Power Workers' Union (PWU) Submission on 2023 Budget Investment Tax Credits

to the Department of Finance Canada, September 8, 2023

The Government of Canada launched a series of consultations with Canadians on measures to grow the clean economy. On June 6, the government requested feedback with no prescribed date on several *budget provisions* including the following Investment Tax Credits (ITCs) of interest to the PWU:

- Clean Electricity (CE) ITC and Clean Technology Manufacturing (CTM) ITC;
- Clean Hydrogen (CH) ITC, announced in the 2022 Fall Economic Statement;
- Clean Technology (CT) ITC, introduced in the 2022 Fall Economic Statement;
- Budget 2023 enhancements to ITC for Carbon Capture, Utilization, and Storage (CCUS); and
- Perspectives on labour and domestic content requirements.

On August 4 the Government requested feedback by September 8 on *draft legislative proposals* related to Measures to Grow Canada's Clean Economy including the following of interest to the PWU: CT ITC; CCUS ITC; and Labour Requirements Related to Certain ITCs.

However, all of these ITC and tax matters are intertwined with the *Powering Canada Forward Report* and the draft Clean Electricity Regulation and have varying implications on Canada's economy and emission reduction objectives. All of these initiatives are focused on securing affordable, clean energy to support Canada's energy transition to a Net Zero electricity grid in the short run (by 2035) and to a Net Zero economy by 2050.[1]

Previously, the PWU has made submissions to Finance Canada on the Clean Technology (CT) ITC introduced by the Fall Economic Statement.[2] The recommendations provided remain pertinent today and included:

- The nation's regional diversity and range of available clean energy options should be recognized including the important role for large and small nuclear reactors across the country;
- Clean energy policies should ensure a low-cost energy infrastructure that sustains Canada's economic competitiveness;
- Financial incentives should create a level playing field for all emission reducing technologies and should ensure cost-effective emission reductions;
- Clean energy investments should enable the maximum growth in jobs and GDP;
- The net lifetime economic benefits of clean energy financial supports should be optimized; and,
- Financial supports should incent the most sustainable and timely pathway to achieving NZ by 2050 and help achieve the objectives of the Clean Electricity Regulation (CER).

The PWU was pleased to see that the 2023 Budget included substantive provisions supportive of investment in nuclear technologies and the prioritization of economic growth and well-paying jobs. The PWU supports: the terms of the CTM ITC and the degree to which it mirrors similar provisions in the U.S. Inflation Reduction Act (IRA); and, the labour provisions in the draft legislative proposals. However, the

[1] Government of Canada, A Made in Canada Plan, Affordable Energy, Good Jobs, and a Growing Clean Economy, March 2023, pages 76 and 78.

[2] PWU submission to Department of Finance Canada on Fall Economic Statement Clean Tech Investment Tax Credit, January 2023.

ITCs still do not represent a level and balanced package of incentives necessary for achieving the objectives of the pending Clean Electricity Regulation.

The PWU provides the following recommendations:

1) The objectives of the electricity related ITCs should be aligned with "*achievable"* goals in the *Powering Canada Forward Report* and the development of the Clean Electricity Regulation (CER);
2) The implementation terms and eligibility dates for the CE ITC should reflect the same principles applied to the CCUS ITC;
3) The CE and CT ITCs should be harmonized with respect to eligible electricity generation technologies to ensure equivalent tax and rate payer benefits for the costs of reducing emissions and support achieving affordability;
4) The CE and CT ITCs should be harmonized to maximize the net economic benefits, including domestic content requirements similar to those provided by the U.S. IRA; and,
5) The "*competent authority*" required by the ITC to commit that the use of federal funding will lower electricity bills and achieve net-zero electricity in that jurisdiction should use validated total system cost and emission assessment methodologies approved for that purpose.

Recommendation #1 - The objectives of the electricity related ITCs should be aligned with "*achievable"* goals in the *Powering Canada Forward Report* and the development of the Clean Electricity Regulation (CER).

