



# 2025 Integrated Resource Plan

Technical Advisory Committee  
Fall 2024 – Meeting 3

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# Land acknowledgment

Manitoba Hydro has a presence right across Manitoba – on Treaty 1, Treaty 2, Treaty 3, Treaty 4 and Treaty 5 lands – the original territories of the Anishinaabe, Cree, Anishininew, Dakota, and Dene peoples and the homeland of the Red River Métis.

We acknowledge these lands and pay our respects to the ancestors of these territories. The legacy of the past remains a strong influence on Manitoba Hydro's relationships with Indigenous communities today, and we remain committed to establishing and maintaining strong, mutually beneficial relationships with Indigenous communities.



# Agenda

## **Purpose:**

Share our modeling & analysis approach and get your feedback on evaluation metrics.

## Topics

1. Updates from TAC Meeting #2
2. Modelling & Analysis
3. Evaluation
  - A Balanced Recommendation
  - Value Themes
  - Metrics
  - Method
4. Next Steps

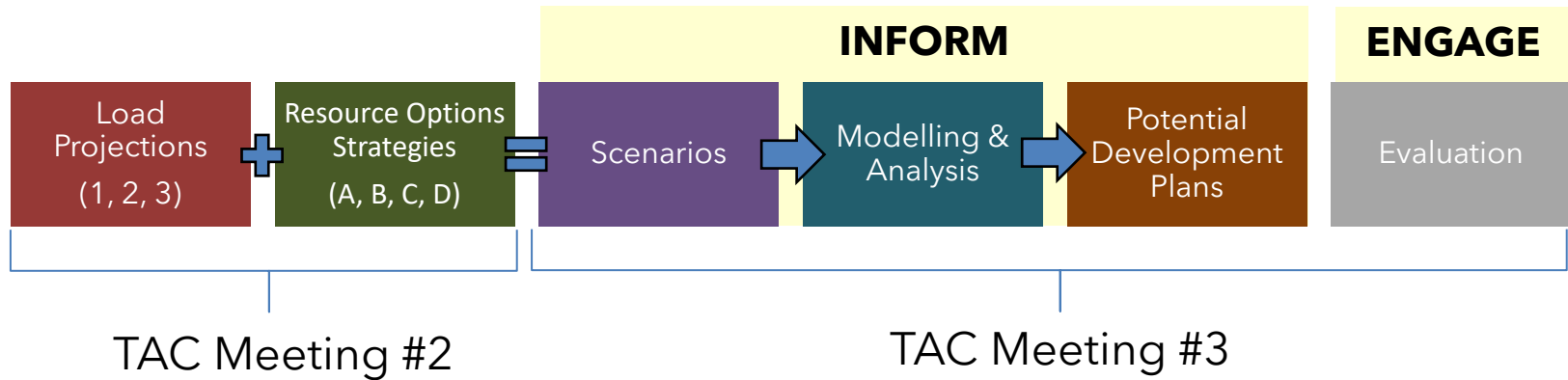
# A Note About Information Included in this Document

All information included in this document is presented as proposed, draft, and/or preliminary. Discussion and feedback is welcomed to inform finalized versions of this information.

Manitoba Hydro is committed to continuing to ensure transparency of our energy planning process. This includes engaging with customers and interested parties in the development of the IRP, so it is informed by feedback heard.

Finalized key inputs, scenarios, and evaluation metrics will be communicated after the planned engagement concludes, including how feedback was incorporated.

# Continuing the Conversation



# Updates from TAC Meeting #2

# Resource Options Inventory



New Hydropower



Upgrade Existing Hydropower



Wind



Solar

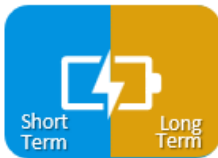
Dispatchable  
& Mature

Intermittent  
& Mature

Dispatchable  
& Emerging



Energy Efficiency



Batteries



Natural Gas/Biomethane  
Fueled Combustion Turbine



Natural Gas Fueled  
Combustion Turbine With  
Carbon Capture



Renewable Diesel Fueled  
Combustion Turbine



Biomass Fueled Steam  
Turbine



Biomass Fueled Steam  
Turbine With Carbon Capture



Hydrogen Fueled Combustion  
Turbine



Market Purchases (Imports)

