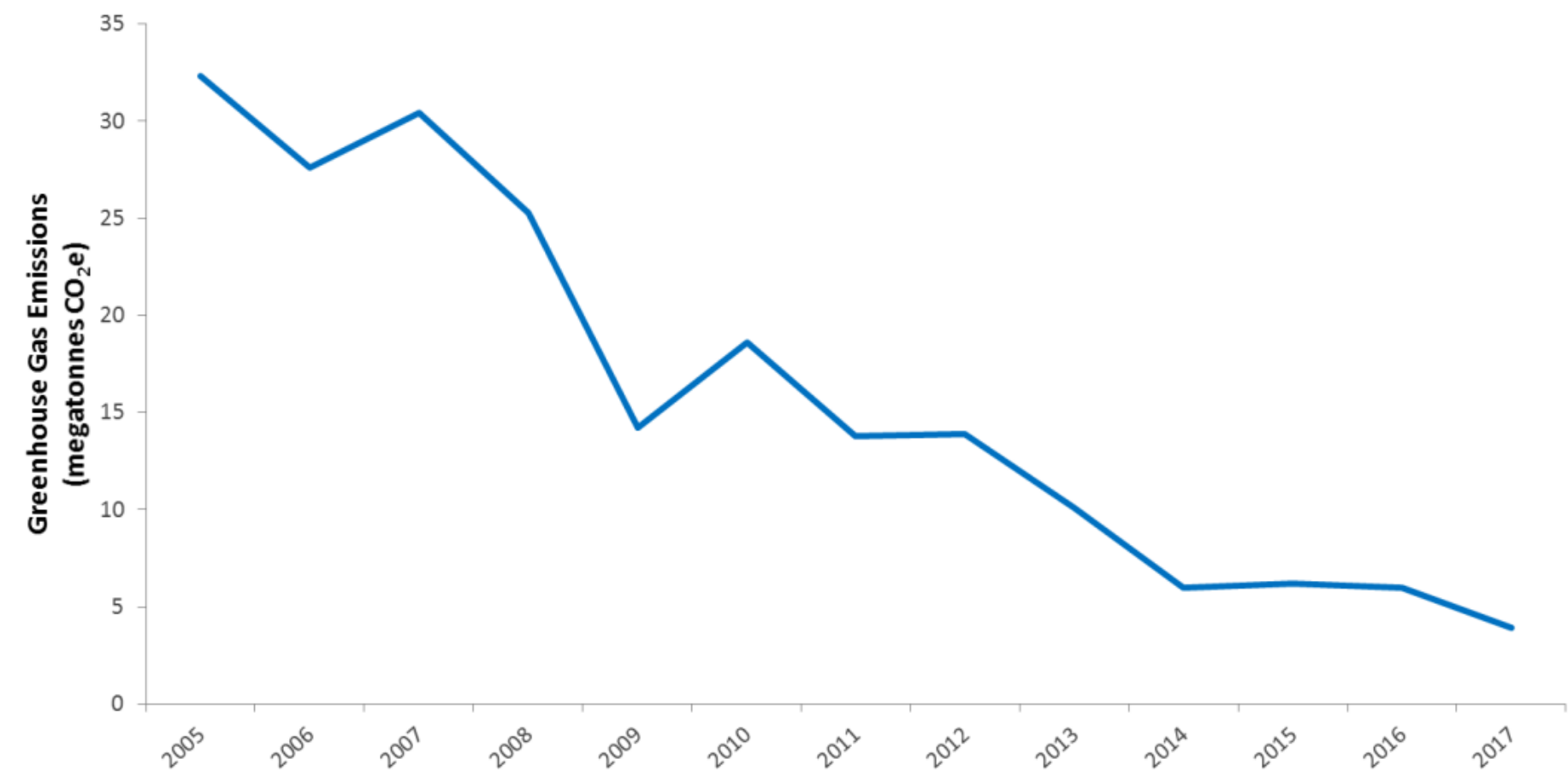
Installed Capacity



Source: Independent Electricity System Operator

