MANITOBA HYDRO'S
2025 INTEGRATED RESOURCE PLAN

Round 2 Sessions
Questions and Answers

The following are responses to questions received during Round 2 engagement sessions held in December 2025 that shared the 2025 IRP Road Map – the outcome of the 2025 IRP development process.

More information about the resource options can be found in the questions and answers from the Mid-Project information session held in July 2025, and information about the key inputs and scenarios considered in the IRP analysis can be found in the questions and answers from Round 1 of engagement.

The Integrated Resource Plan Process

This section focuses on questions related to the integrated resource plan process and its outputs.

What is Manitoba Hydro's role in energy planning and the energy transition?

The Manitoba Hydro Act establishes Manitoba Hydro's responsibility to reliably supply power to meet the needs of the province. Through long-term integrated resource planning, Manitoba Hydro is anticipating and preparing for increased electricity demand. This planning supports a pathway to a net-zero economy in Manitoba by 2050 by identifying resources and strategies needed for the energy transition.

How has the IRP and energy planning process evolved in recent years?

Since completing the first IRP in 2023, Manitoba Hydro studied energy transition pathways to 2050, incorporated the latest energy related policy, information on emerging resource options, and enhanced engagement processes for energy planning. The roadmap in the 2025 IRP includes the addition of a recommended development plan, a sequence of actions we'll need to take to meet Manitoba's future energy needs.

What is a road map and what does it include?

The outcome of the 2025 IRP development process is a road map. The 2025 IRP road map includes:

- **learnings** from the IRP development process;
- a **recommended development plan** that outlines the approximate timing and quantities of resources recommended to meet future energy needs;
- an **alternative development plan** that shows another option that was considered

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and is the next best path to meeting 2025 IRP objectives;

- **near-term actions** to be completed over the next five years to implement the development plan and prepare for the next IRP; and
- **signposts** we will monitor to help understand how and how quickly the energy landscape is changing.

Key Energy Planning Concepts

This section focuses on key energy planning concepts that are important to understand and consider.

Capacity and Energy

What is the difference between capacity and energy with respect to electricity planning?

Many factors must be considered when planning for the energy future to ensure the electrical system can be operated reliably and economically. Peak demand occurs when the demand for electricity is highest, and we must plan for the system to have enough reliable capacity to serve it. **Capacity** is the maximum electrical output a system can produce at a given time, measured in megawatts (MW), whereas **energy** is the amount of electricity consumed over a given period of time, measured in kilowatt-hours (kWh).

For our system planning purposes, we consider how a resource option contributes to accredited capacity, dependable energy, and average energy.

Accredited capacity (MW) is the amount of capacity that a resource can be relied upon to deliver during peak demand. IRP analysis indicates that Manitoba will need more electrical capacity in 2029/30; resources that provide accredited capacity can be added to the system to address this need. For example, solar provides no accredited capacity in the winter when it is most needed to meet peak demand conditions, whereas combustion turbines provide 100% accredited capacity. The accredited capacities of all the resources in the recommended development plan are available on our website.

Installed capacity (MW), also referred to as rated or nameplate capacity, is the maximum electrical output a generator can produce at a given time under specific conditions. For example, Manitoba's Affordable Energy Plan calls for 600 MW of Indigenous owned wind energy, which represents the installed capacity, or output the resource could produce if all turbines were generating at full capacity. For this 600 MW of installed capacity, 20%, or 120 MW, can be relied upon to deliver accredited capacity to serve peak demand conditions. As more wind is added to the system, the accredited capacity available per MW of installed capacity goes down.

Dependable energy (GWh/year) is the amount of electrical energy that the Manitoba Hydro system can produce considering an extended drought where water flow conditions are equivalent to the lowest on record for the entire Manitoba hydropower system (1941). This is an important consideration in energy planning to ensure reliability.

Average energy (GWh/year) is the amount of electrical energy that the Manitoba Hydro system generates on average, based on flow conditions based on 112 years of flow history. This is important when considering system operations in long-term planning. Average Manitoba energy generation from now until 2040 is projected to be approximately 93% hydro generation, roughly 6.5% wind, and less than 0.5% from combustion turbines.

Renewable Resources and Energy Storage

What factors influence pairing renewable resources with energy storage to address Manitoba's energy needs?

The value provided by a resource option is dependent on the characteristics and needs of Manitoba's system.