The Government's 2023 Budget provisions for ITCs: provide policies similar to those in the U.S. IRA; and, promote securing affordable clean energy supportive of Canada's energy transition to a Net Zero electricity grid by 2035. The latter is in conjunction with the draft CER currently out for stakeholder consultation. The 2023 Budget highlights the need to accelerate the development of clean electricity supplies to develop approximately 50% greater electricity system capacity by 2035.[3]

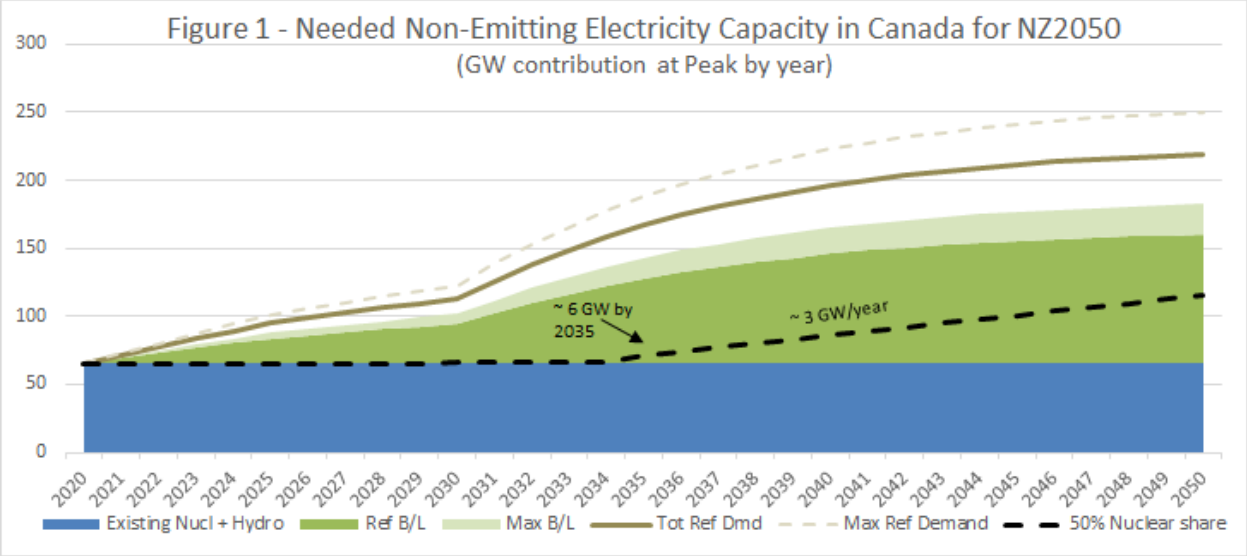
Under the proposed CE ITC, the incentives will not be available after 2034. While the CT ITC requires the assets to be operational by 2034, in the CE ITC it is not a specific requirement. Instead, the CE ITC states that a "competent authority" must provide a commitment that the federal ITC funding will help achieve a net zero electricity sector by 2035. With the CE ITC contingent on supporting NZ 2035 goals, there may be limited practical benefit of the ITC to any nuclear or hydro electric development. The current proposed CE ITC will not incent the accelerated investment in the large-scale electricity infrastructure that Canada needs. Furthermore, the challenges for the scale of new supply development are exacerbated by the concurrent replacement of existing fossil assets as is intended by the draft CER.

