



Projected Supply-Demand Balance in Ontario: A Call to Inaction

**APPPrO 2010 – Making Green Sustainable: Responsibly
Rebalancing the System**

**Presented by:
AJ Goulding, President
London Economics International LLC
ajg@londoneconomics.com
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This presentation provides an indicative outlook of how Ontario's electricity sector supply and demand may evolve over the next 10 years

- This outlook allows us to gauge when supply resources may be needed in Ontario under a number of different supply-demand scenarios
- Each supply-demand scenario is based on a projection of demand and specific assumptions regarding supply- and demand-side resources that are brought online over the forecast horizon

Step 1: Derive supply projections

- Four distinct supply projections created
- Based on 2010 existing supply plus a combination of one or more of the following: firm, contracted, refurbished nuclear, and additional FIT resources
- Sources: IESO 18-Month Outlook, IESO Ontario Reliability Outlook, OPG Annual Information Form 2009



Step 2: Derive demand projections

- Two demand projections were developed based on Ontario's real GDP growth forecast, the historical peak demand growth-real GDP ratio, and either
 - existing demand-side resources only or
 - demand-side resources tied to the OPA's conservation target of 6,300 MW by 2025
- Sources: IESO 18-Month Outlook, IESO Ontario Reserve Margin Requirement, IESO 2009 Comprehensive Review of Resource Adequacy, OPA's IPSP, Ministry of Finance

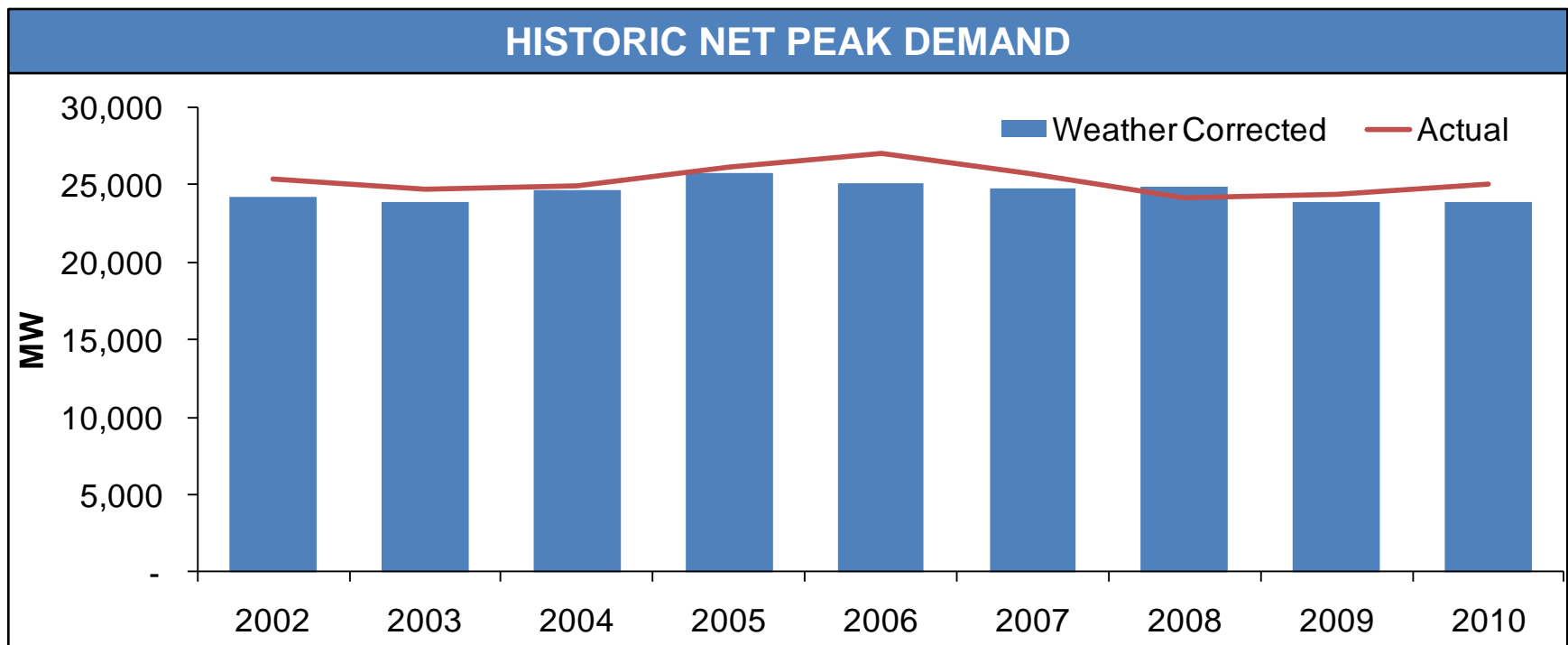


Step 3: Pair each demand and supply projection to create supply-demand scenarios

- Firm supply scenario is paired with 'as is' demand scenario without incremental conservation
- All other supply scenarios are paired with the baseline demand scenario with incremental conservation and linked to real GDP growth
- Required reserve margin until 2014 is based on IESO's forecasts and assumed to be 18% thereafter

The economic slowdown since 2008 has led to a sharp decline in electricity demand in Ontario