Emissions

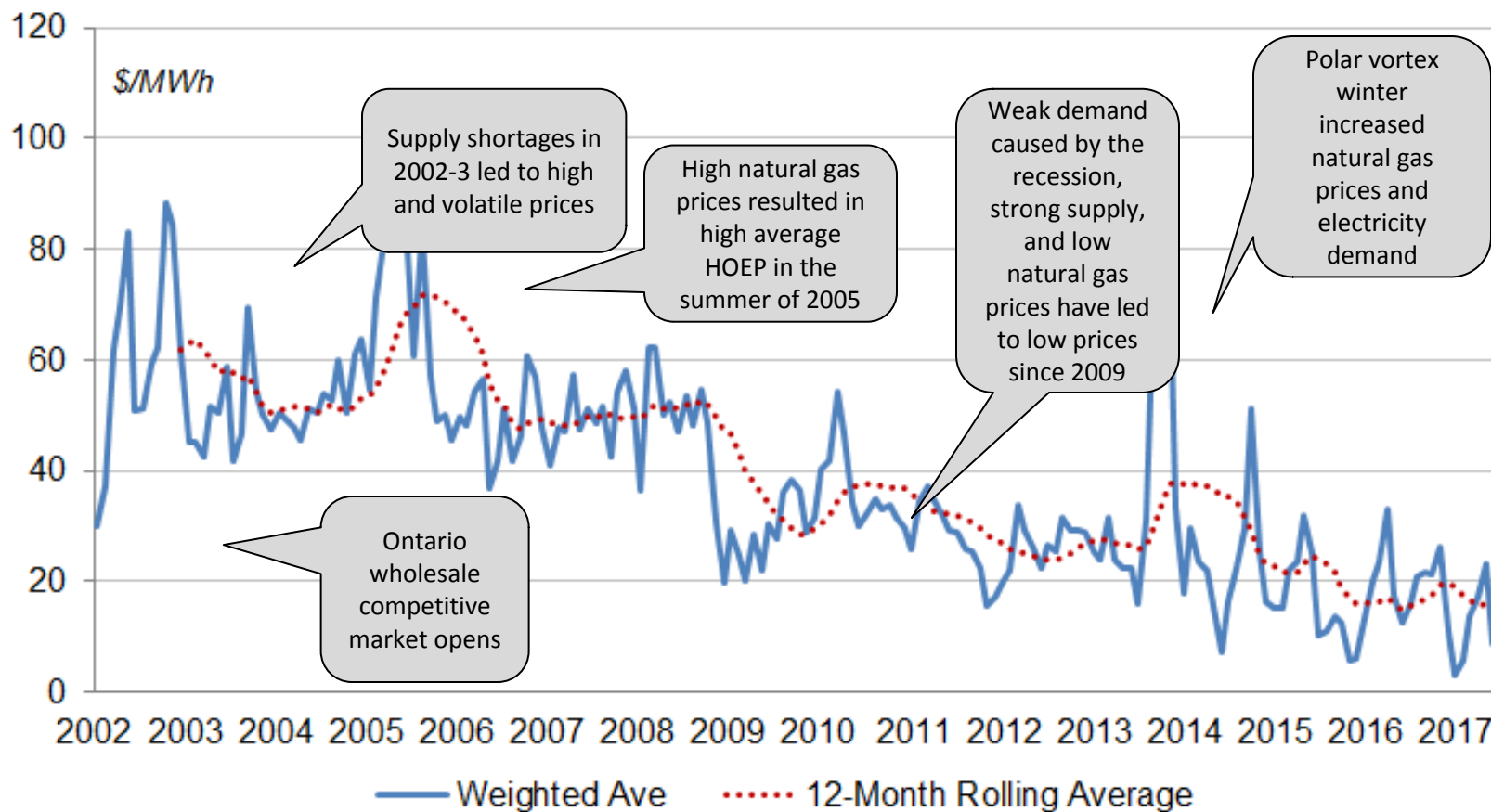
Electricity Sector GHG Emissions, 2005-2017



