



AUGUST, 2022

IESO Hydrogen Program Options Development

For Stakeholder and Community Information

Purpose

- To support the IESO's report back to government on options for developing a program to integrate low-carbon hydrogen technologies into Ontario's electricity grid per the Minister of Energy's letter from April 7, 2022
- **To identify stakeholders and interested parties who are currently planning or contemplating hydrogen projects in Ontario to discuss project details**



Presentation Contents

- Program goals & scope
- Research findings on potential role for hydrogen
- Engagement plan

Minister's April 7th Letter

- The IESO was asked to “investigate and propose program options to integrate low-carbon hydrogen technologies into Ontario’s electricity grid for the purposes of balancing and strengthening our reliable electricity system and contributing to broader decarbonization”
- The report is to include “program options, timelines, costs and any additional advice the IESO may have on how to proceed”

Program Goals & Scope

Based on the Minister's letter and IESO's understanding of system needs, IESO has identified the following program goals and scope:

- Demonstrate potential for low-carbon hydrogen to support grid reliability and decarbonization
- Potential budget to be validated through research and engagement
 - Will seek to leverage 3rd party/federal funding, if possible, in addition to existing funding mechanisms (e.g., Grid Innovation Fund (GIF))
 - Due to scarcity of grid-scale electrolyzers in Ontario, part of funding may be for capital investment

Program Development Principles

- Integrate hydrogen production in a way that supports wholesale electricity market efficiency
- Contribute to enhanced reliability in the near term
- Demonstrate ability of hydrogen to contribute to the decarbonization of the electricity sector
- Link to other IESO/Ministry initiatives, not limited to:
 - Electrolyzer load participating in interruptible rate pilot or as dispatchable load
 - Matching load with hourly clean energy credits (CECs)

Program Budget Development

- As part of developing the report, IESO will identify budget options – anticipate scope to support three to five projects
- Budget options will be developed through a variety of sources:
 - Scan of comparable programs
 - Identification of currently contemplated projects in Ontario
 - Literature review
- Budget options likely to be tied to the different roles hydrogen could play, which will influence the scale and cost

Potential Roles for Hydrogen and Project Focus

Role/Potential Project Focus	Description of Electricity System Functions to be Evaluated
1. Renewable/clean energy integration	<ul style="list-style-type: none">• Smoothing of renewable output compared to forecast output (storage and generation)• Utilization of surplus/constrained clean electricity
2. Natural gas generation blending and/or 100% retrofit	<ul style="list-style-type: none">• Low carbon hydrogen blended into fuel at existing natural gas (NG) facility would reduce emissions• Retrofit existing turbines at small CHP plant to 100% hydrogen fuel input
3. Ancillary services	<ul style="list-style-type: none">• Adjust electrolyzer load and/or fuel-cell output to respond to grid conditions
4. Feasibility studies	<ul style="list-style-type: none">• Could set aside portion of total program budget for cost-benefit/other studies and analytic work on feasibility of longer-term hydrogen solutions (e.g. hydrogen as a long-term electricity storage solution)• Feasibility studies could consider larger scale projects that advance Ontario's larger hydrogen strategy

Engagement Objectives

- Identify potential projects for integrating low-carbon hydrogen into the electricity system to strengthen reliability/contribute to decarbonization
- Clarify the scope/nature of support that potential proponents would need in order to enable projects that would achieve the program goals identified herein
- Collaborate with stakeholders in developing estimates of costs and timelines for hydrogen infrastructure
- Identify opportunities, barriers, and risks related to low-carbon hydrogen programs and projects

Request for Feedback

- The IESO would like to hear from stakeholders who are currently planning or contemplating a hydrogen project in Ontario
- Points of interest include:
 - Project scale, costs, and timelines
 - Barriers to project development
 - Scale of support required to develop a pilot project
- If you are interested in discussing the above, please reach out to engagement@ieso.ca

Engagement Approach

Timing	Engagement Activity
August 4, 2022	<p>Overview of initiative posted in IESO Bulletin</p> <ul style="list-style-type: none">• Outline Minister's request and IESO approach (i.e. proposed scope, principles per this presentation)• Solicit information regarding potential hydrogen projects where proponents are willing to discuss their project details
July 15 – August 31, 2022	<p>Direct discussions with identified potential hydrogen projects</p> <ul style="list-style-type: none">• Ministry staff will be invited to attend meetings with potential project proponents• Discuss timelines, costs, barriers, opportunities
Oct. 31, 2022	<ul style="list-style-type: none">• Due date for IESO submission of program options to Minister

Next steps

If you have an existing or potential upcoming project that could be eligible for this program, we would like to hear from you

- Specifically, we would like to discuss your project scale, timelines, and costs
- If you are willing to discuss these details with the IESO, please email engagement@ieso.ca

Thank You

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