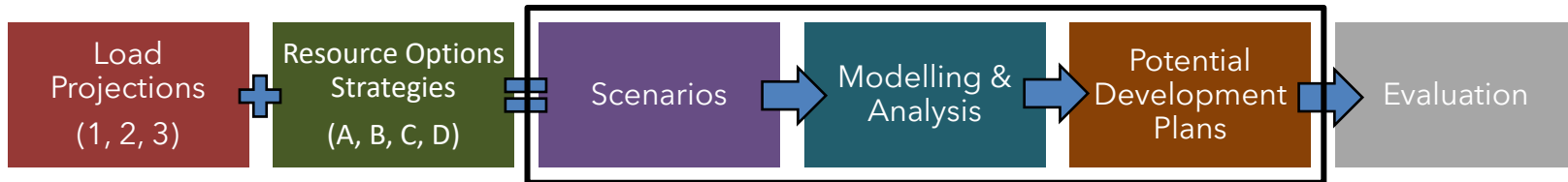


Small Modular Nuclear  
Reactors

All **resources** have  
**different**  
characteristics such as  
**cost, emissions,**  
**dispatchability,**  
**maturity, and time**  
**to in service.**

*This list shows all potential resource options available, however, some may not be available under specific Resource Options Strategies.*

# Modelling & Analysis Approach





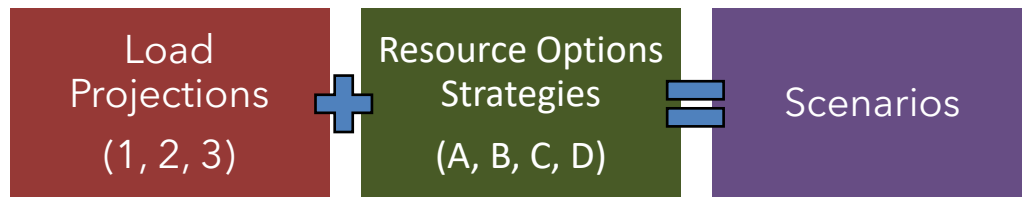
# Objectives of our Discussion

Our goal is to share information about the modelling and analysis approach for the 2025 IRP. Discussion will focus on the following:

- The modelling and analysis process
- How scenarios and sensitivities are defined
- Summarizing current sensitivities that have been identified and their prioritization

# Scenarios

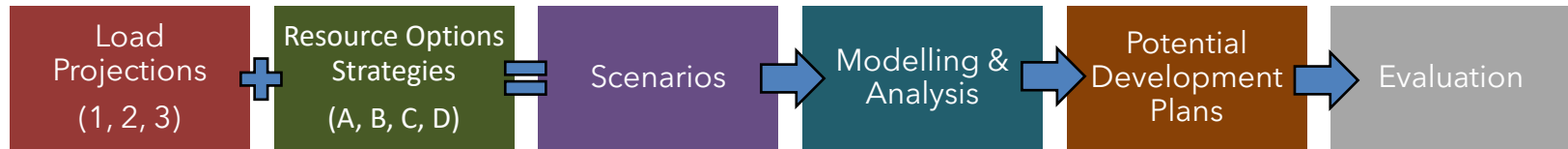
- Scenarios are a likely combination of a Load Projection and Resource Options Strategy.
- Scenarios represent the energy futures.
- Aiming to have a group of scenarios that together, represent a reasonable range of what the energy future might look like in Manitoba.



# Modelling and Analysis Approach

## Potential development plans

- In the modelling and analysis, scenarios produce potential development plans.
- A development plan outlines the required steps to meet future energy needs.
  - It may include building new energy sources, infrastructure or programs to manage energy use during peak demand.

