ONTARIO ENERGY BOARD

Innovation Sandbox Annual Report

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Ontario Energy Board

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1. INTRODUCTION

As the energy sector evolves, the Ontario Energy Board (OEB) is constantly seeking new ways to facilitate innovation that delivers value to consumers and supports important policy priorities like economic development and housing. The Innovation Sandbox (Sandbox) is one of the OEB's key tools to do just that. Established in 2019, the Sandbox provides regulatory guidance to enquiries submitted by innovators and supports pilot projects testing new activities, services and business models in Ontario's electricity and natural gas sectors.

In 2023, the Sandbox received enquiries on topics ranging from grid modernization to electric vehicle (EV) integration. In addition, the OEB demonstrated its commitment to knowledge sharing through the release of its Innovation Handbook, a reference guide detailing the initiatives the OEB has supported to promote innovation in the sector.

The year also included several firsts for the Sandbox. The OEB launched an Innovation Sandbox Challenge, providing $1.5 million and regulatory guidance to support six innovative projects. The OEB was also given the authority to grant exemptions from the requirement to be licensed as an electricity distributor, retailer, wholesaler, unit sub-meter provider or gas marketer for a pilot or demonstration project that furthers its statutory objective to facilitate innovation in the electricity sector.

As part of a partnership between the Sandbox and the Independent Electricity System Operator's (IESO) Grid Innovation Fund (GIF), the two organizations released an interim report on the status of their Joint Targeted Call, offering the sector insight into several pilot projects testing the capabilities of distributed energy resources (DERs) in providing grid services at the local and provincial levels.

2. SANDBOX 2.0 OVERVIEW

Background: The OEB Innovation Sandbox

In 2019, the OEB launched the first regulatory sandbox in Canada's energy sector. Since then, the Sandbox has provided guidance and support to energy sector innovators on a wide range of topics including DERs, net metering arrangements and hydrogen.

This work has been conducted through two streams of support: an Information Service and Project-specific Support. The Information Service offers a simple

way for innovators to reach out to OEB staff with questions about the regulatory framework as it relates to innovative ideas, products, services or business models, or ideas about a specific pilot project. Project-specific support is available to innovators wishing to proceed with a specific project and allows them to request specific forms of support from OEB staff, including customized guidance related to a regulatory requirement and/or assistance in requesting temporary relief from a regulatory requirement. Both services are administered by the Sandbox team, which includes subject matter experts from across the OEB.

While there was success supporting innovation in Ontario's energy sector through these enquiries and projects, the OEB recognized that it could do more, and that a renewed Sandbox would benefit from stakeholder input.

In June 2021, the OEB launched the Innovation Sandbox Renewal Consultation to solicit stakeholder input on the design and features of a renewed Sandbox. This Sandbox Renewal Consultation culminated in the release of the Sandbox 2.0 Report, which included commitments to be implemented in a phased approach from 2022 – 2024 aimed at enhancing the effectiveness of the Sandbox. The commitments that were met in 2023 are highlighted below.

2.1 Sandbox Medium-term Commitments

Awareness and Transparency

Stakeholders expressed interest in greater opportunities for communication and information sharing. Following the release last year of the first enhanced report of the Sandbox, the OEB hosted a webinar in June 2023 to provide insights into Sandbox initiatives spanning from July 2020 to December 2022. This webinar allowed the Sandbox team to engage participants in a discussion on challenges or barriers when exploring potential innovative solutions and how the OEB can support to alleviate some of these challenges. As noted in this report, some of the enquiries that come through the Sandbox identify a legislative barrier that may prevent the implementation of a solution. While the OEB does not have jurisdiction to alter legislation, the Sandbox team brought this issue to the attention of the Ministry of Energy, aligning with the commitment to share insights gathered through the Sandbox, leading to changes in the legislation to allow the OEB to grant temporary licence exemptions for certain pilot projects to support innovation in the sector.

Thematic Sandbox

Stakeholders also expressed interest in a regulator-led thematic Sandbox initiative. Thematic sandbox initiatives are designed to focus on specific energy-related opportunities and challenges. In the fall of 2022, the OEB held a poll to seek public input on potential themes for its Innovation Sandbox Challenge. Following stakeholder input, OEB launched the Innovation Sandbox Challenge in March 2023. This initiative offered innovators in Ontario the opportunity to submit proposals on the following themes: 1) how to move pilots to broader implementation and 2) innovative strategies to enhance customers' understanding of their role in the energy transition. The OEB committed to provide up to $1.5 million in funding to support six innovative projects.