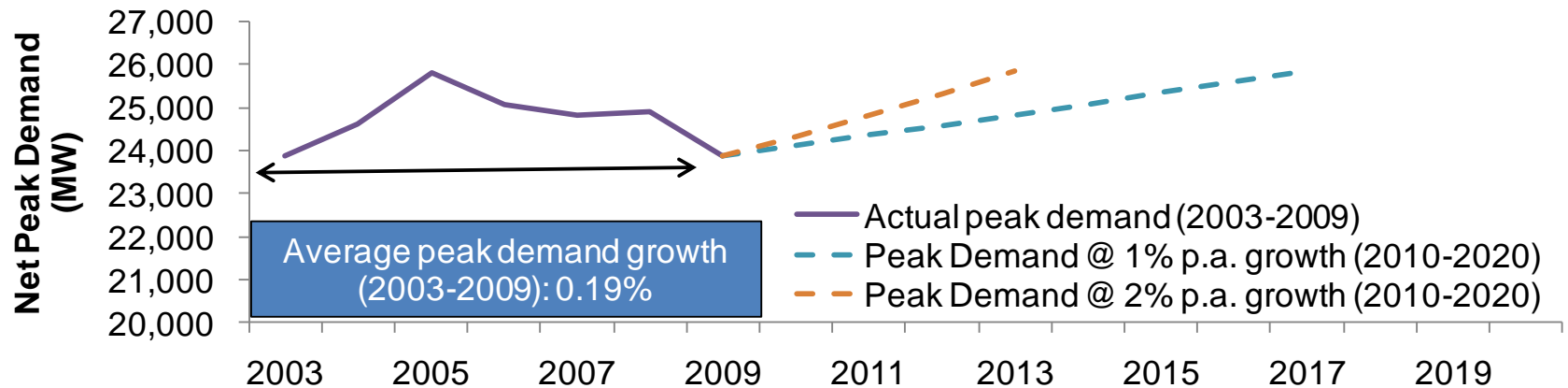
- Since 2008, weather corrected peak demand has dropped by approximately 1,000 MW
- In 2010 net peak demand in Ontario was 25,075 MW (23,916 MW weather corrected)
 - The decline is a result of the economic slowdown and an increase in demand-side resources (conservation and demand response)



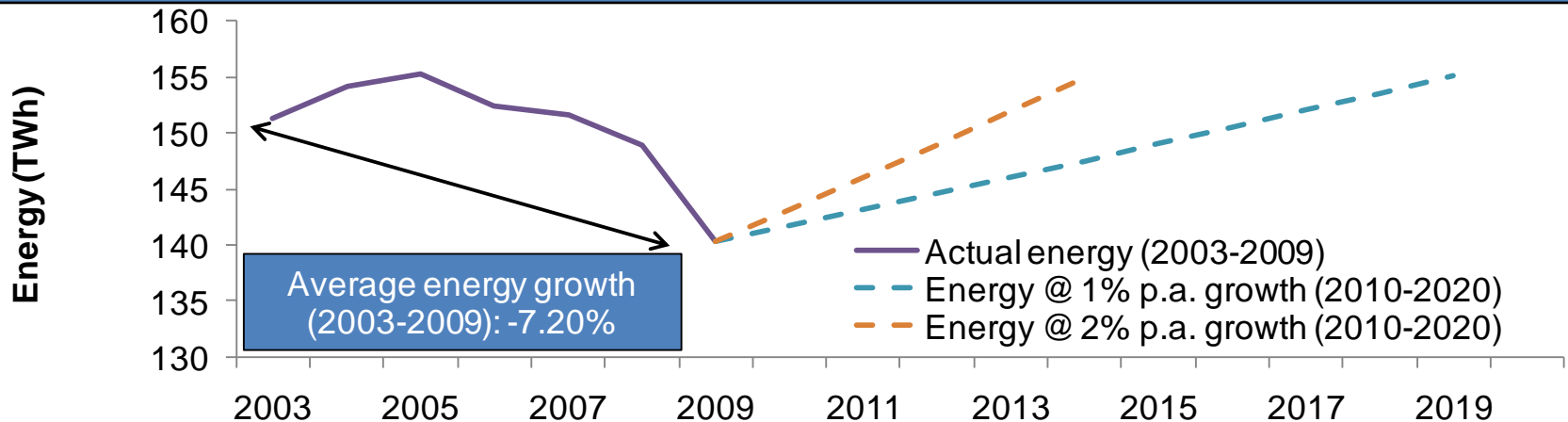
Notes: Industrial electricity demand as a proportion of total Ontario consumption has been declining over the past decade while commercial and residential demand have been rising as a proportion of total consumption.

Ontario needs robust growth over next decade to return to historic weather-normalized peak demand/energy levels

