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Clean Electricity Regulations
Electricity Canada Response

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Re: Electricity Canada's Comments on Canada Gazette, Part I, Volume 157, Number 33: ***Draft Clean Electricity Regulations***

Introduction

Electricity Canada is the national voice of the Canadian electricity sector[1]. Our members generate, transmit and distribute electricity to Canadians in every province and territory, from coast to coast to coast. Electricity companies in Canada have provided affordable, reliable, and clean power for more than 125 years, and since 2005 greenhouse gas emissions in the Canadian electricity sector have been cut in half. This means that Canadian goods and services are made with some of the world's cleanest power.

In this submission we offer context on the current state of decarbonisation in the sector, the difference between existing policies and what is proposed, and where the draft regulations will create challenges for the sector. Individual members will also be making detailed submissions in response to the draft regulations that will offer detailed and specific analyses of their impacts in particular jurisdictions and with specific companies,

We support the federal government's Net Zero ambitions for Canada and the sector is committed to decarbonising the economy by 2050. Every credible path to Net Zero by 2050 relies on electrification of other sectors. Our industry's focus is on being able to grow Canada's electricity system to meet this demand reliably and affordably.

However, Electricity Canada and member companies across Canada are deeply concerned that the proposed Clean Electricity Regulations (CERs) will have significant impacts on the reliability and affordability of electricity in Canada. These impacts could be in nearly every

[1] Given the particular situation in Québec, Hydro-Québec holds different views from Electricity Canada's comments. The company will offer its own comments on the matter.

province, but will be concentrated in Alberta, Saskatchewan, Ontario, Nova Scotia, and New Brunswick. The costs associated with compliance with the regulations as drafted in these provinces will be extremely high. Because of the stringency of the proposed rules, and the lack of feasible compliance mechanisms, **in some provinces it is unclear if compliance with these proposed regulations is possible at any price.**

This stringency and complexity of the rules creates a risk of premature generation retirements. Individual facilities may no longer be commercially viable under the CERs as drafted. The risk of criminal liability for non-compliance exacerbates these challenges. Owners of generation units, especially in open electricity markets where there is no obligation to participate, may just opt to decommission facilities.

Electricity Canada is committed to continuing to work with Environment and Climate Change Canada (ECCC) as it considers feedback and changes to the regulations. These changes should dramatically increase the flexibility of the CERs, including the performance standard, peaker provisions, prescribed life, cogeneration clauses and emergency provisions.

Emissions reductions in the electricity sector have been Canada's greatest climate success story of the past 20 years. Canada's clean grid means that electrification will inevitably deliver substantial emissions reductions. For example, ECCC projects that the proposed zero-emission vehicle mandate will reduce cumulative emissions from vehicles by 430 Mts by 2050. Similarly, the installation of an electric arc furnace at Algoma Steel in Sault Ste. Marie, Ontario, will reduce carbon emissions by 3 Mt a year by 2030.

Realizing Canada's clean energy opportunities is necessary for our continued security and prosperity and reflects Canada's leadership in mitigating climate change globally. For Canada to remain competitive while making the transition to Net Zero by 2050, we must ensure electricity remains affordable and reliable, while continuing to reduce and offset remaining emissions in the sector. We will also need to make sure that the system continues to grow, doubling or tripling the amount of electricity produced annually by 2050 to meet demand. Electricity systems are evolving at a rapid pace to accommodate this growth. Substantial new baseload will be required. The integration of renewable energy sources will require various forms of dispatchable back-up generation to be available when intermittent resources are unavailable.

Our members remain open and willing to collaborate on assessing the impacts of proposed changes. We believe it is necessary for ECCC to engage and consult on specific changes to the regulations

before the regulations are final. This is essential to find solutions that work in every province and enable decarbonisation and electrification of other sectors to meet Canada's Net Zero by 2050 goal. Such consultation would ideally be public and would allow electricity companies to verify that the final regulations will be workable for operators across the country,.

