



environmental
defence

Submission to Environment and Climate Change
Canada

*Comments RE: Proposed Frame for the Clean
Electricity Regulations*

August 17, 2022

Prepared by:

Keith Brooks
Programs Director
Environmental Defence Canada
kbrooks@environmentaldefence.ca

As stated in our comments regarding the discussion paper on the Clean Electricity Standard (and included as Appendix 1 here), Environmental Defence welcomes the Government of Canada's commitments to ensure Canada's electricity grid is 90 per cent non-emitting by 2030 as well as to achieve a net-zero electricity supply by 2035. Implementing Clean Electricity Regulations (CER) is an essential mechanism for achieving these goals.

Electrification must be a core element of Canada's emissions reduction strategy and pursuit of net-zero emission by 2050. For this element to deliver on its potential, it is essential that the electricity sector also be decarbonized.

Fortunately, Canada's electricity supply is already largely decarbonized and Canada has large solar and wind resources at our disposal. There are also untapped opportunities in energy efficiency and energy storage. These system attributes, and a commitment to invest in upgrades to the grid and stronger interties between provinces, mean that Canada is in a good position to reach complete decarbonization by 2035.¹

Below are Environmental Defence's comments on the proposed components of frame for the CER.

Scope:

EDC believes that the scope of the regulations should capture all electricity generation above a certain threshold, including remote communities, and include behind-the-fence operations.

Emissions Standard:

The proposed emissions standard should set an emissions intensity cap at **0 g CO₂e/kWh by 2035**, with regularly tightening interim limits. Electricity can be generated with zero emissions, and setting the cap above zero stops short of the potential for these regulations to deliver on decarbonization.

The standard must be strictly enforced. Facilities that cannot meet the standard should not be permitted to operate. Any non-compliance should face financial penalties that are multiple times greater than the carbon price of the day.

The proposed approach to technology-neutrality is acceptable only if the standard is set to zero.

EDC is strongly opposed to the proposal to allow newer natural gas units built prior to the CER publication date to operate past 2035 for a prescribed period. The CER should clearly signal that these facilities will need to plan to shut down, even if they have not reached the end of their

¹ David Suzuki Foundation, 2022. Shifting Power: Zero-Emissions Electricity Across Canada by 2035

economic life. Jurisdictions in Canada such as the province of Ontario may seek to procure new generation in the period before 2025. The Government of Canada should send a signal now that new generation must be non-emitting to avoid a dash to gas before the CER is brought into force. Otherwise, we risk locking in more gas generation and failing to decarbonize and meet the government's promise, or being faced with stranded assets and/or contracts that must be bought out or broken.

If unabated natural gas is allowed and does operate during emergency circumstances, any emissions must be offset within one (1) year. All emissions must be netted out, or Canada cannot claim to have reached net-zero emissions for electricity.

The CER should clearly stipulate that backup power paired with variable renewables be provided by non-emitting sources such as energy storage and demand response. Allowing gas generators to provide backup power will create an incentive for these plants to remain in operation.

Proposed implementation approach and associated dates

All units should be subject to the CER's emission intensity performance standard when the CER is brought into force. There should be interim standards that ratchet emissions down to zero by January 1, 2035.

We are concerned about the discussion of emissions abatement technologies for natural gas-fired generators. Emissions abatement has not been proven to get facilities close to zero emissions. Lending credence to this unsubstantiated concept risks opening the door to the development of new gas generation which will either imperil Canada's goal of a non-emitting electricity sector or end in stranded assets and the potential for cost implications for both private energy developers and the government. Abatement such as carbon capture also does nothing to reduce fugitive emissions which are of equal impact to the combustion emissions from the gas plant itself.²

The notion of a prescribed life beyond 2035 is highly problematic. Generators typically have power-purchase agreements that span 20 years and design lifetimes that are more than double that. A generator commissioned in 2024 could well argue that its prescribed life should extend well past 2050 – scuttling Canada's push for net-zero and making a mockery of the commitment to a non-emitting electricity sector by 2035.

