

2025 Integrated Resource Plan

Technical Advisory Committee Fall 2024 - Meeting 1





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, Anishininew, Cree, Dakota, and Dene peoples and the National 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: Welcome TAC members! Hear what is important to you as we plan for Manitoba's energy future.

Topics

- 1. Committee Introductions
- 2. Introduction to 2025 IRP
- 3. Engagement Approach
- 4. Review of Terms of Reference
- 5. Signpost Update
- 6. Share key inputs and scenarios, and evaluation metrics
- 7. Next Steps

Committee Introductions

Committee Introductions - Roundtable

Introduce yourself and tell us which organization you represent.

Please share what you hope to achieve or learn from these Technical Advisory Committee meetings.

Introduction to the 2025 IRP

What is an Integrated Resource Plan?

- A utility best practice used across North America to understand and prepare for future energy needs.
- A repeatable process that plans for long-term needs and will be updated as future conditions evolve.
- One output of the ongoing planning cycle at Manitoba Hydro.
- Includes engagement to incorporate feedback from customers and interested parties.

The 2023 Integrated Resource Plan

- Primary objective was to plan for safe, reliable energy that meets the evolving needs of Manitobans at the lowest cost possible.
- Studied how the energy transition could impact our natural gas and electricity systems including generation, transmission and distribution.
- Resulted in a road map that included signposts • and near-term actions
- Notable learnings from the 2023 IRP:
 The energy transition is already underway in Manitoba

 - Investment is required in all scenarios Natural gas will play a role in getting to a low carbon future



Why we need the 2025 IRP now

We need a development plan approved as soon as possible

- We need new resources as early as 2029/30.
- The Manitoba Hydro Act requires Manitoba Hydro to recommend a development plan for approval, prepared as part of an Integrated Resource Plan that is informed by engagement.

What is a development plan?

It outlines the steps Manitoba Hydro will take to meet future energy needs. It may include building new energy sources, infrastructure, and programs to manage energy use during peak demand.

The 2025 Integrated Resource Plan will...

- Result in a road map that will include a recommended development plan of ~10 years.
- Include analysis that extends to 2050.
- Include all energy infrastructure, non-MH owned assets, and investments to defer need for new infrastructure.
- Consider policy from all levels of government, such as federal, provincial, and municipal.

2025 IRP process overview

- 1. Setting direction
- 2. Develop key inputs and scenarios
- 3. Modelling, analysis, and evaluations
- 4. Preliminary recommendation
- 5. Finalize the Integrated Resource Plan



2025 IRP - Engagement Approach

Why do we engage on our energy planning?

Provide openness and transparency to the energy planning process.

• Early and ongoing communications that support understanding and enhance energy knowledge.

Seek out and incorporate feedback from customers and interested parties into ongoing energy planning.

- Incorporate our customers future needs given uncertainty in timing and pace of change.
- Seek knowledge of key factors that may influence energy use and supply in Manitoba.

Bring diverse perspectives together to support consideration of broader impacts.

- Understand impacts of changing energy landscape across different sectors.
- Support consideration of broader social, climate, and economic priorities.

Who do we engage with?

MANITOBA ORGANIZATIONS Public Utilities Board **RESPONSIBLE FOR ENERGY** Government of Manitoba PLANNING Efficiency Manitoba • Representative groups with a demonstrated interest in longterm energy planning, brought together to share diverse perspectives on specific topics. Academics Associations Economic Development Organizations • Indigenous Communities & Organizations Municipalities • Non-Governmental Organizations - Social and Environmental • Large, Commercial, Industrial Customers • IRP Subscribers • General Public in MB

2025 IRP Engagement Opportunities

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Project Website	•-							•
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General Public Survey

Open November 5 - December 19!

- Available for all Manitobans to share their thoughts on their future energy use and what matters to them when it comes to their energy.
- Helps ensure our IRP reflects a variety of customer perspectives from across Manitoba.
- Targeted outreach efforts through direct emails, bill inserts, and social media.



Municipal Engagement

Goals

- Understand municipalities' potential long-term energy needs and plans (as energy users and a governing body).
 Understand potential changes in policy and decisions that may
- impact energy types and sources.

Outreach

- Interviews with municipalities and cities.
- Surveys distributed through regional conferences (Assembly of Manitoba Municipalities).
- Regional sessions in partnership with RMED + MH Economic Development Team.
- Regional in-person sessions (interest being determined).

First Nations & Métis Engagement

Goals

 Understand communities and customers evolving energy needs to inform the 2025 IRP and support meaningful and ongoing engagement on energy planning.

Outreach

- Leader-to-leader and bi-lateral conversations.
- Options that support community-led engagement.
- Technical Advisory Committee & Interested Party Workshops.
- Targeted surveys/interviews with interested leaders.
- Regional in-person sessions / meetings to be determined.

