



January 25, 2019

Rachel Anderson
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street
27th Floor
Toronto ON M4P 1E4

Dear Ms. Anderson

Re: Advisory Committee on Innovation: Report (EB-2018-0287)

The Power Workers' Union ("PWU") represents a large portion of the employees working in Ontario's electricity industry. Attached please find a list of PWU employers.

The PWU appreciates the opportunity to provide input on the Advisory Committee on Innovation Report (EB-2018-0287). The PWU is a strong supporter and advocate for the prudent and rational reform of Ontario's electricity sector and recognizes the importance of low-cost energy to the competitiveness of Ontario's economic sectors.

The PWU believes that innovation should deliver energy at the lowest reasonable cost while stimulating job creation and growing the province's gross domestic product (GDP). We are respectfully submitting our detailed recommendations.

We hope you will find the PWU's comments useful.

Yours very truly,

President

Encl.

cc: Paul Reece

CANADIAN UNION
OF PUBLIC EMPLOYEES,
LOCAL 1000, C.I.C.
244 EGLINTON AVE. E.
TORONTO, ONTARIO
M4P 1K2
TEL.: (416) 481-4491
FAX: (416) 481-7115

PRESIDENT
Mel Hyatt

VICE PRESIDENTS
Andrew Clunis
Jeff Parnell
Tom Chessell



List of PWU Employers

Alectra Utilities (formerly PowerStream)
Algoma Power
AMEC Nuclear Safety Solutions
Atlantic Power Corporation - Calstock Power Plant
Atlantic Power Corporation - Kapuskasing Power Plant
Atlantic Power Corporation - Nipigon Power Plant
BPC District Energy Investments Limited Partnership
Bracebridge Generation
Brighton Beach Power Limited
Brookfield Power Wind Operations
Brookfield Renewable Power - Mississagi Power Trust
Bruce Power Inc.
Canadian Nuclear Laboratories (AECL Chalk River)
Cogeco Peer 1
Collus Powerstream
Compass Group
Corporation of the County of Brant
Covanta Durham York Renewable Energy Ltd.
Entegrus
Enwave Windsor
Erth Power Corporation (formerly Erie Thames Powerlines)
Erth Corporation
Ethos Energy Inc.
Great Lakes Power (Generation)
Grimsby Power Incorporated
Halton Hills Hydro Inc.
Hydro One Inc.
Hydro One CSO (formerly Vertex)
Hydro One Sault Ste. Marie (formerly Great Lakes Power Transmission)
Independent Electricity System Operator
Inergi LP
InnPower (Innisfil Hydro Distribution Systems Limited)
J-MAR Line Maintenance Inc.
Kenora Hydro Electric Corporation Ltd.
Kinectrics Inc.
Kitchener-Wilmot Hydro Inc.
Lake Superior Power Inc. (A Brookfield Company)
Lakeland Power Distribution
London Hydro Corporation
Milton Hydro Distribution Inc.
New Horizon System Solutions
Newmarket Tey/Midland Hydro Ltd.
Nuclear Waste Management Organization
Ontario Power Generation Inc.
Orangeville Hydro Limited
Portlands Energy Centre
PUC Services
Quality Tree Service
Rogers Communications (Kincardine Cable TV Ltd.)
Sioux Lookout Hydro Inc.
SouthWestern Energy

Tillsonburg Hydro Inc.
The Electrical Safety Authority
Toronto Hydro
TransAlta Generation Partnership O.H.S.C.
Westario Power
Whitby Hydro Energy Services Corporation

PWU Submission on the Advisory Panel on Innovation's (ACI) Report to the Ontario Energy Board (OEB)
– Ref EB-2018-0287

January 25, 2019

The Power Workers' Union (PWU) is pleased to submit comments and make recommendations regarding the Advisory Panel on Innovation's (ACI) Report to the Ontario Energy Board (OEB). The PWU is a strong supporter and advocate for the prudent and rational reform of Ontario's electricity sector and recognizes the importance of low-cost energy to the competitiveness of Ontario's economic sectors.