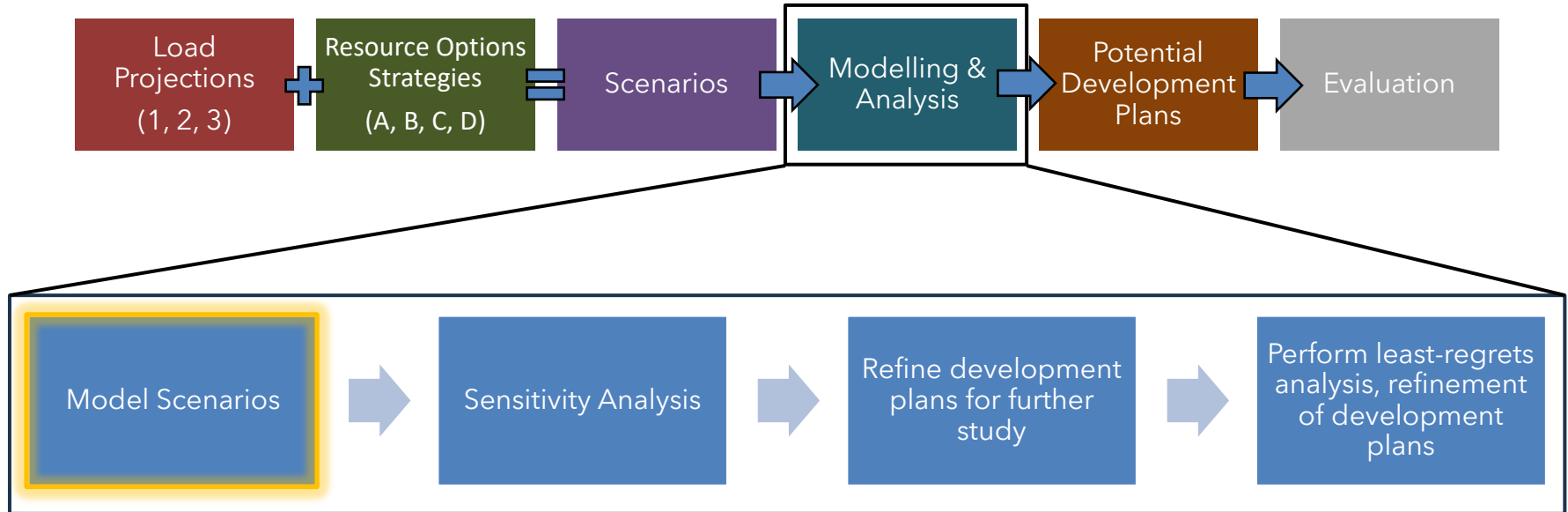


# Sensitivity Analysis

- Sensitivity analysis, or what-if analysis, helps us to understand how individual inputs or assumptions can change a development plan.
- Scenarios are the starting points for sensitivities.

# Modelling & Analysis Process

Outlining the steps to identify potential development plans



# Bringing Together Key Inputs to Define Scenarios

Eight proposed scenarios represent different energy futures

Resource Options Strategies	Load Projections		
	1 - Baseline	2 - Medium	3 - High
A - Technology Neutral	S1A	-	-
B - Net-Zero Grid 2035	S1B	S2B	S3B
C - Near Term Wind Generation Projects	S1C	S2C	S3C
D - No Fuel-Based Resources	-	-	S3D

## **S = Scenario**

Scenarios range from **1A to 3D**, where the number represents a **Load Projection** and the letter represents the **Resource Options Strategy**.

Only likely combinations of load projections and resource options strategies will be studied.

- Those proposed not to be studied are noted by (-).

# Bringing Together Key Inputs to Define Scenarios

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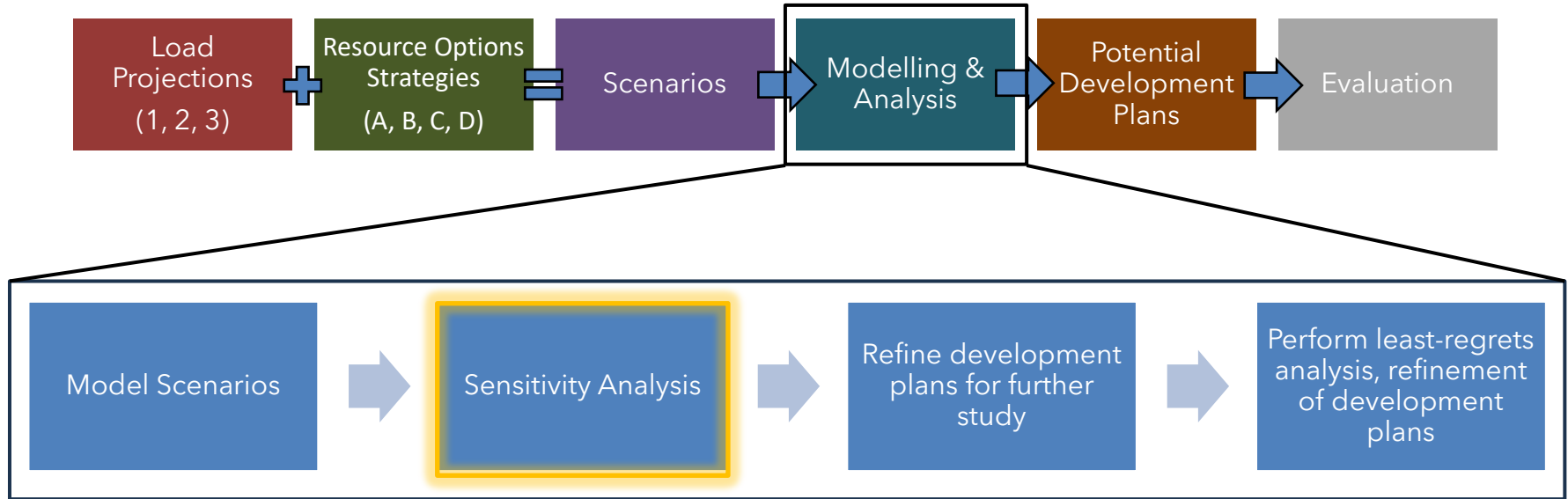
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# Modelling & Analysis Process