This substantial challenge for developing new non-emitting electricity capacity is illustrated in Figure 1.[4] The pace of development required to meet growing electricity demand and displace existing assets is significant. The magnitude of the required development is highlighted by the dotted line showing a nuclear development pathway capable of supplying half of Canada's needs by 2050. This would require

[3] Interpreted from 2023 budget, page 77, Chart 3.4

[4] Strategic Policy Economics analysis for the Canadian Nuclear Association April 2023 Workshop. Annual profile of demand for new non-emitting supply derived from emissions reduction profile contained in Navius Research, Achieving Net Zero Emissions by 2050 in Canada, 2021. Capacity needs for 2035 and 2050 are lowest among the reports assessed. Source :PWU submission to Department of Finance Canada on Fall Economic Statement Clean Tech Investment Tax Credit, January 2023.

operationalizing 3 GW/year of new capacity in every year from 2034 to 2050. This may be an aggressive ambition for the nuclear sector to meet. Under that scenario, other technologies would be required to address not only the remaining 50% of baseload demand but also the needs for intermittent supply as it emerges, including the lead up to 2035. The scale is daunting regardless of the type of generation being considered.



Several provinces have indicated that the CER goal of a net zero electricity grid by 2035 is not achievable for the above noted reasons. It is not achievable in an affordable way because the lower cost large-scale generation facilities such as nuclear and hydro take longer to site and develop.[5] Even in Ontario, where policy signals for 4800 MW of large scale nuclear for the Bruce Power site, 1200 MW of small modular capacity at Darlington and the refurbishment of the Pickering Nuclear Station, it is virtually impossible to complete these projects by 2034. It will also be challenging to operationalize the first units at the Bruce and the Pickering Station refurbishment by this date. As a result, achieving the 6 GW by 2035 as illustrated in Figure 1 may be optimistic, highlighting the urgency to accelerate the planning for the next forecast 3 GW requirement. This pace of development will only be undertaken if the "*clear and predictable foundation supports*" the government seeks with the ITCs are available for the full life of investments in clean electricity that the federal government is aiming to incent.

The timeline challenge for the significant investments required for new hydro and transmission is no less daunting. The notion that a net zero grid by 2035 can be achieved only through non-hydro renewables is a myth propagated by poor electricity system modelling (see recommendation #5).

The PWU's submission to NRCan on Electricity Gird modernization recommended that the Government clearly identify the competing timelines between electrification of the economy and building the electricity system infrastructure required to meet it.[6] As the *Powering Ontario Forward Report* states: *"As more and more Canadians plug in electric vehicles and ride electrified public transit, and as more and more homeowners switch to electric heat pumps, the clean power they need must be there for them—*

[5] Cost analyses were included in the PWU's earlier submission to Finance Canada on the FES ITCs.
[6] PWU Submission to NRCan on Electricity Grid Modernization, March 23, 2023.

when they need it, and where they need it. And we must be able to do the same for companies looking to grow and decarbonize their warehouses, offices, factories, and work sites…."

Since the CER consultation is ongoing until November 2023[7] and that more achievable dates for the CER's 2035 objectives may develop as a result, it may be more prudent for the ITCs' language to refer to the CER and not explicitly define 2034 as the final eligibility date. Additionally, to properly incent investment in accelerating the large-scale, long-development new nuclear, hydro and transmission bulk electricity system infrastructure Canada needs, CE ITC should establish that any projects whose development begins by 2034 are eligible, even if their operational dates are much later.

An unachievable arbitrarily selected 2035 date should not be the criteria. CE ITC eligibility should be applied to technologies supporting the achievement of net zero grid as soon as possible. The rationale is clear – a new nuclear or hydroelectric facility that becomes operational in 2038, would still be contributing to a net zero grid at that time and the project decision taken 10 years earlier would reflect that commitment.

Recommendation #2 - The implementation terms and eligibility dates for the CE ITC should reflect the same principles applied to the CCUS ITC;

The PWU's previous ITC submission recommended that Government financial supports should recognize nuclear, hydroelectric and transmission investments as large-scale, multi-year developments comparable to the challenges confronting CCUS technology projects. New nuclear generation should receive the same financial incentives.

Specifically, the CCUS ITC introduced in the 2022 Budget recognizes the capital intensity and long duration times for CCUS projects. Equivalent terms should be reflected in the CE ITC, specifically:

- Clear focus on Canada's longer-term NZ by 2050 objectives;
- Include eligibility for projects that have 2040 in service dates; and,
- Provide for annual tax credits for expenses incurred in a year versus when the project comes into service.