PEAK DEMAND

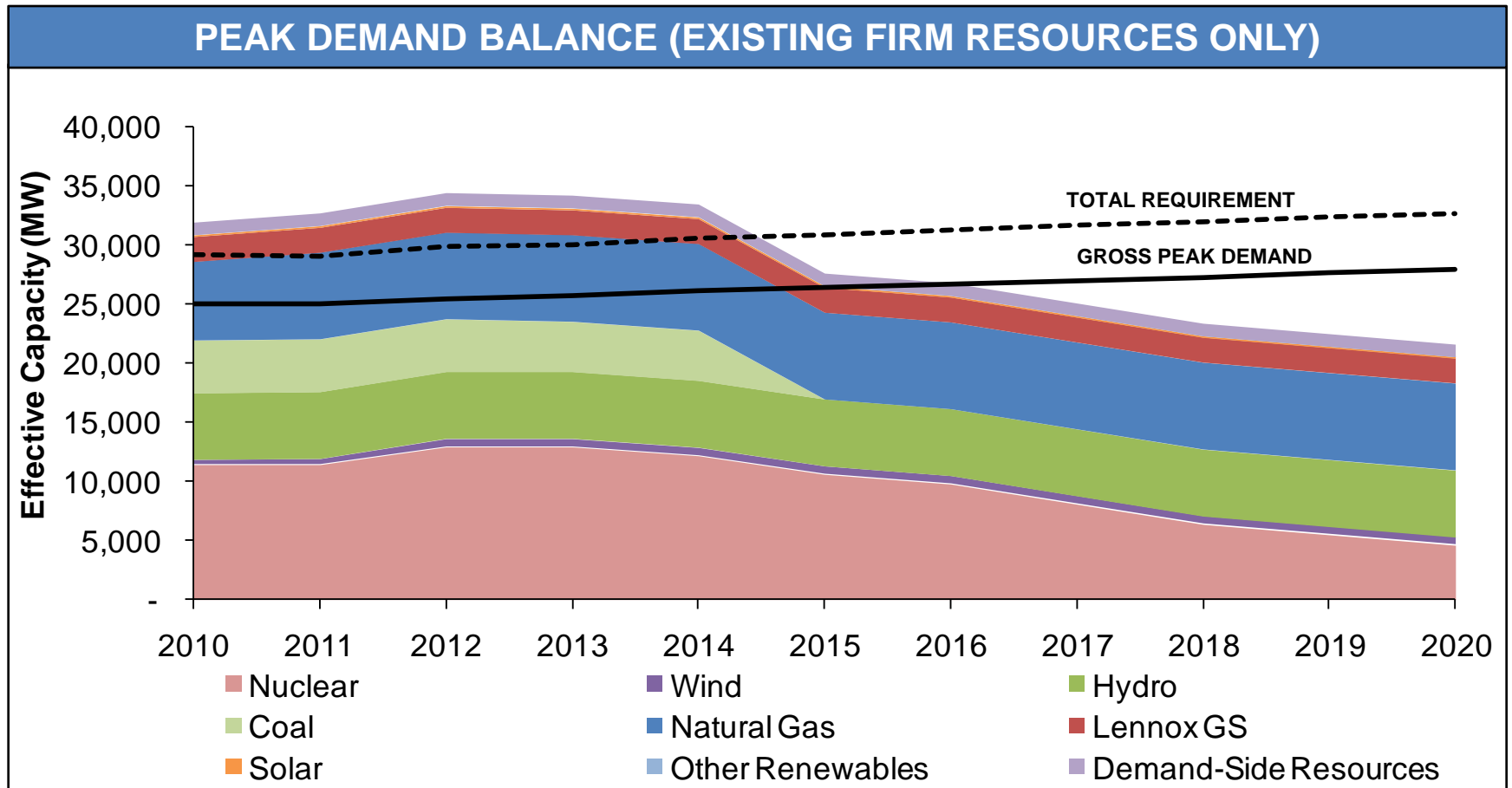


ENERGY



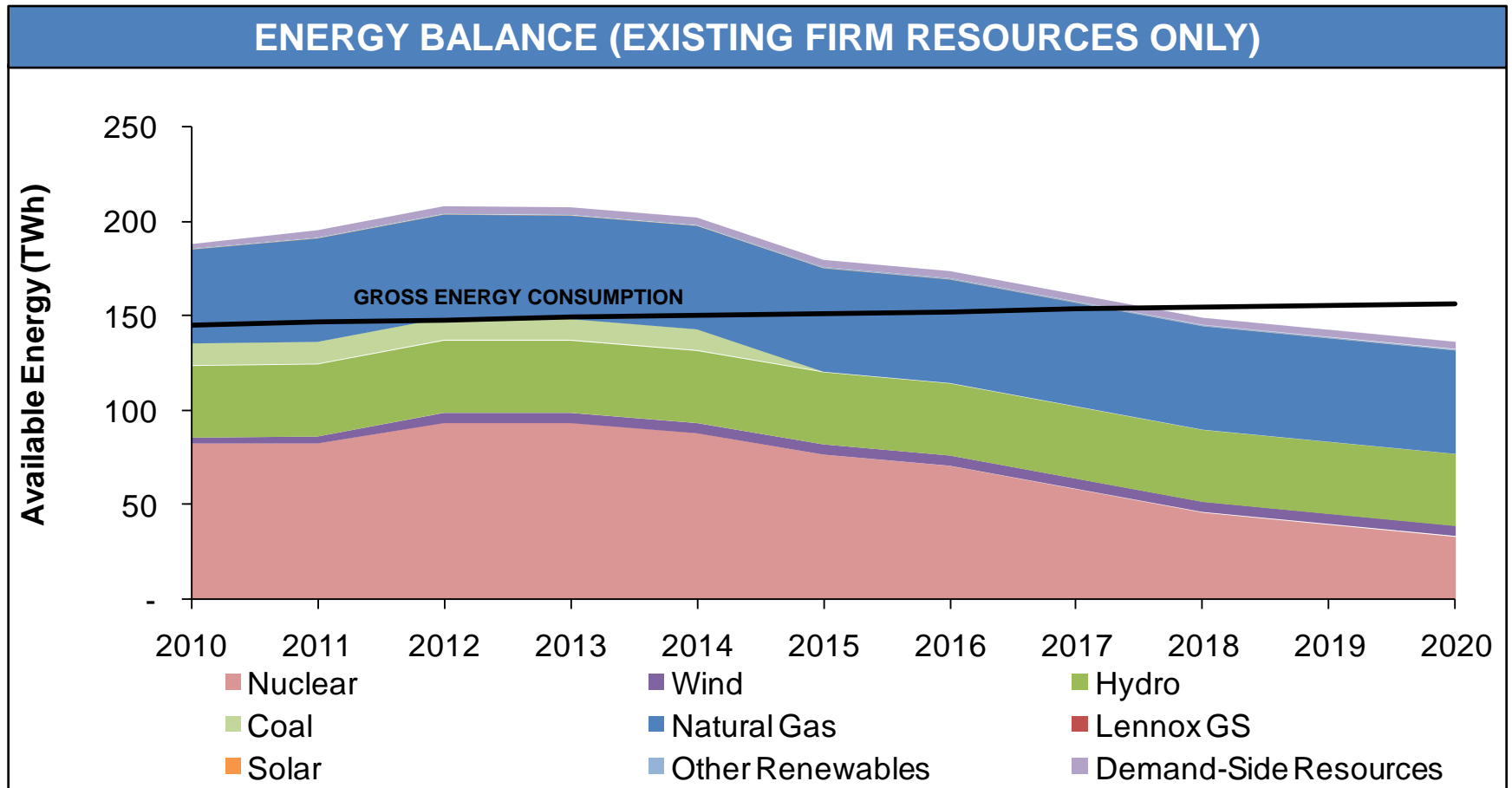
Notes: Peak demand and energy consumption would have to grow at 1.6% and 2% per year, respectively, in order to reach historic highs in five years.