Proposed requirements for financial compliance

Regulated units should be exposed to carbon pricing for 100 per cent of their emissions. There is no risk of leakage in the electricity sector, meaning that the full carbon price should apply and help send a price signal encouraging a move to non-emitting sources sooner rather than later.

² The Atmospheric Fund, 2022. Fugitive Methane – New Guidelines. Retrieved from https://taf.ca/wp-content/uploads/2022/05/TAF_Fugitive-methane-guidelines_2022-2.pdf

As mentioned above, there should be interim standards that ratchet down to zero g/kwh by 2035. Any generators found emitting above the standard, beginning in 2025, should face strict penalties multiple times that of the carbon price.

Offsets should not be a compliance option for electricity generators. Offsets have not been shown to be reliable and routinely fail to meet the tests of additionality and verification. Nature-based offsets also struggle to meet the test of permanence. For example, California's carbon offset program is "dangerously undercapitalized" with 95 percent of the buffer planned for 100 years of wildfires depleted after less than a decade.³

Proposed treatment of industrial units

The CER should regulate all industrial units (including cogeneration) including those that do not offer electricity for sale to the electricity system.

The CER should require all cogeneration units to meet the same standards as those units offering electricity for sale to the electricity system from the day it comes into force.

Proposed exemptions from the CER performance standards for regulated units

We can understand the need for relief for emissions that would be generated during emergency circumstances, which are defined as "extraordinary, unforeseen and irresistible." Such emergencies should be further defined to be those that threaten immediate human health and security and are not economic in nature.

In our view, the CER should apply to units operating in remote and Northern areas. Remote communities would benefit from non-emitting micro-grids and should not be forced to tolerate expensive and polluting electricity systems while the rest of the country's grid is transformed.

³ Vice. 2022. Wildfires Have Burned Through California's 100-Year Carbon Insurance in 10 Years, Study Finds. Available at <https://www.vice.com/en/article/88qqjx/wildfires-have-burned-through-californias-100-year-carbon-insurance-in-10-years-study-finds>



environmental
defence

APPENDIX 1:

Submission to Environment and Climate Change Canada

A Clean Electricity Standard: Discussion Paper Recommendations

April 22, 2022

Prepared by:

Julia Levin
National Climate Program Manager
Environmental Defence Canada
jlevin@environmentaldefence.ca

Environmental Defence welcomes the Government of Canada's commitments to ensure Canada's electricity grid is 90% non-emitting by 2030 as well as to achieve a net-zero electricity supply by 2035. Implementing a Clean Electricity Standard (CES) is an essential mechanism for achieving these goals.

Tackling the climate crisis will require a total transformation of our current industrial systems away from fossil fuels to renewable, non-emitting systems. The production of oil and gas - in all its forms must rapidly decline and be phased out in order to limit global warming to 1.5°C.

It is broadly accepted that the electricity sector is an area where GHG emission reductions can occur most quickly because there are many proven, cost-competitive, non-GHG emitting technologies available today to produce electricity. In fact, many jurisdictions, such as the United States, are committing to reach 100% non-emitting electricity generation by 2035.

Wind energy and solar energy are the lowest-cost sources of new electricity generation available today,¹ with per-MWh costs below those of new hydropower, nuclear or fossil fuel generation capacity on a levelized cost of energy basis.² Transitioning to distributed energy systems running on wind, water and solar, coupled with storage increases the resiliency of the grid, avoids blackouts, lowers energy requirements and consumer costs, while creating millions of jobs, improving people's health, and reducing land requirements.

Environmental Defence agrees that the goal of the CES must be clean, reliable and affordable electricity for all Canadians. The best way to accomplish this is by ensuring the grid is supplied by renewable energy, paired with adequate storage and distributed energy sources, as well as demand-side management and efficiency measures.