All of these terms materially impact the security investors need to finance these projects.

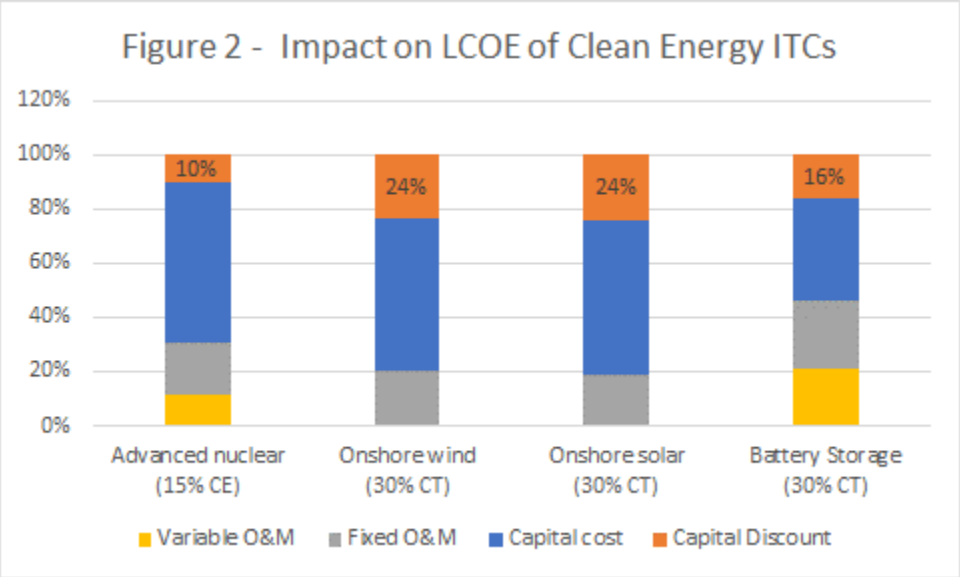
Recommendation #3 - The CE and CT ITCs should be harmonized with respect to eligible electricity generation technologies to ensure equivalent tax and rate payer benefits for the costs of reducing emissions and support achieving affordability.

Other low-carbon technologies such as wind, solar, small hydro and electricity storage are eligible under both the CE ITC and the CT ITC. However, there is an absence of clarity with respect to how these two incentives overlap. The CT ITC offers a 30% tax credit while the CE ITC only offers a 15% tax credit. While it is evident that these two incentives are not stackable, it is not clear as to why a taxable Canadian corporation would pursue the CE ITC when the CT ITC offers double the credit. As such, the 30% offered

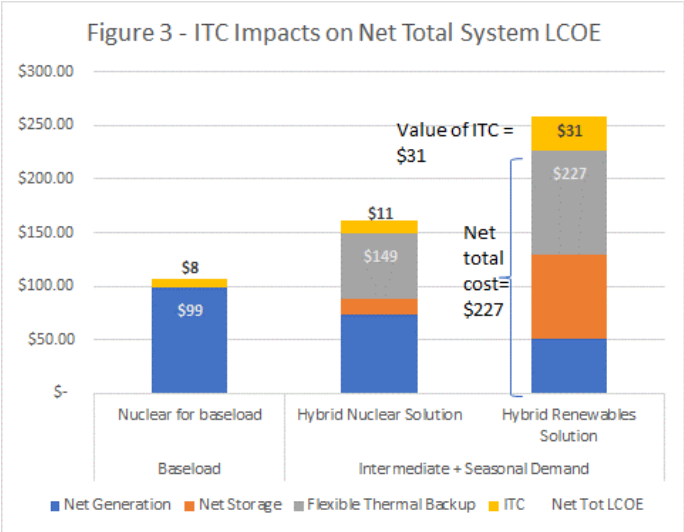
[7] https://www.gazette.gc.ca/rp-pr/p1/2023/2023-08-19/html/reg1-eng.html

by the CT ITC provides an additional material subsidy to technology adoption by taxable corporations that is far greater than that available for large nuclear, hydro and transmission assets of Canada's public utilities.

