

Stakeholder Feedback and IESO Response

Small Hydro Program Design, Virtual Outreach Sessions to Hydroelectric Community – March 25, 29, 30 & April 1, 2022

Following the outreach sessions to the hydroelectric community hosted on March 25, 29, 30 & April 1, 2022, the Independent Electricity System Operator (IESO) invited stakeholders to provide feedback on the materials presented.

The IESO received submissions through its formal feedback process and outreach sessions have been posted on the IESO stakeholder [engagement webpage](#). Please reference the posted material for specific feedback as the below information provides excerpts and/or a summary only.

Feedback Summary and IESO Response

The IESO appreciates the feedback received from stakeholders, as it enables us to refine the design of the Small Hydro Program. The table below responds to the feedback received and is organized by each topic. This document is provided for information purposes only. It does not constitute, nor should it be construed to constitute, legal advice or a guarantee, offer, representation or warranty on behalf of the IESO.

Design Foundation & Goals

Feedback	IESO Response
<p>Stakeholders recommended that a design goal for the program should include recognizing all the value provided by small hydro including the social benefits.</p>	<p>A goal of the program design is to provide a reasonable revenue stream for facilities to continue operating while providing ratepayer value. By aiming to achieve continued operation, the program enables the current provision of social benefits provided by hydro facilities.</p>
<p>Stakeholders noted the need to keep the contract simple, and recommended that simplicity should be a design goal since unnecessary complexity adds risk and cost. For example, stakeholders commented that a capacity payment structure seems overly complicated.</p>	<p>While the IESO recognizes the importance of simplicity, providing both a steady stream of revenue and a structure more reflective of system value is a higher priority for the program design. Linking the revenue streams to the system services that these facilities provide is a key step in aligning revenue with the value these facilities bring to the system. The IESO will keep simplicity in mind as we refine the program design.</p> <p>The IESO acknowledges that changing the structure of the contract payment will require some initial learning and adaptation by facilities at the program outset and will offer opportunities for asset owners to better understand the program design.</p> <p>Complexity does not necessarily increase risk. For example, providing a floor for energy market revenue may increase the complexity of the contract but decreases the risk to the asset owner.</p>
<p>Stakeholders recommended that program goals should account for maintaining facilities in good working order.</p>	<p>The IESO appreciates this feedback and has incorporated it into the evolved design. The principle of incenting facilities to continue proper maintenance will be accounted for in the design through capacity factor performance benchmarks. Capacity payments and a floor on energy payments will provide a stable, predictable revenue stream to enable facility maintenance and asset management planning.</p>

Feedback	IESO Response
<p>Various stakeholders commented that the foundational principles of competition, incenting market-driven operations and flexibility are not appropriate for the Small Hydro program. Stakeholders suggested that competition is only one approach to affordable electricity; that due to the small proportion of overall Ontario energy provided by small hydro facilities their operation is inconsequential to market operations, and that flexibility in future system operation is not relevant since these assets should exist in perpetuity regardless of changes in the broader sector.</p>	<p>The IESO is implementing its Resource Adequacy Framework to ensure we can meet system needs more effectively. The IESO continues to take input from stakeholders and is evolving the procurements and programs to ensure they balance IESO and stakeholder needs.</p>

Capacity Payments

Feedback	IESO Response
<p>Stakeholders recommended that to sustain ongoing investment, capacity payments would need to be at least equivalent to the revenues derived from current contracts, with minimal risk to the fixed payment. Linking the annual capacity auction price to the capacity payments will not provide the necessary certainty.</p>	<p>The design intent of the program is that facilities will receive, on average, compensation comparable to current Hydroelectric Contract Initiative (HCI) base price. This will be provided through fixed capacity payments and energy revenues with limited downside risk provided by a floor price. The IESO is not proposing to link the capacity price in the Small Hydro Program to the annual clearing price of the Capacity Auction.</p>