Outlining the steps to identify potential development plans





# Proposed Sensitivities

1 <sup>st</sup> Priority Sensitivities	
High Market Prices	Test the influence of market prices on resource selections.
Low Market Prices	
Capital Costs	Test the influence of high capital costs on resource selections.
In Service Date (ISD) Changes	Test how delaying the availability of resources influences a development plan.
Direct Air CO <sub>2</sub> Capture (DAC)	Test if the load increase due to the inclusion of DAC for reducing non-combustion emissions impacts the development plan.
Selectable Energy Efficiency	Test the value of seeking energy efficiency beyond the levels in Efficiency Manitoba's DSM Plan extended to 2050.
Adjust assumptions in Resource Options Strategy D (No-Fuel Based Generation)	Test the impacts of not including hydrogen combustion turbines and biomass generation in Resource Option Strategy D.

Not all sensitivities will be applied to all scenarios.

Prioritization will vary based on the Scenario **and will evolve as modelling results become available.**

# Proposed Sensitivities

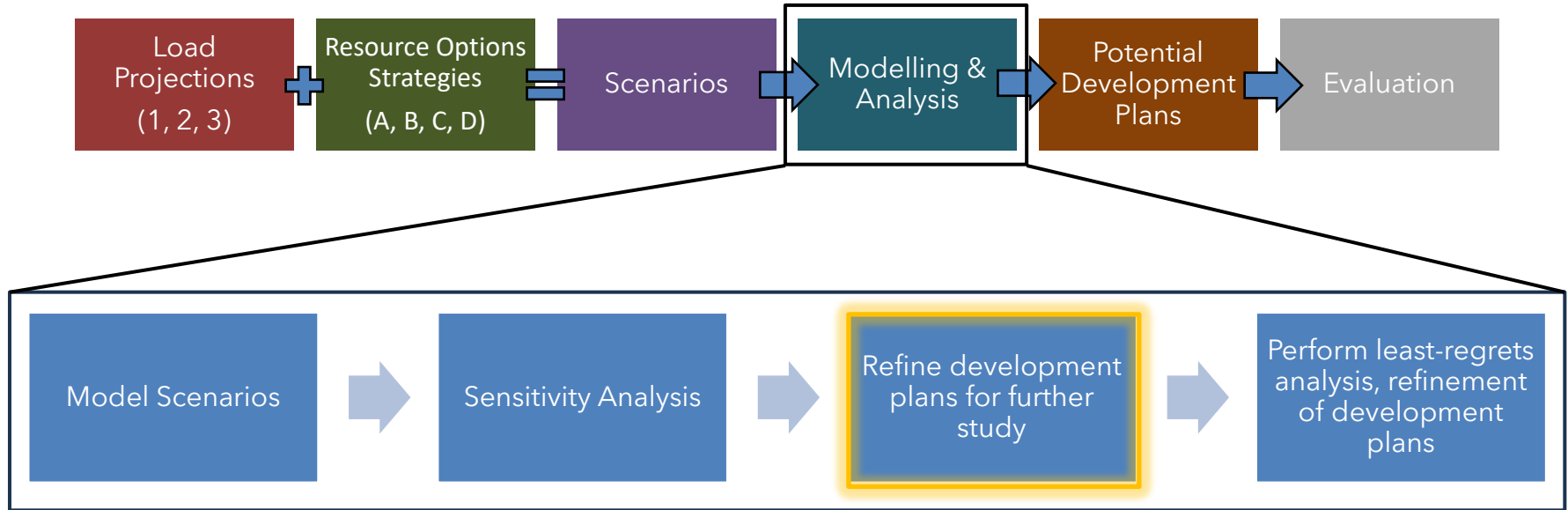
2 <sup>nd</sup> Priority Sensitivities	
Demand Response	Test the value of demand response to the Manitoba Hydro systems.
New Hydrogeneration (Any Project)	Test which hydrogeneration resource option(s) we would build, if we were required to build at least one new hydrogeneration resource.
Hydro Upgrade Projects	Understand potential value of hydrogeneration upgrade projects by requiring their selection.
3 <sup>rd</sup> Priority Sensitivities	
No New Hydrogeneration	Test the value of hydrogeneration resources.
Continued Use of Existing Fuel-Based Resources	Test the importance of continued use of existing fuel-based resources when new fuel-based resources are restricted.
Hourly Price Profiles	Test if resource selections sensitive to market prices are further influenced by hourly market price profiles.