Canada's Electricity Sector today

Canada's electricity sector is one of the cleanest in the world. Canada's electricity is already 84% non-emitting, the second highest in the G7. ECCC has identified how Canada's policy mix, in particular carbon pricing, is already driving significant reductions in electricity emissions. According to ECCC's Fifth Biennial Report, electricity emissions are projected to be further reduced 46% from 2021 levels by 2035. This is based on measures already in place as of November 2022, including the investment tax credits announced in that year's Fall Economic Statement.

Per this report, electricity emissions are expected to fall from 118 Mt in 2005 to 28 Mt in 2035, without any a policy action—including the proposed CERs or measures announced in the 2023 budget.

This is important context in consideration of the proposed CERs. As drafted, they would provide only incremental emissions reductions over the status quo while adding substantial challenges of reliability, investment, and cost to the system. By the government's own analysis in the RIAS, the CERs' aggressive stipulations would only result in a three-percentage point increase in non-emitting electricity by 2035 compared to current projections yet could incur significant financial costs and increased risks to public safety.

Without changes, the proposed regulations would mandate a severe curtailment of critical natural gas generation that offers flexible and dispatchable options for system operators that cannot be replaced by existing technology. This could compromise the safety, reliability, and affordability of the electricity system.

The proposed regulations affect generators in every province, even those with substantial hydroelectric and nuclear assets, as well as those with significant wind and solar capacity. The hastened transition away from natural gas assets would raise capital costs and lead to increased prices for consumers. It would present feasibility challenges, especially for regions that are expected to rely on natural gas for any electrical production after 2035. Concerns go beyond the sector itself, also extending to the potential for the CERs to disrupt existing carbon markets. The impacts of the CERs will compound with existing policies, such as the carbon price. Layering of other emissions

reduction policies that are still under development, such as the oil and gas cap, zero-emission vehicle (ZEV) mandate, and industrial decarbonisation will further amplify rate impacts.

Electricity Canada's View

Electricity Canada members have undertaken detailed region-specific projections of the impact of the CERs that contrast sharply with ECCC's nationally averaged modelling. This suggests a discrepancy that undermines the reliability of projected outcomes. The proposed regulations would have a disproportionate impact on certain provinces, while a national model hides behind averages. Electricity Canada and its members provided substantial feedback and modelling analysis to this effect in 2022 during consultations on the CERs. Unfortunately, the current draft does not reflect this crucial and specific feedback.

It is essential that Canada continues a path that encourages deep, economy-wide emissions reductions to support our national and international climate commitments. Electricity Canada is committed to this task and believes leveraging electrification will be critical. Canada must identify policies that leverage our competitive edge as a jurisdiction with one of the cleanest, most reliable, and most affordable power systems in the world. Our recommendations reflect a balanced view that acknowledges the urgency of climate action while recognizing limits of commercially available electricity technologies.

Electricity companies have a responsibility to provide government with clear and direct advice on policies that impact our mandate to provide safe, affordable, and clean electricity to all Canadians. It is in this spirit that the following concerns and recommendations are provided, including underscoring areas requiring further dialogue and consideration to ensure that the transition to a cleaner energy future is both successful and sustainable.

Response to the Regulatory Impact Assessment Statement (RIAS)

Electricity Canada and its members have carefully considered the impacts of the proposed CERs as measured and identified by ECCC. Below is a summary of concerns with conclusions in the Regulatory Impact Assessment Statement (RIAS).

Feasibility

The draft CERs do not set realistic or achievable limits on fossil fuel-fired electricity generation in Canada. The provisions are restrictive to the extent that, for some units, there would be no possible path to compliance other than unit shutdown. Replacing these baseload and dispatchable units with non-emitting alternatives on the timeline proposed and the technologies currently available is not feasible.

