

Enhancing Ontario's Electricity Markets: Market Renewal Program (MRP) & Transitional Capacity Auction (TCA)

Prepared for IESO Board of Directors

June 12, 2019

Purpose

- To provide an update to the Board of Directors on work related to the IESO's Market Renewal Program (MRP), including next steps with respect to stakeholder feedback and the development of the MRP Business Case
- To seek Board approval to proceed with the design and implementation of the Transitional Capacity Auction
- For the purpose of this discussion, the presentation is divided into the following sections:
 - MRP “refresher”
 - Energy
 - Capacity
 - MRP business case

MRP "REFRESHER"



Refresher

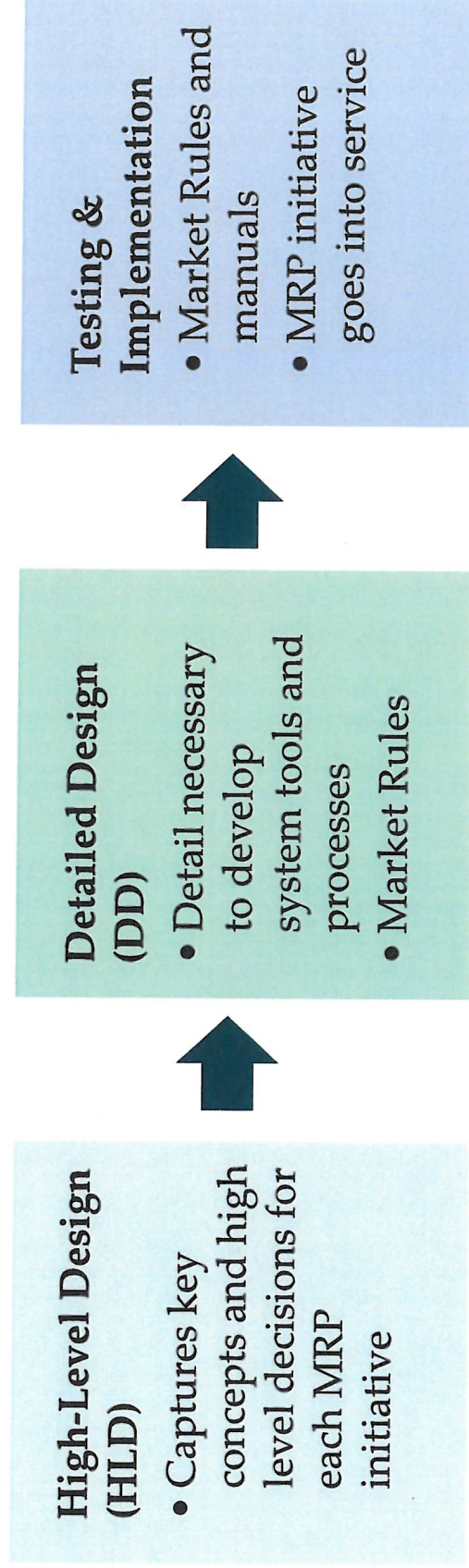
- **Capacity** is an amount of electricity that is available to be generated or reduced when needed. Capacity needs fluctuate as demand rises and falls. To balance electricity supply and demand throughout the day, month, or year, there must be adequate capacity to meet the peak demands.
- **Energy** is the amount of power produced by suppliers and consumed by consumers. It is the key product in the electricity system and provides the backbone around which the system is structured. Energy is the quantity of electricity needed to match supply and demand in Ontario on an hourly basis.
- Capacity can be thought of as 'availability' to produce energy; energy can be thought of as 'production' of energy

Refresher (cont'd)

- MRP is introducing fundamental reforms to the province's electricity markets to improve how we supply, schedule and price electricity to meet Ontario's future needs at the lowest cost
- There are four program initiatives of MRP that fall under two distinct categories – energy and capacity
 - **Energy initiatives include:** single schedule market (SSM), day-ahead market (DAM), and enhanced real-time unit commitment (ERUC)
 - **Capacity initiative includes:** incremental capacity auction (ICA)
- Over the past 9-months, the IESO has released high-level designs for stakeholder input for each of the four MRP initiatives; the IESO is currently reviewing and incorporating feedback as appropriate
- The IESO is in the process of developing a Business Case for MRP; a business case is a pre-requisite to supporting the project for the detailed design and implementation phases

