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Clean Electricity Regulations



One of the most important ways of reducing emissions is by electrifying more parts of the economy that currently rely on fossil fuels, such as transportation, home and water heating, and industrial activities.

▶ Clean, affordable and reliable electricity

▼ Learn about the draft regulations

Draft Clean Electricity Regulations

In Canada, 84 per cent of electricity comes from sources such as hydroelectricity, solar, wind, and nuclear, which are far less polluting than electricity generated from unabated (no carbon capture and storage) coal, oil, and natural gas. As Canada aims to achieve a net-zero emissions economy by 2050, its electricity supply will need to at least double by then, according to recent studies². Meeting this surging demand, while avoiding an increase in greenhouse gas emissions from the electricity sector, makes this a critical time to put in place the Clean Electricity Regulations (CER).

By implementing the CER now, necessary investments can be made early, to help transition Canada to a net-zero electricity grid starting in 2035 and ensure Canadians can still enjoy a reliable and affordable electricity system. The draft regulations were developed around three core principles:

1. maximize greenhouse gas reductions to achieve net-zero emissions from the electricity grid by 2035
2. maintain electricity affordability for Canadians and businesses
3. maintain grid reliability to support a strong economy and meet Canada's growing energy needs

The CER is an integral part of Canada's 2030 Emissions Reduction Plan to help the country reach its emissions reduction target of 40 to 45 per cent below 2005 levels by 2030 and net-zero emissions by 2050. A clean electricity grid will be

the backbone of a prosperous, low-carbon future. Learn more about the [Government of Canada's broader electrification strategy](#).

Send your feedback

Help shape Canada's future clean electricity sector. Send your feedback on the [draft Clean Electricity Regulations](#) by November 2, 2023. The final regulations are expected to be published in the *Canada Gazette, Part II*, in 2024. Comments are requested to be submitted through the new [Online Regulatory Consultation System](#) (ORCS).

Technical backgrounder

▼ Technical backgrounder on proposed Clean Electricity Regulations

At the 2021 United Nations Climate Change Conference (COP26), Prime Minister Justin Trudeau announced that Canada had set a goal of a net-zero electricity grid by 2035.

While Canada was one of the first countries to commit to a net-zero grid, we have since been joined by all G7 countries in committing to net-zero electricity systems by

2035 as a key foundational step in achieving a net-zero economy by 2050.

To support that goal, on August 10, 2023, Environment and Climate Change Canada made public the draft Clean Electricity Regulations (CER). A seventy-five (75) day formal consultation period begins on August 19. The Government of Canada designed the CER to maximize the reduction of greenhouse gas emissions from the electricity sector while enabling Canadians to continue to have access to reliable and affordable power. The CER will set a technology-neutral emissions standard for the generation of electricity that is provided to the grid as of 2035.

To support reliability and affordability, the draft regulations include flexibilities that allow a limited and declining ongoing role for fossil fuel generation. This flexible approach will enable provincial utilities and system operators to plan and manage their systems in accordance with relevant provincial circumstances, while creating a clear signal for reducing emissions over time.

The CER is a critical part of an overall approach to the clean electrification of the Canadian economy to ensure that Canada can achieve its economy-wide net-zero goals through increased electrification of vehicles, building heating and industrial processes. This approach is being supported by federal investments in clean electricity of

over \$40 billion, including historic announcements in Budget 2023, as well as by the recently launched Canada Electricity Advisory Council.

The development of the draft Clean Electricity Regulations

The draft regulations draw on the input from significant engagement with all provinces and territories; public and private utilities; Indigenous organizations; electricity and energy system experts; industry; and civil society. That engagement was launched with the Clean Electricity Standard Discussion Paper in March 2022, followed by the Proposed Frame for the Clean Electricity Regulations in July 2022. Environment and Climate Change Canada (ECCC) received over 315 written comments, held four public webinars with more than 700 attendees, and convened over 150 bilateral meetings.

This extensive engagement helped to inform the design of the draft regulations. For example:

- There is broad support for the three pillars of emissions reductions, affordability and reliability as well as the proposed regulatory architecture of a technology-neutral emissions standard and flexibilities to minimize the stranding of large capital assets (generating units) and to enable the continued use of emitting generation for grid back-up purposes or to supply 'peak' power.

