

# MDAG – Afternoon Session

May 30, 2019

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# Agenda – Afternoon Session

12:00 pm

**Lunch**

12:30 pm

MDAG workplan

» Identifying potential market enhancement projects

» Valuation Process and Assessment

2:45 pm

Final Remarks

3:00 pm

**Adjourn**

# Re-cap

- The IESO, with input from stakeholders, is developing a workplan that will identify and prioritise market enhancement projects of highest value
- Two different approaches for 2019
  - **Workplan 2020:** A simplified approach to identify and prioritise research initiatives
  - **Workplan 2021:** A more thorough process to identify and prioritise market development projects

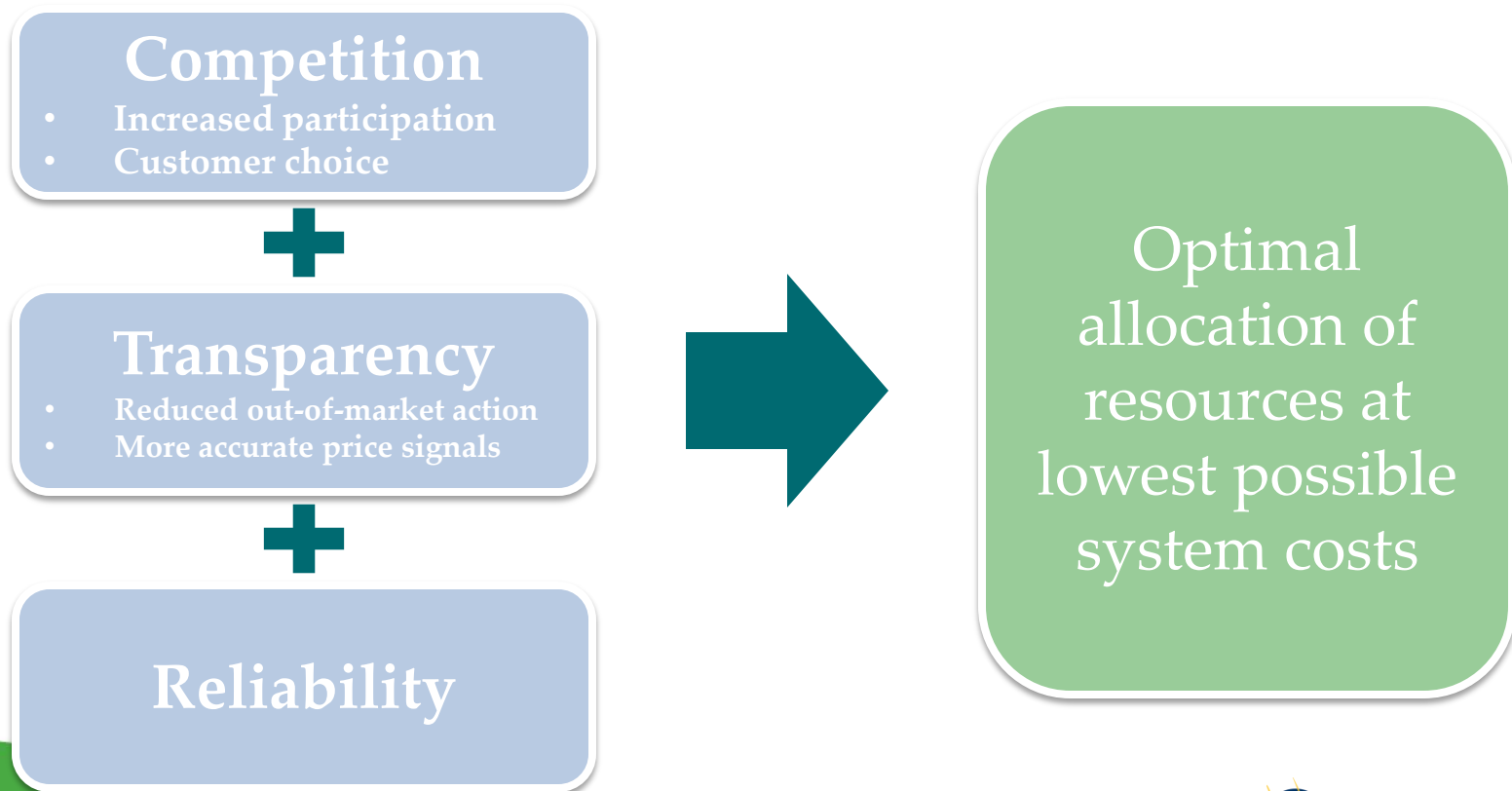
# Purpose of this Session

- For the IESO to provide an overview of how resources currently participate in Ontario's markets, and for the IESO and Members to identify potential areas of market enhancement
- To discuss the evaluation approach/criteria that will be used to prioritise research initiatives in the 2020 Workplan and market change projects in the 2021 Workplan