Not all sensitivities will be applied to all scenarios.

Prioritization will vary based on the Scenario **and will evolve as modelling results become available.**

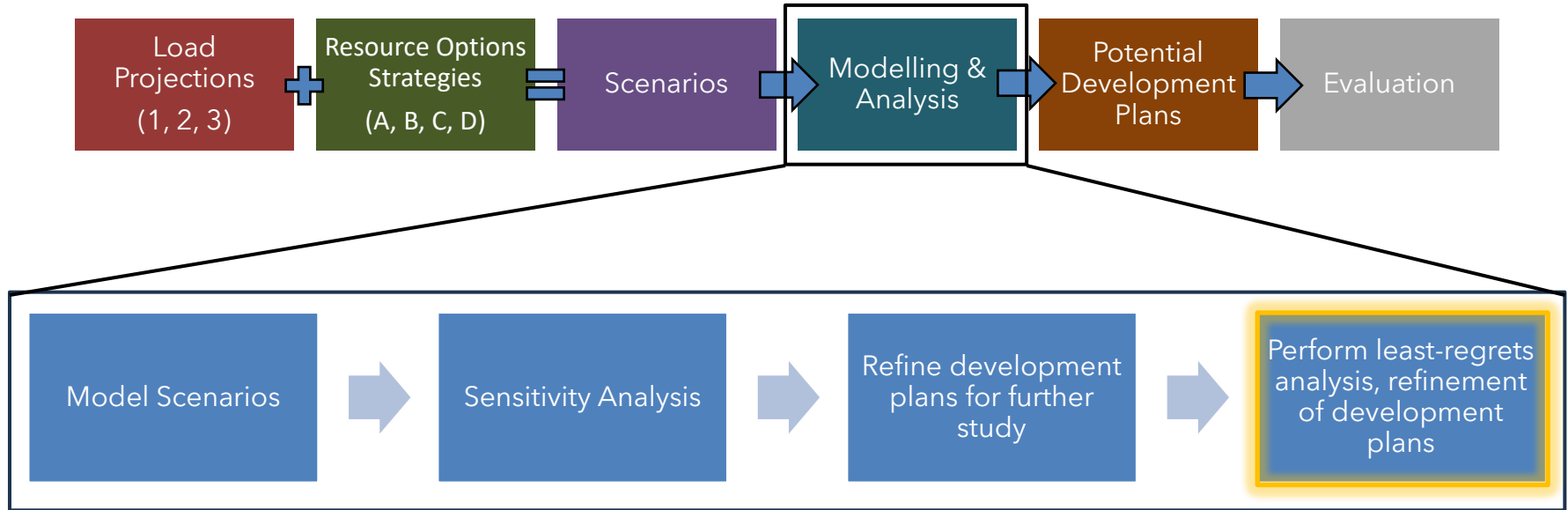
# Modelling & Analysis Process

Outlining the steps to identify potential development plans



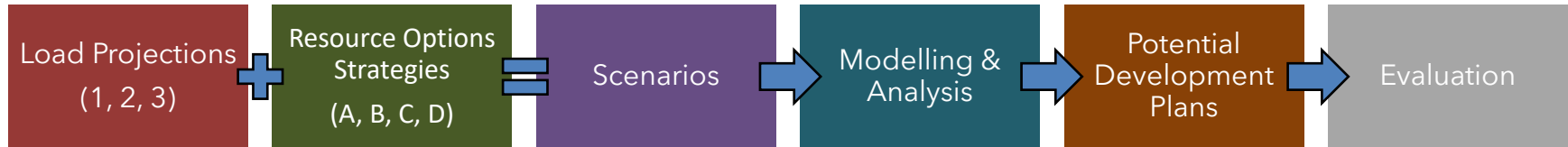
# Modelling & Analysis Process

Outlining the steps to identify potential development plans

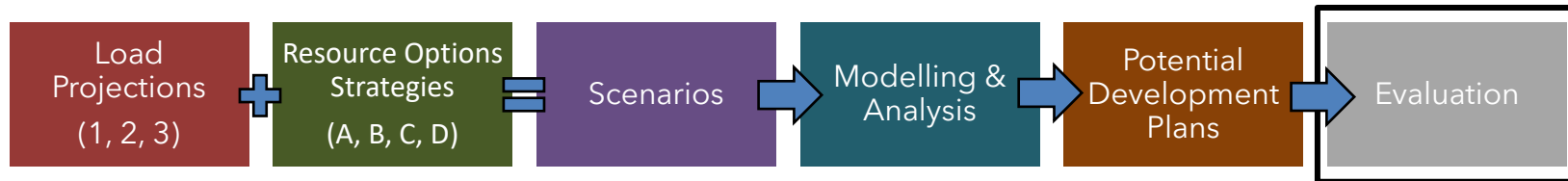


# Next Steps Towards Evaluation

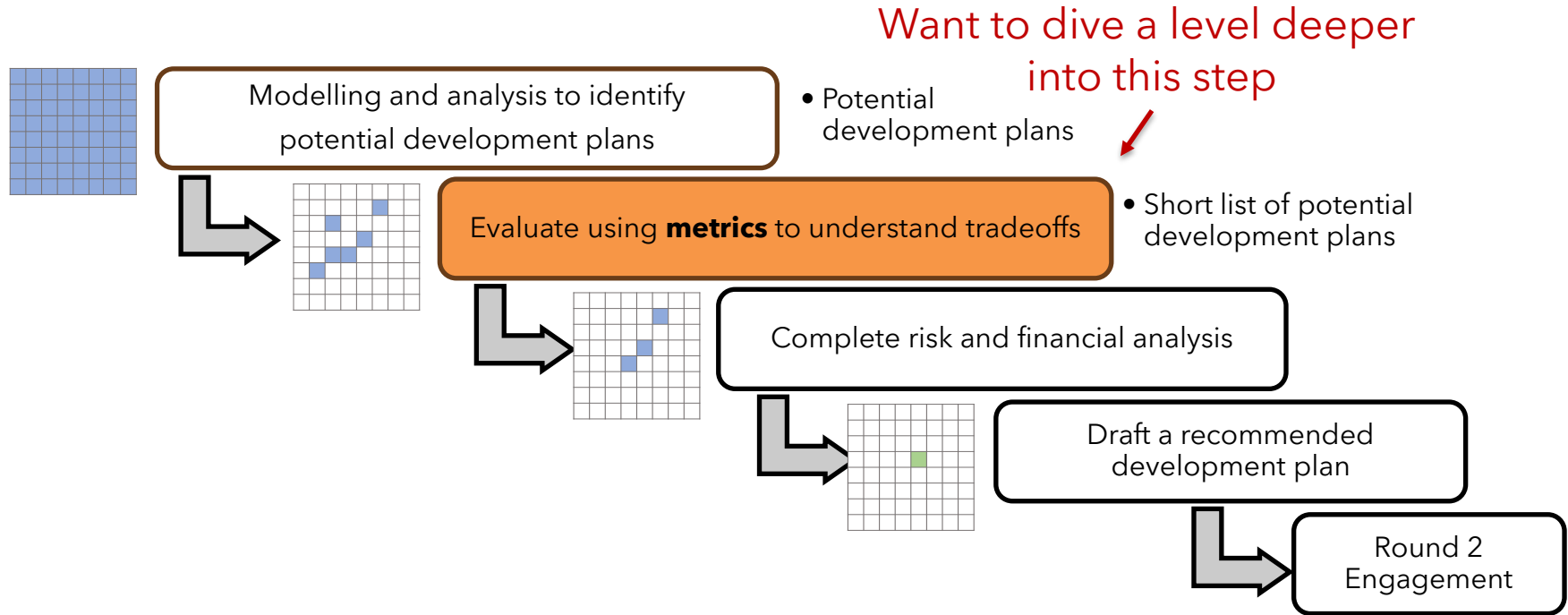
- Approximately 50+ scenarios and sensitivities will be analyzed.
