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Submitted to edc-dec@ec.gc.ca

The International CCS Knowledge Centre (Knowledge Centre) appreciates the opportunity to continue providing our expertise on the draft Clean Electricity Regulations. Carbon capture and storage (CCS) is a proven solution for reducing emissions from fossil-fuel power generation units. Regulations to encourage CCS are crucial for reducing emissions as we move towards a net-zero economy. Generally, they should assist industry's endeavors to lower emissions, spur innovation, and promote enhancement and efficiency improvements for CCS projects.

On February 16, Environment and Climate Change Canada (ECCC) released a public update on the draft Clean Electricity Regulations, sharing what was heard and what is being considered for the final regulations. ECCC is collecting comments on the public update until March 15. The summary provided by ECCC is heartening and includes many of the concerns identified by the Knowledge Centre in our original comments on the draft legislation in November 2023, including the importance of being flexible, reliable, practical, and affordable in the transition to a net-zero grid.

The “What we heard” section of the public update importantly reflects the shared perspective that greater flexibility is needed to meet the originally proposed 30t/GWh unit performance standard (noted in the public update as equivalent to a 95% capture rate) to power generation units considering reducing emissions with CCS technologies. Below, we reiterate our initial points to ensure that the CER maintains a path for CCS projects as a solution for significant emission reductions for power generation units in Canada and for bio-energy with CCS (BECCS) as a carbon removal process to establish a net-zero grid.

The public update recognizes that the proposed 30t/GWh unit performance standard is too stringent and inflexible to be a practicable solution within the timeframes of the Clean Electricity Regulation. This standard, even with a 40t/GWh period for seven years as proposed last year, would not fully recognize the development and optimization cycle required for CCS projects and would have the unintended consequence of increasing risks for CCS investments. An increase in the risk profile for CCS projects might mean CCS is no longer a practicable emissions reduction solution for the power generation sector or for industrial sectors utilizing combined heat and power units together with CCS.

To address these concerns, ECCC is considering an adjustment to the compliance mechanisms in the Clean Energy Regulation moving from a per-unit performance standard (t/GWh) to an annual emissions limit (t/year). The annual limit would still be calculated by an underlying performance standard used to determine a unit annual emission limit, however ECCC is considering “slightly changing” the standard, allowing for the pooling of emission limits from individual units, and to allow greenhouse gas offsets to offset excess emissions. The value of any adjustment of the underlying performance standard was not provided.

Adjusting the performance standard and adding flexibility through an annual limit is a welcome change, but depending on the details, it may still disincentivize investment in CCS projects.

Allowing the pooling of emission limits and using greenhouse gas emissions offsets may provide greater flexibility for power generating units considering CCS. Importantly, however, this will impact different power producers in varying ways. Larger organizations will have greater opportunities to balance emissions through a diversified fleet of generating units, whereas smaller producers that operate a single cogeneration facility for example, would not be able to be as flexible, and the performance standard would play a more direct role in regulating the facilities emissions and the performance of the CCS facility.

The details of such options for meeting the unit performance standard and other considerations noted in the public update, including emergency circumstances and end-of-prescribed life provisions, may play a role in determining the viability of CCS for organizations considering CCS projects or currently operating CCS facilities, including Canada's only operating CCS facility on a power plant - SaskPower's Boundary Dam Unit 3 CCS facility.

Missing from the public update are considerations, as outlined in our original comments on the draft legislation, for existing investments in CCS and considerations for challenges in meeting the timelines outlined in the Clean Electricity Regulations. Such challenges include time-limited incentives for CCUS and an increasing price on carbon emissions. As mentioned in our previous response, background documentation for the legislation expects 35% of currently emitting units will implement CCS. This would represent a doubling of proposed CCS projects across **all** industries by 2035. There are potentially significant challenges in terms of competition for resources and labour if all projects must enter development in a similar timeframe.