# Part 1: Identify Potential Market Enhancements

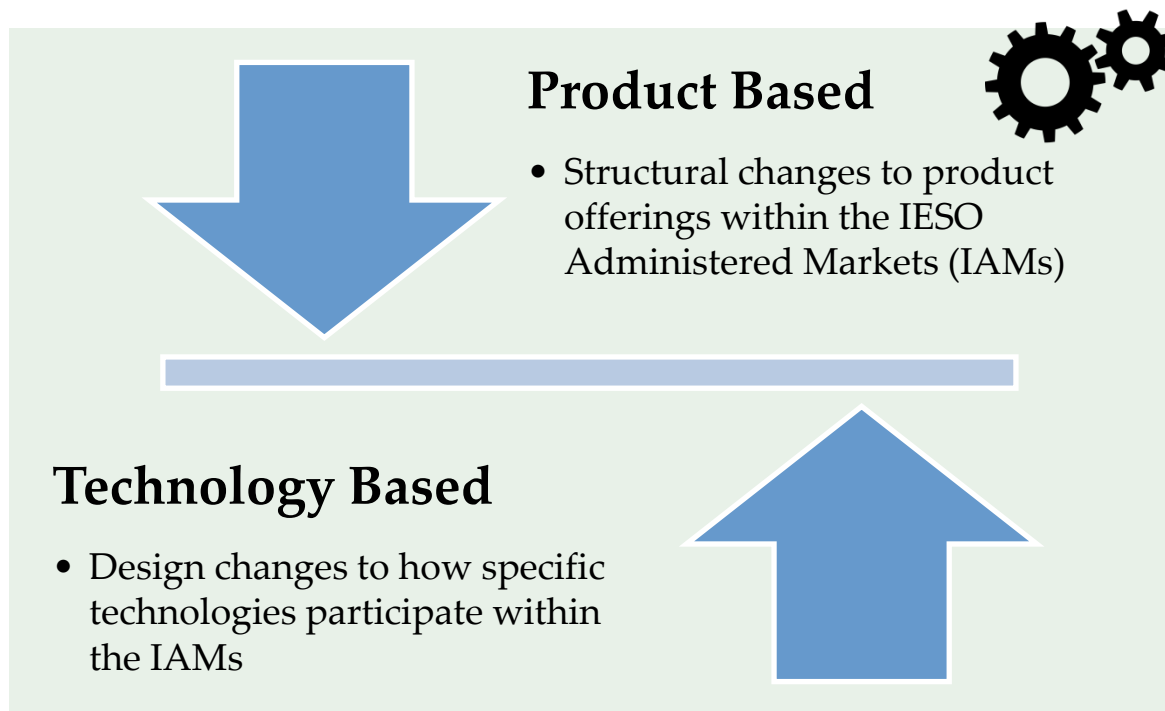
# Goals of the MDAG Workplan

- The group should be mindful that potential projects adhere to the goals of the MDAG and drive towards more efficient market outcomes



# Types of Market Enhancements

- Generally, projects may be product based or technology based but should ultimately align with the goal of advancing the IAM as per the TOR of the MDAG



**Question to MDAG:**  
Are there projects that are neither product or technology based?

# Participation in Ontario's Markets

- Technologies currently provide grid services in a number of ways, however, the IESO recognizes there are opportunities to increase competition and transparency across the markets

Current Technology Participation	Co-optimized				Capacity
	Energy	OR	30-min Flexibility	A/S	
CCGT	Yes	Yes	Yes	Black Start	2022+
SCGT	Yes	Yes	Yes		
VG	Yes	No	No		
Nuclear	Yes	No	No		
Hydro	Yes	Yes	Yes	Yes	
Storage	BTM	PGS	No	RSVC	
DR	Yes	DL's	Yes	No	
DERs	BTM / FIT	No	No	No	
Interties	Yes	One intertie	Yes	No	

Yes

Some

No



# Identifying Market Enhancements

- Through the Workplan process, the IESO will work together with stakeholders to identify market enhancement opportunities

	Co-optimized		A/S	30-min Flexibility	Capacity	
	Energy	OR				
CCGT	Improved optimization				2022+ Enabling storage	<div style="background-color: #007a7a; color: white; padding: 5px; text-align: center;">Yes</div> <div style="background-color: #a6c9ec; color: black; padding: 5px; text-align: center;">me</div> <div style="background-color: #d9d9d9; color: black; padding: 5px; text-align: center;">No</div>
SCGT						
VG		EPOR		<ul style="list-style-type: none"> <li>Re-assess 30-min OR for flexibility</li> </ul>		
Nuclear						
Hydro	Improved optimization			<ul style="list-style-type: none"> <li>Potentially explore a flexibility product</li> </ul>		
Storage	Enabling storage / EPOR		RSVC			
DR		EPOR				
DERs	Enabling storage / EPOR					
Interties	Intertie review					

**Note: these are indicative projects**

# Technology-based Enhancements

## Enabling and enhancing participation of Storage

- Modelling of storage in the energy and A/S market
- Participation model for PGS