Our system currently benefits from significant energy storage through its hydro reservoirs, and the value of solar and wind energy to our system is generally improved by this storage because when electricity is being generated from wind or solar, water can be stored in the reservoirs for future use. However, there is a limit to how much water can be stored in reservoirs. Another consideration is that we need accredited capacity to meet this peak demand conditions, and the amount of accredited capacity the hydro system can provide is limited by the number of hydro generators available to produce electricity.

While other utilities have success using batteries, we consider the value of this resource on the Manitoba Hydro system specifically. Energy storage options that shift energy from the summer to the winter would be valuable to our system, but batteries cannot effectively store energy in one season to be used in another.

The 2025 IRP near-term actions include implementation of a utility-scale battery project. Planning for that project will determine:

- the battery location and sizing;
- a charge-discharge cycle that provides value to the system by storing energy to be used hours or days later to serve times of peak demand;
- the accredited capacity provided;
- the benefits to transmission and distribution system operation and energy market activities;
- the battery recharge limits, which reflect the ability of Manitoba Hydro's system to charge the battery considering transmission and generation constraints. For example, solar energy production is greatly decreased in the winter and wind energy can experience multiday periods with not enough generation to recharge short-term batteries. Also, the ability to recharge batteries during droughts is limited when refilling of hydro reservoirs is more challenging; and
- how the battery may compete with other peak demand reduction strategies to provide accredited capacity, such as demand response and curtailable rates programs that also flatten the load shape/adjust when demand for electricity occurs.

Net-Zero Grid, Net-zero Economy, and Absolute Zero

What is the difference between net-zero and absolute zero?

Net-zero refers to a future state where all greenhouse gas (GHG) emissions are balanced to zero on an ongoing cumulative basis. Absolute zero refers to a future state where no greenhouse gas (GHG) emissions are emitted. Net-zero is achieved through a combination of actions: reducing emissions—such as through electrification and other means—and using offsets or removals from the atmosphere to "net-out" any remaining emissions. Most policies, including the one in Manitoba Hydro's mandate letter, set net zero goals because they consider practicalities essential for a transition that is sustainable and economically viable.

What is the difference between a net-zero grid and a net-zero economy?

Net-zero grid means reducing GHGs and using offsets and negative emissions to achieve net-zero for the operation of the Manitoba Hydro grid. Net-zero economy means taking those same actions for the entirety of the Manitoba economy, including addressing emissions from transportation, stationary combustion of fossil fuels such as building heating, agriculture, industrial processes, water, and fugitive emissions. A net-zero economy will likely increase demand for electricity with Manitoba Hydro's role remaining unchanged from today - to reliably, safely and efficiently supply energy.

Net Zero Grid

How can a net zero grid by 2035 be achieved when the recommended development plan includes natural gas combustion turbines?

A net-zero grid requires all direct GHG emissions from grid-connected fossil fuel generators to be netted to zero. It does not require the elimination of natural gas generation. In a net-zero grid future, combustion turbines must either operate on non-fossil fuels, utilize a non-fossil fuel credit system, or net their emissions to zero using carbon offsets.

What types of carbon offsets are being considered, and are Manitoba based offsets being considered?

Canada's Greenhouse Gas Offset Credit System recognizes offset protocols from a wide variety of GHG reduction and removal projects. While Manitoba Hydro has not selected a specific type of carbon offset for net-zero grid purposes, it is assumed it will be a federally recognized offset and that, from 2050 onwards, it would be a removal offset. For modelling purposes in the 2025 IRP, Manitoba-located bioenergy with carbon capture and sequestration was the assumed offset source.

Net-zero Manitoba economy

Did the IRP consider alternative resource options and pathways to phase out natural gas as an energy source, while continuing to meet energy needs of Manitobans and aligning with a net-zero economy be 2050?

The 2025 IRP included analysis to meet the Province of Manitoba's objectives of a net-zero economy in 2050. Manitoba Hydro also conducted analysis to understand how electricity demands might change if ground transportation and space heating produce no greenhouse gas emissions by 2050 (i.e., they achieve absolute zero). Analysis indicated that while over a range of net-zero economy futures there is a meaningful decline in natural gas usage in Manitoba, some natural gas will remain as a fuel source in the residential, commercial, and industrial sectors in 2050. Manitoba Hydro is also exploring alternative fuels for combustion turbines, alternative fuel credits, and carbon offsets as part of the near-term actions for the 2025 IRP.