Open Dialogue

Additionally, stakeholders expressed interest in hearing more about the Sandbox at conferences, meetings and other industry events. In response, the OEB actively participated in nine dedicated speaking opportunities across different platforms and internationally to share lessons learned on the genesis and evolution of the Sandbox as well as highlighting its role in the energy transition. Key insights that were shared include the following:

- **Facilitating collaboration between the regulator and innovators:** The Sandbox facilitated collaboration between the regulator and energy sector innovators, fostering a supportive environment for experimentation and pilot projects. This helped clarify how regulatory requirements apply to innovative solutions, as demonstrated through the guidance that was provided to Joint Targeted Call proponents.

- **Promoting knowledge sharing and transparency:** The team emphasized the importance of knowledge sharing and transparency in fostering innovation. Initiatives such as webinars, reports, and consultations increased awareness and understanding of the Sandbox's role and objectives among stakeholders, promoting open dialogue and collaboration.

- **Stakeholder engagement for continuous improvement:** Stakeholder engagement played a crucial role in the success of the Sandbox. Input from stakeholders helped to shape the design and features of the Sandbox, ensuring that it remained responsive to the needs of the energy sector and conducive to innovation. Continuous engagement and feedback mechanisms were essential for driving ongoing improvements and enhancements such as the website improvements and obtaining

stakeholder input to determine the themes for the Innovation Sandbox Challenge.

- **Building partnerships for greater impact:** Partnerships with organizations such as the IESO helped amplify the impact and reach of the Sandbox. Collaborative efforts to release joint reports and support pilot projects demonstrated the value of partnerships in driving innovation and knowledge sharing.

Below is an overview of the conferences, meetings, and industry events attended by the Sandbox team in 2023.

Thailand Electricity Regulatory Partnership

The National Association of Regulatory Utilities Commissioners partnered with the Energy Regulatory Commission of Thailand to explore effective strategies for adapting to disruptive technologies and establishing a Regulatory Sandbox Program.

OEB staff offered their thoughts based on their experience with the Sandbox, including lessons learned, new energy technologies and regulatory measures aimed at reducing carbon emissions and promoting energy diversification.

Regulatory Sandboxes and the Energy Transition Workshop

The Florence School of Regulation at the European University Institute hosted this workshop to discuss the significance of regulatory sandboxes in the broader sector as well as within the context of the energy transition.

OEB staff provided an overview of the Sandbox and its role in the energy transition.

First Nations Community Solar and Batteries (DERs) Workshop

This workshop aimed to address challenges and foster sustainable solutions regarding the adoption of solar energy and battery storage systems within First Nation communities.

OEB staff offered insights from projects that sought guidance on regulatory challenges related to DER solution implementation within First Nation communities.

Canadian Institute for Energy Training – Ask Us Anything Session

Focused on various approaches to achieving carbon neutrality, this session enabled discussion and knowledge sharing.

OEB staff highlighted Innovation Sandbox Challenge projects and their potential impact on reducing net carbon emissions.

Blue Cities Conference by Canadian Water Network

With a focus on municipal wastewater management and public health protection, this conference sought to draw insights from various sectors.

OEB staff spoke about how the energy sector is achieving net zero and shared lessons applicable to Canadian water utilities in their efforts to receive net-zero targets.

International Smart Grid Action Network Sandbox Community of Practice

This event centred on insights and best practices related to smart grid technologies.

OEB staff shared lessons learned from their Sandbox experience on enquiries related to smart grid technologies.

Energy Efficiency Day Event with StepUp and Efficiency Canada

This event highlighted initiatives and achievements in energy efficiency, particularly in building electrification, innovation and project financing.

OEB staff showcased the Sandbox and how it supports the OEB's statutory objective to facilitate innovation in the electricity sector, aligning with the event's focus on decarbonization and waste elimination.

QUEST and Pollution Probe's Low Carbon Energy Innovation Initiative – Community of Practice Session

This session gave innovators a platform to share best practices and collaborate on low-carbon energy innovation.