## Enhancing participation of DR

- Enhancing participation in the energy market and access to A/S

## Enhancing participation of Gas-fired fleet

- CCGT modelling, SCGT participation

## Explore opportunities for VG fleet

- Ability to provide A/S

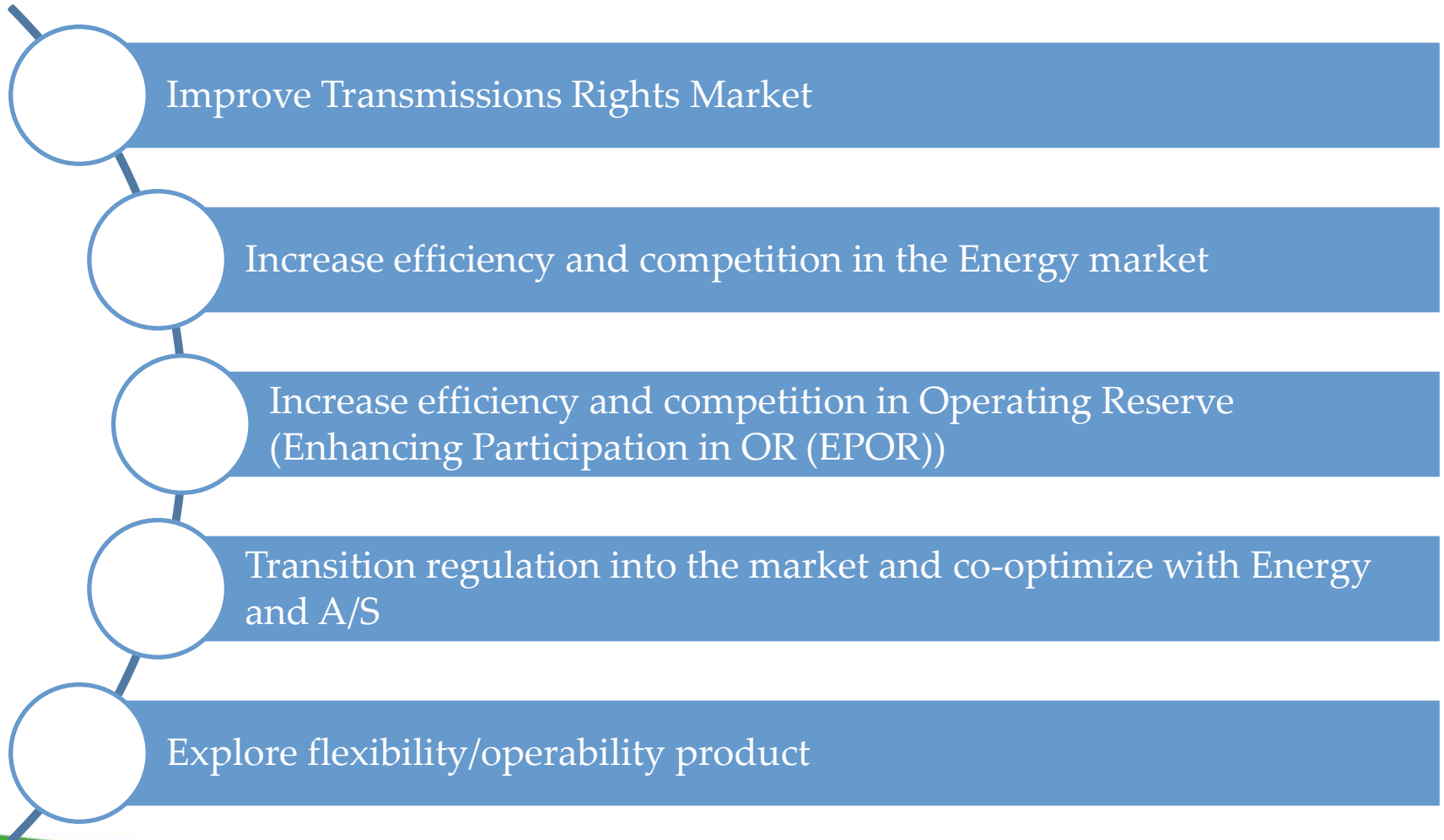
## Intertie Review

- Investigate potential changes to maximize value from interties

## DER Participation in IAM

- Develop participation framework including review of threshold and aggregation modelling

# Product-based Enhancements



# Potential Initiatives and Projects

- At the April MDAG, members asked the IESO to provide an initial list of potential projects, which could help:
  1. spur further discussion on areas of market enhancements, and
  2. facilitate the development of the evaluation and prioritization process
- The overview below provides an initial look at both ongoing projects and potential future areas of market enhancements

## Ongoing Market Change Projects outside MRP/TCA/DR

- Transmission Rights Clearing Account (Ongoing)
- Transmission Rights Review (Commences Fall 2019)

## Potential Research & Market Change Initiatives for 2020+

- Enabling and enhancing participation in Energy, A/S markets
- Intertie Review
- Flexibility needs and considerations post-MRP
- Additional projects to be discussed and prioritized with MDAG

# Enabling Storage

## Background

There are opportunities to enhance the participation of energy storage resources in the wholesale markets.

### Identified by

- Stakeholders and IESO.

### Objective

- Increase competition in the IAM by facilitating energy storage participation while ensuring reliability.

### Considerations

- Infeasible to make any major changes to the DSO in advance of the Market Renewal Program (MRP).
- Related to other projects and initiatives, such as lowering the minimum MW threshold or DER aggregation.

### Timeframe

- Included in the “Enabling Resource Participation” research and potential market change project for 2021 Workplan.

# Enhancing Participation of Demand Response (DR)

Tech-based project

## Background

- There are opportunities to improve the utilization of demand response.

### Identified by

- IESO and stakeholders

### Objective

- Continue to improve the value of DR resources to the IESO-market

### Considerations

- Work with the DRWG to develop projects that enhance DR's value to the energy market, including expanding participation

### Timeframe

- 2019 onward

# Enhancing Participation of Gas Fired Fleet

Tech-based project

## Background

With the foundations put in place by Market Renewal, there are further opportunities to improve the modelling and energy market integration of gas resources.

### Identified by

- IESO and stakeholders

### Objective

- A review of how existing gas generators could be more optimally modelled and utilized within the IESO-administered markets (e.g. “not-so quick start” modelling)

### Considerations

- Scheduling considerations may not be limited to gas generators

### Timeframe

- 2020-onward

# Explore Opportunities for VG Fleet

## Background

Explore opportunities for VG resources to increase its value to the grid by competing to provide a wider range of services.

### Identified by

- IESO and stakeholders

### Objective

- To investigate whether and how the VG fleet can provide additional value to the IESO markets through enabling greater participation in participation in the market

### Considerations

- Relate to Expanding Participation in OR project

### Timeframe

- 2020-onward

Tech-based project



# DER Participation in IAMs

## Background

The IESO is committed to increasing competition in the IAMs by establishing efficient and enduring participation models for DERs to provide a range of grid services.

### Identified by

- IESO

### Objective

- Improve interface and visibility of DERs and enable participation, where and when feasible

### Considerations

- The current 1 MW size threshold for Market Participants is a barrier for many DERs. This may be overcome by enabling aggregation of these resources.
- Other potential barriers include requirements and costs related to metering and telemetry.

### Timeframe

- TBD

# Intertie Review

## Background

In Ontario, intertie transactions are currently scheduled on an hourly basis. Scheduling intertie transactions more frequently could improve the efficiency of the market, support operations and increase alignment with neighbouring markets.

