



**Notes for Remarks:**

**Non-emitting Resources Technical Conference**

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Check Against Delivery

Good morning and welcome everyone.

Thank you for coming out for what I know will be a day of interesting and lively conversation on an important topic – the role of non-emitting resources in the future Ontario electricity marketplace.

I am very pleased to kick-off this conference. Let me start by making a few statements that underpin my thinking, and outline why I am very supportive of our focus on non-emitting resources at this important time in the development of our sector.

First, our wholesale electricity market is integrally linked with reliable system operations. As Chief Operating Officer, I can confidently say that our very skilled operators will always ensure reliability in Ontario. Our electricity markets allow us to achieve reliable operations in a consistent, transparent and efficient manner.

Second, Ontario benefits from a diverse resource mix that is the envy of many jurisdictions. Nuclear, hydroelectric, wind and solar, natural gas generation and price responsive demand work together to provide us with the energy and capacity we need, when we need it. It is my job – and that of the people I work with – to ensure that these resources continue to work together effectively as the reliability needs of the system evolve and as new resources become available.

Next, non-emitting resources have comprised the largest part of our resource fleet transformation over the last decade. As a result, Ontario's electricity supply resources are more than 90 per cent clean and green. This trend will continue as costs of NERs continue to decrease.

Finally, NERs are a key source of innovation in a rapidly evolving sector. The IESO has been a North American leader in the integration of variable generation into our market and system operations. But our work needs to continue – and initiatives like the Non-emitting Resources Subcommittee, the Non-emitting Resources Request for Information and this conference are important elements to help us move forward.

So...in this context...what steps are we taking to move the market forward?

Well, as you know, we are working together to implement the initiatives of the Market Renewal Program. The Market Renewal Program is about improving the way

electricity is priced, scheduled and acquired to meet current and future energy needs reliably, competitively, transparently, efficiently and at lowest cost. It will put in place a strong foundation to manage a range of potential energy futures driven by decentralization, digitization and decarbonization.

Four primary initiatives make up the Program.

A single schedule market will ensure that we have a pricing system that accurately reflects the cost of producing or consuming electricity at a given place or time, and is consistent with our dispatch of resources.

A day-ahead market provides financially-binding prices and schedules ahead of real-time – allowing producers and consumers to manage risk and helping the IESO to manage the grid more effectively.

The enhanced-real time unit commitment mechanism will improve resource scheduling and commitments in real-time, addressing system and resource changes arising after the day-ahead market has concluded.

Finally, market renewal includes the implementation of an incremental capacity auction to improve the way Ontario acquires supply to meet medium- and long-term needs. As most of you know, the IESO already has a capacity auction for demand response resources. The auction has shown us that such a model brings the benefits of competition, innovation and lower cost to the province. The introduction of an incremental capacity auction, in which a wide range of technologies can compete, will help to ensure that the province's reliability needs continue to be met cost effectively.

An important element of a more dynamic and competitive marketplace, and a capacity auction, is to look beyond our boundaries and make sure that we drive towards efficient use of assets across the entire region. Trading electricity across jurisdictions is the bread and butter of our energy markets and we now have turned our attention to trading capacity with our neighbors. This means that other jurisdictions can take advantage of Ontario's clean supply mix when we have excess capacity and Ontario consumers will benefit during times when we need additional capacity from our neighbours.

Market Renewal is just one example of the IESO's ongoing commitment to non-emitting resources.

The 2013 Renewable Integration Initiative focused on enhancing three operational characteristics: forecasting, visibility and control. The tools and processes we implemented in this initiative have been very important in helping us balance supply and demand, and have added flexibility to the power system. There are lengthy periods each year – usually in the spring and fall – when our operators balance supply and demand primarily by dispatching our variable generator fleet.

This initiative was started after we already had material quantities of wind generation connected to the system. While this project was successful – thanks to many of you in the room today – the lesson learned is that when we have an opportunity to get the design right at the outset, we have to use it so we don't *have* to play catch-up later. That's why it is so critically important to have stakeholders at the table at the outset of any system change. All voices must be heard in the process.

Then there is our most recent Operability Study, released in 2016, which found that although it's hard to predict variable generator output, our forecast error is about the same one-hour out, 5-hours out and one-day out – points-in-time when we have to make key resource scheduling decisions. This knowledge has already led to changes in the way we do things – for example, we executed a Request for Proposal last year to bring on more resources to balance supply and demand on a second-by-second basis. The Operability Study will also inform our thinking as we design the Day-Ahead Market and the Enhanced Real-time Commitment mechanism.

The IESO is dedicated to ensuring that we continue to enhance the market in the short-term – ahead of, or in parallel with, Market Renewal. A focus for us is examining our ancillary services and improving overall operability of the system. Ontario is not alone in the quest for greater flexibility – with the growth of non-emitting and variable generation, we need to make sure we have the right services in our market to balance at times when the wind does not blow or the sun does not shine. As a result, we are implementing some changes to our operating reserve market to make sure we can get more flexibility out of our existing assets. Another important focus for us is to make sure we leverage existing and emerging resources to the best extent possible. We will be examining that through the lens of the market as a whole but with a particular focus on our operating reserve.