Hydropower is non-emitting and commercially available in some provinces, but not all. Hydropower has long project development times, and up-front costs are substantially higher than for fuel-based alternatives that provide similar support to the grid. For these reasons, new hydropower will play a very limited role in replacing fuel-based generation on the grid in many provinces.
In addition, the CERs' use of national-level modelling and analysis hides significant regional impacts and does not reflect how they will ultimately be implemented by individual provincial electricity systems.
Without changes, the CERs will cause severe reliability and affordability impacts in multiple jurisdictions across Canada.

Regional weakness in the modelling underpinning the CERs design.

Models are designed to be tools that illustrate the potential outcome of different policy choices. They are constrained by the task that they are designed for. ECCC's NextGrid and E3MC models, designed to look at the impact of the CERs across the country, generalize benefits and impacts across all of Canada. This inevitably hides the significant, likely, and negative impact the CERs will have in individual jurisdictions.

Models used by system operators and utilities for planning purposes are highly detailed, region-dependent, and reflect real constraints across systems to ensure the safety and reliability of provincial grids. Individual Electricity Canada members also have specific and granular system models that can predict localized impacts. These bring a standard of rigour and specificity that is needed for detailed system planning. This level of granularity is what is needed to establish the region-specific impacts of the CERs.

The reliance on NextGrid and E3MC, and their incongruence with modelling results from system planners throughout the country, would suggest that **the expected costs of the CERs modeled in the RIAS are significantly underestimated and hide significant localized cost impacts within**

national averages. These could be severe in those provinces where the CERs' impacts will be concentrated.

Ultimately, the CERs will have to be implemented at the provincial level. While the Federal Government can regulate pollution at a national level, the operation of the electricity system remains firmly at the provincial level, and its requirements for regional planning and operation is much greater than other industrial sectors. Federal policy must mesh with provincial policy.

Accordingly, the government must integrate a more granular, regional set of modelling in its design and consideration of the final regulations. Electricity companies remain willing, as they were throughout the CERs regulatory development process, to work closely with ECCC to establish probable cost and reliability impacts of individual CERs measures.

The RIAS modelling is too optimistic when measuring reliability impacts.

Electricity Canada and its members have not been able to replicate ECCC's modelling results of the potential cost impacts of implementing the CERs at a provincial level, suggesting that ECCC's RIAS modelling is based on overly optimistic scenarios.

In real-life situations, system operators and utilities plan for worst-case scenarios to make sure that there is always enough power to support safety and reliability for all Canadians. In addition to extreme conditions, other modelling considerations that system operators need to consider is power quality. For example, "critical inertia" plays a crucial role in the stability and operation of power grids. ECCC's NextGrid and E3MC models do not appropriately consider these grid services and as such have underestimated the costs associated with preserving them.

The model underestimates full costs based on national optimization and is missing additional infrastructure costs.

Without actual coordination and cooperation from the neighbouring provinces and the federal government, key assumptions about transmission interties in NextGrid may not materialize. For example, the RIAS assumed that the Atlantic Loop would be completed, but earlier this month the project was cancelled. Also, the RIAS does not factor in additional infrastructure costs such as added grid support (ancillary services cost based on increasing renewables) and other added costs beyond generation (i.e., increasing transmission costs). This underestimate overall costs associated with the implementation of the CERs.

The CERs as currently drafted would put Canadians at risk.

Safety and reliability are two different, but related, considerations. Electricity supports critical functions in homes and businesses, maintaining livable temperatures and powering equipment that we all rely on.

Canadians cannot live safely without a reliable grid. It is important to highlight a non-exhaustive list of functions that depend on reliable electricity. It is obvious that people with severe health conditions, such as those requiring dialysis, are at the greatest risk during power outages. Less obvious are those that are very young or very old, have moderately serious health conditions, or mobility issues that would impede their ability to find shelter in hot weather. Canadians living in high-rises cannot effectively keep cool or use elevators during blackouts. And all Canadians are at risk in the winter months during power outages, as most heating systems are reliant on electricity to function properly.