### Identified by

- IESO and Market Surveillance Panel

### Objective

- Explore the reliability and market efficiency impacts of improving energy trading across the interties

### Considerations

- IESO could build on the work it conducted under the More Frequent Intertie Scheduling work in 2017. Goal of this initiative would be to explore opportunities to improve scheduling and trading across the interties.

### Timeframe

- Proposed research initiative for 2020.

# Transmission Rights Clearing Account (TRCA)

## Background

Based on the MSP's recommendation, the IESO is currently reviewing the manner in which it allocates disbursements from the Transmission Rights Clearing Account.

### Identified by

- Market Surveillance Panel (MSP)

### Objective

- To ensure the TRCA surplus funds are disbursed in an efficient and equitable manner

### Considerations

- A report will be published in Q2 2019 that will outline the considerations for this initiative

### Timeframe

- Project is underway and expected to be completed later in 2019.

# Transmission Rights Review

## Background

After the TRCA review is completed, the IESO plans to perform an overall review of the TR Market.

MRP is a foundational redesign of the current market, which makes it an opportune time to review the overall TR market.

### Identified by

- IESO.

### Objective

- Perform an overall review of the TR market including whether its meeting its intended objectives, alignment with MRP, and implement improvements

### Considerations

- The review should be aligned with ongoing MRP developments.

### Timeframe

- This will commence in Fall 2019 and continue through to 2020.

# Increase efficiency in Energy Market

## Background

Increasing liquidity and competition in the IESO markets is pivotal to a well-functioning, cost-effective system

### Identified by

- IESO

### Objective

- The IESO should enable all resources that are technically capable of providing the products and services needed to deliver reliability.

### Considerations

- Linked to enabling participation initiatives and storage, DR and DER, gas-fired projects.
- Even in a broader-based approach, certain elements may need to be technology-specific.

### Timeframe

- TBD

# Expanded Participation of Operating Reserves

## Background

Broaden participation in Operating Reserve to resource types that are not currently providing this service to the grid.

### Identified by

- IESO and stakeholders

### Objective

- To increase competition and reduce the risk of scarcity conditions by expanding participation of Operating Reserves (OR) to other technologies able to meet OR requirements.

### Considerations

- Explore value of enabling participation and unlock value from technologies already competing in the Energy market
- It may not be possible to only enable technologies that currently do not participate actively in the energy market for Operating Reserve alone. This may mean that the technologies should be enabled for both energy and OR together.

### Timeframe

- 2020 Onward

Product-based project

# Transition Regulation into Market

Product-based project

## Background

Regulation is currently procured and operated outside of the IAMs. There may be opportunities to co-optimize regulation with Energy and OR.

### Identified by

- IESO

### Objective

- To understand how regulation could be transitioned from a contract-based approach to a market-based approach

### Considerations

- Ensuring there is sufficient diversity of resources providing regulation services is an important pre-condition
- This would potentially be a large scale project that requires substantial changes to the IAMs.

### Timeframe

- Post 2020 .

# Flexibility Product

## Product-based project

### Background

- Jurisdictions such as CAISO and MISO have introduced flexibility products to manage forecast uncertainty with high volumes of VG penetration.
- The IESO could explore the need and effectiveness of a similar product for the Ontario market.

### Identified by

- IESO

### Objective

- To meet flexibility needs in a transparent and competitive manner.

### Considerations

- The IESO has identified an increasing need for flexibility and has introduced 30-minute OR for flexibility.
- Interim flexibility solution will need to be monitored and assessed for its effectiveness post MRP to determine if it should be enhanced, or if another solution (e.g. flex product) is required.

### Timeframe

- Research initiative 2020.



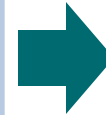
# Break Out Session – Identify Potential Market Enhancements

- Spend 15 minutes in groups of 4 identifying other potential market enhancements. Prepare to discuss with the wider group.

**Technology based  
project(s)**



**Three positive impacts on  
Markets**



**Three challenges to  
Markets**

# Break Out Session – Identify Potential Market Enhancements

**Product based project(s)**

**Three positive impacts on Markets**

**Three challenges to Markets**



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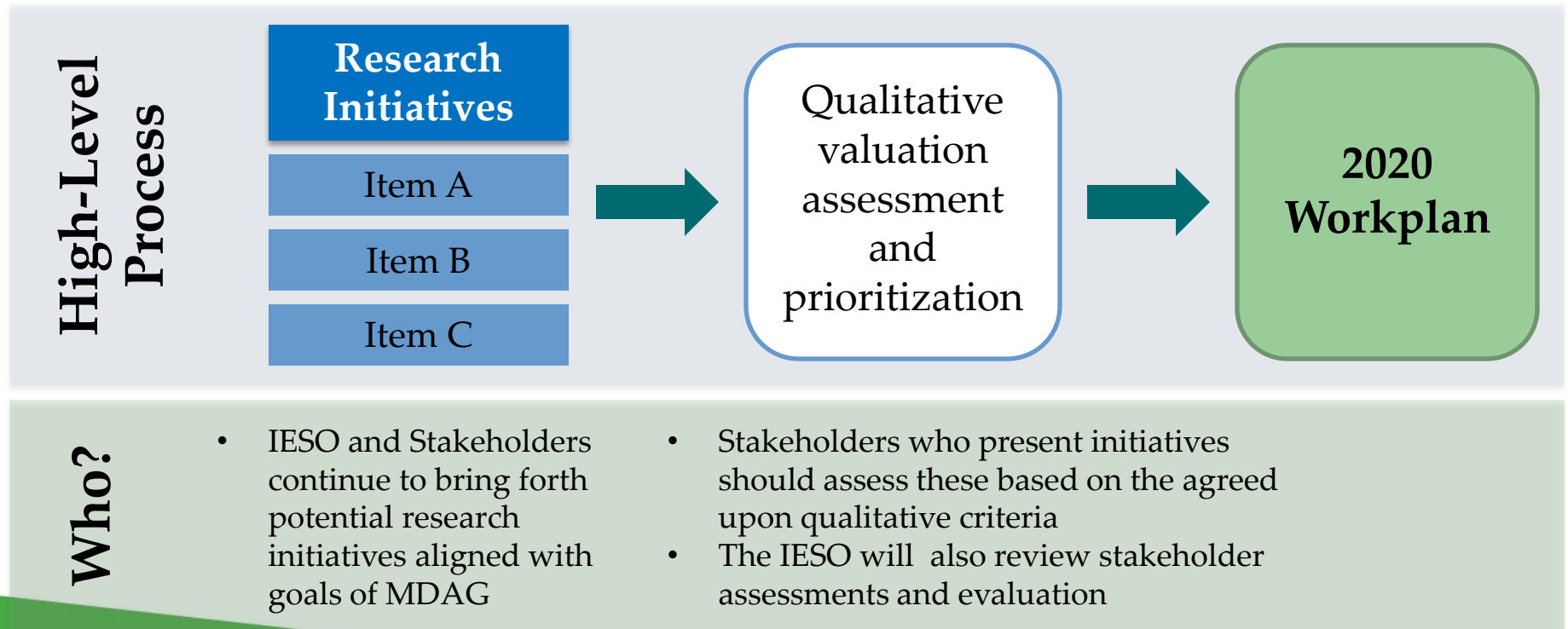
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# Part 2: Valuation Process and Assessment