Refresher (cont'd)

Development and Board approval
of MRP business case



Stakeholder engagement

Refresher (cont'd)

- In addition to the four Market Renewal initiatives, the IESO has also introduced the transitional capacity auction (TCA) – a mechanism to help the IESO meet capacity needs prior to the launch of the ICA
- The TCA, starting in December 2019, will evolve the existing demand response auction to enable competition between additional resource types
- This market mechanism provides an opportunity to phase-in some of the design features that are part of the ICA
- The TCA will allow both the IESO and participants to learn and adjust over the coming years, before significant capacity is needed in 2023

ENERGY



Update on Energy High Level Designs

- High level designs (HLDs) were published for stakeholder review for each of the three energy initiatives
 - Single Schedule Market –September 27, 2018
 - Day Ahead Market –December 20, 2018
 - Enhanced Real-time Unit Commitment – December 20, 2018
- Next steps for the HLDs include:
 - incorporating stakeholder feedback as appropriate
 - providing responses to feedback
 - IESO Board approval of HLDs (targeting August 2019)

Energy HLDs – Stakeholder Feedback

- Only one substantive concern related to design decisions was raised throughout the stakeholdering of the energy stream initiatives
 - Market participants have many years experience with the current market design and are generally aware of the design flaws
 - Stakeholders also understand and accept that the Auditor General and the Market Surveillance Panel have highlighted these flaws in past reports
- The one concern relates to pricing for loads, and has been raised by the Association of Major Power Consumers in Ontario (AMPCO)
- AMPCO has continued to re-iterate its strong preference for uniform pricing to avoid pricing volatility, even if it means higher system costs – this is in contrast to the IESO's proposed locational-pricing approach
 - Uniform pricing refers to a single province-wide price, comprising an average of all Ontario pricing nodes, whereas locational pricing would be calculated based on the average of the nodal prices in a particular zone

Alternative Option for Load Pricing

- Over the last several weeks, the IESO has informally discussed an alternative load pricing option with AMPCO to address its concerns
 - All “active” load participants – those who submit bids in the IESO-administered markets and receive a schedule from the IESO based on market prices – must be subject to nodal pricing
 - All other loads who are passive participants remain on uniform pricing unless they choose to become an active load and will then be settled on nodal pricing
- This option ensures that the IESO sends transparent price signals to loads participating in its markets, aligns dispatch and pricing, and eliminates Congestion Management Settlement Credits (paid when generators or consumers are told to consume or supply electricity when they would otherwise be doing so at an operating loss)
 - However, without proactive engagement, this alternative design could drive participants away from being in the wholesale market and further erode system benefits and market efficiency

Next Steps for Energy HLDs

- Following further discussions with AMPCO, the IESO will present the alternative option to remaining stakeholders at the upcoming 'Market Renewal Program Update' meeting (June 18)
- IESO to update HLD documents and formally respond to written stakeholder comments
- Prior to finalizing the HLDs, the IESO will conduct outreach with the Ministry of Energy, Northern Development and Mines, and the Market Surveillance Panel
- IESO management recommendation to the Board is expected in August 2019, seeking approval of all three HLD documents