The PWU believes that innovation should deliver energy at the lowest reasonable cost while stimulating job creation and growing the province's gross domestic product (GDP). Regulatory policies and plans should leverage the investments Ontarians have already made in the province's low carbon energy advantages and avoid unduly burdening ratepayers and taxpayers with high cost technology that is not yet ready for mass market deployment.

The ACI admits that the report was created primarily from the perspective of electricity distributors and has positioned the findings as the start of a conversation. The OEB has invited all energy stakeholders to provide feedback on the report as well as input to some additional questions:

- What actions should be the highest priority for the OEB?
- What interdependencies should be considered for planning and sequencing the OEB's next steps regarding further policy development and consultations?
- Any gaps or complementary areas of inquiry that need to be considered?

We endorse the OEB's initiative to enable innovation and respectfully propose nine supporting recommendations. One of the highest priority recommendations is the need for a transparent "low cost" criterion for integrating innovation into the regulated rate base. The PWU would support broader stakeholder consultations around the gaps in the ACI Report and regarding key interdependencies with and among Ontario's other policy initiatives such as the Open for Business Strategy, Environmental Plan and Forestry Plan. The remaining eight recommendations explore gaps and complementary areas across the four themes of the ACI report.

Cost Focused Innovation

The PWU believes that the primary goal of policies that support the development of new innovations should be lower cost energy for all Ontarians. This is a major omission in the ACI Report.

1) Recommendation: The OEB should make it a priority to ensure that innovation leads to reduced electricity rates at a total bill level for all impacted stakeholders.

Fundamentally, low cost energy is an enabler for innovation in the broader economy and achieving new and better solutions at lower costs is a fundamental and common driving principle for innovation across all sectors. For the electricity sector, the measure should be total rate payer cost reduction.¹

While the ACI Report uses the term "cost effective" – this term does not mean the same as "lower cost". For example, Ontario's Industrial Conservation Initiative (ICI), may lead to cost effective innovations for

¹ Benefits to ratepayers should be assessed on the realizable cost savings across the total electricity system-based on a reasonable time frame that is relevant to the initiatives proposed.

certain customers. However, the ICI related innovations have not materially reduced overall system costs but instead passed on an increased cost burden to other rate payers.²

Similarly, the roll out of non-dispatchable renewables in Ontario provides another example. Accommodating the inherent intermittency associated with the renewable wind and solar generation added many other costs to the system. Currently, various forms of energy storage are being developed to address this intermittency.³

However, recent studies indicated that using storage to address renewables intermittency, especially utilizing battery technology, is a high cost option for Ontario.⁴ To date, the most cost-effective solution in Ontario is to simply curtail the renewables output. Ontario's IESO curtails 19-26% of grid connected renewables output.⁵ A simple total cost test prior to rolling out the renewables could have yielded significant cost avoidance for rate payers.

As contracts for the gas-fired generation and renewables expire over the next decade, the OEB could play a role in ensuring low cost innovations are considered in the asset replacement options and in providing transparent oversight with respect to the impact on and composition of the Global Adjustment (GA).

ACI Theme #1 - Provide a Transparent and Level Playing Field

The PWU supports the notion of incentives for new beneficial innovations and in providing regulatory certainty for local distribution companies (LDCs) and other regulated entities to ensure cost recovery for the innovation investments made. The PWU concurs with the ACI Report's finding that guidelines are necessary to provide clarity between regulated and unregulated businesses with respect to such investments.

2) *Recommendation: The affiliate code⁶ should be revisited in light of emerging innovations to provide a clear distinction between what constitutes eligible rate base innovations and those which are best treated as unregulated commercial services.*

The purpose of the regulated rate base is to provide the universal good of low-cost reliable electricity. The regulated rate base consists primarily of Ontario's distinct energy advantages: nuclear and hydroelectric generation; the bulk electricity system's distribution and transmission assets; and the IESO's management of bulk system. The OEB has jurisdiction over all of these assets and the purview to ensure all are working cost-effectively together to help keep rates down. As such, any innovations that sustain electricity quality and reliability and its delivery at a lower cost should be rate base items for the cost recovery. The reference basis should be the costs of assets in place in 2013, since much of the new generation since then has only added cost to the system with little value as demand has been stagnant.