# Evaluation Process: Research Initiatives

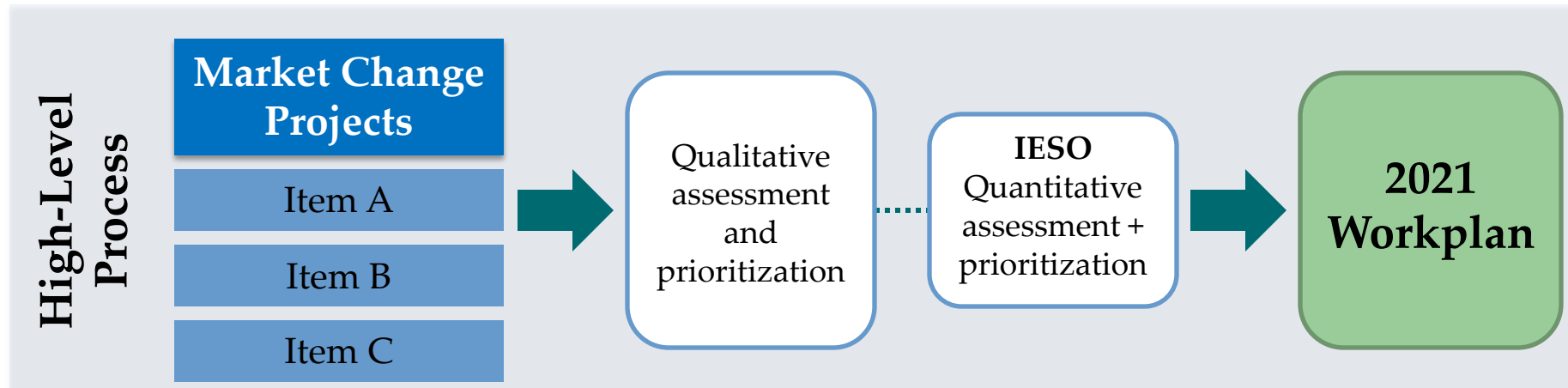
- The IESO proposes to proceed with a two-phase qualitative approach to prioritize research initiatives\*
  1. Review and assessment based on qualitative criteria
  2. Prioritization of initiatives



\* similar to the approach used for the DRWG Workplan

# Evaluation Process: Market Change Projects

- The IESO proposes a three-phase evaluation process:
  1. Projects are first evaluated qualitatively based on agreed upon criteria
  2. A select few projects could thereafter be evaluated more thoroughly in a quantitative manner
  3. Prioritization of the projects