- Most commenters emphasized the need to enable the continued use of some fossil fuels, barring coal, in electricity systems after 2035, in order to maintain reliability as systems complete their transition from emitting sources while also expanding generation in order to respond to demand from an increasingly electrified economy. The draft regulations allow for the continued use of emitting generation in specific circumstances to maintain affordable and reliable electricity.
- The draft CER includes flexibility for units incorporating CCS technologies, reflecting concerns by utilities and provinces that units installing this technology will need a reasonable period of time to optimize its operation.
- Parties shared a wide range of views regarding the treatment of industrial electricity generation (also known as co-generation as it is typically involves the simultaneous production of electricity and steam for industrial use). Many argued that the CER should not apply to cogeneration as there are not sufficiently mature low-emitting alternative technologies to produce high-temperature heat. Others worried that not covering co-generation could lead to a large build-out of industrial electricity generation whose emissions would negate the objective of the draft regulations. The draft CER would cover all generation units that are connected to a North American Electric

Reliability Corporation (NERC)-regulated electricity system and that have net exports to the system (i.e., they sell more electricity to the grid than they buy).

- There is deep interest among Indigenous peoples in participating in and benefiting from the clean energy transition. However, they support the exemption of remote communities because of the challenges in fully replacing diesel generation in those communities.

During the development of the draft CER, modelling exercises were done to test the impact of regulatory parameters. The model included constraints to reflect real-world requirements for system reliability as well as expert information on the cost and readiness of technologies. In this way, the draft CER is premised on maintaining reliability and least cost pathways to net-zero using technically feasible options.

The Clean Electricity Regulations

Disclaimer: This summary does not replace the legal text of the regulations.

The draft CER will set a GHG emissions standard on electricity generators. This technology-neutral approach will give operators of electricity generating units the discretion to determine the least costly and most practical pathway to comply.

The CER would apply to any unit that meets the three following criteria:

- uses any amount of fossil fuels to generate electricity; and
- has a capacity of 25 megawatts (MW) or greater; and
- is connected to an electricity system that is subject to North American Electric Reliability Corporation (NERC) standards ('NERC-regulated electricity system').

An electricity generation unit ('unit') means an assembly of equipment that generates electricity. It must include at least a boiler or combustion engine and may include carbon capture and storage (CCS) systems.

Only units that are *net exporters* to a NERC-regulated electricity system in a given calendar year would be subject to the CER's performance standard for that year. Net exporters export more electricity to a grid than they import from it.

The performance standard would be 30 tonnes of CO₂ per Gigawatt hour of electricity generated ("30 t/GWh") as measured on an annual average basis. As a frame of reference, the best performing natural gas plants in Canada currently emit in the range of 350 to 420 t/GWh, and conventional coal units emit about 1,000 t/GWh.

That standard would apply starting:

- on January 1, 2035, for all units:

- that combust coal or petroleum coke,
- that are commissioned on or after January 1, 2025, or
- that increased their generation capacity by 10% or more since registration of the unit.
- on the latter of January 1, 2035, or January 1 of the year in which the prohibition in subsection 4(2) of the *Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity* begins to apply to a “significantly modified” unit (a unit that has ceased burning coal).
- for any other unit, the latter of January 1, 2035 or 20 years after its commissioning date.

This approach provides considerable lead time to provinces, while the 20-year End of Prescribed Life provision also helps minimize stranded assets.

Flexibilities

In order to ensure the continued operation of a reliable and affordable electricity grid, the draft CER contains a number of flexibilities.

- The draft regulations provide an exemption for the use of fossil fuel-fired units in emergency circumstances.
- They do not apply to small fossil fuel-fired units less than 25MW or to units not connected to the broader NERC grid. Over 97% of Canada’s electricity

emissions are from units over 25MW, and exempting units in remote communities recognizes the technical challenges these communities face in transitioning fully to clean electricity. Rather than apply the draft CER to these communities, the federal government is addressing their clean energy needs via the \$520 million Clean Energy for Indigenous, Rural and Remote Communities program and the Indigenous Off-Diesel Initiative.