Feedback	IESO Response
<p>Stakeholders suggested that capacity payments will undermine operator’s incentive to effectively maintain facilities. Energy based payments ensure down time is minimized.</p> <p>Stakeholders expressed a preference to continue with a program that provides contracts similar to existing contracts, where payment is for energy. This recognizes how facilities were designed and operate.</p>	<p>The IESO recognizes it is important to ensure facilities are contributing to the energy and capacity needs of the system as expected. This feedback has been incorporated into the design by adding an energy component to the payment structure and through capacity factor performance benchmarks. The contractual incentives will ensure that resources are effectively maintained and operated.</p> <p>The IESO acknowledges that there is a preference to maintain the status quo in many cases. The Small Hydro Program design values energy and will be designed to support the expectation that facilities continue to operate similarly to operations under previous contracts. The intent is, that where possible, facilities will shift production in response to market needs. The capacity payment will provide revenue certainty and the energy revenues will encourage energy production to a reasonable extent and price responsiveness where possible.</p>
<p>A stakeholder was opposed to a Qualified Capacity (UCAP) being used as the basis for a capacity payment for small hydro resources. Other stakeholders suggested that nameplate capacity should not be used as a basis for payment as facilities with similar nameplates can have very different characteristics.</p>	<p>The IESO is considering using nameplate or installed capacity and recognizes that resources with the same nameplate capacity may have different characteristics. By incorporating energy price exposure and capacity factor performance benchmarks into the design, the overall payment structure will reflect the value provided by each resource.</p>

Feedback	IESO Response
<p>A stakeholder inquired as to how capacity payments benefit consumers or generators.</p>	<p>Through the Resource Adequacy Framework, procurement approaches are mainly focused on ensuring the IESO acquires services needed to maintain reliability. Hydroelectric facilities provide value through the provision of capacity and energy (and at times, ancillary services). Focusing the program design on capacity and energy better aligns compensation with value. By compensating for capacity and providing some energy market exposure, the design incents resources to better align production with energy market signals. The value of energy production varies widely throughout the year, on a minute-by-minute basis, and is not reflected well in a Power Purchase Agreement (PPA). For example, at times of surplus or system constraints, there is value in resources curtailing their production. A design that better aligns incentives with system needs will deliver greater ratepayer value.</p> <p>A capacity payment will benefit generators as it provides a more reliable and consistent stream of revenue over energy payments alone, which are subject to production variability.</p>
<p>Stakeholders had several questions related to the details of the capacity payment structure including: what is the value of a capacity payment? How will it be calculated? What will it be based on and will it be updated through out the program? Will monthly or seasonal capacity factor fluctuations be accounted for? How will planned outages be incorporated?</p>	<p>The design of the capacity payment will reflect the feedback received from the hydroelectric community. The value of the capacity payment will be determined by equating the revenue between a typical HCI contract with the expected revenue for a reference facility within the Small Hydro Program. The value of capacity that will be established within the Small Hydro Program will remain constant, except for adjustments for inflation.</p> <p>The portion of payment to be indexed and the treatment of planned outages will be considered during program development.</p>

Feedback	IESO Response
<p>Stakeholders recommended a simple bundled capacity and energy contract should be considered. It is recommended that 90% of the terms be fixed capacity payment with 10% of revenues market based. A weighted average contractual energy price could be used as a floor. Stakeholders also suggested that fixed capacity payments combined with a 'contract for differences' for energy sales could work.</p>	<p>The IESO is proposing a fixed capacity payment and to incorporate an energy component into the payment structure, with the use of an energy floor.</p>
<p>Stakeholder suggested that a cost saving measure could involve asking facilities to self manage cost reductions by a certain percentage over the next decade. This approach could incorporate an IESO run audit to evaluate cost effectiveness of each site and provide recommendations to improve.</p>	<p>The IESO appreciates this feedback and has taken it into consideration.</p>

Dispatchability

Feedback	IESO Response
<p>What does it mean to be dispatchable? What is the difference between flexibility and dispatchability as it relates to hydro assets? Is there value in flexibility?</p>	<p>A dispatchable facility is a Market Participant that has the ability to take dispatch instructions from the IESO Control Room on a 5-minute basis. Flexibility is the ability of a facility to control its output. Within the Small Hydro Program design, flexibility will allow a facility to maximize energy production when prices are high, providing additional value for flexibility.</p> <p>Facilities that are able to offer dispatchability provide the IESO with increased control and oversight for grid operation.</p> <p>The IESO will consider enhanced payments for dispatchability in detailed design.</p>