From an economic perspective, unreliable electricity has severe consequences for Canadian's jobs and livelihoods. Blackouts mean businesses and industries must shut their doors or stop operations. Workers cannot work or earn a living when the power is out. Financial institutions are not able to process transactions. Prolonged periods without power mean spoiled and wasted food. Security systems do not function, cell phones do not charge, and blackouts that extend to cell phone towers can cut off large numbers of Canadians from their communicating or calling for help in an emergency.

Electricity providers work around the clock to make sure that power is there when it is needed. Providers of public services need certainty that they are allowed to provide critical support to Canadians when it is needed. **The CERs as drafted would impede companies' abilities to respond to the needs of their grids and would make it far more difficult to reliably provide a critical service that keeps Canadians safe, at a price that they can afford.**

Technologies and supply chains able to replace fuel-based generation are not yet commercially available and at scale.

Government regulations must be achievable with technologies that are commercially available today. While new technologies may reach a point where they can affordably replace the functions and attributes of fossil-fuel powered generation, nothing currently does. This means that, for the time

being, natural gas power generation will be needed to ensure power quality and provide dispatchable energy to meet demand.

High-potential technologies like Small Modular Reactors (SMRs) have made great strides., but as of today there are no commercial scale SMRs in operation anywhere in North America. There are lots of reasons to be optimistic about the role that they will play in Canada's energy mix in 2050, but it is not reasonable to assume large-scale deployment of SMRs throughout Canada between now and 2035. Nuclear power requires additional licensing and permitting requirements that extend development timelines. Ontario is on track to have one SMR in operation by the end of the decade and to build three more afterwards, but other provinces expect much longer timelines. This is especially the case in provinces that do not currently use nuclear power.

Battery storage is being deployed widely in many applications, but today is still limited to short duration uses and is expensive compared to alternatives. While technology development and cost trends have been encouraging, demand for batteries is high and will get higher. Meanwhile, supply will be constrained by the availability of raw materials, such as critical minerals, and time to build out the rest of the manufacturing supply chain. There is no evidence today supports an assertion of enough battery storage available in 2035 to meet the requirements under the CERs as drafted.

Even should batteries be available, a dramatic increase could present system planning challenges. Batteries help solve a capacity issue, but they create one for energy. They must be recharged with available surplus power in order to have available energy when needed. Off-peak surpluses of electricity will likely change in the coming years as more flexible demand is added to the system in the form of grid-scale batteries, electric vehicles, and more.

NERC criteria includes requirements on providing primary frequency response, regulation, operating reserve, reactive support and voltage control, load following and ramping. These are essential reliability services, and compliance with NERC standards is mandatory.

Currently, fossil fuel-based resources, which are largely natural gas-fired electricity generation, provides all these services as well as inertia. These are critical for safety and the operation of the grid, and the electrical equipment powered by it in homes and businesses. Without these generation-embedded functions, equipment can be damaged or destroyed by fluctuations.

Dispatchable fossil fuel-based generation is going to be a necessary complement to intermittent renewables for some time until alternative non-emitting baseload and dispatchable technologies are commercially available and can provide back-up power for the grid on the same scale.

Sufficient essential reliability services, such as inertia, are required for reliable grid operation; this needs to be a modelling consideration to ensure that reliability can be maintained through extreme conditions and with a changing resource mix. The modelling that supports the CERs as drafted does not take these reliability services into account.

Independent System Operators (ISOs) across North America are struggling to identify generation resources that can provide equivalent operating flexibility, fast ramping, and the spinning inertia as natural gas generators. There is no non-emitting, commercially available equivalent that exists at the scale and in the time required to meet a 2035 timeline.