- The draft regulations also allow the use of unabated fossil fuels, barring coal, on a limited basis, such as for meeting additional generation requirements during periods of peak power demand. These 'peaker provisions' will be limited to 450 hours per year and a total of 150 kt of CO₂ in a given year per unit. This will enable regional grids to be stable and avoid black outs during peak winter and summer periods when electricity use is the highest.
- In addition, for a maximum of seven years (or December 31, 2039, whichever is first), a unit using CCS may operate with an emission intensity of up to an annual average of 40 t/GWh if it can demonstrate that the unit is capable of operating at 30 t/GWh. This will give time to optimize the capture rate of CCS equipment.

These flexibilities will be further refined through ongoing engagement with interested parties before the regulations are finalized, which is expected to occur in 2024.

Quantification of electricity generated and of emissions

A unit's total generation is the quantity of electricity it generated during the course of a year, not simply the quantity it exported to a NERC-regulated electricity system.

A unit's total emissions can exclude the emissions captured by its CCS system only if these emissions are permanently stored in a storage project that meets prescribed criteria.

Key findings of the Regulatory Impact Analysis Statement

As is the case with all federal regulations, a Regulatory Impact Analysis Statement (RIAS) accompanies the draft CER. The RIAS describes the projected impacts of the draft regulations on the electricity sector's generation mix and its greenhouse gas emissions, as well as the resulting societal costs and benefits and the expected changes to electricity rates compared to a scenario without the CER. Changes that would be expected to occur regardless of the CER, such as a large growth in electricity generation, ongoing expenditures on maintenance, retirement and replacement of assets, are

included in the baseline comparison scenario. The RIAS also assumes that, as of 2030, remaining electricity generation emissions would be fully exposed to carbon pricing.

Over the 27-year period from 2024-2050, the CER are expected to result in almost \$29 billion in net benefits for Canadians from reduced damage due to GHG emissions and savings from reduced fossil fuel use. This value for net benefits is likely underestimated, as it does not take into account benefits from avoided health care costs due to reduction in air pollutants, such as mercury.

Clean, affordable and reliable electricity will provide the foundation for achieving a net-zero emissions economy by 2050 through emission reductions in other sectors, such as transportation. In addition, the draft CER are expected to deliver nearly 342 megatonnes (Mt) of cumulative GHG emissions reductions between 2024 and 2050 from the electricity generation sector itself. The draft regulations would also shift the mix of generation sources in Canada's electricity system towards low- or non-emitting sources more quickly and to a greater extent than would be expected in a scenario without the CER, which in turn will support greater investment in electricity storage and transmission capacity.

Regardless of the CER, electricity systems will need heavy investments over the next few decades, both for routine replacement of power plants and to expand generation

capacity to support the demands of a growing population and the increased electrification of the economy as Canadians switch from fossil fuels to electricity to power transportation, home heating and industry. The RIAS assumes that electricity demand will increase by at least 1.4 times current levels by 2050, consistent with current trends. It also includes a sensitivity analysis using an increase of 2.5 times current levels by the same year, reflecting higher demand growth associated with achieving economy-wide net-zero emissions by 2050. These projections are broadly consistent with a number of forecasts, including the Canada Energy Regulator's most recent 2023 projection of 2.35 times current demand levels in a scenario achieving economy-wide net-zero by 2050.

ECCC estimates that, in the absence of the CER, under the relatively modest demand growth assumption of approximately 1.4 times current levels, more than \$400 billion in investments will be needed nationally through 2050 to meet increased demand while also undertaking routine maintenance and refurbishment. The CER is anticipated to add relatively minimal additional costs to that overall investment. The RIAS estimates that the incremental additional costs to ensure the grid is non-polluting will increase national average residential electricity rates (in undiscounted 2022 constant dollars) relative to a scenario without the CER by 0.08 cents per

kWh in 2035, 0.49 cents per kWh in 2040 and 0.26 cents per kWh in 2050. This represents an incremental increase attributable to the draft regulations of less than 1% in 2050. As reference, 2021 rates ranged from 7.4 cents /kWh in Quebec to 17.4 cents/kWh in PEI.

These estimates do not take into account the full scope of the more than \$40 billion of funding the federal government has now committed to help provinces, territories and utilities transition to net-zero electricity systems. If provinces choose to take advantage of these measures, it is projected that the federal government would shoulder more than half of the incremental costs of the CER, reducing the impacts on ratepayers.