The affiliate code is the mechanism by which such definitions are currently managed for distribution and transmission companies. However, the total cost of electricity impacting rate payer bills also includes the

² OEB Market Surveillance Panel, "The Industrial Conservation Initiative", 2018

³ IESO, "IESO Report: Energy Storage", 2016

⁴ Strategic Policy Economics, "Renewables-Based Distributed Energy Resources in Ontario", 2018, Brattle Group, "The Future of Ontario's Electricity Markets", 2018

⁵ IESO, Year-End Data, 2018

⁶ OEB, "Affiliate Relationships Code for Electricity Distributors and Transmitters", 2010

commercially contracted nuclear, renewables and gas-fired generation that contribute to the GA. When presented with innovative concepts, the OEB should also consider the implications for these assets and the GA.

With respect to the rate base, the fundamental obligation of this “public good” is to cost effectively provide energy to supply the demand. Future demand is expected in different forms, for example, electrification of public transit, EV charging, mining in the “Ring of Fire”. It is clear that these loads must be served and impacts on the overall rate base clearly understood and optimized through planning. Innovations that reduce the cost of this obligation should be candidates for rate basing, including the adaptation of LDC remuneration models, as suggested in ACI’s Report.

However, clarity is required to help determine whether an innovation should be rate-based – specifically with respect to the purpose of the innovation and how it is adding value to the system. If it is to be rate based as a “common good”, it is important to demonstrate how the innovation will lower rates. Additionally, if the innovation is required by the system it must be demonstrated to be the most cost effective for the “total system”, including consideration of stranded costs. In contrast, innovations involving new small-scale generation sources requesting connection to the grid that are not responding to a rate-base need, such as DER, should be viewed on a commercial basis.

3) *Recommendation: Commercially driven innovations should be accountable for the full cost imposed on the electricity system beyond just the physical integration connection costs.*

The ACI states that their recommendations apply mostly to DER and states that a DER system should be charged their appropriate share of system costs. In order to enable an assessment of the cost implications, the PWU supports the ACI’s call for transparency and consistency for the enablement of such innovative solutions to be connected to the grid, and clear rules for DER integration. This should include clear rules regarding technical matters, e.g. system reliability requirements that must be complied with to minimize costs to the bulk system.

Additionally, the requirements being met by the innovation should be clearly identified, the rationale for solving that problem established, and the connection of such assets to the bulk system is reviewed for total system cost impact as described above. The integration of such commercial service opportunities should not impose costs on rate payers.

While the 2017 Long Term Energy Plan relies significantly on the future adoption of DER to meet Ontario’s future energy needs, studies show that DER is likely to remain a high cost approach and should not be eligible for cost recovery from the regulated rate base. Based on the full cost, prospective customers for these new services can decide if they wish to pay the fully loaded costs associated with these services.

Any proposed innovations should have their total system cost implications compared with alternatives. The underlying need should be assessed to determine whether that need could be eliminated instead. For example, net metering was introduced to help make use of roof top solar power. However, the real value of that power is marginal and limited to displacing gas-fired generation. It offers no savings to the Dx/Tx components of the bulk system as the solar output does not coincide with the system peaks that drive the design and cost of the bulk system assets. But significant costs have been added to the system to accommodate the unneeded generation, such as the capabilities added to allow for the curtailment of the baseload nuclear and hydroelectric output. As mentioned earlier, it is less expensive for the system to curtail the surplus solar energy rather than use it.

