

Demand and Supply

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CONFIDENTIAL DRAFT

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Background

LTEP 2013 Supply Commitments

Planned Flexibility

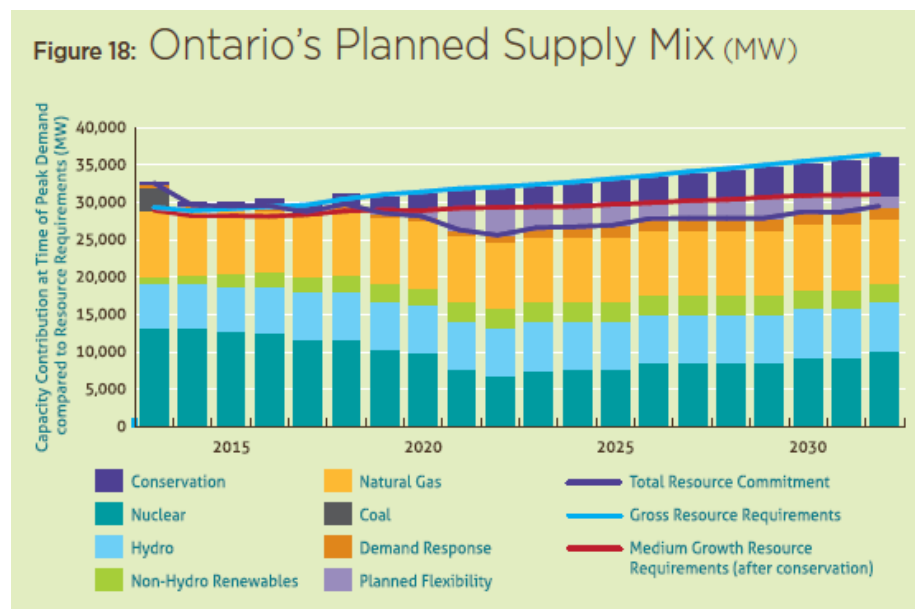
- Ontario needs to be flexible to meet the inherent uncertainty of forecasting demand growth.
- Government will plan for a wide range of possibilities but only commit resources as needs become clearer, while ensuring Ontarians have the energy they need, when and where they need it.

Supply Mix

- To maintain flexibility as circumstances change the integrated supply mix will be inclusive of key elements:
 - Conservation First, Demand response targets, Planned nuclear refurbishments and Continued operation of off-contract generators.

Transmission Implications

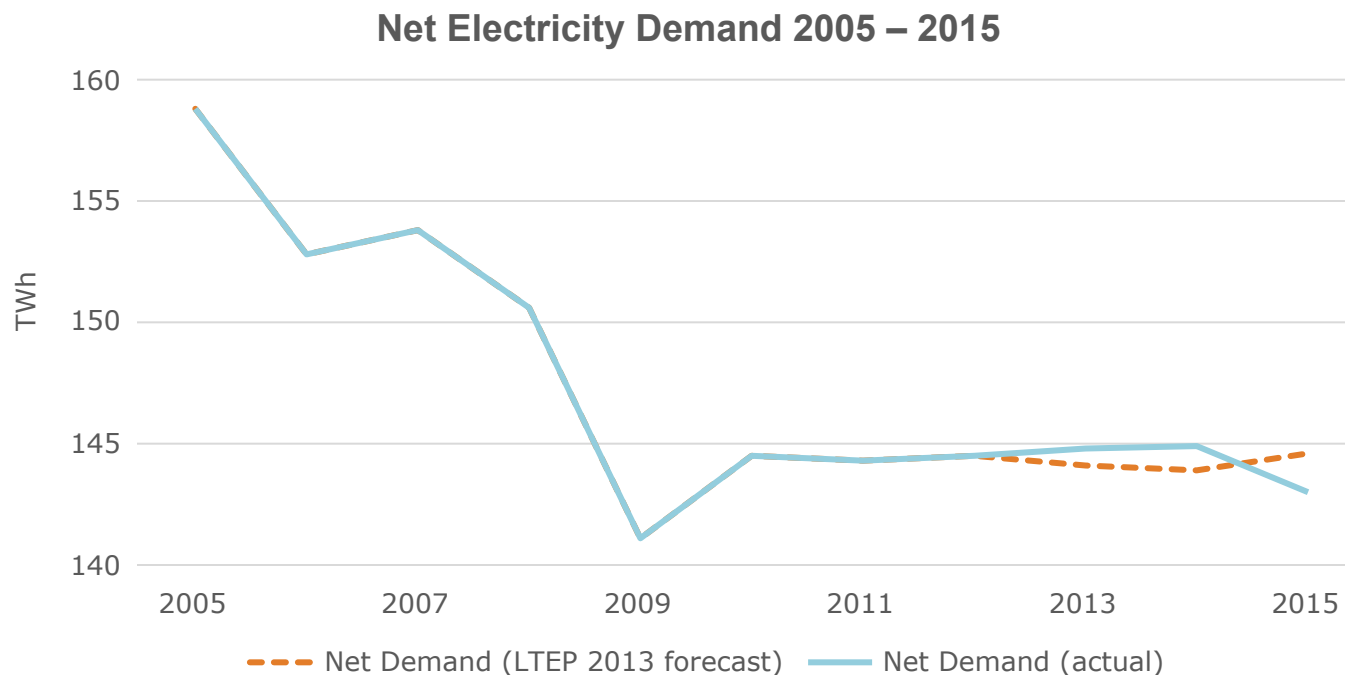
- 2013 LTEP stated that the existing transmission system was sufficient to enable supply mix targets identified



Source: ENERGY

Achievements Since 2013 LTEP

- Electricity supply and demand has materialized broadly in line with expectations:
 - Actual demand in 2015 came in at 1% below LTEP 2013 forecast at 143 TWh; and
 - Supply mix is in line with 2013 LTEP. Note: Nuclear refurbishment scheduled have shifted.