The CERs and other changes to the electricity system are forcing rapid changes to the grid and how it is operated. Balancing and optimising a new and changing mix of generation resources will take time for system operators. To successfully transition to Net Zero, this is a critical discussion to have, otherwise grid operators will be left unable to operate their systems effectively and safely.

Recommendations

Electricity Canada and its members have significant concerns with the scope, approach, and details of the proposed CERs as drafted. These concerns will require detailed discussion and fulsome information sharing before potential solutions can be offered to ECCC. However, after assessing the potential consequences of the CERs on our members' mandate to always provide reliable electricity to all Canadians, under all foreseeable circumstances, we recommend the following actions that can be implemented today:

General recommendations

Provide a transparency in all economic modelling conducted by ECCC relating forecasts and impacts of the CERs.

Such analysis should be regional or jurisdictional in nature, focusing on the impacts in regions that will depend on fossil fuel-based power generation for the foreseeable future. The considerable gap between expert industry modelling and that of the federal government justifies review and clarification.

We also understand that the models used for the design of the CERs are continuously evolving as the department collects feedback. **It is essential that Electricity Canada's members are kept informed about all changes to the model and are permitted to see the inputs and outputs of the model, especially provincial level outcomes that directly affect them.**

Include a comprehensive set of financial compliance options for the CERs.

The potential for criminal liability under the regulatory powers of the Canadian Environmental Protection Act (CEPA), combined with the CERs' extremely stringent rules, would present a significant system planning challenge and a disincentive to invest in electricity systems generally. This situation will be further exacerbated in markets where system operators rely on publicly traded and private companies, who will also need to ensure their operations meet the requirements of the CERs.

Under the CERs as written, it is probable that companies would at times be unable to deliver electricity without breaking the law. Even with changes to the regulations, this situation might still arise. This would create a situation where the only viable compliance path to avoid criminal charges is to not produce electricity, causing power shortages for customers. There is a particular risk of this in jurisdictions with competitive electricity markets where private operators could simply opt not to participate.

Electricity companies provide an essential public good, the provision of which should never be criminalized. It is untenable that companies which are already regulated in financial and operational matters would then be held to a criminal standard when providing a good that is critical to the functioning of society.

Given this, it is important that there be compliance options beyond strict criminal liability. Options across other regulatory frameworks include offsets aligned with provincial and federal systems and recognized emissions credits. These provide an opportunity for generators to find pathways to compliance in the medium-term.

Address regional variations.

Despite the focus on the national scale in the modelling and design of the proposed CERs, the actual impacts will be highly jurisdictional. Costs will be largely concentrated in Nova Scotia, New Brunswick, Ontario, Saskatchewan, and Alberta. Other provinces will bear very little cost initially but could face

higher costs in the future.

Impacts are not limited to strictly monetary costs. The difficulties in complying with the regulations will also be concentrated in these same provinces, and in some cases, paths to compliance will not exist without drastic impacts on reliability. Subsequent sections of this submission will describe the considerable impediments to achieving the goals of this regulation as drafted—some of which cannot be solved even if unlimited funding were available.

As the government finalizes the regulations, specific consideration should be given to how they will impact regions differently and how affordable compliance paths will vary. Providing “flexibility” should not just be about any specific measure, but also consider how individual electricity markets are able to respond.

Focus on developing a durable, consensus policy.

Electricity infrastructure projects take substantial time to construct and cost billions of dollars. They can operate for 50 years or more. As such, they are exceptionally exposed to policy whiplash as regulations and incentives change with the government of the day. Any regulation or policy affecting our sector must seek to be durable over the long term, lest changes affect the economics of a project.

If the final CERs, and other programs supporting expansion of the electricity system, are not so durable, it could put investment at risk.

Comments on the provisions of the CERs

In addition to the general comments on the CERs above, we would offer the following recommendations on individual components of the draft regulations.

A 30 t/GWh performance standard is not possible with existing technology.