OEB staff spoke about the objectives of the Sandbox and projects that came forward related to low-carbon energy innovation.

GridSmartCity New Technology Commitment Meeting

This meeting focused on emerging opportunities and challenges in the electricity supply sector.

OEB staff provided a high-level overview of the Innovation Handbook and shared insights to assist utilities in preparing applications proposing innovative approaches to meet customer or system needs.

3. SANDBOX INITIATIVES

3.1 Information Service and Project-specific Support

Overview of Common Sandbox Enquiries

Many enquiries relied on the Sandbox's information service rather than project-specific support. In most instances, innovators sought guidance on funding, and were subsequently referred to the OEB's Innovation Sandbox Challenge. The Sandbox team engaged in discussions on licensing requirements, storage capacity, and hydrogen uptake, offering insights into the OEB's license exemption authority and the license exemption application process.

In 2023, the Sandbox experienced an increase in enquiries regarding grid modernization and the integration of DERs. Innovators approached Sandbox staff with solutions that explored increasing EV adoption and managing demand peaks using innovative charging technologies. There was significant interest in grid modernization practices aimed at enhancing the reliability and efficiency of electricity utilities across Ontario. The team also engaged in discussions on storage capacity programs, hydrogen uptake, and alternative energy solutions such as thermal batteries for backup power during climate emergencies. There was continued interest from innovators on community net metering projects.

3.2 Innovation Sandbox Challenge

Objectives

During the Sandbox Renewal Consultation, stakeholders identified the importance of funding to support innovation. In response and in furtherance of its statutory objective to facilitate innovation in the electricity sector, the OEB launched its Innovation Sandbox Challenge in March 2023. The objectives of the Innovation Sandbox Challenge are:

1. To support eligible projects that will provide information that the OEB can use to inform current and future policy related to the energy transition, and;
2. To assess the potential for innovative solutions that have the potential to provide value to consumers.

Background

In fall of 2022, the OEB held a poll to seek stakeholder input on the theme of the Challenge. Four options were presented, and respondents had an opportunity to offer new theme ideas. Most respondents selected “Innovative strategies to enhance consumers’ understanding of their role in the energy transition,” followed by “Innovation in digitalization and data use” and “Moving from Pilot to Implementation.” Suggestions on other themes included grid services, alternative utility practices, regulatory reform, energy management and deep retrofit technologies.

Following stakeholder input, the OEB selected two themes for the Challenge:

1. How to move pilots to broader implementation; and
2. Innovative strategies to enhance customers’ understanding of their role in the energy transition.

The first theme was chosen in response to stakeholder feedback expressing the need to ensure that innovative arrangements that provide benefits to consumers can scale up, and that barriers to implementing innovative solutions beyond the pilot stage should be identified. The OEB was interested in research projects with the potential to investigate lessons learned from pilots and those that highlight challenges to broader implementation, as well as recommendations on how to overcome those challenges while ensuring value to consumers.
The second theme aligns closely with the Sandbox’s commitment to delivering public value. This theme was selected to investigate solutions that would enable the meaningful participation of consumers in the transition. The OEB was particularly interested in funding initiatives with the potential to provide consumers with more choice through innovative ways of managing and generating their own energy, while increasing their understanding of the energy transition.

In March 2023, innovators were given an opportunity to submit proposals for solutions that addressed these themes. The OEB hosted a webinar aimed at providing an overview of the themes, providing industry stakeholders with an opportunity to learn more about the application process. In October 2023, the OEB selected six projects to receive one-time total funding of $1.5 million to support innovation in the energy sector.

Overview of Pilot Projects

Alectra Utilities Corp. (Alectra)
Project title: Alectra eMobility Customer Engagement Platform

Alectra will build upon an existing customer engagement platform to test the ability of residential customers with Level 2 EV chargers to participate in demand response events. During demand response events, customers reduce or eliminate their energy use at times when the electricity system is experiencing high demand. This platform strives to deliver tailored insights to customers and offer an opportunity for future testing pathways to enhance accessibility to charging equipment.