- Result will be a series of potential development plans for evaluation.
- Evaluation includes applying evaluation metrics to these potential development plans.



# Evaluation



# Modelling, Analysis and Evaluation



# The Goal: A Balanced Recommendation

**Why?** We know we need to go beyond traditional decision making based on utility lowest-cost and meeting minimum reliability needs.

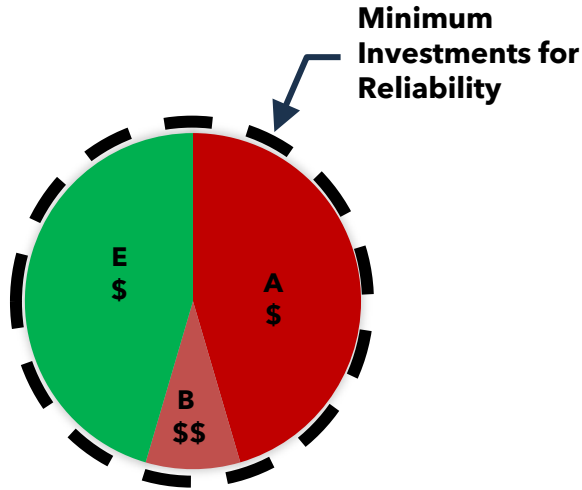
**How will we do this?** By applying the evaluation metrics and understanding of the relative importance of evaluation value themes.