Finally, I'm pleased to tell you about one more *new* example of our commitment to non-emitting resources. In order to unlock the potential opportunities for energy storage, obstacles need to be examined and – where appropriate – mitigated to ensure that storage can be integrated into the market and can compete with other resources in the delivery of services. To assist with this endeavour, the IESO will launch an Energy Storage Advisory Group which will advise, support and assist the IESO in evolving policy, rules, processes and tools to better enable the integration of storage resources.

So... we are in the process of redesigning the marketplace, and clearly non-emitting resources must be a part of the discussions that are making that happen. We know that the pace of change is increasing rapidly and innovation is driving much of that change. The IESO is dedicated to creating a stable but more dynamic and competitive market that gives us the right tools to meet reliability cost-effectively, and we can only do that by sending the right incentives and price signals to you. We are creating the platform that unlocks greater participation and allows you to bring the innovation forward to help us meet system needs. So, it is essential that non-emitting resources are full participants in this effort.

The global trend of decarbonization has put non-emitting resources in front of all Ontarians. Our work to decarbonize our grid is something we should be proud of. Coal was retired as a generation source, nuclear facilities have been refurbished, we've expanded our hydroelectric fleet, and the amount of variable generation on the transmission system and on the distribution system has increased. At the wholesale level alone, wind and solar combined met about seven per cent of Ontario's supply needs in 2017, and our electricity system is now about 95 per cent carbon free.

As I mentioned at the outset, increasing variable generation supply is driving innovation in the sector – and that innovation is allowing emerging technologies to compete with traditional technologies. I mentioned earlier our increased need for second-by-second balancing services. Our recent RFP selected two energy storage facilities through a competitive process to provide a combined 55 megawatts of regulation service, which is traditionally provided by hydro-electric and gas generators. We are strong supporters of innovation in the sector. The challenge, in all cases, is to find the right incentives for all these emerging technologies to participate in our market so the grid works efficiently as an integrated whole.

We have assets that are being added to the grid in innovative new ways leading to a more decentralized yet interconnected system, with more moving parts. We now have over 4,300 megawatts of distributed energy resources in-service and under development in Ontario, over half of which is solar. So there exists a great opportunity to have these resources integrated fully into electricity system operations and markets in order to continue to serve customers at established reliability standards.

The increase in interest of the electrification of transportation to meet climate change objectives provides both a challenge in terms of forecasting electricity demand but also an opportunity for new technologies that can supply the clean energy and other electricity products such as flexibility that we will be looking for.

And then we have increasingly technologically-enabled and engaged consumers with more and more choice in how and where they get their electricity. We have seen municipal and Indigenous communities become more interested in community energy planning. Our last FIT procurement also saw more than 80 per cent participation from Indigenous, community, municipal and public sector entities.

What we *do know* in these uncertain times is that non-emitting resources have an important role to play in our electricity future. We *also know* that these resources need clear, accurate signals delivered through an efficient marketplace – in order to be able to provide what we need and ultimately be successful.

So, we need to work together to create that more open and efficient marketplace while recognizing the unique needs and contributions of different resources.

To that end, there is one part of the market renewal work specifically focused on how non-emitting resources can be a part of the solution.

The Non-emitting Resources Subcommittee was created to understand better:

- Any barriers to the integration of NERs given the proposed market design changes;
- The impact on the market when there are more NERs with low to zero marginal costs; and,
- Any potential need for incentive mechanisms to value environmental attributes and support net zero / low carbon emission facilities.

What we are doing here today is an important part of the subcommittee's work.

The subcommittee's work began in late 2017 and will culminate with a final report expected at the end of this year, informed – in part – by the submissions received as a result of the recently released Request For Information.

If you haven't seen the RFI or need more information, I would encourage you to check out the IESO website under Active Engagements. We are expecting submissions for the first phase by May 4.

The key to the success of the Non-emitting Resources Subcommittee and the Market Renewal Program will be our work with sector stakeholders.

We need to have conversations with stakeholders like the ones we are having today... have had in the past two years .... and will continue to have in the months to come. By listening to stakeholders, we can be assured that we are continuing to make decisions that will ensure that we meet the goals of market renewal. Those decisions will deliver a sustainable market with a solid foundation that is better able to respond more effectively to the demands of a modern grid.

Consumers and system operators have more choices than ever before on the types of resources that can meet their electricity needs. So these conversations also serve another purpose. They also allow us to help you prepare for a new market where all resources have the opportunity to compete to meet the needs of the market. In this new market, we expect wind, and solar, and storage, and demand response, and other non-emitting resources to compete to provide energy, capacity, flexibility and other reliability services. We know that we will need these electricity products in the coming years and we will need you to provide them. Together, we need to design the products and markets that allow this exchange to happen efficiently and cost effectively.

But the work doesn't end with the conversations we are having or the efforts with our stakeholder engagements to implement the market renewal initiatives.

The IESO will need to review how it plans and operates the grid, ensuring that we are sending the right market signals.

We will also continue to be open and transparent about the changes we're introducing so stakeholders can make the best business decisions for now and in the future.

When it comes right down to it, market renewal is not about winners and losers. It's about the opportunity to participate in shaping the marketplace of the future. Today is important. Discussions in forums like this will directly inform the short-, medium- and long-term opportunities for non-emitting resources.

In conclusion ... I am looking forward to the conversations today. While I have another commitment this afternoon, please be assured that I will be following up with my team to find out what was discussed today.

Have a great day!

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