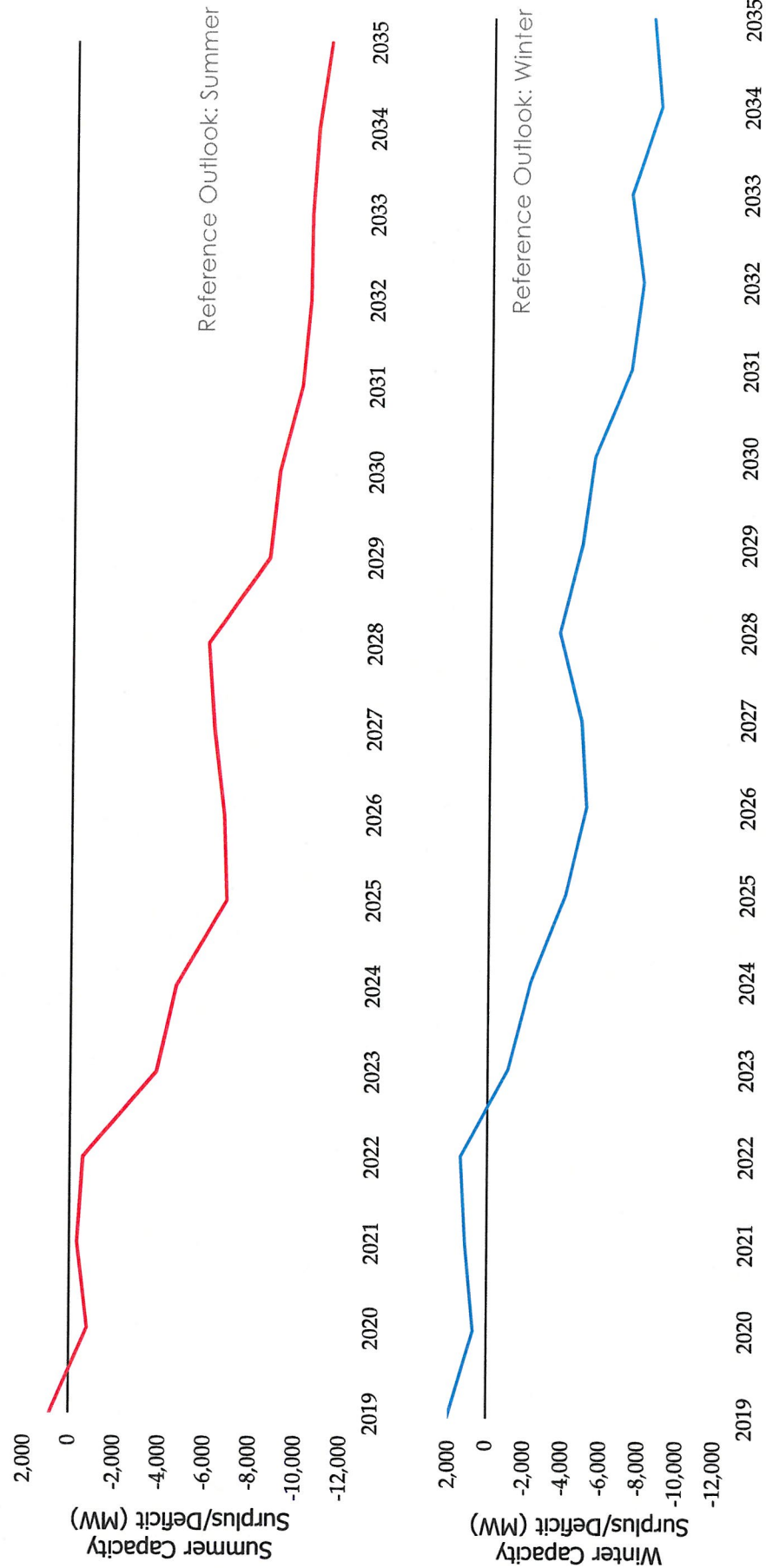
CAPACITY



Capacity Need

- Capacity is the capability to generate electricity (or to reduce the consumption of electricity through demand response) when needed
 - Capacity is essential to be able to manage the changing demand on the system both from hour-to-hour and between seasons
 - A reliable system has adequate capacity committed to meet peak demands under various system conditions including extreme weather
- 'Acquiring capacity' essentially covers the portion of costs to build and/or maintain supply resources
 - In contrast, the energy market covers the costs of a resource to actually run and provide energy
- The IESO needs a more flexible mechanism to acquire capacity to meet Ontario's capacity needs that vary over the next 10 years
 - First capacity need emerges in 2020 and then increases significantly in 2023

Ontario's Capacity Outlook



Capacity Surplus (+)/Deficit (-) (MW)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Summer Surplus , Reference Demand, Without Reacquisitions	847	-811	-335	-583	-3,844	-4,686	-6,878	-6,736	-6,292	-6,018	-8,689	-9,096	-10,077	-10,418	-10,475	-10,724	-11,273
Winter Surplus , Reference Demand, Without Reacquisitions	2,060	710	1,143	1,410	-1,085	-2,263	-4,063	-5,124	-4,838	-3,675	-4,833	-5,451	-7,344	-7,921	-7,306	-8,834	-8,419

