

### Purpose of Notes:

Meeting notes summarize the discussion and feedback from the Technical Advisory Committee without attributing feedback to specific individuals or groups. How Manitoba Hydro takes action on this feedback, is considered along with input from other engagement conversations throughout the 2025 Integrated Resource Plan process. The outcomes of engagement and any actions taken are published following each engagement round in a "What We Heard" document and the Engagement Report with publication of the 2025 Integrated Resource Plan.

### Meeting Details:

**Meeting Date:** December 2, 2024 - 10:00am-1:00pm

**Location:** Manitoba Hydro Place - 360 Portage Avenue, Winnipeg, MB

### Attendees:

<b>Committee attendees (members &amp; alternates):</b>	Manitoba Hydro - Committee Chair- Lindsay Hunter Academic (University of Winnipeg) - Patricia Fitzpatrick City of Winnipeg - Becky Raddatz Climate Change Connection - Curt Hull Eco-West/Éco-Ouest Canada - Dany Robidoux Efficiency Manitoba - Michael Stocki Government of Manitoba - David Scammel Government of Manitoba - Teody Leano Manitoba Chamber of Commerce - Green Advantage - Christa Rust Manitoba Keewatinowi Okimakanak Inc. - Anita Murdock Manitoba Métis Federation - Christian Goulet Red River College - Jose (Jojo) Delos Reyes Public Utilities Board - Brady Ryall University of Manitoba - Cameron Whitton Association of Manitoba Municipalities - Duane Nicol Sustainable Building Manitoba - Laura Tyler Manitoba Sustainable Energy Association - Wayne Clayton Manitoba Industrial Power Users Group - Dale Friesen Consumers Council of Canada - Peggy Barker
<b>Supporting attendees:</b>	Manitoba Hydro - Adam Marcynuk Manitoba Hydro - Andrew Greaves Manitoba Hydro - Diana Mager

	Manitoba Hydro - Kathy Allard Manitoba Hydro - Lindsay Melvin Manitoba Hydro - Shoni Madden Consultant - Urban Systems - Ryan Segal Consultant - Urban Systems - Kayla Dawson Consultant - Urban Systems - Hannah Patton
<b>Regrets:</b>	None
<b>Meeting Materials:</b>	Final Copy Terms of Reference, Recorded Presentation Video - Resource Options Strategies, Member Check-in Survey, Meeting Agenda (Distributed via email prior to meeting) Copy of Meeting Presentation Breakout Activity Workbooks

## Meeting Agenda:

1. Introductions and updates from meeting #2
2. Resources Options Inventory & Proposed Strategies - Questions and Feedback
3. Modelling and Analysis
4. Evaluation
5. Breakout Activity
6. Next Steps

## Introductions and updates from meeting #2

**Slides:** 1 - 7

- **Meeting Overview and Purpose:** An overview of the meeting agenda and purpose was provided. The chair noted that all information presented is proposed and open for discussion and feedback. The information may evolve as it is finalized to incorporate feedback heard through engagement. The chair noted that the focus of meeting #3 is to inform on the modelling & analysis approach, and to both inform & engage them on the evaluation process and metrics.
- **Meeting Format and Activities:** Members were asked to share feedback and reflections on the group structure and meetings to date. Members shared their appreciation for the opportunity to have breakout activities and enjoyed hearing from one another's perspectives at meeting #2. There was a question asked about the use of Menti polls during the virtual interested parties engagement sessions as the results could potentially be skewed if participants answered multiple times at separate sessions. It was shared that the polls were intended to stimulate discussion and to provide multiple mechanisms for individuals to share input during the virtual sessions and that there was not a high concern related to skewing of results.