The PWU supports business model innovations that enable commercially-viable propositions that help attract early adopters (e.g. EVs) where they do not burden ratepayers or taxpayers. The development of such innovations is unlikely to qualify for the rate base due to their purpose and/or targeting of early adopters for new services. These innovations should be classified as commercial business and funded with commercial financial resources. This protect captive rate payers from the risks of innovations that do not pan out.

ACI Theme #2 - Remove Disincentives to Innovative Solutions

Artificial or unreasonable disincentives that inhibit innovation are not in the interests of rate payers. Distinguishing these from legitimate or natural disincentives is the challenge. Natural disincentives abound in the commercial world that deter investments in uneconomic ventures. The PWU offers two frameworks that should facilitate support for innovations for the rate base. Commercial innovations should remain subject to commercial market and competitive forces such as finding a customer willing to pay the cost of a new innovation.

4) *Recommendation: Eligible Innovations to be included within the rate base should be subject to transparent business case tests.*

The PWU concurs with the ACI's conclusion that the OEB should ensure that business cases underpin the OEB's review and approval of such innovations and that a transparent, clear and empirical evaluation methodology and criteria be established that supports the development of robust business cases. Criteria should include the provision of: clear system requirements including demand; alternatives identification and costing; full total system costs, including stranded assets; and the expected economic benefits (jobs, GDP, trade balance). A consultative process should be used to establish the criteria that must be included in the business cases.

Decisions for accommodating new innovations within the rate base should be strategic and ensure payback to both ratepayers (e.g. total system cost) and taxpayers (economic benefits). As well, the supporting business case should demonstrate how the total consumer rate for both Class A and Class B rates will be lowered. Defining the system need should reflect both provincial and relevant integrated regional planning demand forecasts. The full system cost analysis should include full consideration of the impacts on all regulated utilities such as Dx, Tx, Generation, IESO costs and the full GA, including stranded asset costs.

Stranded costs are an important consideration if these costs are to remain recoverable within the rate base. Innovations that would displace existing assets, may be more beneficial if introduced closer to the expiration of the contracts for these assets. For example, distributed resources that would peak shave natural gas-fired generation provide better economic value when there is a viable decision to close the gas plant. If not, the cost of the gas fleet remains and there is no cost-benefit from that peak shaving innovation. Fortunately, Ontario will see its renewables and gas-fired assets come up for contract renewal over the next 15 years representing 30% of Ontario's generation capacity. This potential asset turnover could provide many future innovation opportunities going forward.

Investments in Ontario's energy system, have direct economic impacts not only on energy ratepayers but also taxpayers through job creation, GDP, and the province's trade balance. Nuclear generation is well-

known to be low cost⁷ but also a significant driver of economic benefits.⁸ A recent Strapolec analysis shows that pairing baseload nuclear generation with distributed storage to manage behind the meter demand is a far less costly solution than renewables-based DER.⁹ Given these impacts, the OEB should transparently compare and assess the benefits of such innovations, such as DER versus other alternatives.

For example, there are other integrated energy and environmental solutions that can lead to lower rate payer costs and generate significant economic benefits as well. New nuclear has been shown to be the least costly and most economically beneficial option for electrification by switching out fossil fuel use and facilitating achievement of Ontario's emission reduction targets.¹⁰ Many of the benefits are related to the integration of nuclear, hydrogen production, and innovations in the gas distribution system such as blending hydrogen in the natural gas stream (power-to-gas).

Investments in Ontario's emerging bio-economy provides another integrated opportunity. According to a 2018 Nordic Council of Ministers report, the Nordic Region is shifting from a fossil-based economy to a bio-based economy.¹¹ Today, this already represents about 10% of the total Nordic economy and includes developments in forestry, agriculture, fisheries, aquaculture and bioenergy. China, Japan and other Asian countries are quickly catching up. In turn, a robust global biomass trading system has been established.