Source: Ministry of Energy

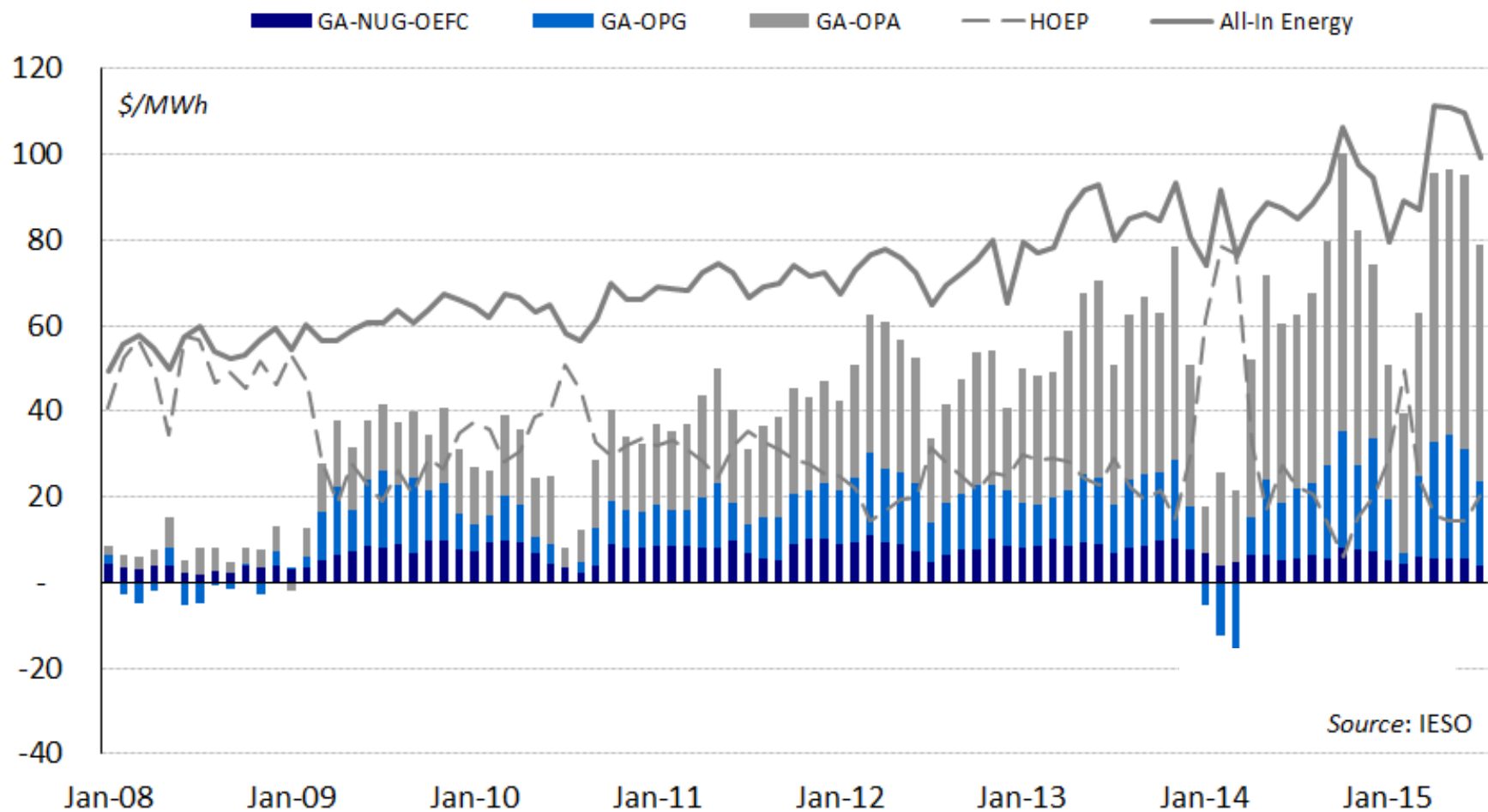
Historical Market Prices

Weighted Monthly Average Hourly Ontario Energy Price



Source: Ministry of Energy

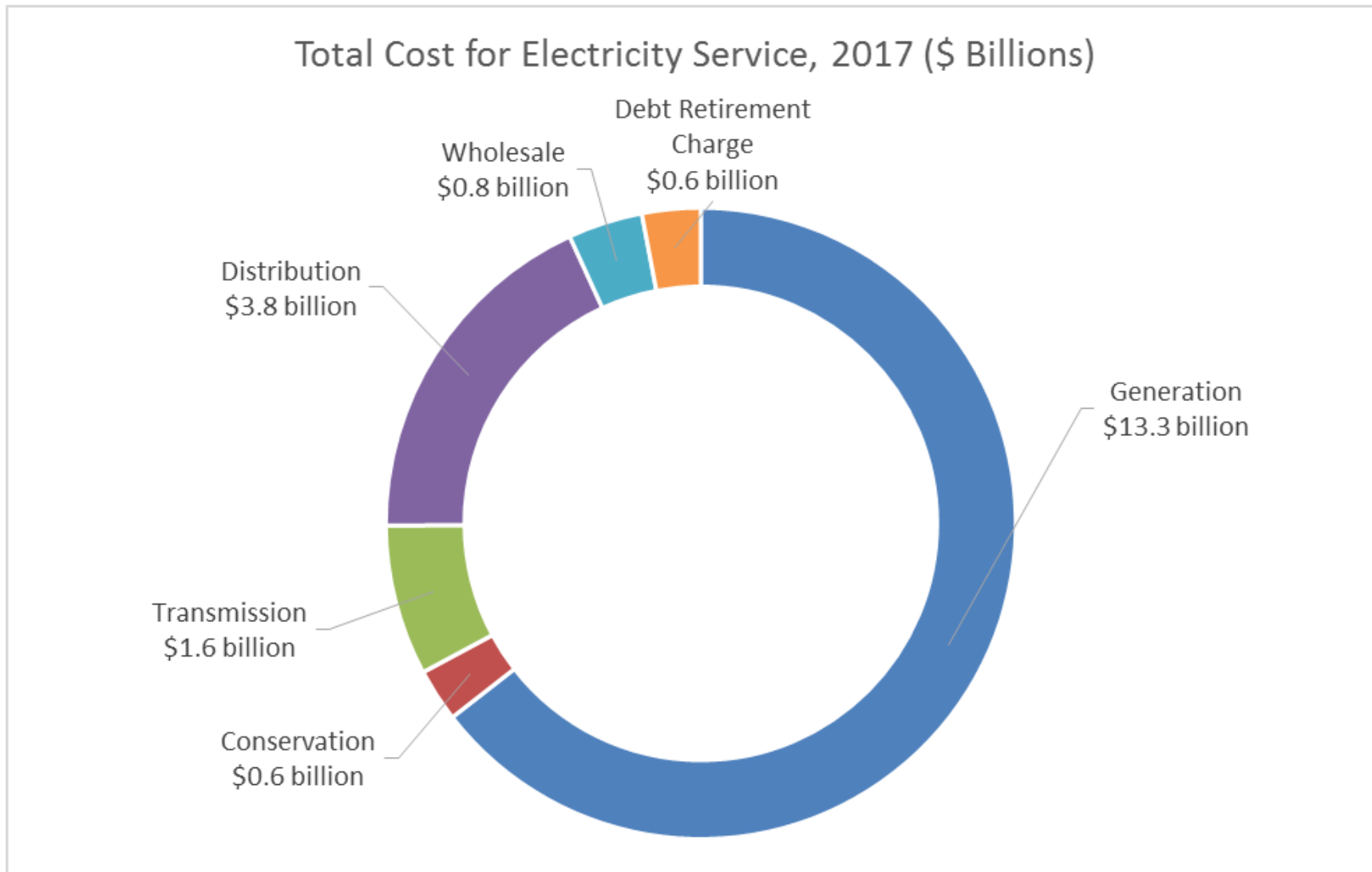
Global Adjustment Components



Source: IESO

Source: IESO

System Costs



Source: IESO & Ministry of Energy, 2017 LTEP