- **Net-Zero Considerations:** Members noted that adjusting the agenda during TAC Meeting #2 to further discuss “net-zero economy” was appreciated. There was interest in learning more about the planning assumptions for direct air carbon capture. The breakdown of the load scenarios and the discussion of future uncertainty beyond ten years was appreciated. It was noted that Manitoban municipalities often face challenges in attracting Federal funding support for net-zero projects due to its already low-carbon energy grid.
- **Scope of IRP:** There was a desire to further understand the scope and boundaries of the IRP when it comes to the analysis outputs both incorporating policy and the potential to influence policy development. Members sought clarification on the difference between a plan developed by the Province to achieve a net-zero economy, and Manitoba Hydro’s IRP analysis that explores the energy needed to serve a net-zero economy.
- **Policy and the IRP:** Concerns were raised about how the IRP may shape policy makers' and the public's views on attainability, particularly with the three load scenarios. It was shared that the load projections do not represent a future path that Manitoba Hydro will implement, rather the projections represent potential customer decisions and the resulting future demand that Manitoba Hydro may need to serve. The three load projections enable the IRP analysis to consider a broad range of potential future energy needs including a net-zero grid by 2035 and a net-zero economy by 2050.
- **Meeting Materials:** The pre-meeting materials were well received, but additional time is needed for review prior to the meeting. Members noted that there is a lot of information being shared at the meetings and that while members appreciate the effort to share the process, it may be important for future meetings to prioritize key content where feedback from participants is needed. This would help to avoid overwhelming participants.

## Resource Options Inventory & Proposed Resource Options Strategies

**Slides:** 10 - 18

- An opportunity was provided for members to share feedback and ask questions on the pre-recorded video on resources options inventory and proposed strategies distributed prior to the meeting.
- **Terminology:** Members noted a need for clarity on some terminology used during the presentation, including: energy, capacity, dispatchability, and net-zero. It was suggested that this terminology should be shared in future meetings and public materials.

- **Information Requested:** More information was requested on emissions forecasts associated with each load projection as well as the “hockey stick” in the medium and high load projections.
- **Resource Options Inventory:** Some members expressed a desire to further understand some of the new technologies discussed, such as batteries, biomass, and hydrogen. Members wanted to further understand where these resources fit in, and how/if storage is being considered as a resource option. There was some concern expressed about combustion turbines being included as a resource option. Members noted the role of biomass in electrical generation versus space heating should be clarified, as well as the use of hydrogen for storage and dispatchability. It was suggested that the term “batteries” be expanded to “energy storage”.
- **Solar Resource Assumptions:** A member shared concerns related to the assumption that solar is noted as zero capacity in the winter, which contradicts data from research locations in Winnipeg and Norway, where the lowest month sees 10% solar output. It was suggested that snow poses a bigger issue than limited sunlight. Assumptions for peak hours should be clarified.
- **Evaluation of Resource Options:** Clarification was sought on how cost, technology uncertainty and consumer behavior change would be considered when evaluating resource options. The committee encouraged further consultation with customers and data from consumer polls on consumer choices and affordability to inform the evaluation of resource options.
- **Strategy D:** Members expressed concern Strategy D policy assumptions did not seem realistic as this would eliminate the use of hydrogen, landfill gas (renewable natural gas), biomass, and any combustion even for backup or emergency purposes. It was suggested that the definition of Strategy D be changed to a more realistic policy articulating “no fossil-based resources”. Members also shared that the use of natural gas was considered acceptable for emergency circumstances. Manitoba Hydro shared the idea behind Strategy D was to look at what an absolute zero grid future could look like, though it was noted that this feedback has been heard several times throughout Round 1 engagement and will be considered.

## Modelling and Analysis Approach

**Slides:** 10-27

- Details were provided on the Modelling and Analysis approach for the 2025 IRP, including how scenarios and sensitivities fit into the process. This included the current proposed listing of sensitivities and their prioritizations.
- **Modelling and Analysis:** Throughout the modelling and analysis process Manitoba Hydro expects to model and analyze more than 50 scenarios and sensitivities. The result of the modelling and analysis process will be a set of meaningfully different

potential development plans that will move forward into the evaluation process, which will include the application of evaluation metrics.