Even with an aggressive peak demand growth forecast (~1.1% p.a.), existing 'firm' supply- and demand-side resources are adequate to meet Ontario's peak requirements through 2014



Notes: Wind and hydro-electric resources are de-rated to 28 and 71 percent respectively; 'firm' resources includes existing demand-side and existing and under construction supply-side resources only; required reserve margin is based on IESO projections (approximately 18%).

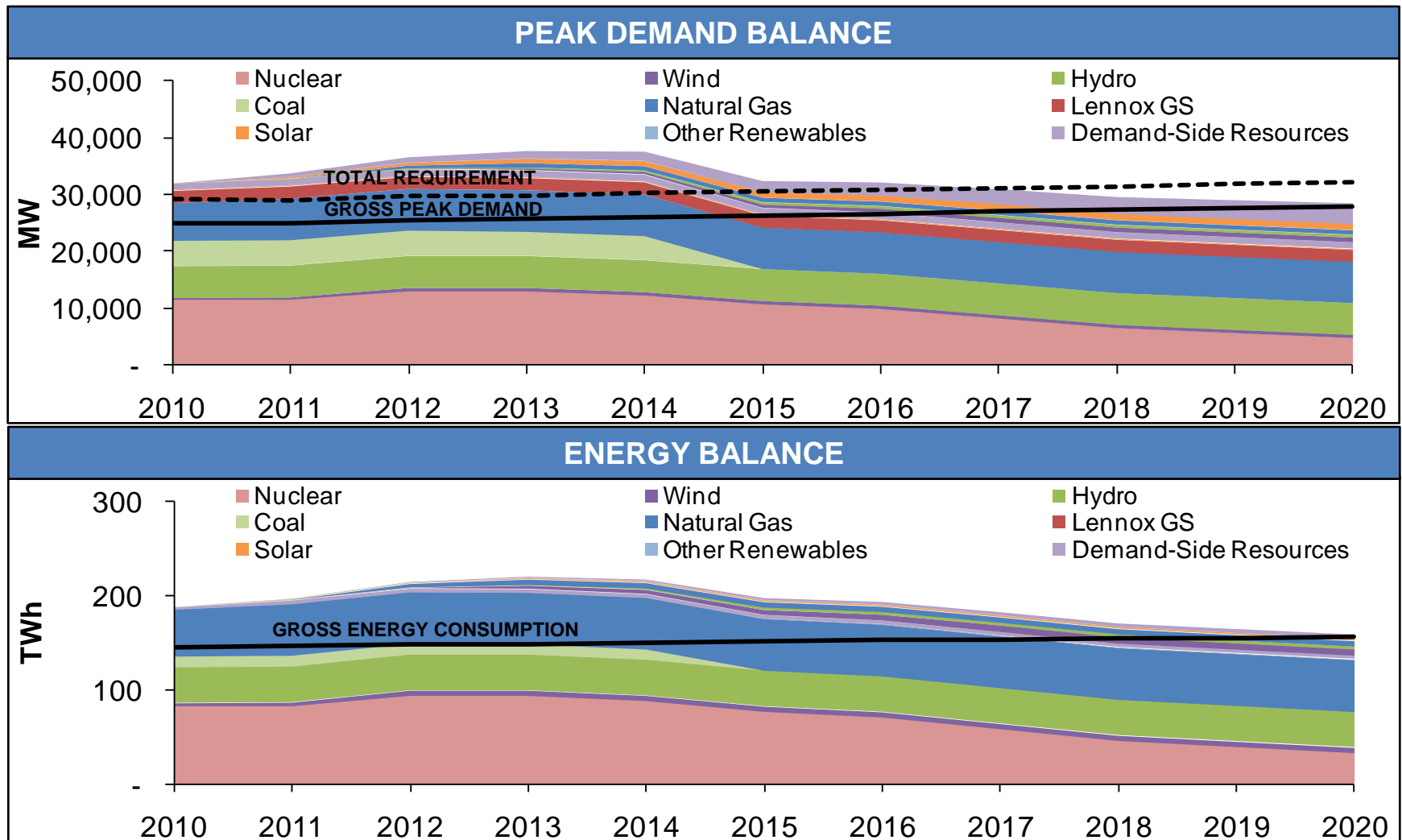
Similarly, existing 'firm' supply- and demand-side resources are adequate to meet Ontario's energy requirements to 2017



Notes: Energy provided from remaining coal-fired resources is limited as a result of regulations that restrict the amount of carbon dioxide emissions they can produce collectively to a maximum of 15.6 megatons in 2010 and 11.5 megatons per year thereafter.