Key Inputs and Scenarios

This section focuses on questions related to key inputs and scenarios considered in the 2025 IRP analysis.

Load Projections

How has increased demand from data centres, artificial intelligence (AI), northern mining and other economic investments been considered in the IRP analysis?

The IRP load projections considered a range of assumptions related to economic development that result in increased electricity demand and were broadened to account for potential changes in the energy landscape. This could include new load from data centres, or AI, for example. However, the IRP does not make specific assumptions about new customer load connection projects. The assumptions underpinning the 2025 IRP load projections are outlined in our Round 1 Engagement Presentation.

Imports / Exports / Interconnections

How were interconnections to other markets considered in the IRP? Are there any plans to look at east-west utility grid connections?

Energy markets outside the province play a role in ensuring system reliability, supporting operational flexibility, and facilitating effective participation within the broader market framework. Details about potential new interconnections were not available during development of the 2025 IRP and therefore they were not included in this IRP analysis; however, opportunities for new or enhanced interconnections, will continue to be monitored and assessed via the IRP signposts.

Geopolitical Influences

How have changes in U.S. trade policy impacted the IRP analysis?

The scenarios analyzed in the 2025 IRP were broad with the intention of accounting for existing policies and potential policy changes both within and outside of Manitoba. The IRP considered a wide spectrum of policy possibilities and integrated the prospective impacts into

the load projections and resource option strategies. Given the broad scope of the IRP analysis, changes in U.S trade policies are not expected to impact results.

Modelling, analysis, and evaluations

This section focuses on questions about the 2025 IRP modelling, analysis, and evaluation of potential development plans.

Potential Development Plans

Will there be any information made available about the potential development plans that were considered but not selected, and were any considered that didn't include combustion turbines?

The 2025 IRP Report will show a comparison of different potential development plans considered. These plans use different combinations, amounts, and timing of the six resource options. The plans were organized into three groupings, including one grouping that focused on reducing the use of combustion turbines through alternative capacity resources. IRP analysis indicated that a potential development plan without any combustion turbines was not viable and therefore not recommended.

Recommended and Alternative Development Plans

This section focuses on questions related to the recommended and alternative development plans.

Energy Efficiency and Demand Response

What types of energy efficiency programs are being considered by Manitoba Hydro?

The reductions in need for system capacity that result from energy efficiency programs are expected to come from the continuation of Efficiency Manitoba's existing programming which meets legislated targets. New or additional programming for building insulation, ground source heat pumps, thermal energy storage, and custom solutions for industrial customers provide additional reductions beyond what is currently legislated.

Demand response and curtailable rate programs are also being developed in collaboration with Efficiency Manitoba and final details of those programs will be shared once developed. Certain aspects may require legislative changes or regulatory approvals including time-based rates. As identified in the near-term actions, enabling infrastructure (such as advanced metering infrastructure) is required and may offer future opportunities.

Wind Energy

How is the location of wind projects determined? And is wind energy being considered beyond the 2035 development plan timeframe?

The location of wind energy projects is out of scope for the IRP. Manitoba Hydro's current wind call for power outlines the locations that proponents can select for interconnecting potential projects to the system. Additional wind outside the 2035 timeframe is a potential option that Manitoba Hydro will continue to explore.

Battery Storage

Why does the development plan only include a 5 MW battery storage project and not more?

The size of Manitoba's first utility scale battery will be confirmed during project planning with 5 MW being provided as a starting point for planning purposes. It would not be prudent to invest in large quantities of batteries before confirming they would provide sufficient value, here in Manitoba, to offset their cost. Please refer to the *Key Energy Planning Concepts* section in this document to learn more about what is considered when planning a battery storage project.

Combustion Turbines fuelled by Natural Gas/Biomethane

How often are combustion turbines expected to be used? And is there a risk that they will be used more in the future than estimated now in response to economic pressures (such as export revenues or financial performance)?

Combustion turbines are expected to operate as backup under conditions such as droughts, weather events, and other system situations. Their use will vary from year to year depending on how often these conditions occur. At this time, combustion turbines are estimated to be utilized, on average, between 0.5% and 5% of their full capability.

Combustion turbines are one of the most cost-effective dispatchable resources, providing critical capacity; however, they are typically not a cost-effective source of energy with other resources, like existing hydro and wind, being more cost-effective energy options. Operational economics reduce the potential for combustion turbines to be used beyond critical backup purposes.