Source: IESO

Current Context

- 2013 LTEP outcomes were based on one central scenario for demand forecast, conservation, and supply mix.
- Policy development since 2013 LTEP, as detailed below, will impact approach of 2017 LTEP:

2013 LTEP Approach	Demand forecast	Conservation	Supply	Price and Emissions
Considerations for 2017 LTEP Approach	• No consideration of impact on Fuels in 2013 LTEP • Only one demand forecast used for 2013 LTEP • No consideration of climate change policies in 2013 LTEP • Electrification of heating not considered in 2013 LTEP	• IESO's 2013 achievable potential study (APS) informed the electricity 2013 LTEP conservation target • In 2016, IESO released an updated APS. OEB also released an APS for natural gas conservation • Potential for cost-effective conservation depends on the demand forecast	• Only one supply outlook used for 2013 LTEP • Nuclear refurbishment schedule revised since 2013 LTEP • Pickering schedule revised since 2013 LTEP • Renewables targets revised since 2013 LTEP	• No consideration of carbon pricing in 2013 LTEP • 2013 LTEP provided detailed bill forecasts, by consumer class

Current Context (cont'd)

- Two technical reports have been developed to inform 2017 LTEP:

Ontario Planning Outlook (OPO)

- The State of the System: 10-Year Review
- Electricity System 20-Year Outlook:
 - Demand Outlook
 - Conservation Outlook
 - Supply Outlook
 - Market and System Operations Outlook
 - Transmission and Distribution Outlook
 - Emissions Outlook
 - Electricity System Cost Outlook
- Four planning assumptions to understand varying levels of electrification
- Comparison of existing and emerging technology

Fuels Technical Report (FTR)

- The State of the System: 10-Year Review
 - Natural Gas
 - Propane
 - Oil Products
 - Wood and Biomass
 - Alternative Fuels
 - Demand (all sectors)
 - Historical GHG Emissions
- Fuels system 20-year Outlook:
 - Demand Outlook (all sectors)
 - Conservation Outlook
 - Supply Outlook
 - Emissions Outlook
 - Fuels System Cost Outlook
- Integrated to OPO

Current Context (cont'd)

- Recent policy announcements that will impact to OPO and FTR outcomes:
 - 8% Rebate;
 - RRRP Enhancements;
 - ICI Expansion; and
 - Suspension of LRP II;
 - Ontario – Quebec Electricity Trade Agreement;
 - IESO's renegotiation of remaining NUG contracts.
- In addition, revised demand and supply modelling is likely to be contingent on expected policy announcements:
 - Additional rate mitigation measures

Stakeholder Feedback

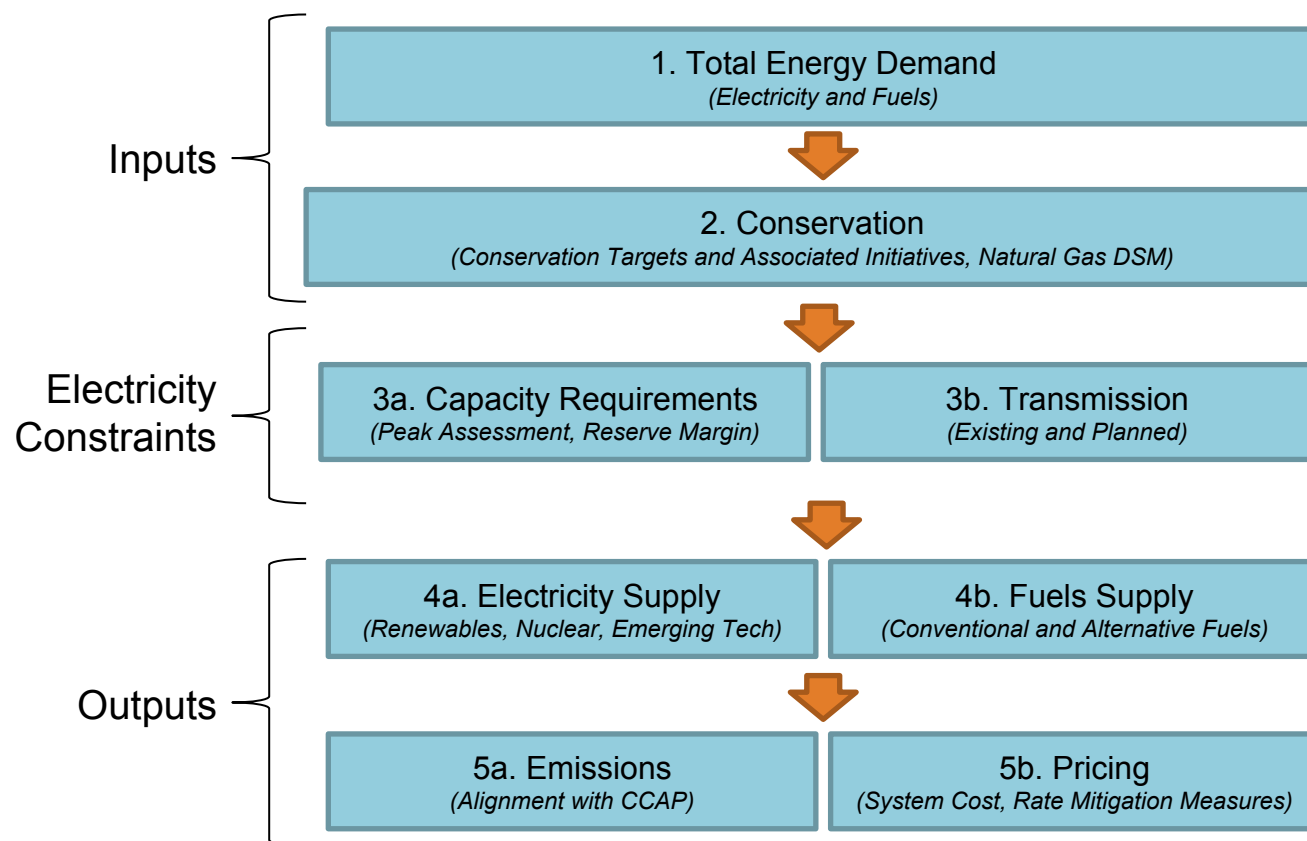
- Summary of stakeholder feedback received through the LTEP consultations has been categorised into a set of themes are listed below:

Supply Area	Feedback Theme	Description
Nuclear	Asset Optimization	Need to optimize existing assets and derive value from things the province has already invested in
	Full Lifecycle Cost	Consider the full costs and emissions along full lifecycle
	Supply Principles	Flexibility, scalability, cost and diversity should be supply priorities
Renewables	Interties / Storage	Deployment of storage technologies and intertie expansion can provide flexibility
Electricity Trade	Capacity Auctions	Should be used for new supply needs
	Lead Times	Consider lead-times of resources when planning supply mix
Fuels	Economic Development	Supply choices have an economic impact (consider costs and employment opportunities in planning)
	Price Signals	Establishment of clear price signals and mechanisms to incent innovation and flexible supply
	Costs	Should be a first consideration in making decisions

Scenario Options

Approach

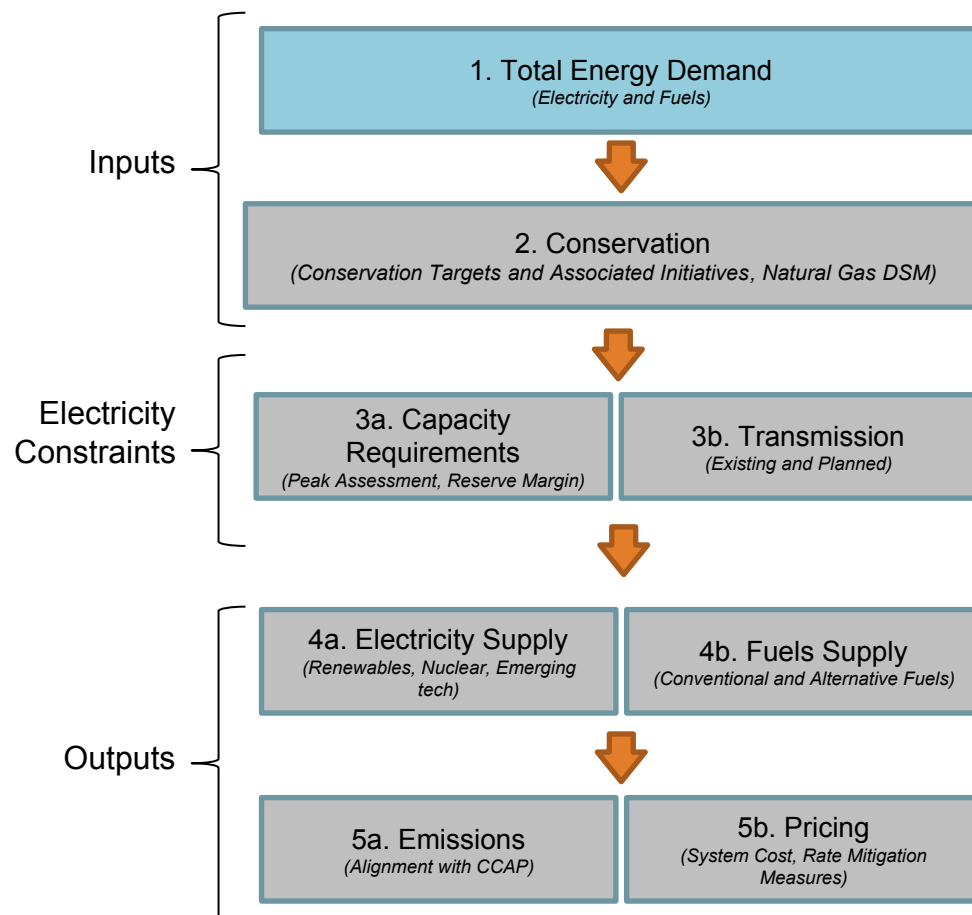
- The 2017 LTEP scenarios can be understood through the design components as outlined below:



- Direction is required to a series of design questions as outlined in the following slides.