The proposed performance standard is based on ideal design assumptions about carbon capture, utilisation, and storage (CCUS) capture rates on natural gas combined cycle (NGCC) units that have not yet been commercially deployed in North America. A 30 t/GWh performance standard reflects carbon capture and storage (CCS) technologies operating at ideal steady-state conditions and at specified ambient temperatures. To date, there are no CCUS units in operation, on NGCC units or elsewhere, that can achieve this performance standard under expected operating conditions, let alone

examples that could consistently meet this capture rate. The performance standard must recognize the current technological standards of other emerging net-zero technologies, while applying equitably to all net-zero technologies including carbon capture, utilization and storage, hydrogen, and others.

It is not practicable to have a binding performance standard that cannot be met. Electricity companies will not spend billions of dollars on technology without certainty of bringing them into compliance with future regulatory requirements. As such, if the performance standard is not actually achievable in commercial operations, it will likely discourage investment in carbon capture technology in Canada and result in these projects failing to achieve Final Investment Decision, particularly in jurisdictions that rely on private investment for development of these technologies. This would be counter-productive to the broader deployment of emissions reduction technologies in Canada.

Any final performance standard for 2035 must be founded on the use of existing technologies that are commercially available and deployable under real-world conditions. The standard should also allow compliance mechanisms which account for operational realities. These could include credits, offsets, or averaging.

The 450-hour "peaker" limit is an insufficient and inappropriate measure to support grid reliability.

There is a broad view amongst electricity generators that the 450-hour limit on fuel-based generating units is insufficient, including companies that do not operate units that would be subject to the regulations today. The 450-hour limit is universally out-of-step with the real-world requirements of electricity systems across the country.

An hourly limit presents several profound operational challenges:

- It does not appropriately consider emissions. An hour with a unit running at minimum is treated the same as an hour with a unit running at maximum.
- It does not recognize units that may require long lead times at minimum output for operation. These hours would count against the 450 hours during hours of minimum emissions and no benefit to the system.
- Limits as applied to individual units would lead to perverse outcomes: the most efficient/lowest emitting units would reach the 450-hour limit first, leaving inefficient/higher emitting units remaining to generate while idling the efficient units.

- Limits can create perverse incentives: electricity companies may preserve scarce operating hours for local use, despite there being an ongoing or emergency need in adjacent jurisdictions. This would work against regional grid integration and require buildout of unnecessary excess local capacity at additional cost to customers.

The final CERs must allow for substantially greater use of peaker generation. Even in the RIAS, the government indicated that the 450-hour limit was likely the lowest limit that should be considered.

Electricity Canada members have provided substantial input to the ECCC team, both before and after publication of the draft regulations, about the system requirements for natural gas generation and the need for greater flexibility. As the government develops final regulations, the government must continue to work with our industry to develop an appropriate peaker provision that meets the needs of the system while reducing emissions.

Such a provision should include:

- A substantially greater operation limit than the 450 hours proposed in the draft regulations.
- Use of alternate measures to define operating limits, such as capacity factor, and/or limiting tonnes of emissions, rather than hours of operation. These would better align with actual operational realities of generation facilities.
- Other flexibilities, including, but not limited to, fleet averaging across units to better support electricity reliability and enable the more efficient units to run more often.
- Specific consideration for the non-energy role that fossil fuel generation provides. In some areas, specific units are essential for grid stability and power quality. A flat, per-unit hourly limit does not recognize the characteristics of these systems.

We note that this provision would still require that generators pay a carbon price for any emissions that they produce. Electricity Canada supports this; it allows for operational flexibility while appropriately incentivising non- or less-emitting generation assets as a first priority.

The 20-year end of prescribed life provision will need to be significantly increased to reduce the impact on some provinces' electricity systems.

With limited compliance flexibility and very constrained peaker provisions, an arbitrarily short "Prescribed Life" term of 20 years will create abrupt transitions. This could raise concerns of reliability and capacity availability and will increase the potential for stranded investments.