Residential Consumers

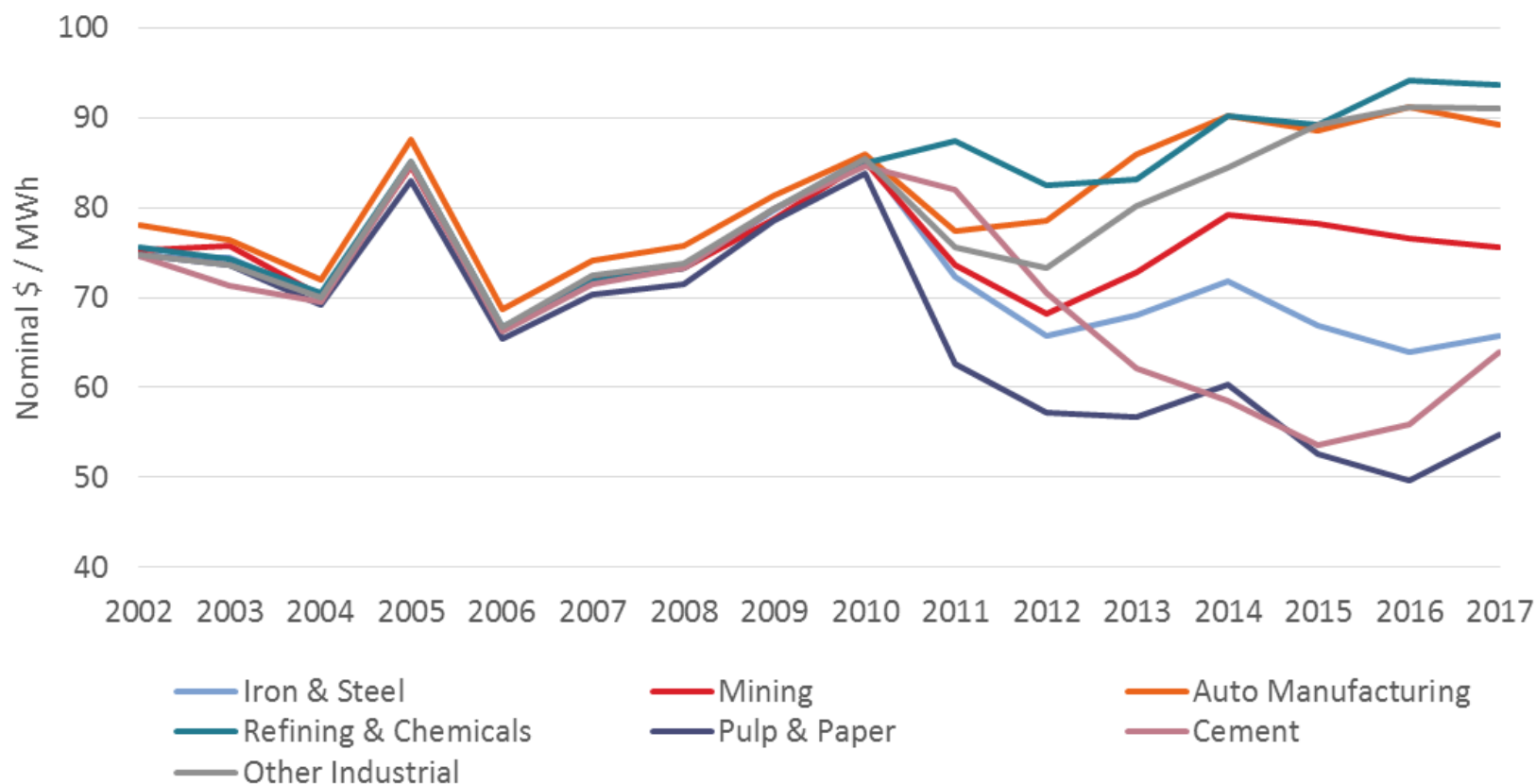


Source: Ontario Energy Board

TOU price period	Winter hours	TOU prices effective July 1, 2017 through April 30, 2018
Off-Peak	Weekdays from 7 p.m. – 7 a.m. All day weekends and holidays	6.5 ¢/kWh
Mid-Peak	Weekdays 11 a.m. – 5 p.m.	9.5 ¢/kWh
On-Peak	Weekdays 7 a.m. – 11 a.m. and 5 p.m. – 7 p.m.	13.2 ¢/kWh

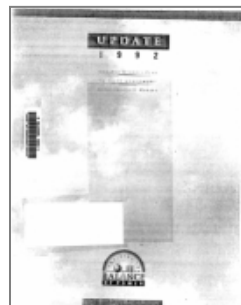
Large Consumers

Indicative All-In Electricity Price



Note: 2017 reflects year to date October
Source: Ministry of Energy

History of Electricity Planning in Ontario



1992:
Ontario Hydro issued a revised Supply/Demand Plan Report - *Providing Balance of Power: Update 1992*.