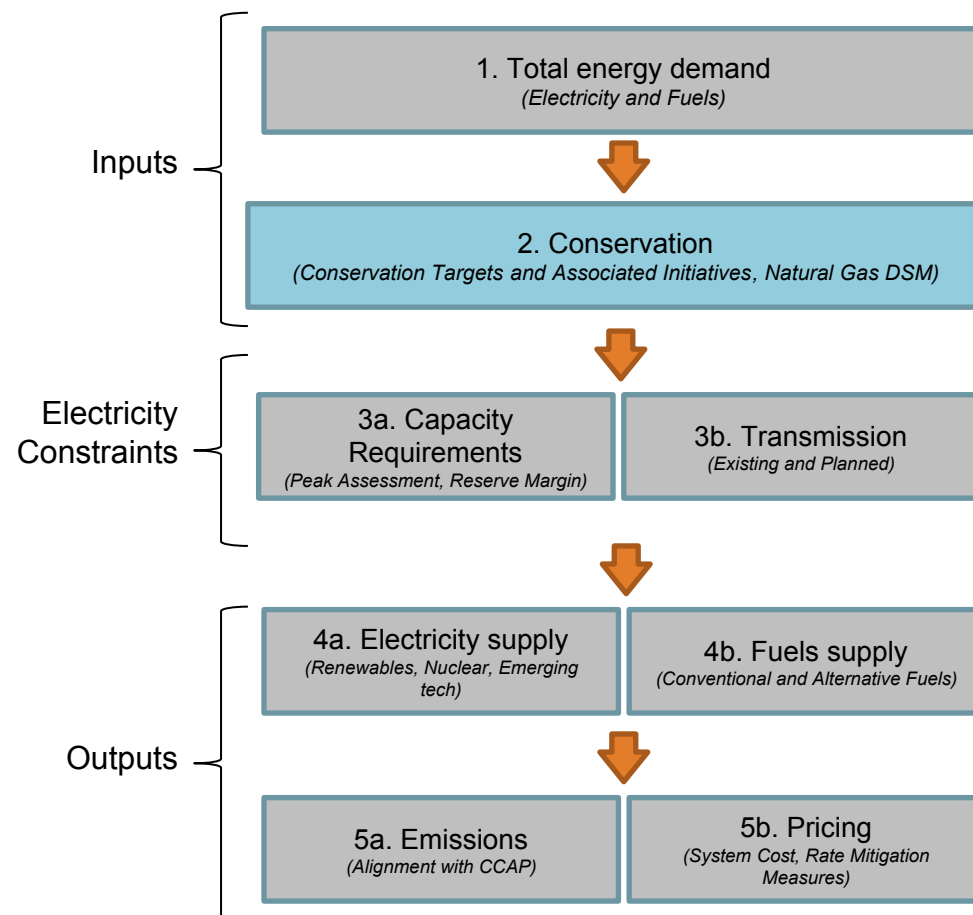
Design Questions – Total Energy Demand

- Description of design component:
 - Total demand across Ontario for all fuels and all sectors (e.g., residential, commercial, industrial, transport).
- Key design questions:
 - How many demand scenarios should be considered? If multiple, what different scenarios?
 - How should the integrated (e.g., electricity and fuels) scenario be developed and focus on? (e.g., heat pumps or furnace combination?).
 - Who will develop the integrated scenario?
 - What is the planning horizon?
 - Should the demand scenario(s) be aligned with climate change policies?