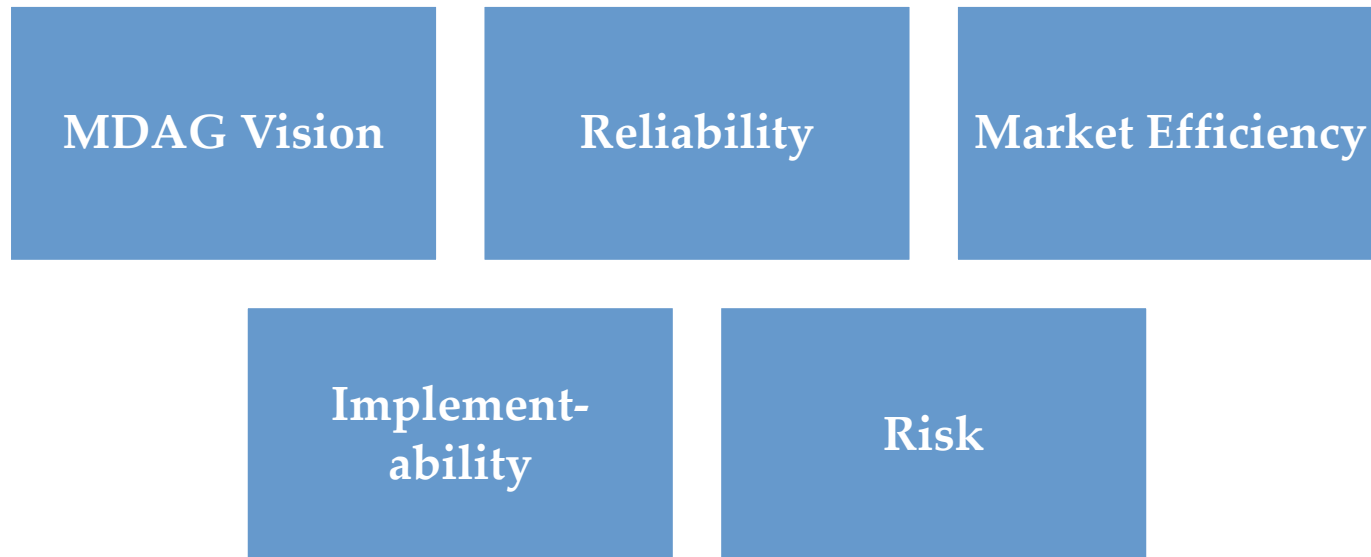


## Who?

- IESO and Stakeholders continue to bring forth projects aligned with goals of MDAG
- IESO / Stakeholders to evaluate their projects
- IESO to review and finalise qualitative evaluation
- Projects that meet the qualitative criteria will be further assessed quantitatively by the IESO
- Prioritization based on outcome of the assessment

# Value Assessment

- Building off the DRWG and MRP principles, the following items could be reviewed in a valuation assessment for potential MDAG projects and initiatives



**Question for MDAG :** Should initiatives and projects satisfy each standalone value assessment to be considered further?

# Step 1: Alignment with MDAG Vision

- The first step consists of binary “Yes” / “No” questions to establish whether the minimum criteria of initiatives and projects are met
- Initiatives and projects that satisfy all three criteria will proceed further in the evaluation process

## Potential Questions

- Is it needed for reliability or regulatory purposes?
- Will it require design changes to the IAMs?
- Does it align with the MDAG vision of enhancing the IAMs?

Yes

No

Yes

No

Yes

No

## Step 2: Reliability

- Markets exist to ensure the efficient allocation of resources, however the reliability of the system is always the priority

### Potential Questions

- Will the project enhance system reliability?
- What are the expected reliability impacts on the system? Expand on the magnitude of the reliability impacts when compared to the system as a whole.

### Expected Reliability Impact

High

Med

Low



# Step 3: Market Efficiency

Increased competition and transparency are driving forces of any competitive markets. In electricity markets these provide prices that signal system needs on a locational basis

## Potential Questions

- Describe how the project enhances market efficiency
- Will it result in less out-of-market payments. If so, by how much?
- When compared with total system cost what are the estimated impacts?
- How will the project impact and improve market and price transparency?
- Describe how it enhances competition.
- How much competition does it introduce when assessed against the overall Ontario system?

## Expected Market Impact

High

Med

Low

# Step 4: Implementability

- The IESO will conduct this assessment to ensure the proposed project or initiative is feasible and practical
- Stakeholders inform on the degree of stakeholder support and indicate the level of changes required for market participants.

Potential Questions

## IESO Assessment

- **Is the project something the IESO could implement in the short, medium, or long term?**
- **Is this considered a small, or large scale project?**
- **Are there any examples/lessons learned from other jurisdictions?**
- **What are the IESO internal constraints in terms of capital and personnel to deliver on the project?**
- **Any linkages to other projects?**

## Implementability

High

Med

Low

# Step 5: Risk

- This step aims to understand the associated risks and barriers, and how the level of risk may vary over the short and long term

## Potential Questions

- What are the risks to this project, in particular to delivering the estimated value?
- How does the value assessment change in the short term and longer term?
- Are there other barriers and/or risks that might decrease the value of the project or initiative?