Large Customer Engagement

Goals

- Understand large customers' potential long-term energy needs and plans of top energy users.
- Understand if these customers anticipate major long-term changes in the source or quantity of energy.
- Understand motivation of these anticipated changes and factors that may impact the rate of change.

Outreach

 Interviews with top 15 natural gas users, large customers considering fuel switching, and large fleet owners.

2025 IRP Technical Advisory Committee (TAC)

Purpose

- Gather diverse perspectives from various Manitoba groups actively interested in long-term energy planning.
- Foster comprehensive dialogue on various components of the 2025 IRP.
- Provide feedback (from each members' perspective and the group they represent) on IRP development aspects such as key inputs, scenarios, and evaluation metrics.
- Feedback shared will be considered along with feedback heard through other 2025 IRP engagement.

 - Not require to reach consensus.
 Not responsible for decisions within the 2025 IRP.

Membership Criteria

Committee membership includes a cross-section of knowledgeable participants that have significant interest or experience with Manitoba Hydro's Integrated Resource Planning processes. Specifically, members were invited considering the following criteria:

- Can bring a representative or collective perspective to the discussion.
- Have a broad focus and interest (based on mandate or research) on long-term energy planning, or knowledge of key factors that could influence energy use in Manitoba.
- Having an understanding of Manitoba Hydro's long-term energy planning aids their organization's mandate and objectives.
- Have a demonstrated interest in Manitoba Hydro's long-term energy planning through involvement in previous Manitoba Hydro IRPs by and/or Public Utilities Board processes.

Responsibilities of Members

- Attend all scheduled meetings.
- Review materials in advance to enable active participation.
- Focus discussions on issues and topics relevant to the 2025 IRP development.
- Actively engage in discussions, communicate respectfully, and foster an inclusive environment.
- Conduct yourself honestly, fairly, ethically and with integrity. Respect all members, Manitoba Hydro staff, and facilitators.
- Disclose any potential conflicts of interest.
- Bring the perspectives of the organization or sector represented and commit to share information back with them.
- Committee participation does not restrict members from seeking intervenor or presenter status in future Public Utilities Board hearings or other regulatory processes.

Responsibilities of Manitoba Hydro

- Manage group coordination including recruitment, establishment of meeting schedule, and coordination of meetings and required resources.
- Retain an external facilitator to chair and moderate meetings.
- Ensure Subject Matter Experts from within Manitoba Hydro are available to support discussions as needed.
- Review feedback from TAC members and be accountable to share back how it was considered within the IRP where appropriate.
- Post all TAC meeting materials and presentations to the Manitoba Hydro public website.

Committee feedback

- Members are asked to formally share any feedback or recommendations for Manitoba Hydro during scheduled meetings for documentation in the meeting notes.
- Manitoba Hydro will review this feedback in consideration of alignment to the 2025 IRP scope, schedule, and ability on what can be achieved.
- Proposed for Manitoba Hydro to respond to how feedback was addressed using the following coding system:
 - 1. Informational, no action needed
 - 2. Action required, expected in coming months
 - 3. Concern or suggestion, for future discussion or consideration
 - 4. Clarification needed

Meeting Schedule

Meeting	Agenda & Topic Focus
Meeting #1: November 8, 2024 10:00 AM - 1:00 PM	 Committee introductions. Review of 2025 IRP Terms of Reference. Introduction to the 2025 IRP. Share and seek feedback on the 2025 IRP proposed key inputs and scenarios. Share and seek feedback on the 2025 IRP proposed evaluation metrics.
Meeting #2: November 21, 2024 11:00 AM - 2:00 PM	 Share approach to developing 2025 IRP proposed load projections and seek feedback to inform final 2025 IRP load projections. Summary of resource options strategies and introduction of the resource options inventory.
Meeting #3 December 2, 2024 10:00 AM - 1:00 PM	 Overview of 2025 IRP proposed modelling plan including scenarios and sensitivity analysis. Share evaluation methodology including initial evaluation metrics and seek feedback to inform the evaluation metrics.

All meetings scheduled for Manitoba Hydro Place (360 Portage Ave.), Winnipeg, MB

Next Steps

- Reach out to absent members.
- Collect and review feedback on draft Terms of Reference.
- Revise Terms of Reference document based on feedback and discussions.
- Finalize Terms of Reference document and circulate to members.

Reading the signs to help you navigate the energy transition.

What are the signposts?

Indicators that inform on the timing, pace, magnitude, or type of changes happening in the energy landscape.

- Government actions
- Customer decisions
- Electric Vehicles
- Technologies & Markets

By monitoring signposts, trends can be identified to anticipate and understand when and how changes are occurring.

Signposts explained



Government actions: Energy related policy across jurisdictions can influence the pace and scale of decarbonization, leading to changes in the world of energy. Monitoring municipal, provincial, federal, and international policies helps ensure Manitoba Hydro is keeping ahead of policy changes shaping our industry.