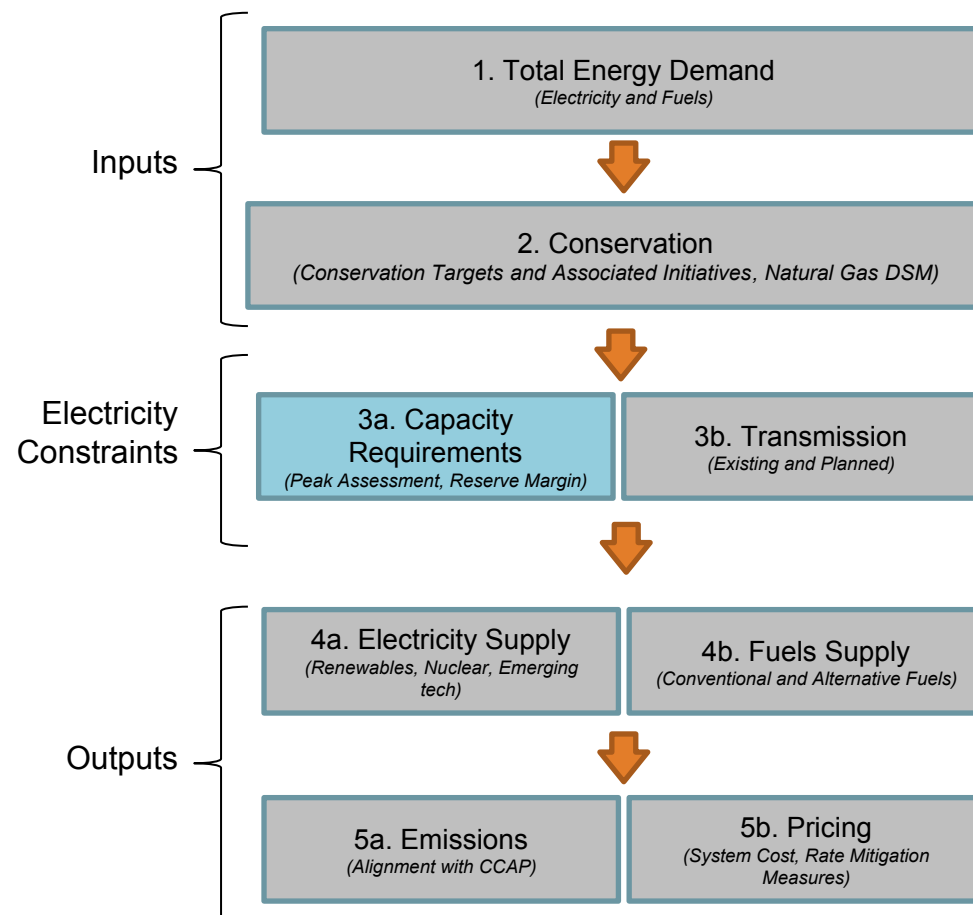
Design Questions – Conservation

- Description of design component:
 - Conservation targets and associated initiatives including utility programs and demand response; and
 - Conservation can play a role in reducing forecasted demand.
- Key design questions:
 - Which electricity demand scenario should inform the electricity conservation target? Should we increase the long-term electricity savings target of 30 TWh in 2032?
 - Should there be a conservation target for natural gas? Which demand scenario should inform the electricity conservation target?
 - Should there be a conservation target for fuels other than electricity and natural gas (e.g., propane, fuel oil)?
 - How will all targets consider CCAP energy saving initiatives?



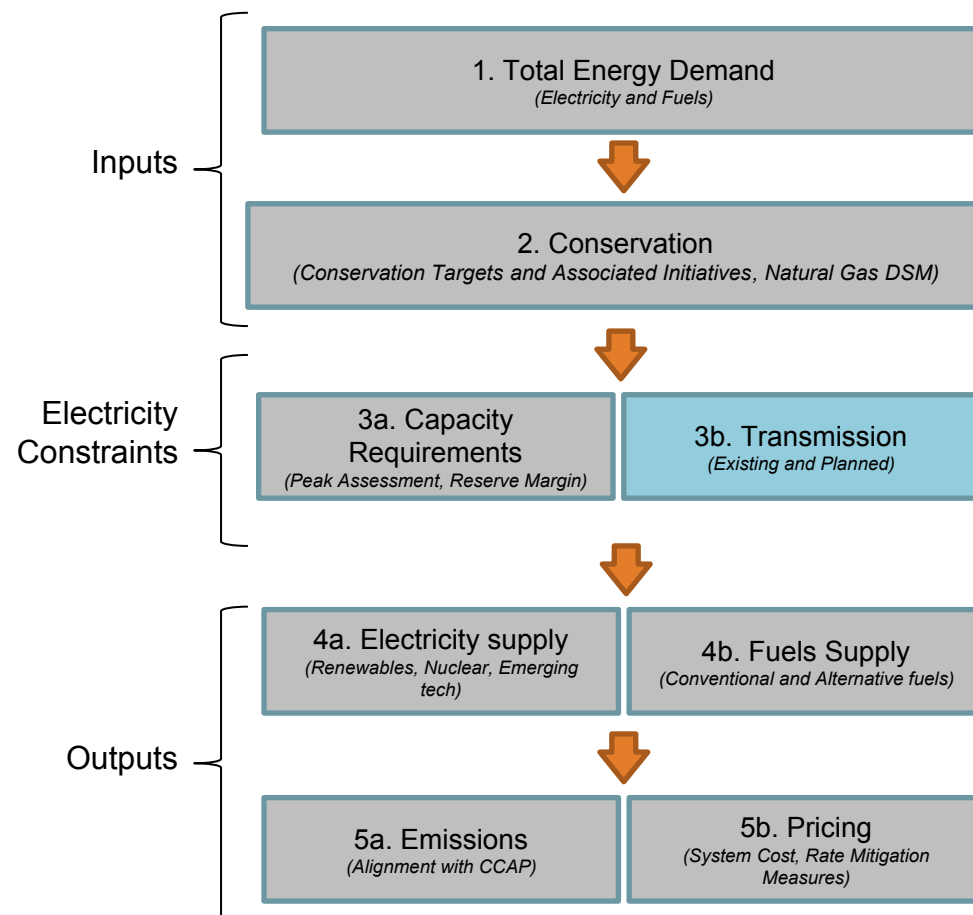
Design Questions – Electricity Capacity Requirements

- Description of design component:
 - Peak demand projection and reserve margin requirement.
- Key design questions:
 - How will the peak demand requirements be met?
 - Will we be technology agnostic?
 - Will gas be assumed for analysis purposes?