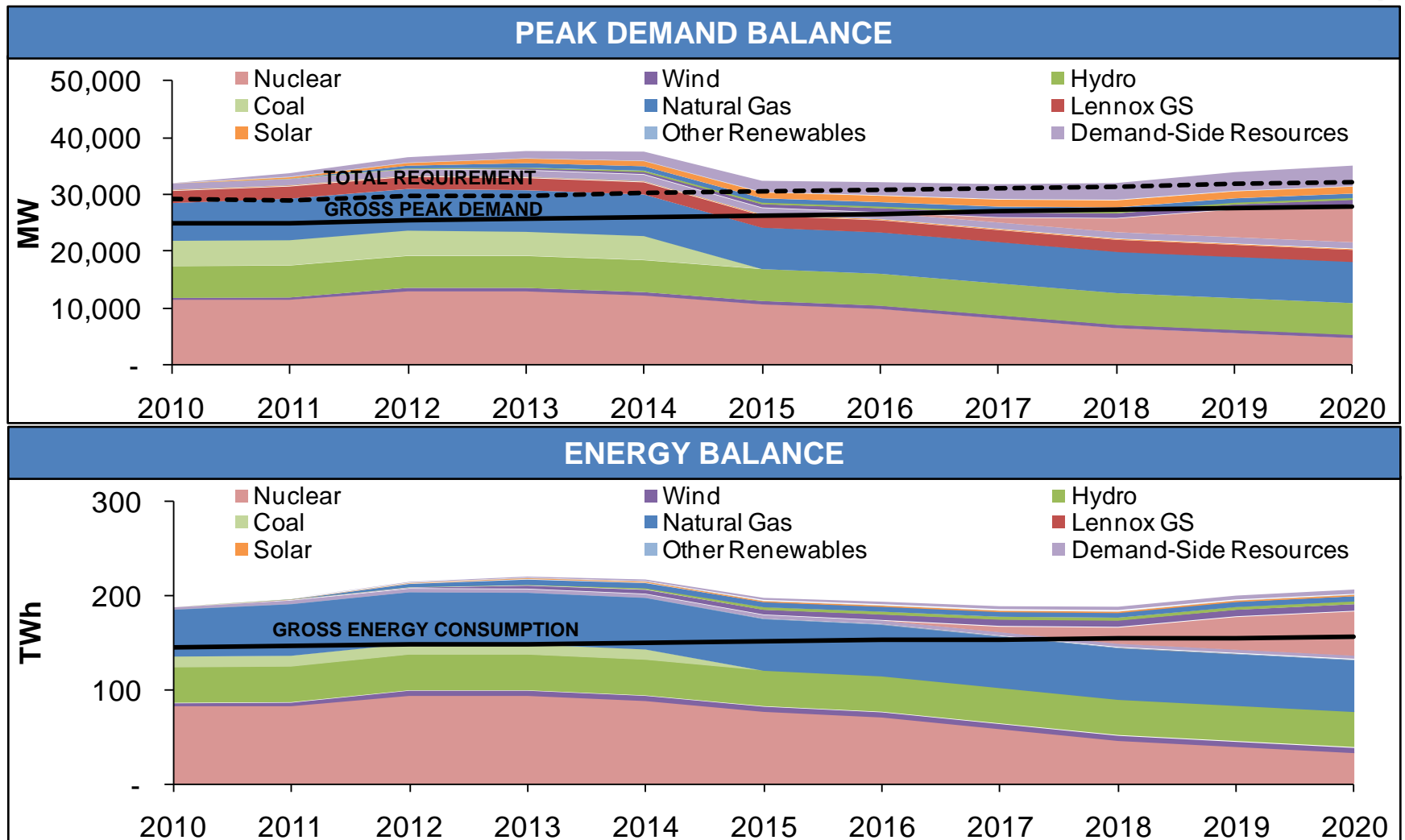
Source: LEI analysis

Including all of the 'contracted' resources, the province is not expected to need additional capacity or energy until after 2016 and 2020 respectively



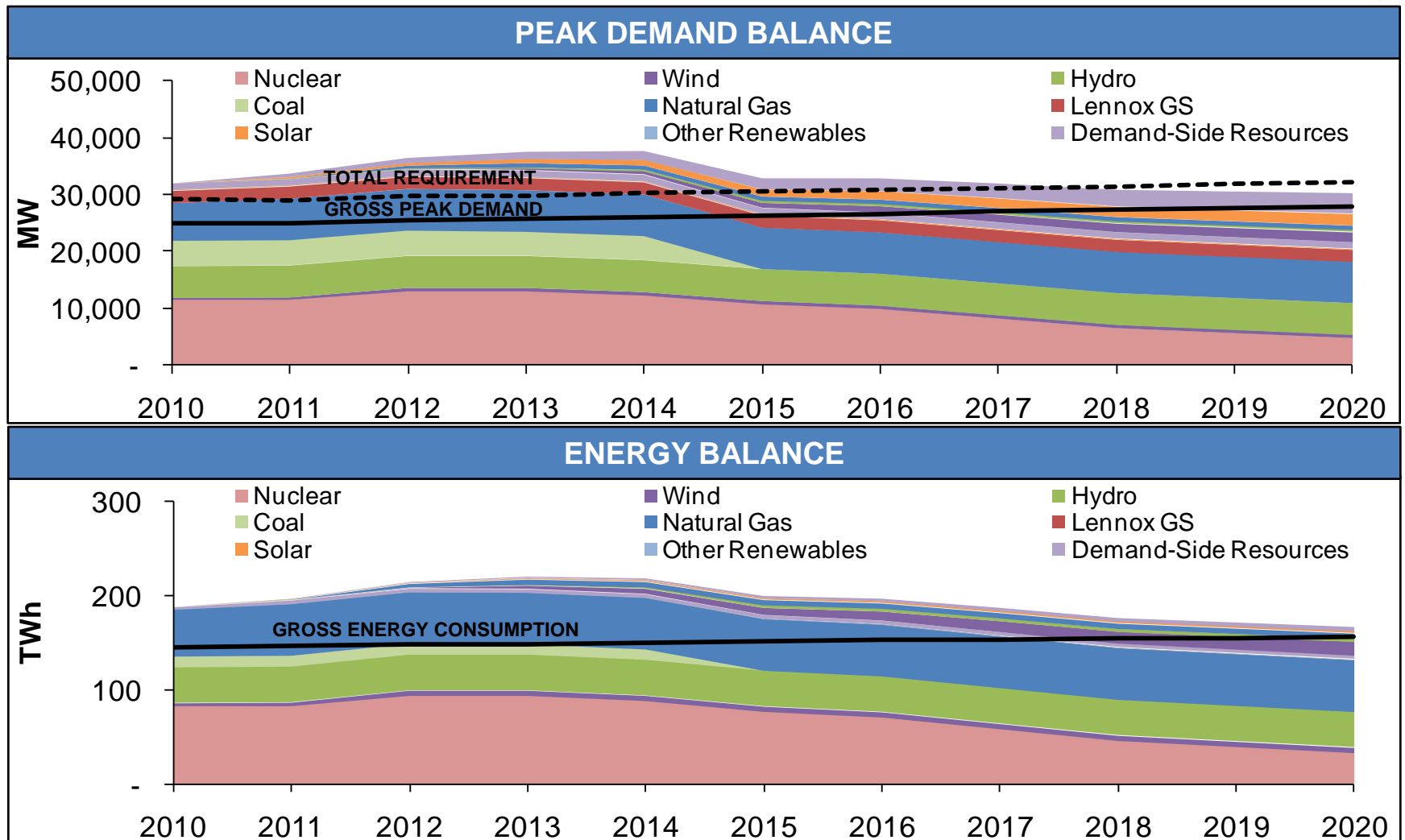
Notes: 'Contracted' resources includes under development resources with an OPA and/or MoE contract (e.g. CES, FIT, Samsung, etc.); including imports could delay need for capacity further.