- **Scenarios:** An overview of eight proposed scenarios was provided. Scenarios represent a likely pairing of a load projection and resource option strategy, used to represent a possible energy future. Once scenarios are defined, they can be applied in the capacity expansion planning model, which in turn will output key information defining a possible development plan. Scenarios range from Scenario 1A - the least restrictive energy policy paired with the lowest load projection, to Scenario 3D - the most restrictive energy policy along with the highest load. It was shared that only likely pairings will be studied, this was confirmed by members as a reasonable approach.
- **Limitation of Space Heating Assumptions:** Members expressed concern that only having three load projections may be limiting. It was suggested that the full electrification of home heating should be considered in an additional load projection. There were concerns that planning assumptions do not consider replacements prior to end of life, and that it is not clear how consideration of other space heating options such as air and ground source heat pumps, or biomass are considered within each load projection.
- **Sensitivities:** An overview of sensitivities was provided. Sensitivity analysis helps explore how changing a specific input or assumption can impact or change a development sequence. A sensitivity is used to test the potential impact of an assumption change on development plan results. The initial prioritizations focus on sensitivities that will provide insights that are relevant to understanding what is expected to be the most likely risk and regret factors, such as market prices, capital costs, and in-service date delays.
- **Additional Scenarios and Sensitivities:** Members suggested the full electrification of transportation and space heating should be considered as an additional scenario. Members noted additional considerations for scenarios and sensitivities including market prices, upset limits, cost and operational impacts of overbuilding, operations and maintenance, technology/equipment availability and behavioural changes. Behavioural changes in response to high utility costs, as seen in Alberta, were also mentioned.

## Evaluation

**Slides:** 28 - 39

- **Evaluation Metrics:** The four proposed value themes were reviewed: Reliability, Costs, Environmental, and Social. The purpose of the evaluation step is to undertake a broad assessment of strengths and weaknesses of the potential development plans. The evaluation process is intended to be an engagement-informed assessment used to arrive at a short list of potential development plans and help inform a balanced recommendation.

- **Balanced Recommendation:** The goal of arriving at a balanced recommendation was shared. The recommendation will go beyond lowest-cost analysis and just meeting reliability planning criteria. The result is intended to be a balanced recommendation that meets foundational energy system reliability requirements (traditional reliability planning criteria), addresses policy and mandates, is robust to changes and uncertainty about the future, and reflects what Manitobans has shared is important to them related to energy planning. The recommendation is intended to reflect the needs and priorities of Manitobans. As with any multi-objective problem with competing values, it is expected that no single development plan will be a top performer in every metric or value. It was noted that this is a new step in the IRP development process, and it is expected that the methodology will evolve with future IRPs.
- **Value Theme Prioritization Activity:** To seek additional feedback on the relative importance of which value theme, a table-based prioritization activity was facilitated with members to understand what is most important to them and why. Each table had a notetaker/facilitator assigned to record the discussion.
  - **Reliability:** Generally emerged as the top priority with many noting it as crucial. A member noted that for many business and industrial customers, the cost of unavailability is much higher than the cost of energy itself.
  - **Cost:** It was noted that the value themes were interconnected and that each had their own "cost" associated with it. It was suggested that calculating the cost associated with each metric be considered for a more direct comparison across the metrics. The use of "cost" as shorthand for rates was debated, with some participants regarding it as too broad of a concept. It was shared by a member that low energy rates might encourage power waste and that costs should reflect real expenses rather than being inflated to reduce usage. interdependency between cost and reliability was emphasized.
  - **Environmental:** Environmental responsibility was considered highly important, with participants expressing a willingness to pay more for it. However, it was acknowledged that not everyone can afford this choice. The environmental and social impacts of Manitoba Hydro were seen as significant and noted they should be addressed through government mandates, policy, and regulations.
  - **Social:** Some participants believed that the cost of energy should be based on providing reliable service rather than being used as a tool for social justice or penalizing certain groups. A member noted that Manitoba Hydro should not be used as a social justice tool. Some argued that Manitoba Hydro should focus on its core mandate of providing reliable energy and leave broader social and environmental issues to government policy. Some members suggested that evaluation needs to articulate clearly what the roles and responsibilities are for Manitoba Hydro as compared to the Province.