This project will identify the characteristics of business models and financing features customers best respond to so that programs can have an Ontario-wide deployment. These insights can be leveraged to push forward decarbonization initiatives that require customer uptake. As more households transition to electrification, the demand from EV charging and eventually heat pumps is expected to increase, potentially surpassing the capacity at the grid edge. This pilot project will demonstrate how a utility can use DERs installed in customer homes to postpone the need for system upgrades driven by the aforementioned factors.

Hydro One Networks Inc. (Hydro One)
Project title: Bringing Along Low-Income Customers in the Energy Transition

Hydro One and CLEAResult, an energy efficiency consultancy firm, will engage low-income customers to help them play a more active role in and better understand the effect of demand response in the energy transition.

This project's goal is to help Ontario electricity distributors more effectively serve and engage low-income customers in energy transition initiatives. It's aimed at gaining a better understanding of how low-income customers with baseboard heaters can achieve winter bill savings by leveraging smart thermostats to control their heating. Electricity distributors throughout Ontario are also expected to learn more about the potential for baseboard smart thermostats to

deliver demand savings (in demand response events) and bill savings.

Oakville Hydro Electricity Distribution Inc. (Oakville Hydro)
Project title: Digital Customer (Residential and Small Business) Education and Engagement on Energy Transition

Oakville Hydro will build a mobile application to help residential and small business customers understand and assess their energy transition options (e.g., solar, storage, heat pumps). The project will include the collection of data on customer readiness, as well as customer outlook on the control and management of DERs. It will also estimate the timing of load growth impacting grid capacity and reliability, along with the associated costs under different business models. In addition, it will identify opportunities to further tailor and optimize innovative strategies to better meet the needs and preferences of residential and small business customers.

Pollution Probe
Project title: Innovation in Rural, Remote and Indigenous Communities

Pollution Probe will develop a framework to help Ontario's rural, remote and Indigenous communities better understand, participate in and benefit from energy innovation. This project will explore how governments and utilities can more effectively address a community's unique path to net zero. It will also explore how clean energy innovation could be scaled up across more communities, by providing areas for demonstrating or deploying new clean technologies within these communities.

Powerconsumer Inc. (Powerconsumer)
Project title: Flexibility Markets Handbook: Mapping DSO Functionality from Pilot to Scale: Identifying Regional Opportunities for Utility-scale Integration of Flexibility Services in the Energy Transition

Powerconsumer will leverage flexibility market use cases, demonstrated or simulated, to create a Flexibility Handbook for Ontario distributors to enable scalability. Increasing flexibility in the distribution grid is a tool to manage growing DER penetration and demand side market participation.

This project will address several policy areas of interest, including the functionalities and role of a Distribution System Operator, integrating DERs, opportunities for co-ordination between gas and electricity distributors, planning for the energy transition, and ways to increase customer engagement as the system transitions.

Taykwa Tagamou Nation
Project title: Indigenous Community Solar: Innovations to Enable First Nation Energy Transition Leadership

Taykwa Tagamou Nation will investigate the challenges and opportunities arising from the energy transition for Ontario's First Nations communities, exploring the scalable deployment of renewable energy projects.

This project will explore effective implementation strategies, regulatory considerations and community engagement regarding the deployment of renewable energy projects. These lessons are expected to inform future renewable energy initiatives, not only within First Nations communities but also in other regions facing similar challenges and opportunities.

Upcoming Innovation Sandbox Challenge Milestones

Overall, progress has been achieved on all projects. The OEB will continue to monitor the Innovation Sandbox Challenge projects and explore how their insights can be integrated into OEB initiatives and shared more broadly with others who can benefit from the projects' insights.

3.3 Joint Targeted Call

In June 2021, the OEB announced it had partnered with the IESO on a first-of-its-kind collaboration to support innovative projects to help meet the province's growing energy needs. The OEB's Innovation Sandbox and the IESO's GIF held a joint targeted call for innovative proposals that test the capabilities of DERs in providing services at both the local and provincial levels. Seven projects were selected, five of which received regulatory support from the Sandbox.

These projects focus on several themes: managing EV charging, exploring the potential benefits of DERs and implementing the DSO model in Ontario. The Sandbox aims to derive regulatory insights related to cost/revenue allocation and understand to what extent enhancing the capabilities of DERs can potentially lead to savings for ratepayers.