Customer decisions: Choices customers make can impact energy demand, for things like electricity and natural gas. Monitoring these decisions helps us understand how we can continue serving these need in the future.



Electric vehicles (EVs): Monitoring EV adoption and its impact on electricity demand will help us plan for the energy future.



Technologies & markets: Keeping on top of technologies, including those used to produce, deliver, and store energy, and changes in energy markets.

Do you want to know more about the Signpost Update?

https://www.hydro.mb.ca/docs/ corporate/irp/2023-irpsignpost-update-en.pdf



Reading the signs to help you navigate the energy transition

Through the process of developing the 2023 RP, we found that the energy transition is underway in Manness and that there is uncertainty about the provid this charge. The 2023 RP Read Way included significants that were identified as leading indicators to be mentioned to we could better understand the paper of strange and how it multit impact Maintaba traffic and the could better we denote the paper of strange and how it multit impact Maintaba.

Signposts - how we recognize change

By montaining signparts – indicators that inform on the timing, pace, magnitude, or type of changes happening in energy landscape – we can identify breads to anticipate and before understand when and how our outcomer's tends are changing and how we can reveal them.



Step 2. Develop Key Inputs and Scenarios



Step 2. Develop key inputs and scenarios

What is included in this step of the 2025 IRP development process



Developing key inputs and scenarios

Underpinned by planning assumptions

- The **planning assumptions** underpin the key inputs.
- **Key inputs** for the 2025 IRP include:
 - Load projections
 - Resource options strategies
- A load projection and a resource option strategy are combined to create an energy future scenario.



Key inputs and scenarios

Load Projections

- Anticipated electrical demand and natural gas demand.
- Based on planning assumptions.

Resource Options Strategies

- Represents potential policy impacts that
 limit what resources can serve future demand.
- Based on planning assumptions.

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- Represents a specific energy future.
- It is a likely combination of a Load Projection and a Resource Options Strategy.

Key Inputs

Load Projections

Key Inputs

 Load
 Resource

 Projections
 Strategies

 Key Inputs

Load projections

Overview

- Load projections show the energy demand Manitoba Hydro might be required to serve.
- Planning assumptions are common between electricity and natural gas.
- The net-zero economy by 2050 future is uncertain and could result in a range of electricity and natural gas demand that needs to be served by Manitoba Hydro.
- Three proposed load projections:

Load Project	Assumes
1 - Baseline	Minimal changes from current policies and customer decisions.
2 - Medium	Moderate impact from government actions and customer decisions.
3 - High	Significant impact from government actions and customer decisions.

Manitoba Greenhouse Gas Emissions

Average Manitoban GHG Emissions Between 2018 - 2022 (21.6 Mt per year)



2025 IRP Round 1 Engagement – TAC Meeting #1 Further descriptions of the categories and subcategories found in Table A9-1 in the <u>NIR Part 3</u> https://publications.gc.ca/collections/collection_2024/eccc/En81-4-2022-3-eng.pdf 38

Proposed load projections

Electric energy and demand (net of Efficiency Manitoba Plan)



Proposed load projections

Natural gas (net of Efficiency Manitoba Plan)



²⁰²⁵ IRP Round 1 Engagement - TAC Meeting #1

Proposed assumptions for the load projections

Economic growth

Energy Policy (incl. GHG policy)

Electrification of Transportation

Space Heating (electrification, ASHP, GSHP, energy efficiency)

Customer Self-Generation & Storage (e.g. solar)

Energy Efficiency (incl codes & standards, base EM plan)

Industrial Decarbonization

Industrial Economic Development

Hydrogen Production

CO₂ Capture

RNG & Hydrogen

Demand Response



Resource Options Strategies

Key Inputs



Resource options strategies

Overview

- Resource options strategies reflect the potential ways Manitoba Hydro may be required to meet electricity and natural gas demand.
- Policy is a key driver that influences what resources may be allowed to serve energy needs.
- The strategies are based on the full inventory of resource options available to meet future energy needs in Manitoba.
- The different strategies reflect a range of potential policies that could influence the resource options.

Proposed resource options strategies

Four proposed strategies and their assumptions

Resource Options Strategies		Assumptions			
Α	Technology Neutral	Compliant with federal Clean Electricity Regulations.			
В	Net-Zero Grid 2035	Strategy A, plus requirement that electricity grid is net-zero by 2035.			
С	Near Term Wind Generation Projects	Strategy B, plus up to 600 MW of Indigenous majority owned wind with dispatchable resources for reliability.			
D	No Fuel-Based Resources	Strategy B, plus requirement of no fuel-based combustion turbines post 2035 (i.e. no natural gas, hydrogen, biomethane, or biomass generation).			