IESO's Staged Approach for Capacity



Starting summer 2020, Ontario's capacity need in the near term can be met by enhancing the existing Demand Response (DR) auction that has run annually over the past four years

TCA Project: Decision/Recommendation

- The Transitional Capacity Auction (TCA) Project is seeking Board of Director approval to proceed with the design and implementation work of the TCA Project:
 - up to \$10M
 - concluding June 30, 2022
 - ... including cost and time contingency

TCA Project: Summary

- The TCA will be designed to satisfy the near-term capacity needs in the period starting summer 2020 until winter 2024/2025*
- The TCA project will deliver the following:
 - Increased competition beyond demand response resources, by enabling existing and market-enabled resources (i.e., generators, imports, etc.) to participate in the upcoming capacity auctions
 - Incrementally evolve auction rules and processes to enhance the reliability and efficiency of the capacity resource (i.e., capacity qualification process, and performance assessment)

** The ICA is expected to run in Q4-2022 for the summer 2025+ capacity period*

TCA Project: Benefits

- TCA will address the IESO reliability requirements for capacity starting in the summer of 2020
- TCA will encourage competition at the best price for ratepayers (estimated \$180M total savings in the TCA timeframe) compared to traditional contract procurements
- Prepares the IESO and participants for the transition to a comprehensive, transparent, competitive capacity acquisition mechanism
- Like the ICA, the TCA will provide a regularly executed, flexible approach to meeting capacity needs providing greater certainty to participants

TCA Project: Cost and Schedule

- The project is seeking approval for the range of project costs as listed below:
 - **Capital:** \$5.42M to \$7.37M
 - **Operating:** \$1.96M to \$2.63M
 - **Total Project Cost:** \$7.38M to \$10.00M
- The project is expected to be complete by September 30, 2021 plus a schedule contingency to June 30, 2022
- Project costs, schedule, and risks will be reviewed regularly by the Project Steering Committee
- IESO Board approval will be required for any changes that exceed the total project cost (\$10M) and schedule (June 30, 2022)

TCA Project: Key Risks

- Significant capacity need in to 2023+:
 - The IESO's capacity need increases significantly during the next few years; the IESO must create an appropriate business environment and auction process to sustain and develop resources such that sufficient capacity is available when needed when the capacity requirement increases significantly (2023-2026)
 - The "reliability assurance" capacity ensures reliable future operations by building the market in advance of when larger reliability (capacity) needs arise in 2023
 - Proactively enabling additional resources in advance of significant reliability need is an appropriate way to maximize future participation when the demand for capacity increases significantly in 2023
 - As a result, the TCA will assess and may incorporate, as applicable, additional capacity into each of the 2020 to 2022 auctions in order to develop conditions to increase the likelihood of successful, reliable outcomes in the years when capacity needs increase significantly

TCA Project: Key Risks (cont'd)

- Lack of stakeholder support anticipated due to expanded participation, compressed timelines for engagement, etc.
 - Mitigation tasks include executive outreach to build relationships and understand areas of concern and support
 - Increased IESO focus on DR Working Group to move forward issues of concern to DR community
- Unhappy stakeholders launch challenge of TCA Market Rules to Ontario Energy Board
 - The IESO continues to have proactive engagement with stakeholders to understand key concerns and reduce this risk
 - Should the TCA be delayed:
 - the IESO may continue to hold DR auctions using existing market rules to meet our short-term reliability need for capacity
 - the TCA Project will amalgamate design and implementation work stages to enable 2020 auctions

Update on Capacity High Level Design

- The Incremental Capacity Auction (ICA) HLD was published for stakeholder review, comment and feedback on March 22, 2019
- Significant stakeholder feedback has been received, with comments organized in three broad themes:
 - Feedback on decisions that will be made during the detailed design phase
 - Feedback seeking changes from high level design proposals
 - Most substantially, feedback from stakeholders who do not agree with an Incremental Capacity Auction – in whole or in part
- No comments were received from consumers or groups representing Class B consumers – those that pay for the full cost of the generation contracts