Expected short term risk <2 years

High

Med

Low

Expected long term risk >5 years

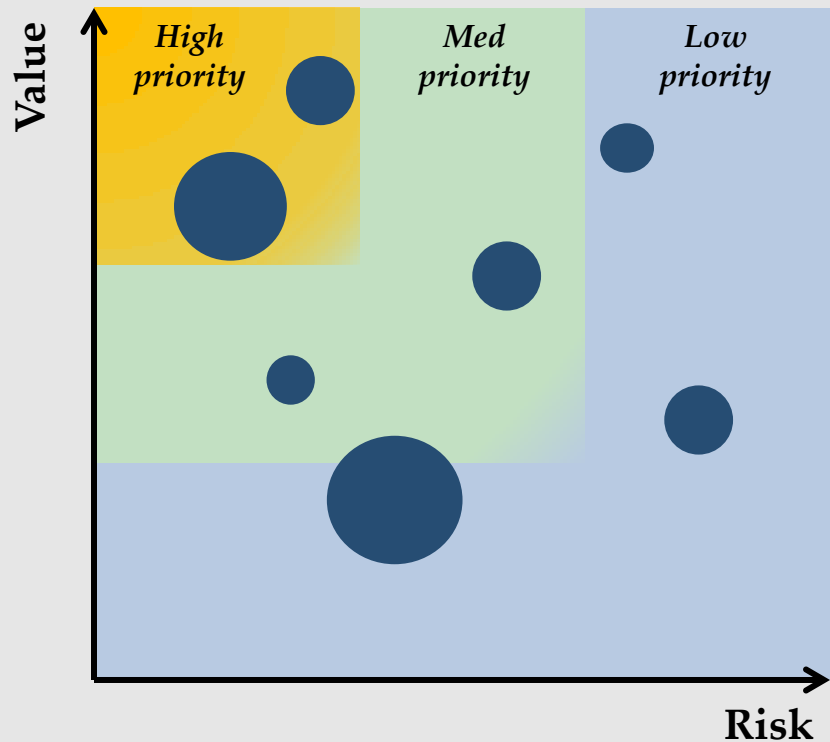
High

Med

Low

# Prioritization

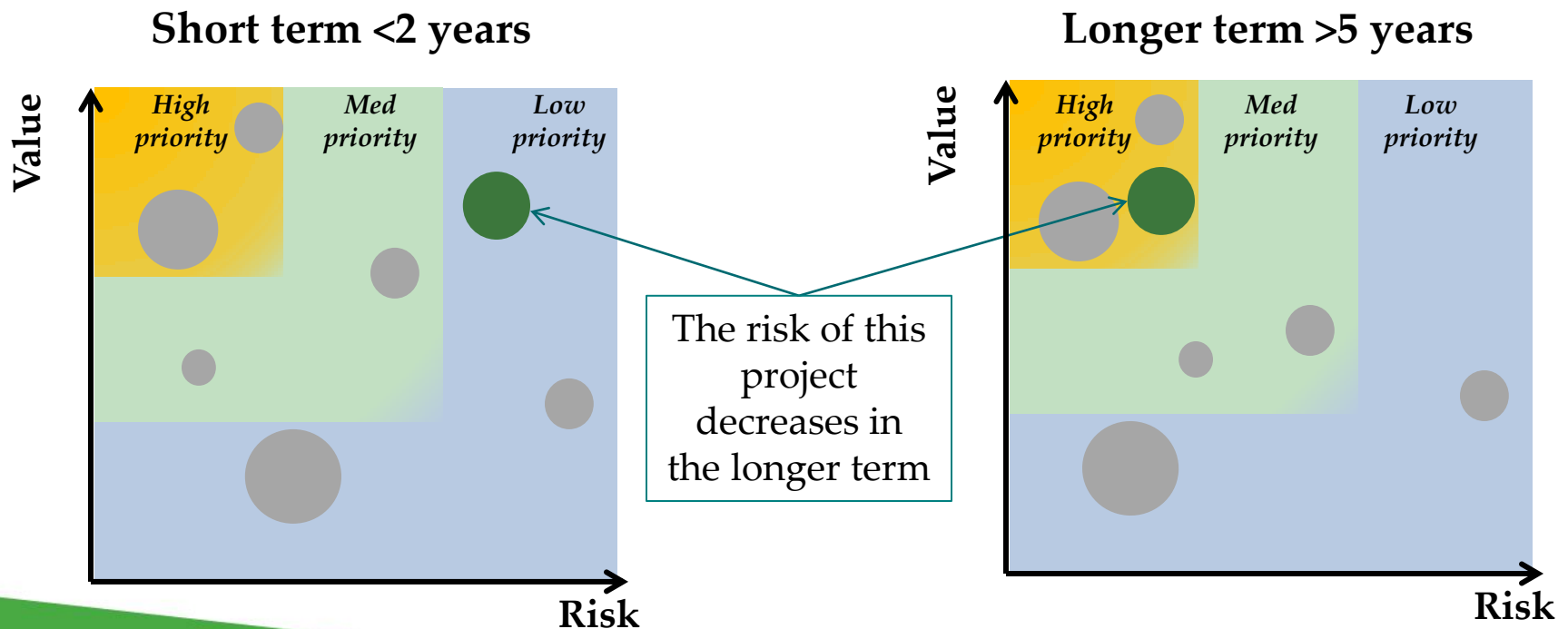
- Based on the 5-step process an assessment of the highest value and lowest risk items will move forward



- Projects will be assessed on the basis of what value they can deliver, degree of risk and an assessment of the implementation impact
- The most valuable, low risk projects will be prioritized in the upper left quadrant
- The scale of the project can be illustrated by the size of the circle

# Prioritization (Continued)

- It is important to consider that high value projects may be high-risk in the short term, but lower risk in the long term



# Break Out Session: Qualitative Criteria

- Is the MDAG agreed on the initial valuation assessment steps put forth by the IESO?
- Are there other steps aligned with MDAG goals that should be considered for the Workplan?



# Break Out Session: Valuation Assessment

- Spend 15 minutes in groups of 4 discussing which questions should be included as part of the valuation assessment.

**Step 1: Alignment with MDAG Vision**

**Step 2: Reliability**

# Break Out Session: Valuation Assessment

**Step 3: Market Impacts**

**Step 4: Implementability**



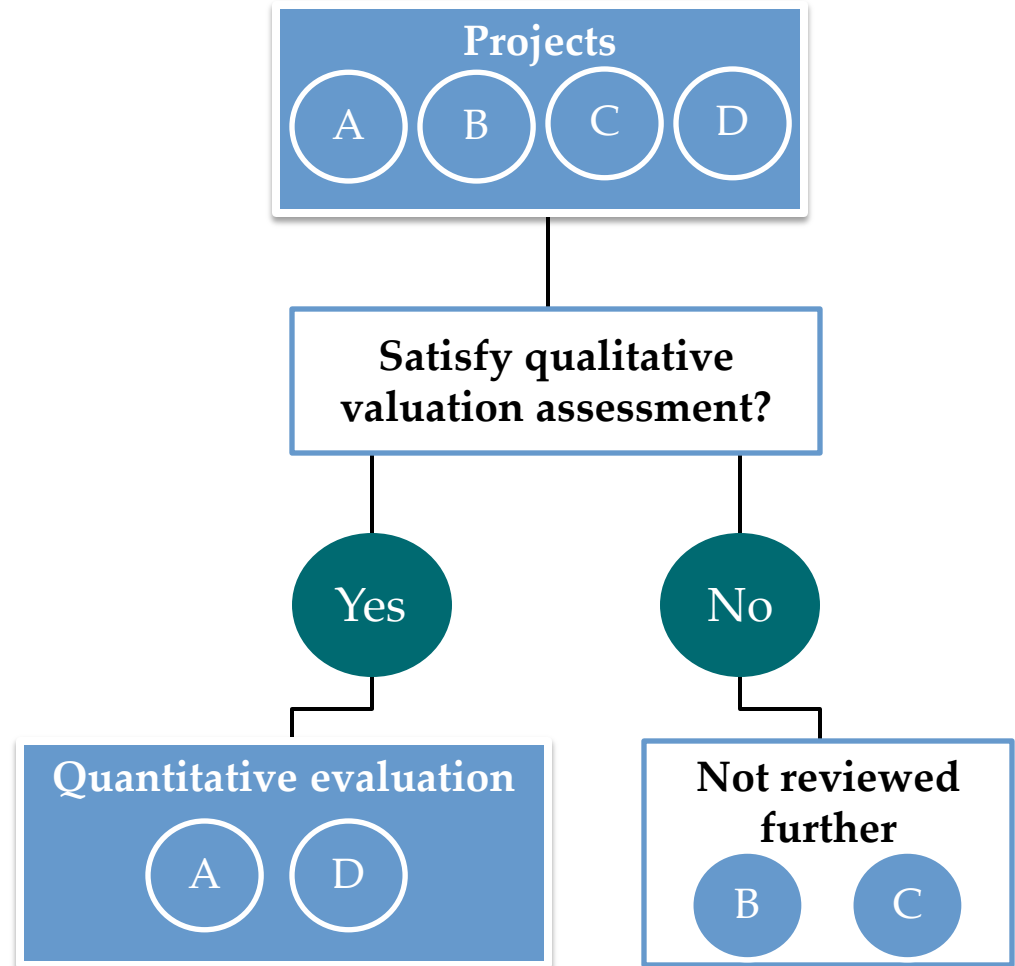
# Break Out Session: Valuation Assessment