Key outcomes for the Clean Electricity Standard

- Requires Canada's electricity to be 100% non-emitting by 2035.
- Sends an immediate and clear signal against new emitting electricity generation assets
- Generates early and deep reductions of GHGs, rather than relying on greater reductions closer to 2035.
- Drives investments in non-emitting, cost-effective, already commercially available and reliable renewable electricity
- Secures cost effective GHG reductions.
- Protects and enables energy affordability and access to electricity
- Prevents locking in new fossil fuel infrastructure

¹ Lazard (2021) Lazard's Levelized Cost Of Energy Analysis, Version 15.0. Available: <https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/>

² CanREA (2021) Powering Canada's journey to net-zero. Available: https://renewablesassociation.ca/wpcontent/uploads/2021/11/CanREAs2050Vision_Nov2021_web.pdf

To achieve these outcomes, Environmental Defence recommends:

- The CES regulations under the *Canadian Environmental Protection Act* (CEPA) set emissions intensity caps to **0 g CO₂e/kWh by 2035**, with regularly tightening interim caps. The tightening rate must align with the pace needed to achieve the 2035 target but also the existing commitment to a 90 per cent emissions-free electricity system by 2030.
- Use the CES as a backstop where provinces regulate to the federal CES intensity level or the federal standard applies to that province. Any equivalency agreement should provide a confident alternative pathway to achieving the same GHG reductions and should involve all key stakeholders in its design.
- In addition to ensuring that no new fossil fuel generation is added to the grid, the CES should eliminate all existing electricity supply from fossil fuels well before 2035 (whether abated or not).
- Expose electricity emissions to the full carbon price and require provinces with their own carbon pricing systems to match the price stringency and expose generators to the full extent of the carbon price.

Concerns with allowing abated fossil fuel generation, offsets, SMRs and unproven technologies

Environmental Defence is concerned with the role given to natural gas generation, unproven technology, SMRs and offsets in the CES discussion paper. None of these expensive, dangerous and unproven technologies and measures align with achieving maximum reductions from the electricity grid, which is necessary for Canada to do its fair share to tackle the climate crisis. Indeed, recent modelling studies show that Canada is not on track to meet its climate change targets and this is in part due to Canada's current approach of leaning too much on short-term solutions that promote more efficient use of fossil fuels.³ The Government of Canada cannot credibly say it is serious about climate change when it is continuing to allow the burning of fossil fuels to generate electricity.

Carbon capture, utilization and storage (CCUS) is a speculative technology that has not been proven to be effective at scale. Despite five decades of research and tens of billions of dollars in subsidies globally, the current scale of CCUS is minute. CCUS has a track-record of over-promising and under-delivering. For example, while originally projected to capture 90 per cent of emissions, Sask Power's CCUS project at the Boundary Dam is now estimated to capture just 37 per cent of emissions.⁴ The vast majority of projects never get off the ground.⁵

³ Langlois-Bertrand, S. et al. (2021). Canadian Energy Outlook 2021 — Horizon 2060. Institut de l'énergie Trottier and e3c Hub. Available: <http://iet.polymtl.ca/energy-outlook/>

⁴<https://environmentaldefence.ca/wp-content/uploads/2022/03/Buyer-Beware-FFS-in-2021-March-2022.pdf>

⁵ Abdulla A. et al (2021) Explaining successful and failed investments in U.S. carbon capture and storage using empirical and expert assessments. Environ. Res. Lett. Available: <https://iopscience.iop.org/article/10.1088/1748-9326/abd19e/pdf>

Furthermore, CCUS only addresses a fraction of emissions from the lifecycle of natural gas and does nothing to address fugitive emissions. Lastly, natural gas is already not a cost-effective way to produce electricity, equipping natural gas power plants with expensive and energy-intensive CCUS greatly adds to those costs. For example, if instead of paying for the CCUS retrofit of the Boundary Dam thermal coal power plant, the government of Saskatchewan had instead turned to wind power generation, it could have saved electricity consumers in Saskatchewan more than \$1 billion while generating the same amount of electricity.⁶

Direct air capture (DAC) poses significant challenges for energy use and there is currently insufficient evidence that it provides a feasible climate mitigation solution. Since CO₂ represents 0.04% of air by volume, massive volumes of air must be filtered to capture any reasonable amount of CO₂. DAC is in its infancy and is very costly (the range of costs for DAC vary between USD \$250-600 per tonne of CO₂ captured⁷) and energy intensive, with serious doubts about its effectiveness.⁸ One study examining the potential of DAC to help meet the Paris Agreement goal found that wide scale deployment of DAC would account for a full one quarter of global energy demand for heat and power by the end of this century.⁹ The buildout of DAC would significantly delay efforts to achieve and maintain a 100% renewable energy system. Another concern with wide scale DAC deployment are the impacts associated with the manufacture of the chemical sorbent required to capture CO₂ from the atmosphere.