ICA: Challenges

- The volume of statements from stakeholders that express concern with the ICA is increasing
- Some stakeholders support the ICA but are also advocating for other market changes concurrent with MRP, such as energy payments and expanding participation in the market, among others
- Some resource types such as nuclear and hydro do not see how an ICA would work for them
- Some fallout from Alberta, where their capacity market is being challenged following the election of a new government
- Challenges reflected in conversations regarding the development of the MRP Business Case, where ICA alternatives are being proposed

ICA: Observations

- Given that an ICA is a new mechanism for Ontario, this reaction is not surprising
 - Ontario experience with capacity auctions limited to the successes of the DR Auction 2015-18
 - AMPCO members benefit from contracts through suppressed energy prices and can use Industrial Conservation Initiative to reduce exposure to Global Adjustment
 - Ontario suppliers have benefitted greatly from the existing contracting mechanism; ICA would increase their share of risk (Ontario Class B ratepayers have borne most of the risk of acquiring capacity)
- Stakeholders know that we are at a critical juncture where a number of decisions are in play:
 - TCA under development with an objective to execute in December 2019
 - IESO seeking to wrap-up high level design phase for energy and capacity
 - Market Renewal Program Business Case being developed to accompany the IESO's 2020-22 Business Plan

ICA: Proposed Path Forward

- The IESO intends to take some time to fully understand stakeholder comments and concerns regarding the ICA by delaying closing off the HLD
- The IESO will sharpen its messaging around ICA – what its strengths and weaknesses are, what it means for different resource types and the benefits of market integration
- To support the Business Case, the IESO intends to assess alternatives to the ICA – in consultation with stakeholders, and with support from external resources
- The IESO intends to continue build and execute the TCA – beginning in December 2019 – to continue to build confidence in capacity auctions

ICA: Implications of Path Forward

- The MRP Project Team will not wrap up discussions with stakeholders in-time to support a recommendation for the IESO Board of Directors to approve the ICA HLD in August 2019
- If pace of the detailed design is stalled, the ICA project will slip past the target date of Q4 2022 for its first auction
 - The IESO will need to assess the evolving picture for resource need in 2025 and beyond and determine how best to address it



MRP BUSINESS CASE

MRP Business Case Overview

- The MRP Business Case will be based on:
 - The net financial benefits associated with implementing the four HLDs developed with stakeholders
 - The operational and reliability impacts
 - The benefits of supporting future market developments
- The assessment horizon will be:
 - Q3-2022 to Q2-2025 for energy only net benefits
 - Q3-2025 to Q2-2035 for the first 10 year period of net benefits when all initiatives are operational
 - Additional cases/years will be assessed based on stakeholder feedback

MRP Business Case Context

- The timelines and approach to complete the Business Case will continue to be refined to:
 - Ensure we can utilize the latest forecasts that will be released in the Annual Planning Outlook; and
 - Work closer together with stakeholders and ensure the Business Case reflects the feedback we receive
- The IESO will work to ensure the Annual Planning Outlook, the Business Case and the IESO Business Plan are sequenced appropriately
- This will mean that the timelines and engagement approach for the Business Case will need to be adjusted

2019 Business Case and 2017 Benefits Case

The 2017 Benefits Case took a **top-down** approach and scaled the benefits realized from similar initiatives in other jurisdictions to Ontario



By contrast, the MRP Business Case will take a **bottom-up** approach based on Ontario-specific analysis:

- Design as per the Ontario-specific market with the energy and capacity high-level designs implemented
- Market simulation tool customized to generate market outcomes over time
- Granular data assumptions based on existing assets and Ontario topology

Indicate directionally the potential benefits

Ontario-specific analysis outlining the expected costs and benefits post-MRP implementation

Integration Benefits

- While the Business Case will clearly state the benefits of each work stream separately, it is important to examine the interplay between the two work streams
- Integration benefits will reflect many of the challenges and costs the IESO has faced over the past decade
 - buying too much steel in the ground
 - having too much energy (surplus baseload energy and paying for foregone energy)
 - the lack of flexibility and need to pay extra to constrain units on out of the market
 - using assets in ways that were not anticipated, e.g. combined-cycle gas turbines (CCGTs) for meeting operating reserve and flexibility
 - siting in the wrong location (e.g. wind farms in congested areas or issues related to key power system limits)

