Lindsay Melvin: Hello. I am Lindsay Melvin, Manager for the Integrated Resource Planning, Policy and Coordination Department. A key component of preliminary outcomes for the Integrated Resource Plan (IRP) is the near-term actions. I am going to introduce us to draft near-term actions that have been developed as part of the 2023 IRP road map. You are going to see five draft near-term actions today. These actions are not final and are proposed to start the conversation. I would first like to explain how we came up with the actions and how we see the actions being implemented. The near-term actions are comprehensive because they reflect the broad scope of the IRP. The actions identify next energy planning steps for the gas and electricity systems in Manitoba, including the generation, transmission, and distribution and non-Manitoba Hydro owned assets for both systems, as well as non-wire solutions such as energy efficiency or rates.

We also considered how energy changes in sectors other than the electricity sector in Manitoba could impact the demand for electricity and gas. Given this broad scope of the IRP and the uncertainty in the energy landscape, the draft near-term actions are also broad and intended to be comprehensive. The near-term actions were developed based on the learnings presented. Learnings reflect the outcomes of this first IRP and that some planning areas are more or less developed than others. Therefore, you will see that some actions look to investigate potential future options while others take us along a more direct path towards decisions and implementation. We followed a principle of taking planning steps without skipping a step. And lastly, the actions were developed to be achievable in the next two to five years. Some actions will require more effort to achieve than others.

It is also important to note that the implementation of near-term actions require planning and confirmation of the scope of an action in order to see if that action is feasible to complete in the next two to five years. Because the actions are comprehensive and therefore numerous, we anticipate that the actions will need to be prioritized. We also acknowledge that these near-term actions will require collaboration and we look forward to continuing the conversations as we plan, implement, and carry out these actions. Let's look at the five near-term actions now. There are five near-term actions proposed for discussion. Each of these actions has between three and five more detailed sub actions associated with them for a total of 19 near-term actions.

Actions one and two, managing peak demand and being ready for potential rapid growth address immediate challenges. Actions three and five, reducing carbon content and preparing for deep decarbonization both reflect the learning that strategic use of natural gas can play a role in the energy transition. Action four, enhancing the Integrated Resource Planning process, involves evolving our engagement conversations as well as being prepared for a more complex energy future. Each near-term action provides a contribution towards making sure our electricity and natural gas supply and delivery systems meet the needs of customers for the next 20 years and beyond. The actions compliment each other and work together to be ready for a broad range of

potential futures. We will now look at each near-term action and their sub actions in more detail.

The first proposed near-term action to actively manage increasing winter peak load was inspired by the learning that all scenarios result in increased winter peak demand. Addressing the potential challenge of peak demand can be accomplished through the following actions. These actions help address the potential need for capacity without the addition of new resources. The potential value of a dual fuel program was demonstrated through sensitivity analysis, which showed an overall reduction in Manitoba greenhouse gas emissions with relatively less cost. Therefore, further steady on this topic is recommended. Energy efficiency was shown to have most value during peak demand in the modelling and analysis, and therefore we look forward to exploring this more with Efficiency Manitoba. Demand response through shifting load was shown to delay requirements for new capacity at resources, and therefore there is an opportunity to explore what demand response programs could look like in Manitoba.

And lastly, rates were identified as a topic of high interest in Round one engagement, the customer survey, and therefore the role of rates should be explored through developing rate design options. Accelerated decarbonization and steady decentralization future described in scenario four had the highest electricity demand in this IRP. The learning that the energy transition is happening and that the pace of change is unknown, but that it could be accelerated by policy, further demonstrates that the demand for electricity could be significant and that it could be required quickly in the future. Therefore, near-term action two positions Manitoba to be ready for rapid growth in electricity demand. These actions are the next steps to have the supply and delivery of energy ready to meet customers' needs. Action 2.1 seeks the opportunity to pursue cost-effective options to enhance existing hydropower plants. Action 2.2 specifically prepares for an accelerated future. And action 2.3 reflects that modelling and analysis results consistently showed wind as an economic energy resource and that complimentary capacity needs to be further investigated.

Actions 2.1 and 2.3 both come from the learning about common modelling and analysis results across scenarios. Action 2.4 is a next step to making a resource decision. A resource development plan is a sequence of potential resources to provide energy and capacity with consideration for in-service times and need dates. This IRP did not commit to recommending a development plan. The analysis is showing that potential supply mixes and solutions may change given the forecast and assumptions in the model. Preparing a range of development plans will allow us to explore the tipping point for what needs to change to put an alternative into play. Action 2.5 is quite broad relating to distribution and transmission, and recognizes the need for modernization, expansion, addressing peak demand, and considering the detailed operational needs of customers in the long term.