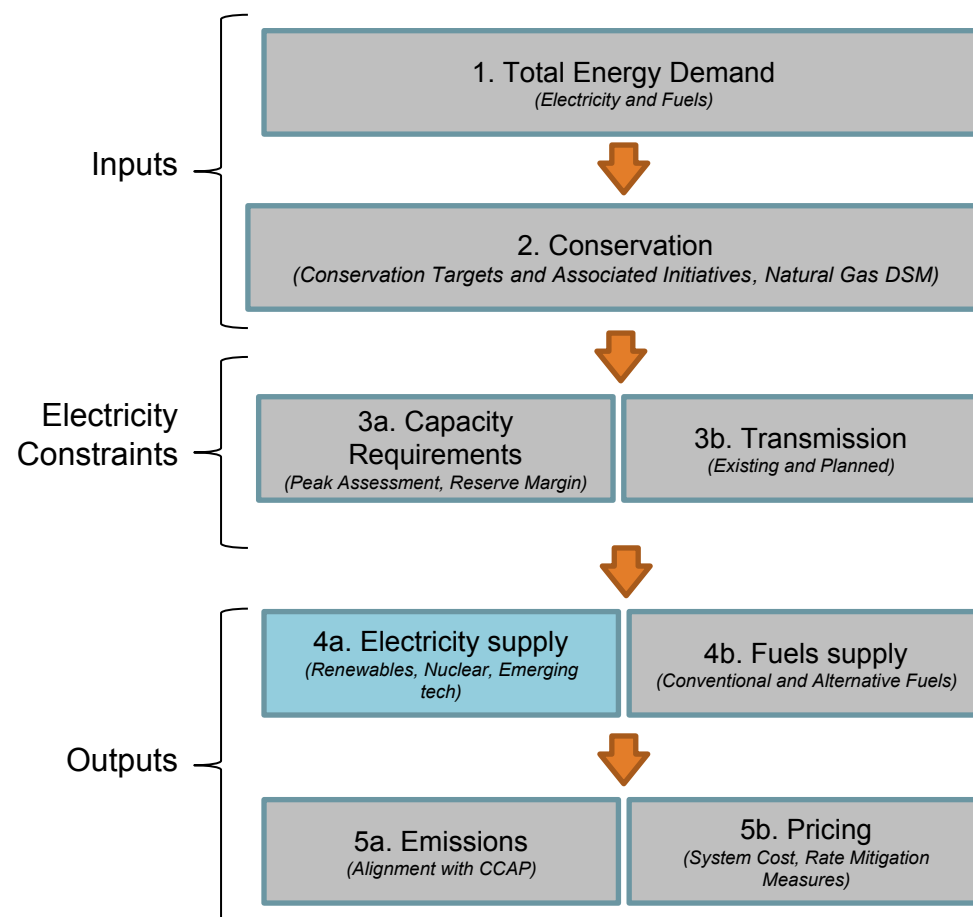
Design Questions – Electricity Transmission

- Description of design component:
 - Transmission lines within the province and interties with neighbouring jurisdictions.
- Key design questions:
 - If multiple demand scenarios are considered, would multiple transmission scenarios also be presented?
 - Should the transmission scenario(s) be aligned with climate change policies?
 - What are the assumptions for intertie activity and build?