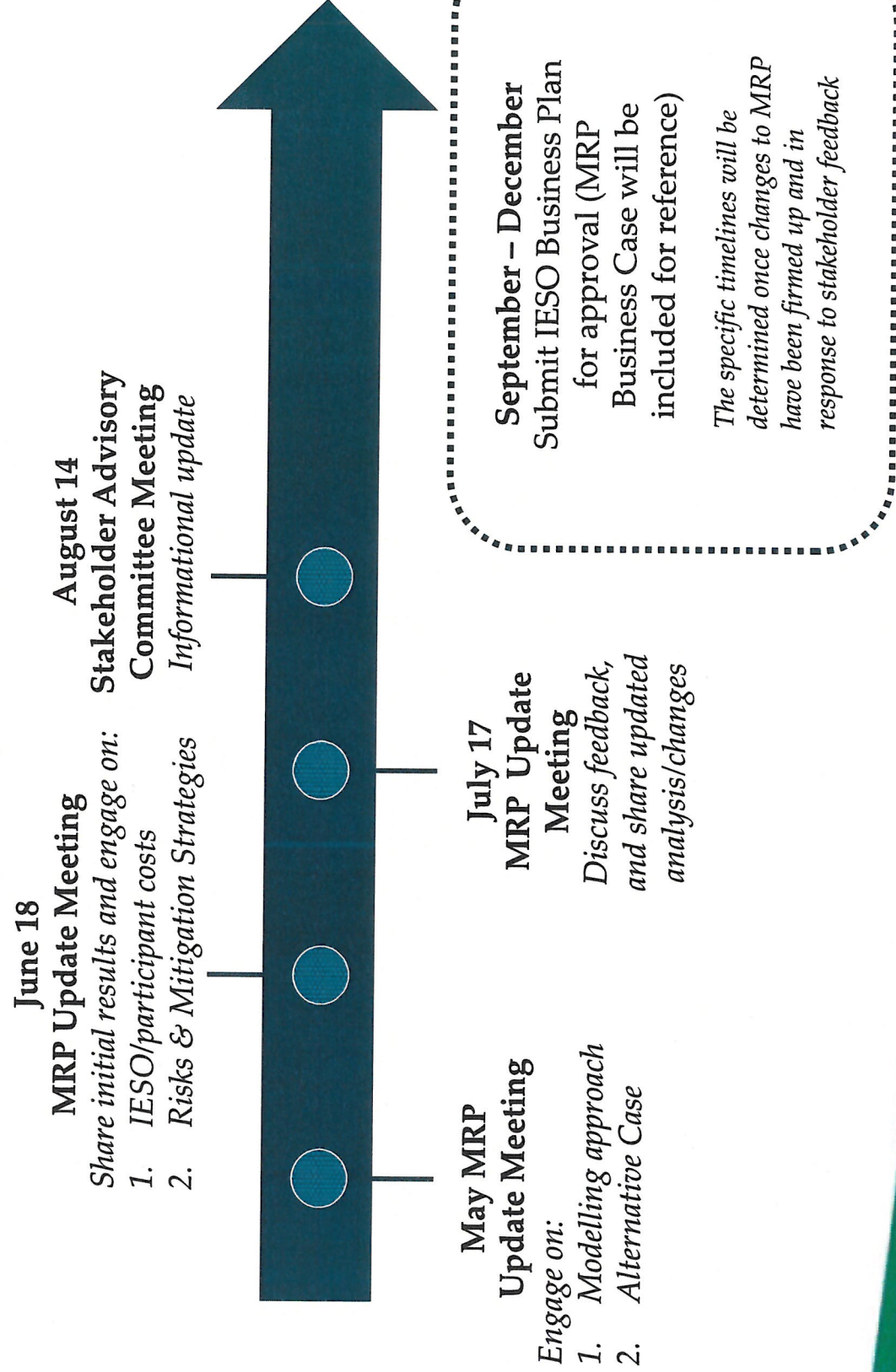
The Alternative Case

- The benefits of MRP will be assessed by comparing the MRP design to an alternative case
- For the 2017 Benefits Case, the alternative case assumed a continuation of the current energy market design:
 - Long-term centralized contract procurement model
 - Uniform pricing for the energy market
 - Absence of a financially binding day-ahead market
- For the MRP Business Case, we will take the alternative case from the 2017 Benefits Case as a starting point, and work with stakeholders to refine the assumptions and inputs
 - The IESO will work with stakeholders to define what other potential alternative cases should be modelled
 - Impacts to approach, scope and timelines will be assessed as a result of feedback that will be submitted