As the PWU previously recommended, ITCs should create a level playing field for all clean technologies without bias that can result in uneconomic decisions. The disparity created by the differences in the ITCs can materially impact the costs to rate payers (who pay the net cost of electricity) and taxpayers (who fund the ITCs). Rate payers pay the net levelized cost of electricity (LCOE) after the subsidy. For example, as illustrated in Figure 2, the lower cost to taxpayers of the 15% CE ITC may only save ratepayers 10% of nuclear generation costs, while the 30% CT ITC will reduce the cost of renewables by 24%.[8]



The PWU's previous submission presented an analysis of the total system cost of various generation options which indicated that nuclear generation offered the best economic choice. The cost impact of the ITCs may encourage developers to choose uneconomic projects for ratepayers and taxpayers. Achieving a NZ grid requires a supply mix that is capable of meeting the forecast demand for electricity, both baseload and variable. Baseload demand exists 24x7, 365 days/year while variable demand fluctuates up and down depending upon the time of the day and/or season of the year. The impact of the ITCs on the LCOE of the *net total system cost* is illustrated in Figure 3. It shows that a renewables-based solution would benefit from a $31/MWh taxpayer subsidy, but the net



[8] LCOE components obtained from the IEA 2022 Annual Energy Outlook.

cost to ratepayers would be 125% more costly than a nuclear baseload solution and 50% more costly than a nuclear based solution for intermediate demand.[9]

While large subsidies for renewables appear to lower the cost of generation when they are operating, it does not address the integrated costs of the system required to meet demand. In building a net zero grid, the impacts of variable demand fluctuations increase the complexity of the supply mix by requiring storage and flexible generation. To compensate for their intermittency, renewables need even more backup from storage, other available generation and grid integration. The cost of a renewables-based system, even with a substantial taxpayer funded ITC subsidy remains an uneconomic choice for achieving a NZ grid.

The ITCs should not incent the development of uneconomic resources but should instead create a level playing field and focus on reducing the LCOEs for all forms of non-emitting electricity generation by a similar percentage.

Recommendation #4 - The CE and CT ITCs should be harmonized to maximize the net economic benefits, including domestic content requirements similar to those provided by the U.S. IRA.

A transparent and robust cost benefit analysis of the investments being considered provides the best way to determine the net impact on taxpayers. The PWU's previous submission showed that for an equivalent ITC of 30%, the economic benefits from a nuclear baseload investment would generate sufficient tax revenue for government to effectively payback 95% of the cost of the ITC after 20 years. For a renewables-based system investment the payback would be only 50%.

For the nuclear scenario, an ITC of only 15%, as per the proposed CE ITC, would provide a payback to taxpayers exceeding the cost of the ITC by almost a factor of two. For taxpayers, the CT ITC pays back only half of the cost while the CE ITC for nuclear returns to taxpayers twice what it cost. This is not a level playing field in benefits for taxpayers.

One major factor impacting the significant difference in the comparison of the economic benefits is the domestic content associated with the investments. Nuclear generation in Canada has a very high domestic content ranging between 80% and 90%. This provides a significant payback for the ITC costs. Renewable technologies are primarily manufactured outside of Canada.

The U.S. IRA provides an additional ITC of 10% for future investments that by 2025 have at least 55% of the product components ***manufactured*** in the U.S.. Matching the domestic content requirements should be an important Canadian response to create and sustain a competitive manufacturing sector here. In response to the question posed by Finance Canada on this topic, the PWU recommends Canada should adopt the U.S. IRA provisions regarding the domestic content.