Ontario's vast, renewable forestry and agricultural biomass resources can be better leveraged to produce more innovation, good paying jobs in forestry, agriculture, transportation and renewable, low-carbon energy—heat, electricity and biofuels. For example, the bio-economies of Sweden and Denmark are integrating: forestry; pulp and paper; wood products; combined heat and power networks fueled by renewable biomass; recycled waste and “black” bag garbage; bio-refineries producing fuels and high value chemicals; and transportation infrastructure. Both countries have created tens of thousands of jobs and billions in economic wealth, reduced fossil fuel imports, and lowered their GHG emissions.

Making similar strategic investments in Ontario's northern-based biomass resources could achieve the same. Converting Ontario's Thunder Bay Generating Station to a biomass combined heat and power plant represents one immediate opportunity. These kinds of investments represent cost effective electricity solutions that do not burden rate payers while creating jobs and reducing emissions and forest fire risk through better management of Ontario's forests.¹²

The OEB rate hearing process is the regulatory check that protects ratepayers from commercially risky investments. Business cases should be subject to regulatory review before innovations are considered for funding within the rate base.

The opportunities to utilize Ontario's current, short-term electricity surplus should be considered when defining total system cost implications and the economic benefits. These opportunities include: electrification of public transit; private and public adoption of electric vehicles; hybrid residential home heating; and the commercial production of hydrogen. These innovations become competitive when the cost of electricity is low and beneficial when the economic impacts are higher than the alternatives.

⁷ FAO, “Nuclear Refurbishment”, 2017

⁸ Conference Board of Canada, “Refurbishment of the Darlington Nuclear Generating Station”, 2015

⁹ Strategic Policy Economics, “Renewables-Based Distributed Energy Resources in Ontario”, 2018

¹⁰ Strategic Policy Economic, “Ontario's Emissions and the Long-Term Energy Plan”, 2016

¹¹ Nordic Council of Ministers, The Rapidly Developing Nordic Bio-economy, 2018

¹² Pembina Institute, “Biomass Sustainability Analysis”, 2011

5) *Recommendation: LDCs should have access to a discretionary R&D budget aimed at innovations that lower costs to the rate base, subject to transparent oversight.*

The PWU supports the ACI's conclusion that improved or more timely regulatory processes could be beneficial. Innovation could be accelerated by providing a discretionary budget for regulated entities' investments in innovations. We also concur that such an R&D provision be subjected to an appropriate level of oversight. The portfolio of R&D projects and the spending of this budget should be periodically reviewed and publicly reported. This will ensure that all projects so funded are motivated to reduce the regulated rates from a total system cost perspective. The R&D objectives should be transparently reviewed to surface the expected cost/benefit for ratepayers and taxpayers. The funded discretionary R&D portfolio should be limited to exploratory R&D and small-scale proof of concept pilots that are needed to inform the requisite business cases and establish the basis for the regulatory decisions regarding rate base funding.

ACI Theme #3 - Encouraging Market-based Solutions & Customer Choice

The regulated rate base is by definition not a market based or commercial system. Customer choice is the domain of commercial service providers. The combination of market forces and customer choice rarely leads to low cost. Catering to customer choice is always a premium service due to economies of scale. This was the philosophy behind Henry Ford of the Ford Motor Company once stating, "Any customer can have a car painted any color that he wants, as long as it is black."

6) *Recommendation: Dx system, operational and demand data be made available in a transparent manner to enable innovators access to the information.*

Access to information, data, and user needs leads to insight, concept generation and innovation development. Transparency is about letting innovators know what the needs and requirements are. The IESO provides such data for the bulk system components it manages. Transparency of information should be required of LDCs and the cost of making it available should be covered by the rate base with some provision for some elements of a user pay model.

7) *Recommendation: The role of the OEB should not be "encouraging" market-based solutions and customer choice.*

There is no clear need for the OEB to perform such a role.

Firstly, aside from competitive procurement processes, which are a recognized good practice, it is not clear that LDC level "market-based solutions" as represented by the IESO administered markets, are a necessity for the regulated rate base.