The IRP learning indicated the need to plan towards net-zero greenhouse gas emissions, and this includes considering the carbon content in natural gas. These draft actions leverage existing natural gas assets using low carbon alternative fuels. Action 3.1 and 3.2 both explore renewable natural gas. There are a variety of roles that Manitoba Hydro could potentially play with respect to renewable natural gas, and this ranges from being only a distributor to being a purchaser and a seller of renewable natural gas. The roles along with the supply, demand, and cost of renewable natural gas should be investigated further. Adding hydrogen to the natural gas system is another potential decarbonization option. Action 3.3 to investigate the feasibility of this option for Manitoba is a first step.

Enhancing Integrated Resource Planning is one of the next steps to prepare for a more complex future. Action 4.1 actions the learning for the opportunity for the energy planning community to work together in the best interests of Manitoba. A foundation was established during this IRP, and we need to further develop and integrate engagement into Manitoba Hydro's energy planning process. We look forward to continuing to build the energy planning community together. Action 4.2 reflects the learning that future decisions will be complex. Evaluation criteria based on total energy related costs rather than solely on utility based costs will better inform those decisions. These total energy related costs will include costs customers may incur directly due to the energy transition.

This broader perspective on the cost of the energy transition will help evaluate potential trade-offs between solutions. Broadening this analysis may also help identify where incentives or financial support could be necessary to help manage the energy transition. Learning three noted that there are many ways to reliably meet long-term needs. Energy markets and interconnections are some of those ways. Action 4.3 allows for the opportunity to build upon existing interconnections and looks for opportunities as energy markets evolve. Action 4.4 addresses the need to advance energy planning to better reflect regional variations across Manitoba. Manitoba is a vast province with unique needs for different geographic areas. Providing this detailed planning is one way to better manage the energy transition.

This near-term action focuses on work needed now to ensure Manitoba is ready for a future with deep decarbonization. Modelling and analysis results indicated that as the energy transition moves further towards deep decarbonization, there may be a greater reliance on developing technology resources to meet customer demand. Given the consistent presence of wind in the IRP results and the near-term action to plan for wind. Action 5.1 addresses the complimentary need to examine how to optimally integrate variable renewable resources into the electric system. This is because there is a limit to the amount of variable renewable resources that can be added to the system before impacts to existing generation and transmission systems result in technical issues and increased costs.

Action 5.2 is to investigate the potential of hydrogen in the future. Hydrogen has potential to support decarbonization efforts. It can be blended with natural gas to minimize its carbon intensity used directly to decarbonize energy use that is hard to electrify, or used like a battery for electricity generation. This action is also intended to obtain a better understanding of the potential for short and long-term storage of hydrogen. Action 5.3 captures technology such as carbon capture storage and sequestration that are generally in their earlier stages of technical development. These resource options came into the analysis results when decarbonization was accelerated and emission reduction regulations were more aggressive. Further work is needed to refine the assumptions and estimates for these options. We also need to better understand the potential feasibility of these technologies within the Manitoba context.

So to summarize, in total there are five draft near-term actions and 19 sub actions. Now that we've reviewed the learnings and proposed near-term actions in the draft road map. Let's look at the final component of the road map, the signposts. You will see four signposts proposed for discussion. These signposts are not final and were proposed to start the conversation. Let's start by defining what are signposts. Upon implementation of the road map, signposts will be monitored and reported on. The learnings of this IRP showed us that the energy transition is happening in Manitoba. However, the pace of change is unknown and could be influenced by factors such as energy policy or environmental, social, and corporate goals.

Signpost are indicators that tell us something about the timing, pace, magnitude, or type of changes happening in the evolving energy landscape. But actively monitoring signposts, we can look for trends to anticipate and understand when and how changes in the energy transition are occurring. Such insights may cause us to prioritize, expedite or delay, modify or update, or add or remove near-term actions. There are four signposts proposed for discussion and these signposts were developed because they reflect the areas with the most uncertainty in the evolving energy landscape in Manitoba. The four proposed signposts are, government actions, customer decisions, zero emission vehicles, and technologies and markets. For each signpost, I'll walk you through more details regarding what is included in this signpost and what may be monitored.