[9] Strategic Policy Economics analyses from Electrification Pathways for Ontario, 2021, adjusted to reflect nuclear and renewables cost assumptions used for the IESO Pathways to Decarbonization Study (P2D), 2022.

Recommendation #5 - The "*competent authority*" required by the ITC to commit that the use of federal funding will lower electricity bills and achieve net-zero electricity in that jurisdiction should use validated total system cost and emission assessment methodologies approved for that purpose.

As noted in Recommendation #3, the decision criteria of paramount importance should be the net impact on total system costs. The PWU's previous submission described the modelling challenges that can misinform policy makers about the viability and costs of some renewables-based options.[10] These modeling challenges have been discussed in many academic journals with the general conclusion that the benefits and viability of using renewables to supply a net zero grid are overstated.[11]

In a recent NRCan Hydrogen Progress Report, the modeling consultants provided a disclaimer stating that the fidelity of their models does not provide the fidelity required to measure and predict the impacts on daily variability of demand or intermittent renewables supply, impacting the estimates of the capacity needed from flexible generation backup.[12]

The emission impact of the required backup supply options for intermittent renewables is of paramount importance. In Quebec, that backup supply can be sourced from dispatchable large reservoir hydroelectric power. In Ontario however, the P2D Study by its Independent Electricity System Operator (IESO) assumed that the flexible generation would be hydrogen-fired thermal generation. The PWU agrees with the IESO's P2D study that replacing Ontario's existing gas-fired generation with hydrogen-fired generation by 2035 is not possible, and even if it was, it would be very costly. In Ontario, it is not at all clear that intermittent renewables solutions can contribute significantly to achieving a net zero grid without the needed large-scale, dispatchable, non-emitting backup supply that is unlikely to be available by 2035 or 2050.

While the 2023 Budget language describing the CE ITC requires that a "*competent authority*" commits to the affordable and net zero implications of investments made using federal funds. It should be made clear that such commitments in support of any specific investments must be based on an approved and validated analytical methodology for estimating the implications on total system costs and emissions. In such analyses, the technologies that will be deployed to provide the backup flexible generation and/or storage should be explicitly identified so that the costs and emissions implications can be transparently assessed and validated.

Closing

[10] PWU Submission to Environment and Climate Change Canada on Canada's Clean Electricity Standard Discussion Paper, April 2022.

[11] Hans-Kristian Ringkjøb∗, et al., "A review of modelling tools for energy and electricity systems with large shares of variable renewables", 2018, Renewable and Sustainable Energy Reviews; Miguel Chang a,*, et al., "Trends in tools and approaches for modelling the energy transition", 2021, Applied Energy.

[12] NRCan, DRAFT-NRCan-Biennial Report-Consultations-2023-06-16, HYDROGEN STRATEGY FOR CANADA BIENNIAL REPORT, Page 21. "*The modeling results show that use of hydrogen for electricity generation is close to zero. However, it should be noted that the modeling only takes into account 16 representative time slices (i.e. data points for time-varying parameters) per year, and therefore, detailed fluctuations in electricity load profiles are not represented*."

The PWU supports the federal government's initiatives to provide tax credits to projects that reduce the emissions in Canada's electricity generation. The PWU recommends that the government's financial supports provide a level playing field for all non-emitting technologies and consider the timelines for the development for new nuclear generation, the achievability of the CER goals by 2035 and the net economic benefits that will accrue to Canada from a well-designed ITC.

The PWU has a successful track record of working with others in collaborative partnerships. We look forward to working with the federal government and other stakeholders to strengthen and modernize the electricity system of Canada and Ontario. The PWU is committed to the following principles: Create opportunities for sustainable, high-pay, high-skill jobs; ensure reliable, affordable, environmentally responsible 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 government's objectives to transition to a Net-Zero economy and supply low-cost and reliable electricity for all Canadians. The PWU looks forward to discussing these comments in greater detail with Finance Canada and participating in the ongoing stakeholder engagements.