Is there a plan to reduce use of natural gas fuelled combustion turbines, for example by using alternative fuels, co-generation, or dual-fuel capability? How is Manitoba Hydro supporting or investing in the development of local alternative fuel supplies (biofuels, RNG, hydrogen)?

Manitoba Hydro is exploring alternative fuels, alternative fuel credits, and carbon offsets as part of the near-term actions for the 2025 IRP. Manitoba Hydro would work with local proponents to explore a variety of mechanisms that could support emissions reductions from electricity generation to cost-effectively achieve a net-zero grid by 2035.

Cost and Rate Impacts

What is the impact of the recommended development plan on electricity rates?

Electricity rates are established through a formal regulatory process involving Manitoba Hydro and the Manitoba Public Utilities Board. This process is separate and distinct from the IRP process and includes factors outside the scope of the IRP.

What are the costs of the individual resources in the recommended development plan?

The costs presented for the recommended development plan represent the portfolio of resources and include the costs for transmission and distribution upgrades that are above and beyond the costs to sustain existing assets. While costs for individual resource options will be provided in the 2025 IRP report, direct comparison of them is not straightforward because the value that a resource option provides to Manitoba's system depends on the characteristics of the portfolio it is in.

How do cost estimates in the IRP relate to cost estimates provided by the Provincial Government?

The cost estimates in the 2025 IRP analysis were developed at the time of analysis and are planning-level estimates used to compare proposed development plans (i.e. portfolios of resources). Project planning for the implementation of each of the resources in the recommended development plan will result in updated cost estimates as current and more detailed information is incorporated.

How does the cost of the alternative development plan compare to the recommended development plan?

The cost of the alternative development is approximately $300 million less than the recommended development plan. The alternative development plan was not recommended because it has a lower potential for socio-economic benefits and has less alignment with Manitoba's Affordable Energy Plan.

Near-term Actions and Signposts

This section focuses on questions related to the near-term actions that will be completed over the next five years to implement the development plan and prepare for the next IRP, and the signposts that Manitoba Hydro will monitor to help understand how and how quickly the energy landscape is changing.

Many initiatives that support the energy transition are already occurring throughout Manitoba. How does Manitoba Hydro intend to work with organizations and partners across Manitoba to implement the development plan, prepare for the next IRP and continue ongoing planning?

Manitoba Hydro recognizes that we are only one player in our energy transition, and our future progress requires us to work together in collaboration with all Manitobans. We appreciate the time and effort Manitobans have taken to provide their feedback on the 2025 IRP and expand our collaborative relationships. Manitoba Hydro will leverage the feedback gathered and connections made during the 2025 IRP to continue collaborating with Manitobans to build alignment, provide timely, evidence-based advice, share outcomes and learnings from our energy planning, and advance economic reconciliation with Indigenous Nations.

What happens if resources in the development plan are delayed, including energy efficiency programs?

As part of the IRP's near-term actions, we will monitor progress on implementation of the recommended development plan and the new resources being developed. Every new

resource project will have its own project plan that outlines its business case, schedule, budget, and the risks that could cause delays. By tracking each project individually, we can monitor progress and spot issues early and address them.

Using our IRP signposts, we will also continue to monitor how actual electricity use grows so we can plan to remain sufficiently ahead of demand. By monitoring both project implementation and load growth, we can review our IRP analysis to see whether any adjustments are needed to the recommended development plan. This ensures we can continue to meet our customers' energy needs.

For efficiency programs, Manitoba Hydro will work closely with Efficiency Manitoba to monitor implementation and adjust programs as needed.

Links

- Mid-Project Information Session Questions and Answers: https://www.hydro.mb.ca/docs/corporate/irp/2025-irp-july-info-session-q-and-a.pdf
- Round 1 Engagement Questions and Answers: https://www.hydro.mb.ca/docs/corporate/irp/2025-irp-round-1-q-and-a-EN.pdf
- Canada's Greenhouse Gas Offset Credit System: https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system.html
- Round 1 Engagement Presentation: https://www.hydro.mb.ca/docs/corporate/irp/2025-irp-round-1-presentation-122024.pdf
- Six resource options: https://www.hydro.mb.ca/docs/corporate/irp/6-irp-resource-options-v0725.pdf
- Call for Wind Power: https://www.hydro.mb.ca/corporate/call-for-wind-power/