A longer prescribed life will also allow more time for new electricity technologies to be deployed affordably at a commercial scale and take advantage of existing infrastructure. The prescribed life should more closely match the useful life of a power plant.

As with the peaker provision, even with a longer-prescribed life, generators would still pay a carbon price for any emissions that they produce. Electricity Canada supports this; it allows for operational flexibility while appropriately incentivising non- or less-emitting generation assets as a first priority.

The emergency provisions in the CERs are currently unworkable.

The emergency provisions as drafted do not allow for operational responsiveness and would increase the risks to reliability and public safety for little to no greenhouse gas (GHG) emissions benefit. They create a dual obligation where an operator might be ordered by a system operator to support the grid for an ongoing energy emergency, but at the same time be required to seek separate approval from the Minister of Environment and Climate Change and wait up to 15 days for a decision. This is untenable.

Furthermore, adjacent regions routinely support each others' capacity needs during emergencies by transferring or wheeling through electricity. In the event of an energy emergency declaration, balancing authorities and market participants may even be required to provide information on resources available to support an energy deficient entity. This timely coordination is essential during emergency situations, and adding additional friction would have an overall negative effect on planning and responsiveness for the system as a larger whole.

The CERs must recognize that system operators, as a matter of course, take actions in advance of system emergencies to prevent such emergencies and ensure safety. These measures may even include plans to mitigate when necessary through imports from neighbouring jurisdictions. This reflects the value offered through an integrated grid, of being able to draw from different regions not undergoing the same immediate pressures or demands. Failure to allow for such actions will put individual generators in an impossible compliance position. The final CERs must allow for system operators or similar entities to ensure that there is sufficient power in times of emergency without creating risk for electricity operators to be in violation of federal law.

This process must be clear and automatic. It cannot require additional approvals from the federal government. The government should work with system operators to define how this process would

work, establish measurable thresholds, and prioritize system reliability and public safety over strict compliance.

Cogeneration will require significantly more time to understand. As written, the CERs would have a drastic impact on cogeneration within and outside of the electricity sector.

Cogeneration allows for fossil fuel combustion to contribute to multiple uses, maximizing efficiency. It provides a valuable resource for system operators and offers an additional revenue source for industries that sell excess electricity onto the grid. Without selling to the grid, this energy is wasted. There are no known examples of installing CCUS on a cogeneration facility, and it is not clear that it is feasible to do so. Compared to the meaningful, but relatively modest, benefit of continuing to sell excess electricity onto a grid, the cost of installing a CCUS unit on a cogeneration unit—assuming it can be done at all—would be prohibitive for most if not all industrial operators.

It is far more likely that cogeneration systems will simply disconnect from the grid or decommission their electricity generation equipment in favour of cheaper but less efficient boilers to supply their heat requirements. This would result in a loss of available electricity to the system and increased costs for industrial operators. Most importantly given the focus of the regulations, it will not bring a reduction in actual GHG emissions and could even increase them as industrial users shift to less-efficient sources of steam.

Cogeneration represents a significant amount of reliable generation on the grid and losing that capacity would further add to the challenges of building capacity leading up to and after 2035.

Applying electricity-specific regulations to cogeneration adds exceptional complexity, even in regulations as intricate as the CERs. The likely negative outcomes, including loss of available baseload or dispatchable power and the impact on industrial competitiveness, is unlikely to come with any meaningful reduction in carbon emissions. The final regulations should balance the probable harms of inclusion of existing cogeneration against realistic additional emissions reductions.

The CERs will not exist in a vacuum. Canada must have corresponding and usable policies that support grid expansion.

To meet the requirements of growing demand, let alone the CERs, Canadian electricity companies will need to build and retrofit thousands of megawatts of generation capacity. They will need to reinforce and expand the transmission network and modernize distribution.