Feedback	IESO Response
<p>Stakeholders stated that in the consideration of becoming dispatchable, many factors would have to be considered and in many cases, the barriers to becoming dispatchable are extensive or insurmountable. These factors include: required modifications for automation, public safety requirements, ecological impacts, co-dependencies on cascading systems, limitations of run-of-river operations, Water Management Plans, impacts of cycling of equipment (wear, risks to reliability and production), efficiency (wastefulness) of spilling water, resource/staffing requirements for 24-7 operation to communicate with the IESO, access and costs of stop-log manipulation, permitting or re-permitting requirements, efficiency zones for equipment operation, dam stress loading, limitations of reservoir elevation rule curves, lack of ponding or minimal ponding.</p> <p>Some stakeholders are open to considering dispatchability if the contract structure accounts for required facility modifications and if the facility can still operate to maintain water management and environmental requirements.</p>	<p>The IESO appreciates this feedback and recognizes the barriers or limitations to becoming dispatchable that exist for many facilities and does not intend to penalize facilities that must maintain/consider public safety in their operations or adhere to Water Management Plans.</p> <p>Where there is interest from small hydroelectric participants at sites that have the potential to become dispatchable, the IESO is considering an approach to support, to a reasonable extent, the costs required to become dispatchable. The feasibility of a facility becoming dispatchable will be specific to the operating limitations of that facility and the compatibility with the IESO requirements for dispatchability.</p>
<p>Stakeholders do not think it is justified to describe facilities as offering "less value" if they are not dispatchable. Non-dispatchable facilities should not be penalized in the contract structure. Stakeholders suggest that hydroelectric facilities were designed to operate to maximize energy production, and can generally provide continuous generation. Hydro facilities should be considered as a baseload resource that do not need to be dispatchable.</p>	<p>Non-dispatchable facilities will not be penalized within the Small Hydro Program design.</p>

Feedback	IESO Response
<p>Stakeholders suggested that the current approach of using on peak and off peak rates to incent production during specific periods of the day is suitable. This encourages operators to determine feasible operating strategies that generally follow system needs without the complexity of following IESO dispatch instructions. The existing on-peak/off-peak times could be adjusted to better reflect current system needs as the existing fleet may be able to shift their daily production within the water management restrictions to better reflect system requirements over time.</p>	<p>The Small Hydro Program design encourages and rewards flexibility by enabling facilities to respond to system needs according to the capabilities of the facility. A facility that is flexible and shifts production to times when energy prices are higher will receive higher energy revenues.</p>

Tranching

Feedback	IESO Response
<p>Stakeholders suggested that fixed costs for smaller facilities are disproportionate compared to larger facilities and so tranching may have merit, especially for facilities less than 1 MW that may be on the cusp of feasibility.</p>	<p>The IESO appreciates this feedback and is considering including enhanced payments for facilities under 1MW. This design element will be reflected in the report back to the Minister.</p>
<p>Stakeholders thought tranching is a good concept that could have merit as it may offer ability to better fit contract payments to the size/capability of hydro facilities. Conversely other stakeholders expressed concern that tranching could add unnecessary complexity and provide no value if it attempts to achieve a granularity within the Small Hydro fleet that is irrelevant or insignificant (especially at a system level).</p> <p>Stakeholders suggested attributes that could be considered in developing tranches might include Dx/Tx connections, watershed location, location, hydrological conditions, similar water management control, market participant vs non-market participant, ownership type, head pond availability, ability for daily peaking, ability to provide ancillary services and dispatchability.</p>	<p>The IESO appreciates this feedback and is currently considering enhanced payment structures for facilities under 1MW, dispatchable facilities and specific ownership structures in the Small Hydro Program design. This will be reflected in the report back to the Minister.</p> <p>Variations in the payment structure, beyond those just listed, may be further considered during program development.</p> <p>Facilities with daily peaking abilities have the opportunity to shift production to times when energy prices are higher and will receive higher energy revenues, negating the need for a separate tranche for peaking facilities.</p>

Contract Length

Feedback

Stakeholders suggested that contract terms of 10 years would be prohibitive in securing financing as traditional lenders will be looking for longer terms that are more aligned with hydro asset investment cycles. Shorter contract lengths are inconsistent with the reality of long lifespan/perpetual assets like hydroelectric facilities and the capital investment required to support continued operation, introducing stranded investment risk. Reinvestment is required continuously, possibly on a lumpy basis given the longevity of components and dependent on where in the lifecycle each piece of equipment is. Without revenue certainty, investments (which may require 3 to 5 years of planning) may be postponed. A long forward period or long contract period will help with certainty so that major capital projects can be planned and funded. Several stakeholders suggested that revenue certainty is required for at least 15 to 20 years.