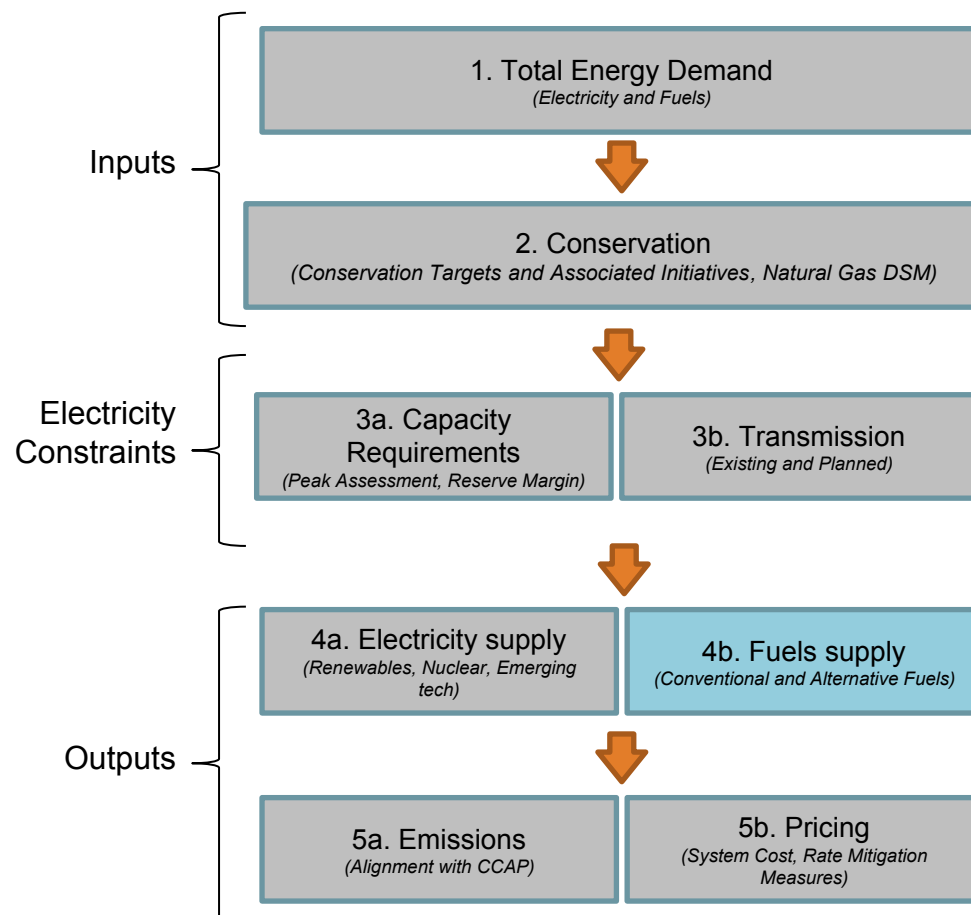
Design Questions – Electricity Supply

- Description of design component:
 - Electricity generation mix and capacity outlook
- Key design questions:
 - How prescriptive will the 2017 LTEP be in determining the supply outlook?
 - What initiatives are being proposed in the Renewables, Enhance Market-Based Outcomes 2017 LTEP decks which need to be included for consistency?
 - What is the assumption for nuclear refurbishment, Pickering closure? (as per OPO or other?)
 - What are the assumptions for renewables build?



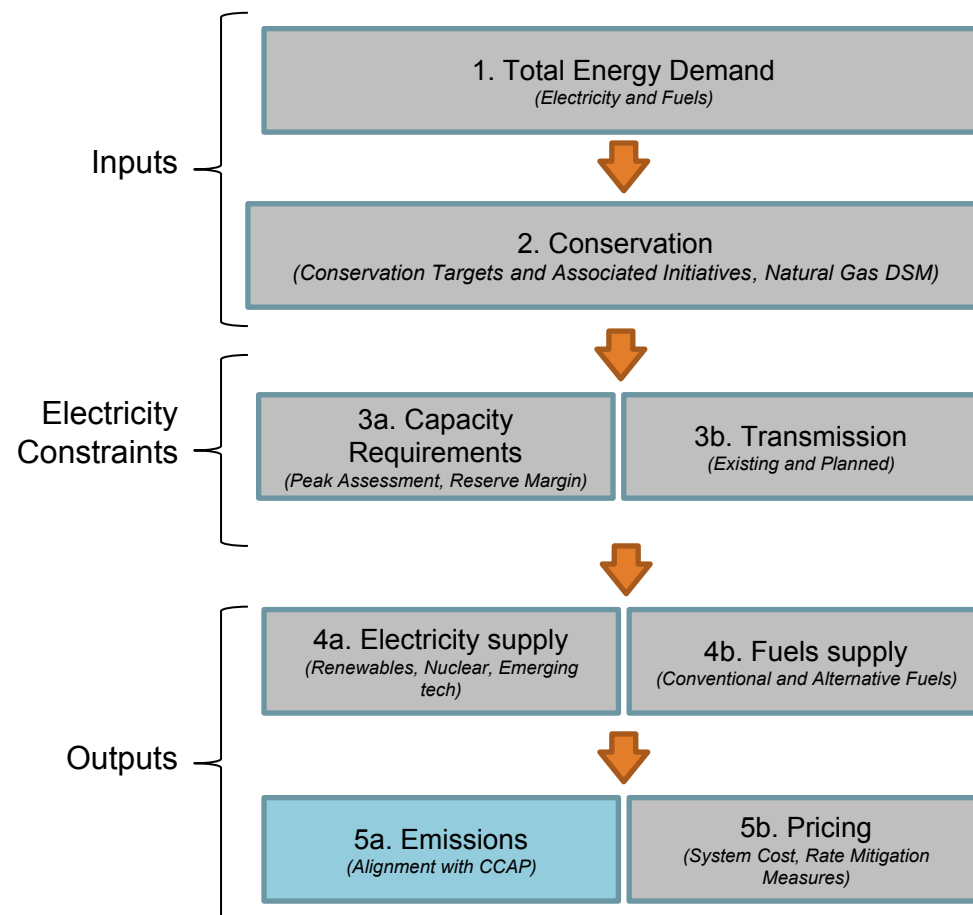
Design Questions – Fuels Supply

- Description of design component:
 - Fuels supply mix and capacity outlook.
- Key design questions:
 - How prescriptive will the 2017 LTEP be in determining the fuels supply outlook?
 - What are the assumptions for alternative fuels?
 - How will the fuels supply outlook be impacted by climate targets?