Refurbishing the Bruce B and Darlington nuclear units would provide the province with sufficient capacity through 2020



Notes: Nuclear refurbishments assumed to take two years/unit and to occur as follows: Bruce A 3,4 (Dec. 2013-Dec. 2014), Bruce B 1-4 (Dec. 2014-Dec. 2017), Darlington 1-4 (Dec. 2016-Dec. 2019)

Without a major nuclear refurbishment initiative, 'firm', contracted, and additional FIT resources together will eventually be insufficient to meet the province's requirements



Notes: Includes an additional 3,200 MW of wind and 800 MW solar through 2020 in addition to 'firm' and contracted resources.

Ontario is in a state of oversupply through 2014



- Supply availability is expected to remain robust over the next decade given existing resources and projects currently under development
 - Shortfall in capacity beyond 2014 is created as a result of the coal phase-out
 - Inter-tie capacity could be used to delay additional capacity requirements even further
- Demand is expected to remain low over the next 10 years due to the moderating effect of reduced economic growth and conservation and demand management measures
- Nevertheless, there is significant uncertainty going forward with respect to electricity demand in Ontario, hampering the ability of developers to make investment decisions
 - Given this uncertainty, it may be more sensible for planners/developers to pursue small investments rather than large investments (excluding nuclear)
 - Uncertainty may be ameliorated (but not eliminated) once the updated Long Term Energy Plan is released
- Some local generation requirements may arise as a result of transmission and other physical constraints



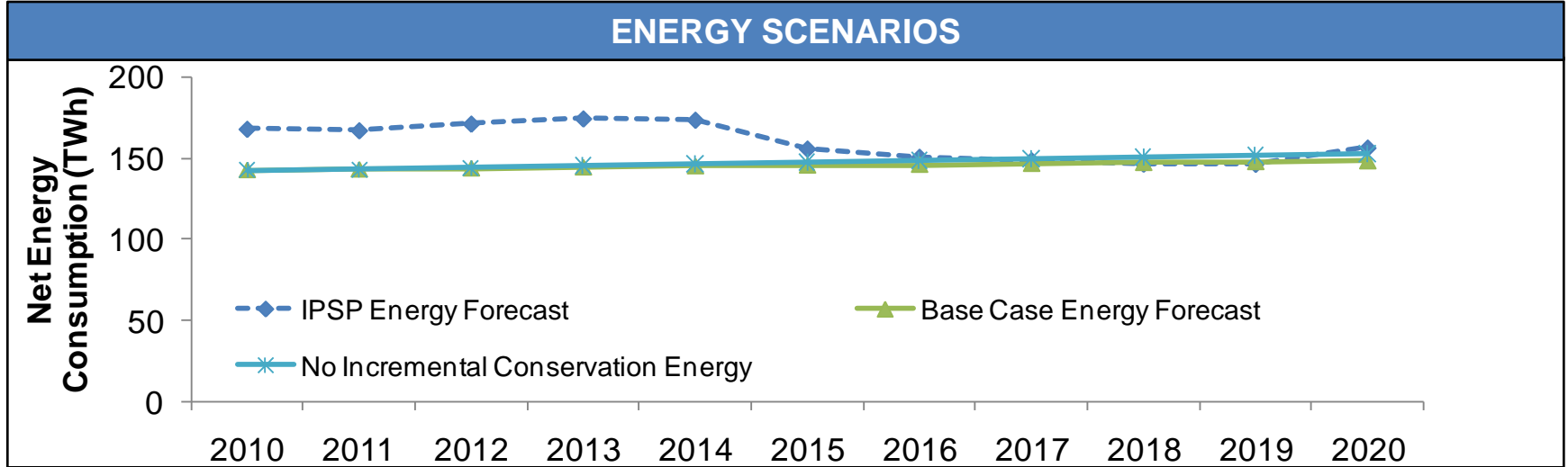
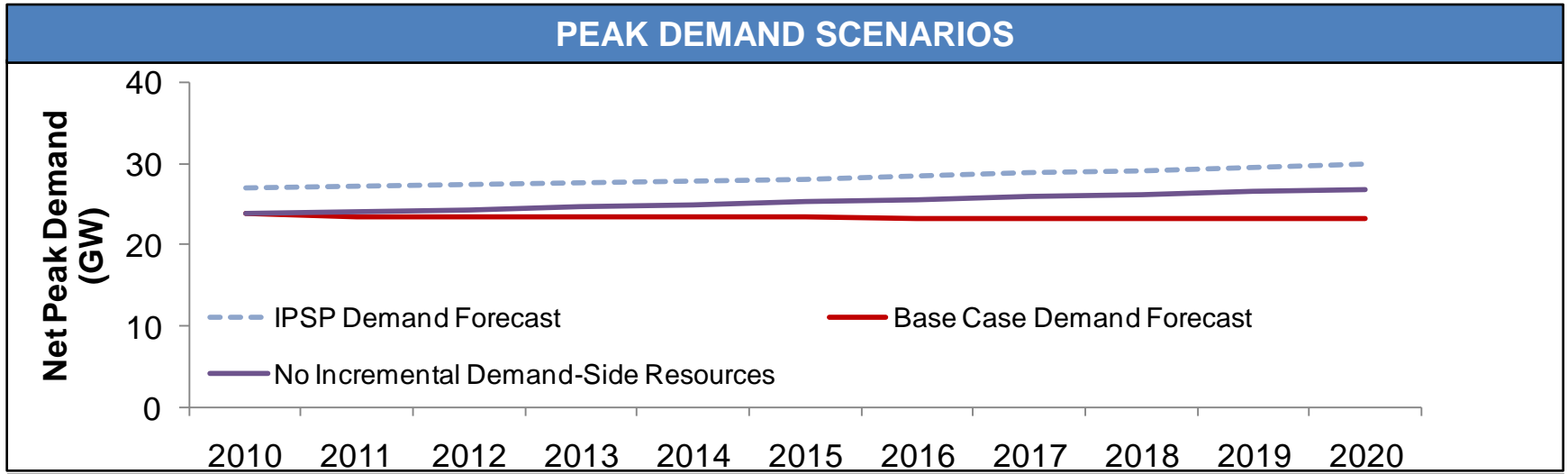
Key lessons