Business Case Engagement & What We Have Already Heard

- **Tight timelines:** current schedule to complete MRP Business Case by August is very tight and may not allow for sufficient stakeholder input
- **Clear definition of benefits:** need to explain different categories of benefits (e.g., energy, capacity and integration), how they are calculated and relate to the different types of efficiency savings
- **Alternative Cases:** stakeholders have expressed a strong desire to develop more than one alternative case reflective of their views
- **Market Participant costs:** stakeholders are interested in understanding MRP implementation costs for market participants and have these quantified in the Business Case
- **Sensitivity modelling:** MRP business case modelling should include sensitivities on a range of assumptions including re-contracting costs, demand, carbon prices and delays to the nuclear refurbishment schedule

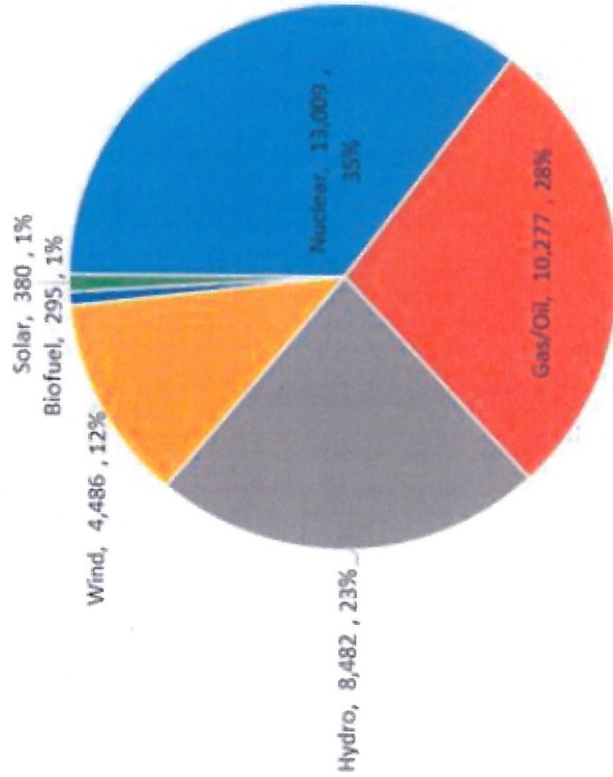
High-Level MRP Business Case Timeline



APPENDIX

Installed Capacity and Energy Output: 2018

2018 Installed Capacity (MW)



Bottom Line – in 2018 nuclear and hydro provided:

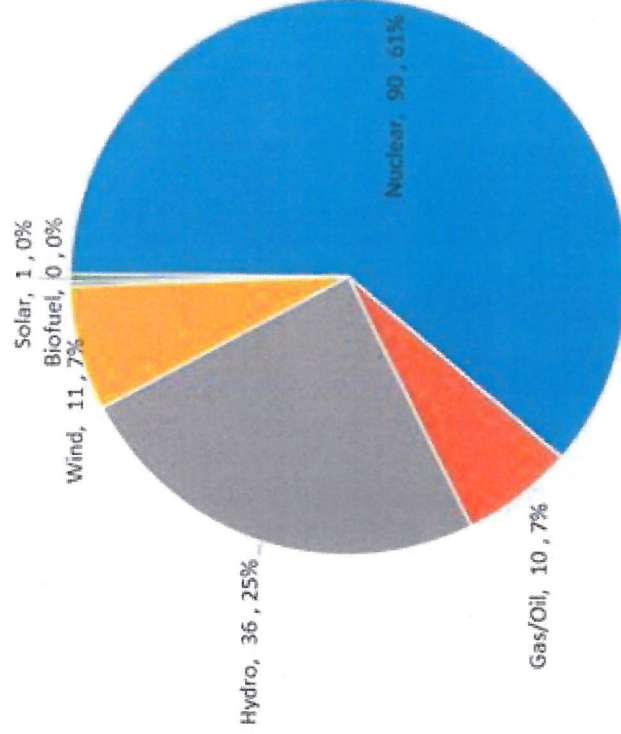
- 86% of Ontario's energy
- 58% of Ontario's capacity