**Step 5: Risk**

**Other?**

# Quantitative Valuation Assessment

- Research initiatives will not be subject to a quantitative review
- Highest value market change projects will be further assessed quantitatively by the IESO



# Quantitative Valuation Assessment

- As part of the quantitative evaluation, the IESO will attempt to quantify some key benefits, however, the scale of the analysis will be project specific:
  - A simpler review for small scale projects
  - A more thorough review of larger scale projects
- An important consideration for the quantitative evaluation is that projects identified for system reliability will need to be given highest priority



# Next Steps

- At the June 27 MDAG the IESO will present the next iteration of the workplan qualitative evaluation criteria and aim to finalise this with members
- Members are invited to provide written feedback on the evaluation criteria by June 13 to [engagement@ieso.ca](mailto:engagement@ieso.ca)

# Appendix

# Case Study: 30-Minute OR for Flexibility

- The IESO has developed a test case to understand how the evaluation process might work in practice

## Context

- The IESO's Operability report highlighted the need for increased system flexibility due to changes to the supply mix
- The project was seeking an enhancement guided by market principles that could assist with a system reliability need

## Objective

- To identify and implement a market solution that would enable system flexibility in a transparent and competitive manner

## Solution

- Schedule additional 30-minute OR using existing market processes :
  - Indicate flexibility need by increasing 30-minute OR in advance
  - Schedule/commit resources as required in pre-dispatch

# Case Study: 30-Minute OR for Flexibility

- The following tables include a simplified valuation assessment intended for illustrative purposes only

Criteria	Description	Meets Criteria
Aligned with MDAG Vision	<p>Is it needed for reliability, economic, or regulatory purposes?</p> <ul style="list-style-type: none"> <li>This project is predominantly for reliability to ensure there is sufficient flexibility when it the need is required.</li> </ul>	Yes
	<p>How does the project align with the goals of the MDAG?</p> <ul style="list-style-type: none"> <li>Along with ensuring greater reliability, overall efficiencies will be gained by reducing out-of-market actions to provide system flexibility.</li> </ul>	Yes
	<p>Will it require design changes to the IAMs?</p> <ul style="list-style-type: none"> <li>This will leverage existing market mechanisms to enable flexibility through increasing 30-minute OR.</li> </ul>	Yes

*Note: For illustrative purposes only*

# Case Study: Valuation Assessment of 30-Minute OR for Flexibility

Criteria	Description	Expected Impact
<b>Reliability</b> Is this project needed for system reliability?  What are the reliability impacts on the system	<ul style="list-style-type: none"> <li>The control room is able to reliably operate the system using out of market measures.</li> <li>With the change in supply mix there is a need for a market based mechanism to ensure sufficient grid flexibility.</li> <li>No negative grid impacts are foreseen.</li> </ul>	<b>Med</b>
<b>Market Efficiency</b> What are the market efficiency impacts?	<ul style="list-style-type: none"> <li>Improved price signals and greater transparency of market needs for flexibility by representing flexibility through increasing OR requirements.</li> <li>Increased competition from a range of resources able to provide 30-minute OR for flexibility.</li> </ul>	<b>High</b>

*Note: For illustrative purposes only*



# Case Study: Valuation Assessment of 30-Minute OR for Flexibility

Criteria	Description	Expected Impact
<b>Implementability</b> <ul style="list-style-type: none"> <li>Is the project something the IESO could implement in the short, medium, or long term?</li> <li>Is this considered a small, or large scale project?</li> <li>What resources are required to deliver the project?</li> </ul>	<ul style="list-style-type: none"> <li>This is considered a small scale project that the IESO could implement in the short term.</li> <li>It is envisioned this project will require minimal resources as it is building off the 30-minute OR product that already exists. Minimal capital and personnel resources are needed to implement this project.</li> </ul>	<p><b>High</b></p>
<b>Risk Assessment</b> <ul style="list-style-type: none"> <li>How does the value assessment change in the short term and longer term?</li> <li>Are there other barriers and/or risks that might decrease the value of the project or initiative?</li> </ul>	<ul style="list-style-type: none"> <li>Enabling 30-minute OR for flexibility is a low risk using existing market based mechanisms for calling upon flexibility.</li> <li>For this particular solution, there are no barriers preventing enabling 30-minute OR for flexibility in the short term. In the longer term the IESO may want to re-assess its effectiveness and weigh against other potential solutions.</li> </ul>	<p><b>Low risk in short and long term</b></p>

*Note: For illustrative purposes only*