- For the foreseeable future, investment will be procurement driven, so understanding supply-demand dynamics is essential
- Ontario has time to plan because firm and contracted resources are likely sufficient to meet demand and energy requirements through 2016 and 2020, respectively
 - Given the abundance of resources, the province may be able to consider capacity capping FIT, or adopting annual limits to it
 - The province may be able to consider paying developers to delay projects that are in early stages of construction
- However, conservation targets may become harder and more costly to achieve over time
- The province needs to come to a consensus regarding the future role of nuclear; otherwise, other larger investments may be stymied by uncertainty



APPENDIX – DETAILED ASSUMPTIONS

Several demand and energy scenarios were considered



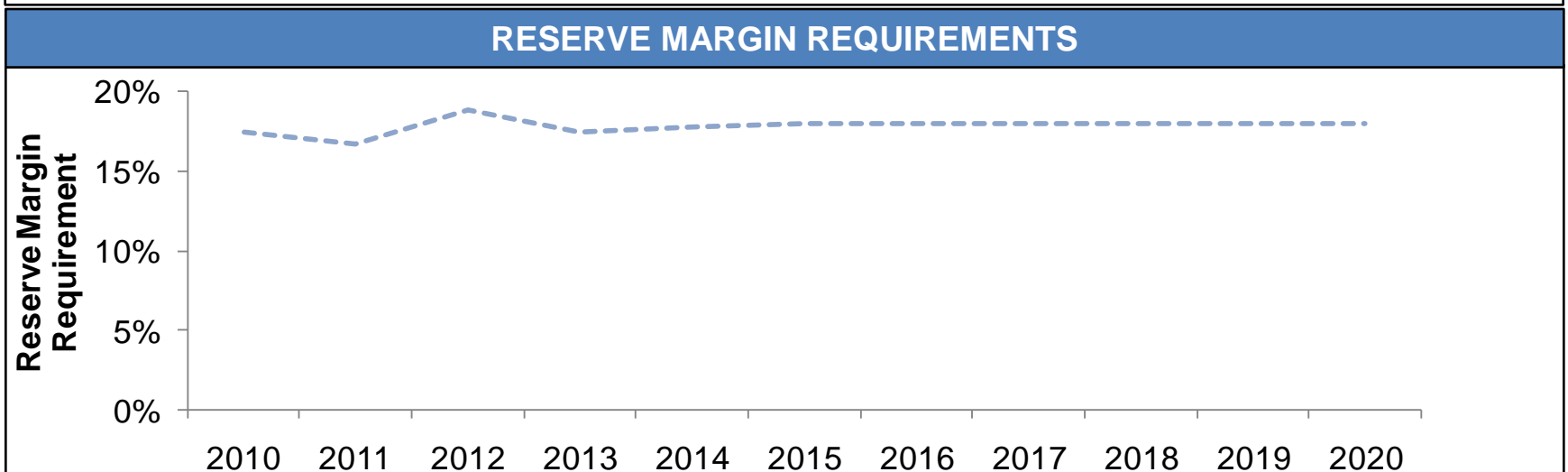
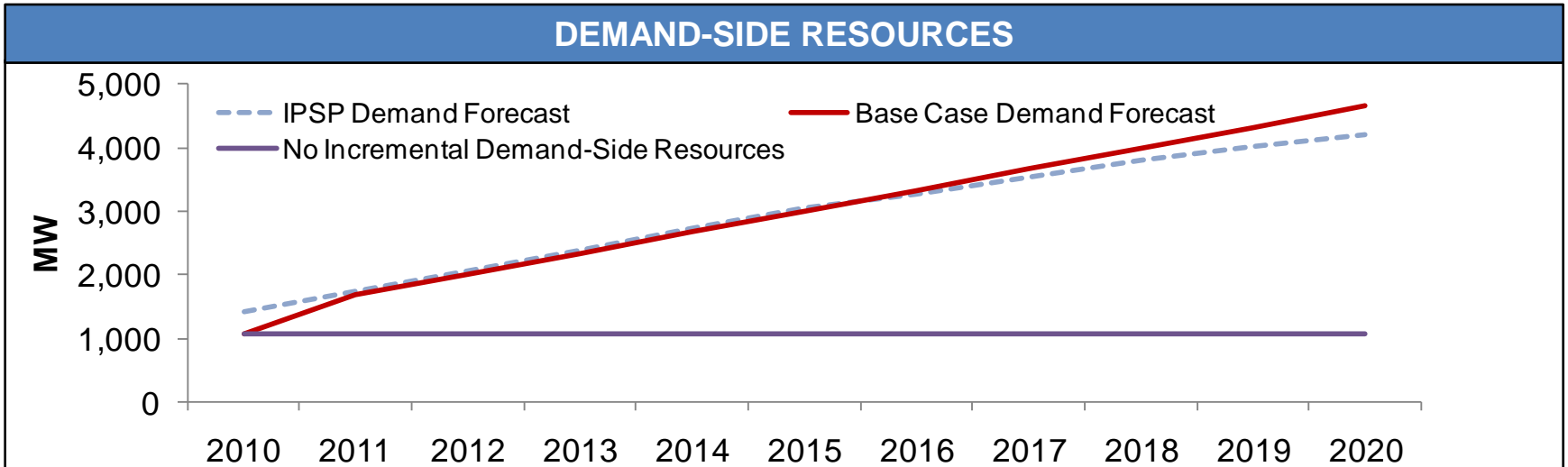
Almost 8,000 MW of contracted supply-side resources are expected to come online by 2017