A key learning of this IRP is that energy policy will be a major influence on the pace and scale of decarbonization. Policy can influence customers' decisions related to energy as well as Manitoba's Manitoba Hydro supply options. When we say energy policy, we mean that to include both the rules, which are legislation, regulations, codes and standards, as well as the financial supports that governments provide through incentives, programs, and funding. While climate change has been a focus of governments, energy policy can also be used to advance other priorities such as reconciliation with indigenous peoples and economic development. And lastly, in addition to monitoring government actions in Canada, we will also monitor the actions of U.S. governments and

international bodies, because those actions can impact Manitoba Hydro and our customers, or provide insights into potential future policy.

The second signpost is customer decisions. Monitoring and anticipating customer decisions is important to ensure we have the energy customers need when and where it is needed. Through engagement, we learned that all customer segments are considering energy related decisions and may influence the pace profile and location of energy load changes in growth. This information influences the planning for the supply and delivery of natural gas and electricity. For some, cost or affordability may be a significant driver, while for others, climate adaptation and resiliency or working towards net-zero may be important. Changes behind customers meters can have a large influence on future electricity and natural gas loads. For example, our customers may be considering upgrading their facility or equipment to decrease energy use, switching to different fuels, or electrifying their heating and industrial processes. Customer feedback from some of Manitoba Hydro's largest natural gas users and round two engagement indicated that some customers are looking at switching to electricity in their operations to reach net-zero or environmental, social, and governance goals. Some are also interested in using renewable natural gas. One topic of particular interest for customers and governments is zero emission vehicles.

Our third signpost is dedicated to zero emission vehicles. Greenhouse gas emissions related to transportation account for approximately nine megatons out of 21.7 megatons in Manitoba. Reducing transportation emissions is a significant component on the pathway to net-zero. This signpost will monitor various aspects of zero emission vehicles including the cost, availability, and ability of light, medium, and heavy duty zero emission vehicles to meet customer needs. This includes monitoring changes in the technology along with influencers on the decision to adopt these vehicles, and details of where and how such an adoption will impact the demand for electricity as well as the grid's ability to deliver energy. The fourth and final signpost is technologies and markets. Technology refers to the technology that Manitoba Hydro and its customers may use to generate, deliver, or store energy or capacity, and those used to produce renewable fuels.

Market changes can include the price of commodities such as natural gas, the availability and cost of renewable fuels, and changes in wholesale electricity markets and neighboring jurisdictions. In the IRP learnings, we acknowledge that there are many options to meet future energy needs. However, the development stages of such solutions can vary. We have near-term actions to investigate some technologies and monitor meaning those and a broader list of solutions ensures we are investigating the right solutions at the right time. For example, there are few operational examples of small modular reactors, hydrogen fueled generating stations, or natural gas generation with carbon capture and storage. Similarly, we have some information about the availability and cost of renewable natural gas within and outside Manitoba, but there is still much to learn about its full potential. We also have a near-term action to

further study the evolving role of energy markets. However, developing a signpost to monitor regarding energy markets will help inform such study. This concludes an introduction to the proposed signposts.

We would really like to thank everyone for their participation in discussions to date and throughout the journey of Manitoba Hydro's first integrated resource plan. Before we close out this session, we wanted to share the next steps in completing the IRP. We will be taking the feedback and input gathered from this round of engagement to help refine the IRP outcomes, including the proposed road map and near-term actions. We are in the process of finalizing the modelling and post modelling analysis, and intend to release the full IRP report for publication this summer. The IRP report will summarize the analysis and also include a complimentary report on the engagement, including what we heard. It's expected that these are released this summer.

The 2023 IRP is Manitoba Hydro's first comprehensive IRP, and it is a foundational step towards planning for the future energy needs of our customers and Manitoba. The IRP is directional and it will not provide all the answers. In these sessions, we explained why it will be critical that the IRP road map has the flexibility to adapt as the future unfolds, so that we can continue to be agile and leverage new technologies and solutions. Much like the evolution of the energy transition, steps to prepare for and make decisions to meet this transition will also evolve. We are committed to continuing the conversation after the IRP is published. There are a few items that are ahead of us that relate to the implementation of the draft road map we shared.

First, we will be scoping and developing plans for the draft near-term actions beginning in the fall, and we intend to share this information in winter 2023. Second, we will need to continually monitor the energy transition. The signposts identified are key items that we will watch and report on. Third, as we work through the near-term actions, we can expect that the world will continue to change. This will mean that the road map will be updated and refreshed when significant change occurs. Moving beyond the implementation of the road map, the development of an IRP is a repeatable process. It's not a one-time occurrence and it is expected to be completed on a recurring basis. When specific investments are needed to meet future energy needs, these will be incorporated into the analysis of future IRPs. Existing processes to review and approve investment decisions and actions will still be followed. Thanks again for your participation. Today, and throughout this process, we have and we continue to learn a lot.