Similarly, stakeholders expressed concern that being "eligible" for a contract but not being able to enter into an agreement until near the end of their existing term exposes them to too much uncertainty / political risk that the program may change or be cancelled. Stakeholders recommend allowing facilities to sign on to a contract years before their existing contract expires. Additionally, stakeholders noted there is a risk of owners deferring major capital investments until the end of their existing term and then competing for limited resources to supply equipment and construct upgrades concurrently starting in 2030.

IESO Response

Based on this feedback, the IESO has evolved the design to incorporate an option for a contract that is longer than 10 years. Facilities can sign a 20-year contract upon program opening. All contracts will end 20 years from program opening, regardless of when a resource joins the Small Hydro Program.

The certainty provided by the fixed capacity payment and guaranteed energy revenues (via the floor mechanism), should alleviate challenges related to financial security and investment time horizons.

Feedback	IESO Response
<p>Stakeholders are concerned the IESO may over-procure and use "flexibility" to choose not to re-contract with existing small hydro resources at the end of the Small Hydro Program. "End of life" is not applicable to hydro facilities.</p>	<p>The IESO appreciates this feedback and will consider this as it continues to implement the requirements of the Resource Adequacy Framework. The Small Hydro Program will provide sustaining revenue under the assumption that these assets will be in operation beyond the end of the Small Hydro Program.</p>
<p>Stakeholders suggested that a Program Review should not be required as contracts issued in 2023 should be designed to anticipate future changes. Stakeholders commented that if a review occurs, it should not impact contracts that have already been put in place, because if terms are at risk, the uncertainty may reduce financing opportunities and/or cause facilities to postpone investment until terms are fixed. Additionally, stakeholders commented that the value of a review would be dependent on the number of facilities that had joined the program and there being sufficient opportunity to identify issues and concerns, collect data, gain experience operating under the Market Renewal Program, etc.</p>	<p>The IESO continues to assess the need, scope and timing for a formal program review after the implementation of the Market Renewal Program. The IESO agrees that contracts signed before a program review would not be subject to the results of the program review. The IESO agrees that any program review as a result of the implementation of the Market Renewal Program will require sufficient time to obtain necessary information and data against which a review would be assessed.</p>

Investment

Feedback	IESO Response
<p>Some stakeholders communicated that upgrade /expansion potential exists to increase capacity/efficiency, but would require investment and an amended connection agreement with Hydro One. Stakeholders noted that upgrades/expansions were previously supported through contracts and should be included in the program.</p>	<p>The ministerial directive states to "sustain" hydroelectric assets such that they can "continue operation". Upgrades that are achieved through small design efficiencies or equipment improvements realized during reasonable "replacement in kind" projects, as site maintenance demands, and supported through the existing payment structure, will be incorporated into the contract. The IESO recognizes that some sites may have the potential for expansions, and in the report back to the Minister, the IESO will highlight that there are opportunities for expansions.</p>

Feedback	IESO Response
<p>Stakeholders indicated that Indigenous and community ownership (or interest in ownership) exists for several sites/projects and could be supported through price "adders".</p>	<p>The IESO appreciates this feedback and intends to incorporate it into our report back to government.</p>
<p>Stakeholders indicated varying levels of interest and knowledge related to adding on-site batteries including: having already installed one in Ontario, developing a battery + hydro facility in another province, having considered it and identified barriers, participating in the current IESO Hybrid Integration engagement and being open to the idea pending the business case and feasibility.</p> <p>Beyond on-site battery storage, stakeholders suggested considerations for investment could include adding charging services for EV vehicles, the production of green hydrogen, integrating on-site wind or solar and tying indigenous participation to these initiatives.</p>	<p>Thank you for this feedback. At this time the IESO is not considering enabling the installation of on-site batteries through the Small Hydro Program design. Feasibility assessments and business cases are currently not mature enough to continue consideration.</p> <p>The IESO acknowledges there are opportunities for future consideration regarding the integration of clean technology at hydroelectric sites and the potential to incent further community and Indigenous participation. At this time the IESO is not considering site investments beyond asset sustainment, but feasibility and interest of projects could potentially be re-examined at the Program Review.</p>