The PWU believes that most of the innovations envisioned for the future electricity systems, such as DER, are fixed cost in nature. It is unlikely that investments in these technologies will be made on the vagaries of a real time competitive market. It is well recognized that zero-variable cost assets are causing market failure in Ontario as well as many U.S. and international jurisdictions.¹³ There is no natural or real price

¹³ General Electric: 'Electricity Pricing Reforms Are Coming- It's Just a Matter of When and How', By Richard Stuebi; Frayed Wires: As California enters a brave new energy, can it keep the lights on? By Julie Cart, January 16th, 2019; Prognosis negative: How California is dealing with below-zero power market prices. By Herman K. Trabish, May 11th, 2017;

signal that will enable a viable market for these services. The possible exception could involve innovations that proliferate variable cost, gas-fired microturbines, which would commit Ontario's energy supply to long-term, carbon-emitting fossil fuel imports. As a result, any need for complex market structures to be funded by the rate base would have to be clearly established under the business case criteria described earlier.

Market structure innovations may be more suited to a commercial service than the regulated rate base. As a subset of the IESO administered market, it is by definition a commercial market mechanism. Under a commercial model, niche buyers may wish to purchase premium branded services. However, the rationale for real time market exchange appears weak. This innovation should be reviewed under the recommended affiliate code clarification process.

Secondly, the OEB "encouragement" role should be limited to the elimination of barriers based on an updated affiliate code that separates regulated rate base from commercial services. The need for the OEB to "encourage" customer choice through the funding of the public good of the regulated rate base is not evident.

The public good is defined as affordable, reliable energy, a subject to be further detailed in the aforementioned update of the affiliate code. Customer choices, above the base service level can be viewed as "commercial", which would be subject to full costing and be paid for by the customers that seek the choice. Such items should not be considered eligible for the rate base until appropriate business cases are made as previously noted.

8) *Recommendation: Advances in monitoring and control should be explored where they are likely to be beneficial in providing low cost reliable energy.*

This recommendation is specific to managing demand behind the meter, not the two-way market-based model for DER which is addressed by recommendation (8) above. This distinction is important. Managing behind the meter demand can have the effect of smoothing the demand on the distribution system and by extension the demand on grid connected generation supplies. This innovation could increase the utilization of these core rate base assets. Being able to supply greater demand with the same asset reduces the unit cost to ratepayers.

A good example is the implementation of controllers that optimize the charging of electric vehicles (EVs). The system has an obligation to supply the electricity demanded by its connected ratepayers. Too many EVs on the same circuit can overload the existing capacity, requiring an upgrade. Smoothing EV charging over the low demand night time hours allows the distribution system to avoid capacity additions and also reduces the short-term surplus baseload conditions that Ontario has been experiencing. Both are clear cost benefits to rate payers. DER in the form of storage located at the end of distribution circuits and that could perform similar functions in a cost-effective way should be considered in the process. The recommended business case process should establish what is in the best interest of ratepayers.

ACI Theme #4 - Embrace Simplified Regulation

The PWU supports the ACI's conclusion to simplify regulation.

9) *Recommendation: Simplifying regulation provided it remains focused on total system rate payer cost benefits and applies to all of Ontario's energy resources such as nuclear, hydropower and biomass.*

It is important that the result of a regulatory simplification retains the ability to transparently provide sufficient oversight to protect ratepayers from adverse risks typical of the early stage innovation lifecycle.

The PWU has a successful track record of working with others in collaborative partnerships. We look forward to continuing to cooperatively work with the OEB and other energy stakeholders to advance innovation across Ontario's entire electricity system. The PWU is committed to the following principles for building Ontario's energy advantages: Create opportunities for sustainable, high-pay, high-skill jobs; Ensure reliable, affordable electricity; build economic growth for Ontario's communities; and, Promote intelligent reform of Ontario's energy policy.

We believe these recommendations are consistent with, and supportive of the objectives for enhancing innovation in Ontario's electricity sector. The PWU is willing to discuss these comments in greater detail at the OEB's convenience.