- **Reconciliation** was noted and seen as integral to all aspects of energy transition. Reconciliation was viewed as a foundational component that considers past and current impacts and intersects with other priorities. Some members noted that reconciliation should be considered as its own value theme. The impact of Manitoba Hydro on northern communities and the need for a just energy transition were highlighted as significant issues that require attention.
  - **Economic Reconciliation:** It was noted that when comparing future resource development plans, considering opportunities for economic reconciliation is appropriate.
- **Evaluation Metrics Breakout Activity:** A breakout discussion activity was facilitated with members to seek feedback on the metrics within each of the four value themes. Four stations were set up with a notetaker/facilitator and subject matter expert to discuss. Members were invited to move around to each station to provide input or to provide written input in a breakout activity workbook. A summary of feedback from this activity is included below:
  - **Reliability:**
    - **Adequate supply metric:** Members highlighted the need for system improvements in transmission and distribution infrastructure, emphasizing the importance of distribution reliability for the energy transition including public communication related to reliability expectations. Several issues were highlighted including EV distribution, backup power, and the impact of behind-the-meter solar. Climate resilience (emergency preparedness), load demand impacts, and the commitment of neighboring communities to load growth were also discussed, along with the importance of maintenance and the impact of extreme weather failures.
    - **Resource diversity metric:** Members noted the importance of considering diverse resources in a hydro dominant system. Discussions focused on clarifying and understanding the assumptions behind the resource diversity analysis and how different resources are utilized.
    - **Technology maturity metric:** Members identified the need to understand how resources are identified and evolve in maturity from Manitoba Hydro's perspective. The importance of incorporating long-term stationary energy storage was emphasized, as well as considerations of commercial availability, location, and operations and maintenance impacts. Establishing a baseline of technologies considered in IRP 2025 was suggested.
  - **Cost:**
    - **Net system costs metric:** Members suggested the metric consider neighboring communities commitments and impacts on load

growth, the importance of maintenance, and impacts of extreme weather failures.

- **Direct customer cost metric** should consider the balance between customer costs and affordability impacts. Members emphasized the inclusion of societal costs in developments plans and potential to assign a dollar value to environmental and social costs. Regional targeting of energy efficiency programs and rate designs were identified as opportunities, as well as timing of EV charging. Clarifying what is included within this metric would be helpful, including whether it includes all new appliances or just additional, and if it includes behind the meter self-generation.
- **Environment:**
  - **Greenhouse gas metrics** should clearly explain what is included within the calculations. Members emphasized the importance of ensuring the development plan meets requirements for a net-zero grid by 2035, and answers if Manitoba can serve transportation and space heating needs without using fossil fuels. Suggestions were that emissions calculations should consider the social costs of carbon, methane releases (e.g., from flooding), grain drying, and the potential of carbon offsets. A member sought clarification on whether the metric would consider changes to land-use (e.g., permafrost).
  - **Environmental metric** considerations included resilience, ecosystem health, impacts on wildlife, and sources of environmental monitoring data. The effects on ecosystems and species population health were identified, along with the impacts of recent and ancient sun exposure. Historic and present environmental impacts and unresolved issues, such as short-term water licenses on dams, were noted. Behavioural considerations included personal responsibility in power conservation.
- **Social Metrics:**
  - Members emphasized that Reconciliation or **Economic Reconciliation metric** could be its own value theme. They noted the need for a baseline definition of economic reconciliation, suggesting it should address historical and ongoing impacts, with a focus on public interest and quantify these impacts for future measurement. One member highlighted the importance of acknowledging an Indigenous worldview, noting this is circular and should include both storage as well as generation. Members stressed the importance of being involved in planning and policy development, highlighting the need to redefine roles and relationships through trust, transparency, governance, and empowerment.



## Next Steps

**Slides:** 45 - 52

- **Additional Session:** The chair proposed that based on interest from members, there could be an opportunity developed as an optional session for members to further discuss and address questions related to resource options, energy and capacity. Members were receptive to this optional meeting being offered with many raising their hands with interest in participating.
- The chair noted the next regular scheduled meeting will take place in Spring 2025. It was suggested the optional session could be scheduled in early January 2025 as well as an additional session in February 2025 to update members on how engagement feedback has been considered. Members were receptive to these meetings being added.