Moreover, analysis from the Canadian Climate Institute shows that household expenditures on *energy as a whole* (including electricity, fossil fuels, and energy-using equipment) will decrease by 12% by 2050 as Canadians shift away from using fossil fuels towards clean electricity. * Even accounting for the investments needed to expand and clean the grid, using electricity as our predominant energy source will save Canadians money as they stop paying for more expensive gasoline, diesel, home heating oil, and natural gas, all of which are subject to price volatility due to global supply factors outside of Canada's control.

A multi-pronged approach to clean electricity

While the CER is a central component of the federal government's approach to achieving clean electricity, it is not the only policy supporting a net-zero electricity grid by 2035.

As outlined in "Powering Canada Forward: Building a clean, affordable and reliable electricity system for every region of Canada" (published August 8, 2023), the Government of Canada is taking a comprehensive and collaborative approach to building a net-zero grid in a way that ensures continued access to affordable, reliable power by all Canadians. Following the historic investments made in Budget 2023, the Government of Canada has now committed over \$40 billion to support the transition to a net-zero grid reliably and affordably across all regions. These include:

- Nearly \$3.0 billion for the Smart Renewables and Electrification Pathways Program.
- \$10 billion in low-cost financing from the Canada Infrastructure Bank for clean electricity projects.
- A 15 percent refundable Clean Electricity Investment Tax Credit – with an estimated cost of \$25.7 billion over the lifetime of the incentive – for eligible investments by taxable and non-taxable entities in certain technologies for the generation and storage of clean electricity and its transmission between provinces and territories.

- A 30 per cent refundable Clean Technology Investment Tax Credit for eligible investments by businesses in certain electricity generation and storage equipment, low-carbon heating, and industrial zero-emission vehicles and related charging or refuelling infrastructure.
- A 30 per cent refundable Clean Technology Manufacturing Investment Tax Credit for eligible investments in machinery and equipment used to manufacture or process clean technologies, or to extract, process, and recycle key critical minerals.
- \$520 million for the Clean Energy for Indigenous, Rural and Remote Communities programs for renewable energy and capacity-building projects and related energy efficiency measures across Canada. This includes the complementary Indigenous Off-Diesel Initiative, which provides clean energy training and funding for Indigenous-led climate solutions in remote Indigenous communities.

The Government of Canada is working closely with provinces, territories and experts to support the electrification agenda. It launched the Regional Energy and Resource Tables in 2022 to prioritize and advance net-zero growth opportunities. Through the Regional Tables, the Government is also seeking to establish formal collaboration with Indigenous partners to identify and accelerate opportunities to transform Canada's

traditional resource industries and advance emerging ones. In May 2023, the Canada Electricity Advisory Council was launched as an independent body of 19 experts who will provide the Government of Canada with advice—through the Minister of Natural Resources—to help accelerate investments that promote sustainable, affordable and reliable electricity systems.

Conclusion

Clean electricity is fundamental to achieving a net-zero economy by 2050. The draft CER have been designed to achieve this while enabling the continued provision of affordable and reliable electricity to Canadians and their businesses.

Interested parties are invited to provide feedback to inform the final version of the regulations. A seventy-five (75) day formal consultation period begins on August 19.

Past engagements

Environment and Climate Change Canada engaged extensively with industry, utilities, experts, provinces and territories, Indigenous organizations, and non-governmental organizations to design the CER.

- [Clean Electricity Regulations Frame Document \(July 2022\)](#)
- [A Clean Electricity Standard in Support of a Net-zero Electricity Sector: Discussion Paper \(March 2022\)](#)

- [Opening the Loop: a Clean Electricity Standard Webinar \(March 2022\)](#)

▶ Electricity profile by provinces and territories

▶ Support for net-zero electricity

Learn about electricity in Canada

- [Electricity in Canada](#)
- [Renewable energy](#)
- [Energy sources and distribution](#)
- [Canadian energy information portal](#)
- [Electricity sector emissions](#)

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- [1 Canadian Climate Institute: The Big Switch – Electricity in Canada](#)
 - [2 Canadian Climate Institute: The Big Switch – Electricity in Canada and Canada Energy Regulator: Canada’s Energy Future 2023: Energy Supply and Demand Projections to 2050](#)
- [* The Climate Change Institute’s Clean Electricity, Affordable Energy \(June 2023\)](#)
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