These investments require a massive skilled workforce that is ready to work, and already living in Canada. As well, a scale-up of global supply chains will be needed for scarce materials that are in demand in nearly every jurisdiction in the world. Success will also require a regulatory process that allows for timely permitting of key projects.

There is not a sufficient labour force to build the required infrastructure by 2035.

Due to the scale of the net-zero transition, the capital investment and implementation required for the CERs will push the labour market far beyond the status quo.

Electricity Human Resources Canada's (EHRC) Labour Market Intelligence Report projects a need for 28,000 new employees by 2028 due to growth and retirement. An *additional* 36,000 will be needed by 2035 to meet a net zero pathway. Existing school graduates and job changers will be insufficient to meet this demand, and EHRC projects nearly half of core electricity occupations will have economy-wide shortages. Accordingly, 80% of electricity sector employers expect to have difficulties recruiting workers to meet this need between 2023 and 2028.

The labour force employed to meet today's comparatively modest needs is already stretched to the limit. The capital investments on the scale required by the CERs as currently drafted, let alone broader electrification, cannot proceed as expected under current labour market trends. Reversing these trends will itself be a massive task, requiring the training or retraining of thousands of Canadians who are otherwise not currently pursuing trades.

There is insufficient time to permit the required infrastructure for 2035.

Electricity infrastructure projects are tremendously complex, require long lead times and can take years to design, build and construct, even outside of any government approval process.

Regulatory approvals in Canada remain complex and cumbersome. Canada struggles with moving permitting and approvals processes forward. In 2020, the World Bank ranked Canada 64th in the world for ease and speed of obtaining construction permits. Earlier this year, Electricity Canada published *Build Things Faster*. The report detailed the barriers to building infrastructure quickly, and identified the necessary preconditions to being able to successfully navigate permitting processes for a net-zero transition in the electricity sector. These include the government delivering on promised actions, such as the implementation of the "One Project, One Approval" framework described in Budget 2023 and coordination of federal project permitting and approvals through a single central federal office.

As of this writing, permitting process timelines have not improved, though we are optimistic that the federal government is starting to consider regulatory efficiency and further announcements will be forthcoming. That said, any reforms and their impact are still hypothetical at this point, and current permitting processes are far too slow to facilitate meeting the provisions in the CERs as drafted.

The permitting and approvals situation is not improved with the recent Supreme Court of Canada (SCC) decision on the constitutionality of most of the Impact Assessment Act (IAA). Regardless of whether there will be direct impacts on the application of the Act to electricity projects, the decision has opened the door for further litigation, which is not likely to speed up approvals under the IAA.

Conclusion:

Canada's electricity system is clean and getting cleaner – emissions reductions in the power sector since 2005 actually exceed Canada's overall emissions reductions. As we move towards 2050, the electricity sector will serve as the foundation for decarbonisation of other sectors.

Ultimately, by the government's assessments, the CERs as drafted offer only incremental emissions reductions over and above what is projected in the government's biennial submission to the Paris Agreement. The focus should be on ensuring that new measures support the expansion of the electricity system and maintain affordability and reliability.

At present, the CERs do not do this. Without significant additional flexibility, these regulations would cause serious reliability issues and cost implications. These impacts would be national, but would have concentrated impact in Nova Scotia, New Brunswick, Ontario, Saskatchewan, and Alberta.

As it moves forward, the government must address issues outlined in this document in all the key provisions of the draft regulations—End of Prescribed Life, Performance Standards, Peaker provisions, emergency provisions and the treatment of cogeneration.

ECCC should ensure that any new modelling uses an appropriate level of regional granularity to measure the true impact of regulations. Continued reliance on current national-level models will hide significant negative impacts, including to cost and reliability. Ultimately, impacts to these will have a negative impact on public safety.

Electricity Canada will continue to work with members and ECCC to provide specific recommendations to address the shortcomings of the draft regulations. We are here to work with government collaboratively and expeditiously to find solutions to expand the grid and meet the future needs of Canadians.