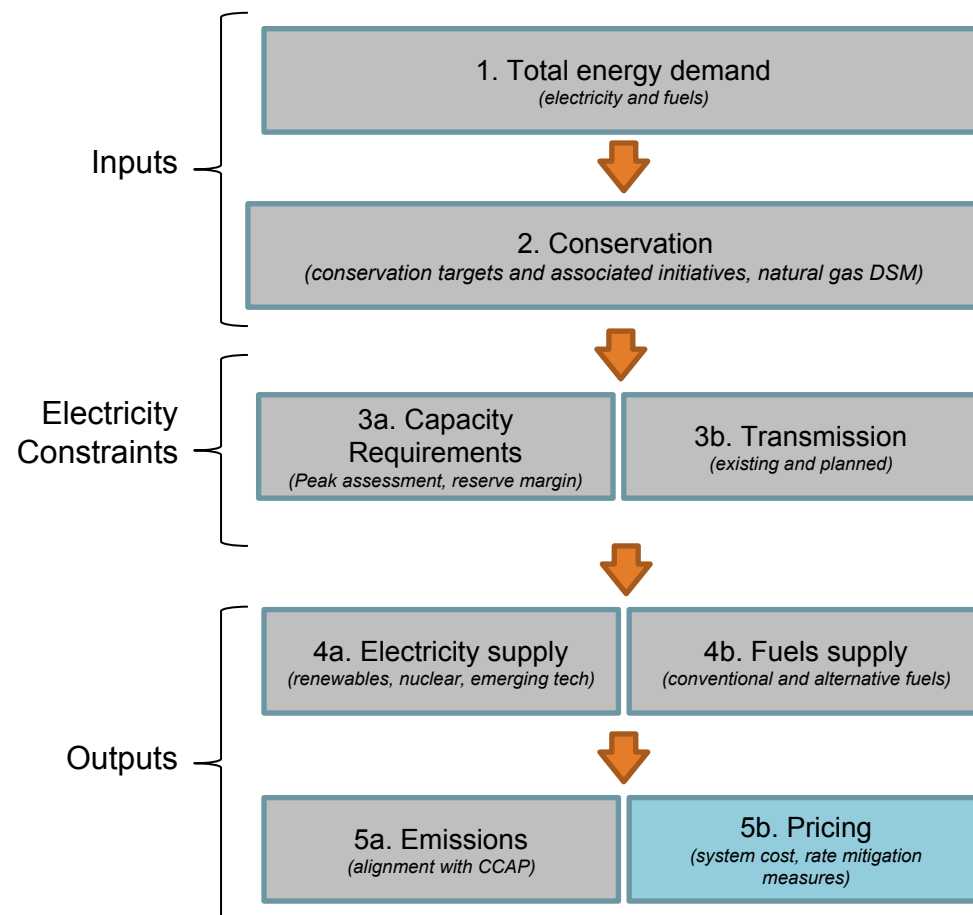
Design Questions – Emissions

- Description of design component:
 - Climate targets and emissions outlook.
- Key design questions:
 - To what extent will the 2017 LTEP emissions outlook align with CCAP?
 - What is our outlook on carbon pricing?
 - Is natural gas going to be assumed for any electricity capacity requirements?
 - What are the assumptions for purchase of allowances from other jurisdictions?



Design Questions – Pricing

- Description of design component:
 - Total system cost, individual electricity and fuel costs.
- Key design questions:
 - What initiatives are being proposed in the Measures to Bend the Cost Curve and other LTEP decks which need to be included for consistency?
 - What level of modelling granularity included in outlooks? (e.g. consumer class bills as per 2013 LTEP or average unit cost as per OPO)
 - What fuels costs or bills to include (e.g. natural gas, gasoline, diesel, heating oil, propane)?
 - What assumptions for supply choices that need to be considered from pricing perspective?
 - What assumptions for added cost of climate initiatives?



Next Steps

Next Steps

- Address key design questions detailed in the scenario options section
- Update scenario(s) based on responses to key questions
- Share scenario(s) with IESO to align on electricity outlook
- Agree on approach to fuels scenarios

Appendix

Summary of Proposed LTEP Initiatives

Initiative
1. Xx
2. Xx

Considerations for Conservation Design Questions

Design Question	Consideration
1. Which electricity demand scenario should inform the electricity conservation target? Should we increase the long-term electricity savings target of 30 TWh in 2032?	• Potential for cost-effective electricity conservation depends on the demand scenario. • IESO's addendum to the APS identified significant potential for cost effective electricity conservation (incremental to current spending). IESO will be briefing the Minister on the APS addendum results. • The IESO APS results (including those in the addendum) are based on the 2013 LTEP demand forecast. Once a demand forecast(s) is selected, the IESO would need to update their analysis to reflect different technology penetration and avoided cost assumptions.
2. Should there be a conservation target for natural gas? Which demand scenario should inform the electricity conservation target?	• Establishing a long term target for natural gas conservation is challenging. – The regulatory framework for natural gas utilities is different from electricity utilities. Electricity utilities are required to deliver conservation programs as a condition of license, while natural gas utilities deliver conservation programs on a voluntary basis. – CCAP initiatives could potentially overlap with natural gas utility programs and the future of the DSM framework post 2020 is uncertain. • Through the 2017 LTEP, ENERGY could direct the OEB to undertake analysis on the feasibility of a long term natural gas conservation target. • If there is a desire to set a long term natural gas conservation target in the 2017 LTEP, ENERGY could ask the OEB to update its APS analysis to account for the selected demand forecast(s). • OEB's current APS analysis is based on a natural gas demand forecast which assumes an overall increase in natural gas consumption over the long term.

Considerations for Conservation Design Questions (cont'd)

Design Question	Consideration
3. Should there be a conservation target for fuels other than electricity and natural gas (e.g. propane, fuel oil)?	• The FTR included analysis on more than 10 fuels including those relating to the residential, industrial and transportation sectors. • ENERGY has limited regulatory authority over other fuels. • It is expected that CCAP energy saving initiatives will focus on other fuels. • Through the 2017 LTEP, ENERGY could explore expanding conservation to other fossil fuels via work with MOECC on establishing the low carbon-deployment entity and its programs.
4. How will all targets consider CCAP energy saving initiatives?	• IESO and Navigant have considered the impact of CCAP initiatives in the OPO and the FTR. • However, CCAP initiatives could overlap with existing conservation programs and impact achievement of long term target. • Through the 2017 LTEP, ENERGY can highlight the ministry's intention to continue to work with its agencies and MOECC, and other ministries, to implement the climate change agency– building on existing energy efficiency and demand management programs.