Other

Feedback	IESO Response
<p>What are the "other procurement mechanisms" to which some small hydro facilities might transition to in the future?</p>	<p>As the IESO continues to evolve the Resource Adequacy Framework and the associated market mechanisms, small hydro facilities may be enabled to participate in mechanisms that are currently under development or may exist in the future. For example, small hydro facilities may consider participating in the Capacity Auction or a distributed energy resource (DER) model in the future.</p>

Feedback	IESO Response
<p>Stakeholder inquired as to if the IESO will be conducting a specific engagement with indigenous communities and if there will be specific procurement designs for indigenous owned facilities. Stakeholder inquiring as to how indigenous participation will be incented and if it will apply to facilitate that are currently owned by Indigenous communities or if it will also encourage participation in future projects. Stakeholder recommends increased rates for Indigenous owned facilities.</p>	<p>Under the Small Hydro Program design, Indigenous Communities have not been specifically engaged as the dialogue has centred around existing facilities that are eligible for the program (whoever the owners may be). The IESO is considering recognizing Indigenous ownership through an adder on the capacity payment. Currently the program scope does not include expansions. If the final design does include an Indigenous ownership adder, the IESO is proposing that increases in Indigenous ownership should result in a proportionate adder to their capacity payment.</p>
<p>Stakeholder suggested that there will be increasing demand for clean energy, such as hydro, and that facilities should receive some or all of any future revenue from clean energy credits.</p>	<p>The IESO will retain ownership of clean energy attributes for projects acquired through non-competitive programs.</p>
<p>Stakeholders recommended the IESO consider expanding eligibility into the program to small hydro facilities with contracts expiring after 2030 and to facilities that have never had contracts with the OPA/OEFC. Additionally, stakeholders encouraged the IESO to continue to the consideration of the treatment of facilities above 10MW in the design of the Small Hydro program.</p>	<p>In the report back to government, the IESO will highlight that the Small Hydro Program design could support expanded eligibility, in order to incorporate facilities with contracts expiring after 2030. These facilities could have the same opportunity to participate in the program as facilities that are currently eligible, meaning they could have the option of entering a contract ending 20 years after program opening. As the IESO needs to maintain system flexibility in the future, increasing eligibility would not necessarily mean increasing the duration of the program, which is proposed to end 20 years from opening.</p> <p>As per the Directive, the IESO will be providing an assessment of large hydro facilities (greater than 10MW) and intends to use the learnings and concepts developed through the Small Hydro Program as a basis, recognizing that the design may need to evolve to adapt to larger generators.</p>

Feedback	IESO Response
Stakeholder recommended engaging with the Lender Community regarding the program design to ensure facilities can receive financing.	The IESO appreciates this feedback and has taken it into consideration and will continue to keep in mind through program and contract development.
A stakeholder was concerned that the engagement process/timeline does not provide sufficient opportunity for dialogue.	The IESO has worked to provide an appropriate amount of dialogue with the eligible community in the development of the Small Hydro Program design, within the bounds of the timelines the Directive has provided. As the IESO moves into program and contract development, there will be more opportunities for engagement.
A stakeholder recommended the IESO use examples to demonstrate what the contract structure would look like.	Examples have been provided through the workshop materials (presented May 19, 2022).
The layout of this feedback form leaves the same space for both question and answer; if the goal is constructive feedback, this format should be biased towards making room for answers.	The feedback form provided for the workshop has been updated to reflect this feedback.
A stakeholder recommended the IESO hold education sessions on how the new structures will work and providing program specialists at the IESO to assist generators that may need support understanding the contract.	The IESO appreciates this feedback and will offer (a) session(s) on the program and contract details to support the transition.