Resource options strategies

Examples common planning assumptions

Electricity and natural gas system characteristics

- System hydrologic inflows
- Current power generation supply mix
- Interconnections with neighbouring markets

Modelling and analysis parameters

- Transmission planning criteria
- Generation planning criteria for dependable energy and capacity
- Fuel availability and cost (e.g. natural gas, biomethane)
- Demand driven natural gas and electric delivery system costs
- Firm export contracts are not renewed
- Demand side resources (e.g. Efficiency Manitoba plan, demand response)

Resource options inventory

Resource options inventory

A common planning assumption



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

& Mature

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Biomass Fueled Steam Turbine Hyd



Turbine

Market Purchases (Imports)

Small Modular Nuclear Reactors

Carbon Capture

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



Including Sensitivities





Overview

- 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.



Proposed scenarios

Eight proposed scenarios represent different energy futures

Pesource Options Strategies	Load Projections				
Resource Options Strategies	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 (-).

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 will test the robustness of the potential development plans against different risks.



Sensitivity analysis

Test key planning assumptions that have a high potential to impact results

Proposed sensitivities:

- Higher or lower market prices
- Increased capital costs for new resources
- Delays in new resource construction
- Lower or higher water inflow conditions (climate change)
- New hydrogeneration and capacity enhancements at existing hydro stations

Not all sensitivities will be run on every scenario.

Sensitivity analysis, or what-if analysis, helps us to understand how individual inputs or constraints change a development plan.

This means we can test the robustness of the outcomes against different risks and understand if that will change the outcomes.

Next steps towards evaluation

In Step 3 - Modelling, analysis and evaluations:

- 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.

In Step 2 – develop key inputs and scenarios, we establish the evaluation metrics to prepare for Step 3.



Evaluation Metrics



Evaluation metrics

What are evaluation metrics and how will they be used?

- **Modelling & Analysis** identifies cost-effective potential development plans that meet reliability planning criteria, mandates and regulations.
- **Evaluation** narrows the list of potential development plans towards a recommended development plan using evaluation metrics.

Evaluation Metrics:

- reflect what Manitobans have shared are important factors for them.
- are used to compare and assess trade-offs between potential development plans.
- can be numbers-based (quantitative) or descriptions (qualitative).
- need to be established early in the process ahead of evaluation taking place.

Evaluation methodology

This is how we use the evaluation metrics



Proposed evaluation metrics

Four themes that reflect previous research and engagement



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

Proposed reliability evaluation metrics

Proposed descriptions



- Adequate Supply: Ability for energy supply to meet future demand
 - This metric will consider the ability to meet future energy needs at time of peak demand, and to ensure reliable operations during drought.



- **Resource Diversity:** Potential to diversify resources in our existing systems
 - This metric will compare how new resources can mitigate exposure related to any one specific resource (e.g., regulatory change, fuel supply risk, water supply variability)



- **Technology Maturity:** Consideration of the risks and opportunities of various technologies
 - This metric will compare the maturity, and consider the risks, of established technologies and emerging technologies.







Proposed cost evaluation metrics

Proposed descriptions



Net System Costs: An estimate of the total costs to supply electricity and natural gas.

- This metric will be used to compare the need for revenue to cover total costs.
- This will be expressed as both a cumulative net present value and as an annual value.



Customer Direct Costs: An estimate of direct customer cost impacts.

• This metric will be used to compare the potential direct energy related incremental costs to customers as a result of a development plan, such as new appliances or heating systems needed.





Proposed environmental evaluation metrics

Proposed descriptions



GHG Emissions: An estimation of future greenhouse gas emissions

• This metric will be used to compare incremental emissions impacts between potential development plans.



Environmental Considerations: The potential effects on the environment

• This metric will help understand differences from a broad perspective and will include potential effects on the air, land, water, and people.





Proposed social evaluation metrics

Proposed descriptions



Economic Reconciliation: Potential for future partnerships and other opportunities that benefit Indigenous communities, peoples, and businesses

 This metric will be used to compare the potential to support job creation, advance training opportunities, support business development, and ownership of new generation projects.



Socio-Economic Benefits: Future potential benefits to the Manitoba economy and community well-being

• This metric will be used to compare potential benefits such as economic development and job creation associated with the construction and operation of new resources in the development plan.









Next Steps: shaping our energy future together

What's next?

- Finalize the 2025 IRP Terms of Reference.
- Meeting notes and presentation to be shared.
- November 21, 2024 Meeting #2 Key Inputs
- December 2, 2024 Meeting #3 Scenarios and Evaluation Metrics

Let's talk about the future

- Complete our customer survey by December 19, 2024: hydro.mb.ca/future
- Questions or comments? Email us at: IRP@hydro.mb.ca

Thank you!

Hydro.mb.ca/future Email us at: IRP@hydro.mb.ca

To request accessible formats visit hydro.mb.ca/accessibility.