Other resources in Ontario's fleet are needed for:

- Capacity – that is, ability to meet Ontario's energy needs on peak days
- Other services needed to operate the power system including operating reserve, and ramping

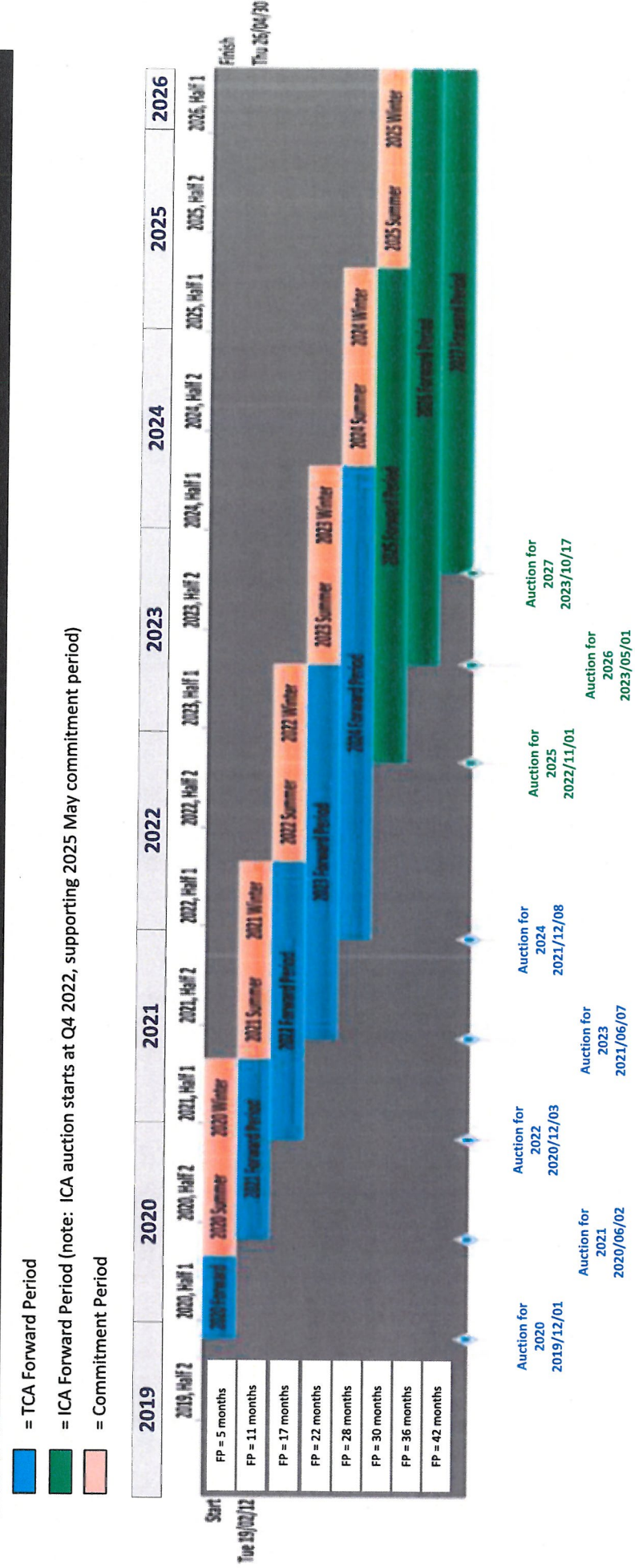
Fuel	MW	TWh
Nuclear	13,009	90
Gas/Oil	10,277	10
Hydro	8,482	36
Wind	4,486	11
Biofuel	295	0
Solar	380	1

2018 Energy Output (TWh)



Proposed TCA and ICA Timelines

HIGH LEVEL TIMELINE: EVOLUTION OF DR AUCTION



Assumptions:

- 1) Auctions take place approximately semi-annually until forward period = 2.5 yrs.
- 2) First ICA takes place by Q4 2022.