CONTRACTED RESOURCES												
Project Name	Fuel Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Halton Hills enerating Station	Gas	-	632	-	-	-	-	-	-	-	-	-
York Energy Centre	Gas	-	-	393	-	-	-	-	-	-	-	-
Greenfield South Power Plant	Gas	-	-	-	280	-	-	-	-	-	-	-
East Windsor Cogeneration (CHP)	CHP	84	-	-	-	-	-	-	-	-	-	-
Thorold Cogeneration Project	CHP	236	-	-	-	-	-	-	-	-	-	-
Becker Cogeneration	CHP	-	-	15	-	-	-	-	-	-	-	-
Healey Falls	Hydro	-	16	-	-	-	-	-	-	-	-	-
Hound Chute	Hydro	-	10	-	-	-	-	-	-	-	-	-
Island Falls Hydroelectric Project	Hydro	-	16	-	-	-	-	-	-	-	-	-
Lower Sturgeon, Sandy Falls and Wawaitin	Hydro	-	35	-	-	-	-	-	-	-	-	-
Little Long, Harmon, Kipling and Smoky Falls	Hydro	-	-	-	-	-	450	-	-	-	-	-
Byran Wind Project	Wind	-	65	-	-	-	-	-	-	-	-	-
Raleigh Wind Energy Centre	Wind	-	78	-	-	-	-	-	-	-	-	-
Greenwich Wind Farm	Wind	-	-	99	-	-	-	-	-	-	-	-
Kruger Energy Chatham Wind Project	Wind	-	-	101	-	-	-	-	-	-	-	-
Talbot Wind Farm	Wind	-	-	99	-	-	-	-	-	-	-	-
Gosfield Wind Project	Wind	-	-	-	50	-	-	-	-	-	-	-
FIT Bioenergy	Bioenergy	-	49	-	-	-	-	-	-	-	-	-
FIT Hydro	Hydro	-	64	64	64	-	-	-	-	-	-	-
FIT Solar PV	Solar PV	80	190	190	190	-	-	-	-	-	-	-
FIT contracts	Solar PV	-	37	37	37	-	-	-	-	-	-	-
FIT Wind	Wind	166	178	515	670	-	-	-	-	-	-	-
MicroFIT	Solar PV	-	9	-	-	-	-	-	-	-	-	-
RESOP bioenergy	Bioenergy	28	-	-	-	-	-	-	-	-	-	-
RESOP hydro	Hydro	26	-	-	-	-	-	-	-	-	-	-
RESOP solar PV	Solar PV	53	-	-	-	-	-	-	-	-	-	-
RESOP wind	Wind	94	-	-	-	-	-	-	-	-	-	-
Samsung contract - Solar	Solar PV	-	-	-	100	100	100	100	100	-	-	-
Samsung contract - Wind	Wind	-	-	-	400	400	400	400	400	-	-	-

Source: LEI analysis

Targeted demand-side resources and forecast reserve margin requirements are illustrated below



Notes: Reserve margin requirements up to 2014 are based on the IESO's 18-Month Outlook (August 2010) and the 2009 Reserve Margin Requirements report; 18% is assumed thereafter.

In-depth analysis of the Ontario electricity market and other markets worldwide is available from LEI



LONDON ECONOMICS PRESS

For a more in-depth analysis of the supply-demand dynamics in Ontario (and other markets worldwide), London Economics International LLC (LEI) publishes semi-annual market reports and 10-year energy price forecasts for the IESO market through London Economics Press (LEP).



Along with providing price projections, the reports highlight major developments in Ontario as well as the underlying structural dynamics. LEI also provides more detailed market price forecasts tailored to clients' individual needs, including longer time horizons and forecasting of plant-specific revenues or the impact of structural or market design changes.

Website: www.londoneconomicpress.com