In 2023, several projects made considerable progress with some having moved ahead with program design and participant recruitment, while others continued to work on program development, recruitment, and technology integration. Others transitioned into the testing phase of their resources. The Sandbox and IESO'S GIF released the Joint Targeted Call Interim Report in November 2023, providing updates on the status of the projects and their contributions to OEB/IESO initiatives, as well as broader industry discussions.

3.4 Licence Exemptions

Following the Sandbox Renewal consultation, the OEB committed to identifying opportunities with the Ontario Ministry of Energy to facilitate innovation through legislative change. The OEB explored potential legislative amendments that could better promote innovation in the sector, allowing it to support and approve more projects through the Sandbox.

In June 2023, Section 57.1 was added to the *Ontario Energy Board Act, 1998*, enabling the OEB to grant exemptions from the requirement to be licensed as an electricity distributor, retailer, wholesaler, unit sub-meter provider or gas marketer for a pilot or demonstration project that furthers its statutory objective to facilitate innovation in the electricity sector.[1] On October 19, 2023, the Ministry of Energy hosted a webinar in which OEB staff provided examples of the types of projects that would be eligible for a licence exemption, as well as the process to follow when seeking one.
The OEB is currently accepting applications for exemptions under section 57.1

[1] Effective January 1, 2024, those who are granted a temporary licence exemption under the new section 57.1 are also exempt from certain additional provisions under the *Ontario Energy Board Act, 1998*, the *Electricity Act, 1998*, and the *Energy Consumer Protection Act, 2010*. See the posting on Ontario's Regulatory Registry for further information.

and has posted an application form on our Applications webpage. The OEB encourages innovators to reach out to the Sandbox to discuss their pilot project and how a licence exemption could help it move forward. The Sandbox team will work with innovators to determine whether a licence exemption is the appropriate tool for their specific project.

3.5 Innovation Handbook

Innovation is a key component of a thriving and sustainable energy sector as it evolves with the energy transition. In alignment with the OEB's objective to facilitate innovation, OEB staff compiled an Innovation Handbook in March 2023. This handbook contains OEB policies and related materials that have supported innovative projects and proposals. It functions as a reference tool for industry innovators.

As part of the development of the OEB Innovation Handbook, stakeholder sessions were conducted in January 2023 to gather feedback on a draft version. The OEB sought input from stakeholders it anticipated would be the primary users of the Handbook, including the Adjudicative Modernization Committee, the DER Connections Working Group as part of the DER Connections Review, and the Electricity Distributors Association. An overview of comments received and how they informed the final version of the OEB Innovation Handbook can be found in the Summary of Stakeholder Feedback on the OEB Innovation Handbook.

4. WHAT'S COMING UP IN 2024

The Sandbox team will focus on several initiatives in 2024. These include:

- **Innovation Sandbox Challenge:** The projects that are part of the Innovation Sandbox Challenge will begin their project designs, with some initiating testing and program rules. The OEB will continue to be actively involved in supporting these projects through reoccurring check-ins, reviewing project milestones, and offering regulatory guidance.

- **Joint Targeted Call:** The projects that are part of the OEB-IESO Joint Targeted Call will continue testing. The OEB will continue to monitor these projects and explore how their insights can be integrated into other OEB initiatives related to DER integration. These insights will be incorporated in the final report, which will then be shared with stakeholders once projects conclude. Projects are expected to conclude towards the end of 2025.

- **Innovation Handbook:** The Innovation Handbook will be updated to reflect new initiatives, including OEB staff bulletins, frameworks, code amendments, and reports related to facilitating innovation in the energy sector.

- **Regulatory Partner:** The OEB will support the IESO's next GIF call for proposals as a regulatory partner. Once successful applicants are selected by the IESO, they will be directed to the OEB's Innovation Sandbox. Applicants are expected to seek and receive (subject to OEB approval) regulatory guidance as a condition of their first milestone.

5. CONCLUSION

The year 2023 marked many milestones for the OEB's Innovation Sandbox. The initiatives undertaken have not only addressed immediate challenges but have also laid the foundation for future work related to facilitating innovation within Ontario's energy sector. Looking ahead to 2024, the OEB's Innovation Sandbox will continue to support innovation in the sector to deliver value to consumers and help advance important policy priorities in a sector that is constantly evolving.