Aug 2007:
Ontario Power Authority files an application for approval of its first Integrated Power System Plan (IPSP) with Ontario Energy Board. The review was suspended in late 2008.

Dec 2013:
Ministry of Energy releases its 2013 Long- Term Energy Plan (2013 LTEP) – *Achieving Balance*.

1988

1992

2005

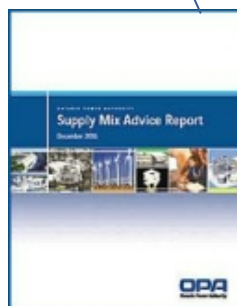
2007

2010

2013

2017

Dec 1988:
Ontario Hydro publishes its first 25-year Demand/Supply Plan (DSP) Report - *Providing the Balance of Power*.



Dec 2005:
Ontario Power Authority issues a Supply Mix Advice Report in response to the Minister of Energy's request.

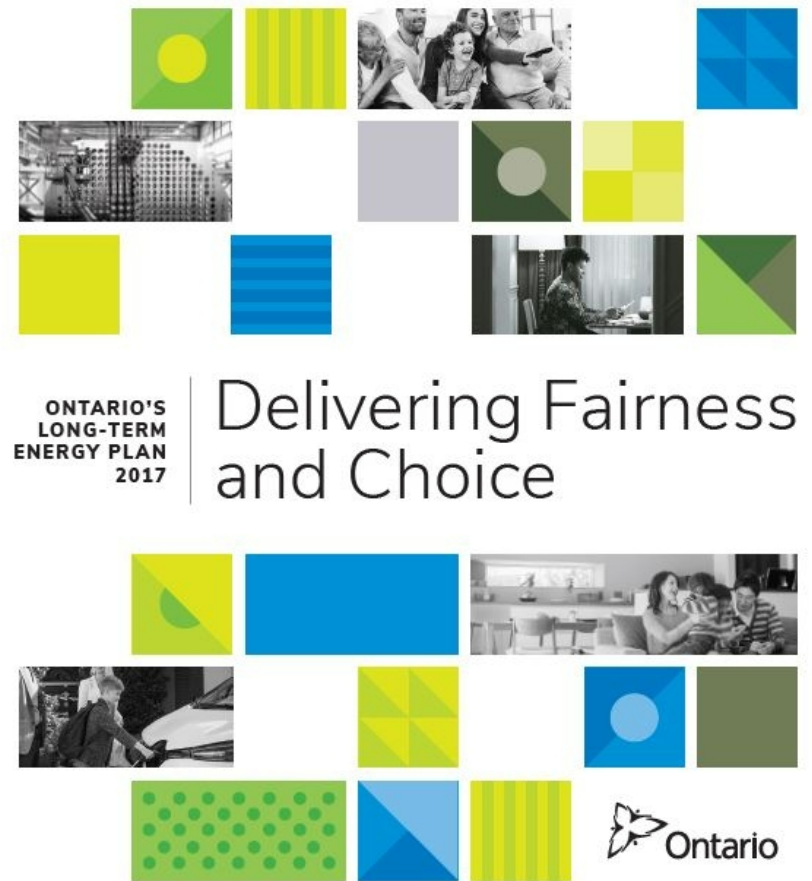


Nov 2010:
Ministry of Energy releases its 2010 Long- Term Energy Plan (2010 LTEP) – *Building Our Clean Energy Future*.



Oct 2017:
LTEP 2017 released.

2017 Long-Term Energy Plan



The Long-Term Energy Planning Process

- The LTEP Process
 - In 2016, the Ministry of Energy enshrined in the *Electricity Act, 1998* an enhanced process for developing Long-Term Energy Plans.
 - The process includes the following steps:
 - Release of technical reports
 - Engagement Process
 - Development of LTEP and Implementation Directives
 - Implementation Plans