**The result?** A balanced recommendation for a development plan that:

- meets foundational reliability requirements,
- addresses policy and mandates,
- is robust to changes in the energy landscape, and
- reflects what is important to Manitobans.

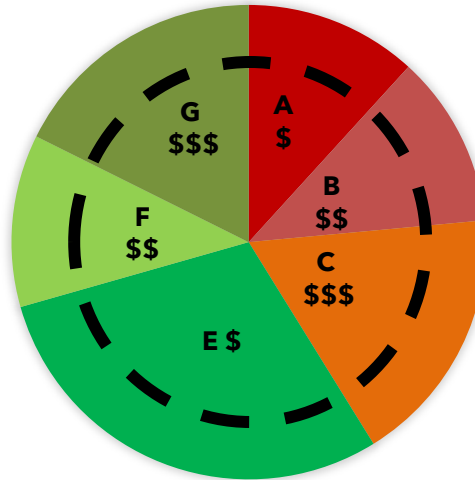


# A Balanced Recommendation



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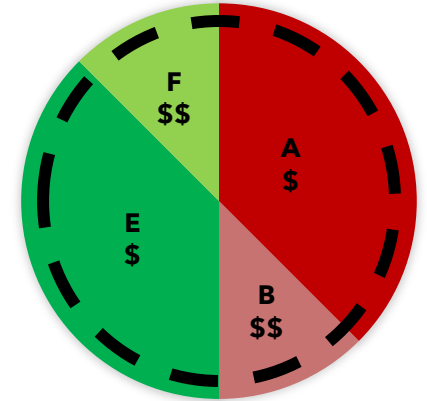
Minimum Supply for Reliability at Least Cost



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Excess Surplus,  
Costly, Less Effective Options

## Balanced Recommendation



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Robust to Uncertainty,  
Resources with Valued Attributes  
Cost Effective

# Summary: A Balanced Recommendation

- The recommended development plan will be **determined by more than lowest-cost analysis** and planning criteria.
- A balanced recommendation is intended to **reflect Manitobans' energy needs and priorities**.
- Value themes and metrics will be used to **assess tradeoffs**, and **no single plan will yield the best results** in every metric.
- This is a **new step in the process** – we expect that evaluation metrics, the relative importance of value themes, and the evaluation method will continue to evolve with future IRPs.

# Evaluation Value Themes

# We Are Looking For Your Feedback

## **Understanding the relative importance of each value theme:**

- How important each value theme is when compared to the others.

## **Shaping the metrics:**

- If there are other themes or metrics we should be considering.
- Describing and characterizing the metrics results using a range you can relate to (i.e., example: favourable vs. less favourable?)

# Proposed Evaluation Value Themes

Four themes that reflect what we're hearing and learning is important to Manitobans