The use of offsets has been widely discussed, and convincingly refuted as a sustainable strategy.¹⁰ Studies have shown that most offset schemes do not lead to emissions reductions.¹¹ Issues of additionality and verifiability are very difficult to enforce. Offsets should not be used in sectors where achieving zero-emissions is possible, such as electricity.

The role that natural gas plays in providing fast-response power and for peaks can be achieved through a combination of measures, including effective demand-side management. In fact the

⁶ Glennie, J. (2015) Analysis of the cash and carbon flows of boundary dam coal-fired power station. Saskatchewan Community Wind. Available: <https://static1.squarespace.com/static/5394a3cbe4b032d797fe179c/t/55142e0ee4b06a02803077d1/1427385870286/150326-BoundaryCCSReport.pdf>

⁷ Lebling, K. et al. (2021) Direct Air Capture: Resource Considerations and Costs for Carbon Removal. World Resources Institute. Online: <https://www.wri.org/insights/direct-air-capture-resource-considerations-and-costs-carbonremoval>

⁸ Climate Action Network International (January 2021) Position: Carbon Capture, Storage and Utilisation. Online: https://climatenetwork.org/wpcontent/uploads/2021/01/can_position_carbon_capture_storage_and_utilisation_january_2021.pdf

⁹ Realmonde, G., Drouet, L., Gambhir, A. et al. An inter-model assessment of the role of direct air capture in deep mitigation pathways. *Nature Communications* 10, 3277 (2019). <https://doi.org/10.1038/s41467-019-10842-5>

¹⁰ See for example Nicholas Rivers and others, "Federal carbon-offset proposal will likely give illusion of progress, even as it increases emissions," CBC, March 29, 2021. Accessed at: <https://www.cbc.ca/news/opinion/opinion-carbon-offsets-1.5951395>

¹¹ Murphy, A. (2017) 85% of offsets failed to reduce emissions, says EU study. Transport & Environment. Available: <https://www.transportenvironment.org/discover/85-offsets-failed-reduce-emissions-says-eu-study/>

latest official national greenhouse gas inventory demonstrates that Canada would have achieved greater emissions reductions from the transition off of coal, if it had not been for the increased use of natural gas offsetting those reductions.

Decarbonizing Canada's grid can protect people's health in addition to helping to meet our climate goals. The phasing out of coal-fired electricity generation creates significant health benefits by improving local air quality. However, simply shifting from coal to natural gas for electricity means that communities are still affected by hazardous air pollution, such as nitrous oxides.

Treatment of electricity under the OBPS

The Federal government can provide a strong incentive to accelerate the transition to the 2035 target by ensuring that the carbon price at the core of Canada's current greenhouse gas emission reduction strategy sends a clear pricing signal to the electricity sector that non-GHG emitting generation is preferred to GHG emitting generation in both federal and provincial carbon pricing frameworks. While new natural gas-fired electricity generation faces increasing exposure to the carbon price over time and will feel the full force of the carbon price in 2030, existing natural gas-fired electricity-generation facilities are largely sheltered from the Federal carbon price – providing no real incentive to reduce emissions from these facilities or explore alternative forms of generation.

Therefore Environmental Defence also recommends that the federal government remove the electricity sector from the Output-Based Pricing System (OBPS) and expose the sector to the full carbon price, in line with the federal benchmark in each compliance year. We further recommend that the government require provinces with their own carbon pricing systems to match the price stringency and expose generators to the full extent of the carbon price.