Operators of CCS facilities have the goal of optimizing their facilities to reduce CO₂ emissions as much as possible. Respecting the significant investment required to build and operate a facility, leniency for operators to be able to optimize CCS equipment and power generation facilities in good faith should be strongly considered in the CER. **In considering changes to the draft clean energy regulations, ECCC should consider providing additional leniency in relation to power generation units implementing a CCS technology and/or a considerably higher unit performance standard.** The rationale for such considerations is as follows:

1. Carbon capture facilities have incentives to optimize capture efficiency.

The setting of these compliance mechanisms should be developed in step with other federal policy positions that have been designed to incentivize private investment in CCS projects – most importantly the Investment Tax Credit for CCUS (CCUS-ITC), the Greenhouse Gas Pollution Pricing Act (GGPPA), and the Canada Growth Fund's (CGF) investments through mechanisms such as Carbon Contracts for Differences. These three initiatives and provincial equivalent/complementary programs are what CCS projects are built upon. The CCUS-ITC provides incentives for projects to build CCUS at capacities for the widest scope of emissions possible.

Further, the opportunity to generate credits and alleviate the costs of emitting carbon dioxide is what will offset the operational costs of CCUS projects. This opportunity provides a clear incentive for industries to reach as high of an emission performance standard as possible. Using an overly stringent performance standard to enforce a capture performance is not necessary to incentivize power generators from maximizing their operational performance.

2. The Clean Electricity Regulation's unit performance standard will impact CCS projects in more industrial sectors far beyond electricity.

For some sectors and processes, a capture project is much more economically feasible with combined heat and power (CHP) integration. For this reason, the CCUS-ITC allows for dual-use heat and power units to be considered proportionally as eligible expenses for the incentive. Flue gas streams from a power generation unit and the industrial process may be combined and captured together. The Knowledge Centre has worked extensively with project developers leveraging the use of CHP plants as part of their project plans to provide the necessary power and heat for the CCS facility that captures CO₂ from both their plant process and from the CHP plant. CCS project proponents seek to make their projects financially viable by selling power to utility providers which, depending on the size of the CHP plant, makes their power generation activities subject to the CER. This design leads to a complex set of interdependencies between the production plant, the CHP, and the requirements of the utility which may purchase power from the project developer.

Even if electricity and industrial emissions are treated separately, any unit performance standard based on a capture rate will impact the whole facility. This means that the unit performance standard will have impacts on the development of any CCS projects that integrate heat and power and combine emissions. This could be a major impediment to processes such as the production of cement that have limited options to reduce emissions outside of CCS and require CHP plants for economic viability.

3. The goal of a net-zero economy requires flexibility to innovate at-scale.

It is imperative that any performance standard provides room for power generating units to pursue testing, demonstrating, and novel implementations of innovative and not-yet commercially proven carbon capture technologies. These innovative activities in support of the scale-up and viability of CCS technologies is a priority of Canada's Carbon Management Strategy. Innovation in carbon capture technologies on power generation units can provide benefits in terms of step-change cost reductions, reduced energy required to operate CCS facilities, and provide economic opportunities for innovative Canadian businesses. Ensuring that the clean energy regulations does not add a legal risk when taking on innovative technologies for demonstration and/or commercial projects is crucial for Canada to remain at the forefront of CCS technology development.

Future BECCS projects have the opportunity to generate electricity while removing carbon from the atmosphere. Carbon removals, representing negative emissions on Canada's emissions balance sheet, are essential for a net-zero economy. As BECCS facilities use biomass as a fuel source, CCS facilities with varying flue gas components will have varying capture efficiencies and will require iterations to optimize and fully be implemented. Additionally, BECCS facilities that are a natural fit for pulp and paper mills may not have the ability to take advantage of pooled emissions from other power generating units and will likely have fewer options to meet annual emission limits. Recognition of this in the unit performance standard is critical if the CER is to enable any development of BECCS projects in Canada.

For these reasons, we ask that the Government of Canada provide another period of consultation with further details on the considerations listed in the public update. It's crucial to comprehend whether the Clean Electricity Regulations will introduce new operational risks for power generating units considering emissions reductions using CCS and the decarbonization of other sectors reliant on CHP plants. This

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understanding is essential for Carbon Capture and Storage projects nearing their final investment decisions. There is an urgent need for communicating greater flexibility for this regulation driven by the growing impacts of the changing climate and time-limited incentives such as the CCUS-ITC.

We are always open to discussing the topics mentioned above, as well as any other issues related to CCUS. We look forward to collaborating on finding viable and adaptable solutions as we move forward together.

Sincerely,



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