**Reliability**



**Costs**



**Environmental**



**Social**

# Evaluation Metrics

# Proposed Evaluation Metrics



## Reliability

Adequate Supply

Resource Diversity

Technology Maturity



## Costs

Net System Costs

Customer Direct Costs



## Environmental

GHG Emissions

Environmental  
Considerations



## Social

Economic

Reconciliation

Socio-Economic  
Benefits

*Note: highlighted metrics are new for the 2025 IRP*

# Evaluation Metric Framework

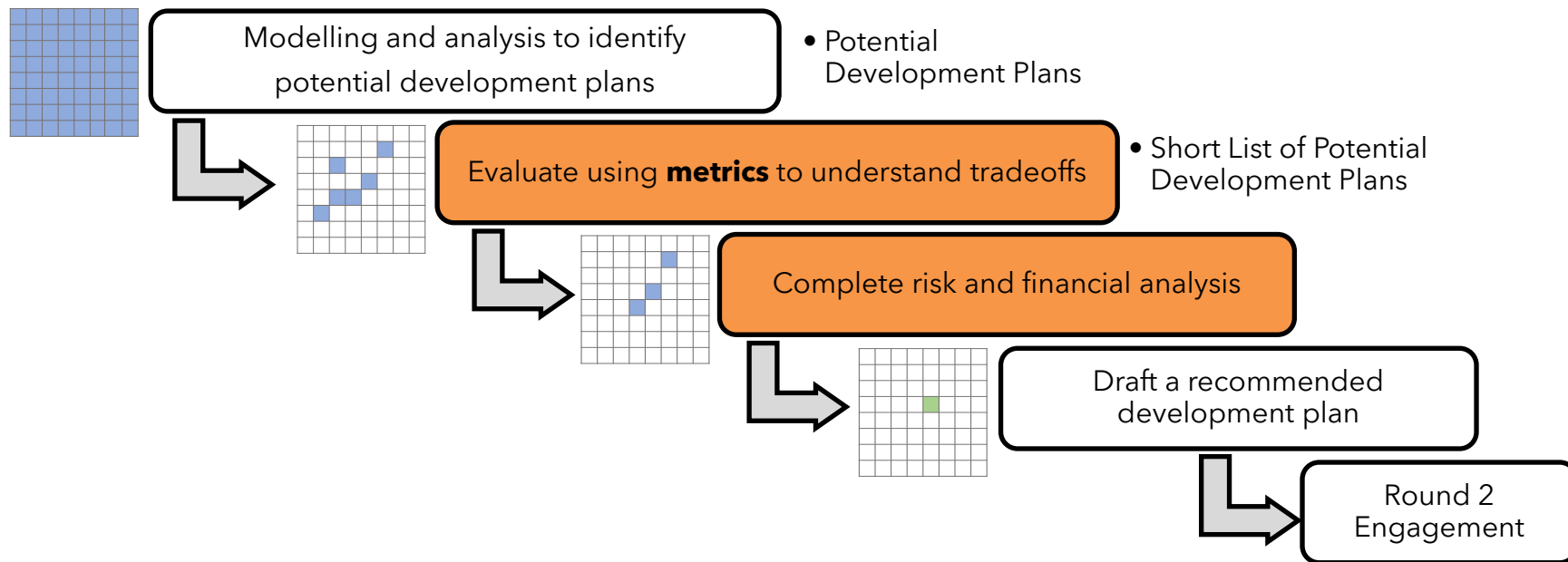
Value Theme	Evaluation Metric	Description	<div>Range</div> 
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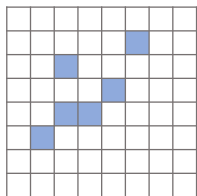
# Evaluation

# Modelling, Analysis and Evaluation

Evaluation method, risk and financial analysis



# Evaluation Method



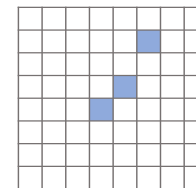
**Potential development plans** from modelling & analysis



Plan	Reliability	Costs	Environment	Social
A	More Favourable	More Favourable	Neutral	Neutral
B	More Favourable	Neutral	More Favourable	Less Favourable
C	Neutral	More Favourable	Less Favourable	Less Favourable
D	Neutral	More Favourable	More Favourable	More Favourable
E	More Favourable	Less Favourable	More Favourable	More Favourable
F	More Favourable	More Favourable	Neutral	More Favourable

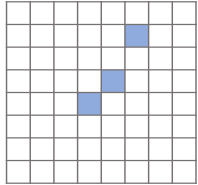
Less Favourable	Neutral	More Favourable
Less Favourable	Neutral	More Favourable

**Short list of potential development plans**  
proceed to risk & financial analysis

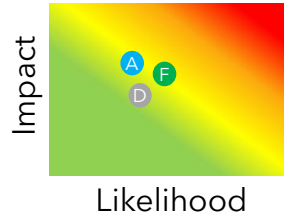


# Risk and Financial Analysis

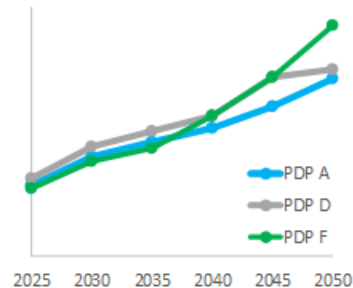
**Short list of potential development plans**  
from evaluation



## Risk Assessment



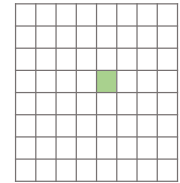
## Financial Analysis/ Rates



## Financial and Risk Mitigation Required

- Actions and adjustments (“nudges” to plans) based on financial analysis and risk assessment/mitigations
- Plans adjusted without reducing value

**Balanced recommendation on development plan** to be shared in round 2 engagement (Spring 2025)



# Next Steps

# Next Steps: Shaping Our Energy Future Together

## What's next?

Finalized key inputs, scenarios, evaluation metrics

Spring 2025

## Let's talk about the future

Complete our survey by December 19, 2024: [hydro.mb.ca/future](https://hydro.mb.ca/future)

Questions or comments? Email us at: [IRP@hydro.mb.ca](mailto:IRP@hydro.mb.ca)

# Thank you!

[Hydro.mb.ca/future](https://hydro.mb.ca/future)

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