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November 2, 2023

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RE: Fertilizer Canada Response to the Proposed Clean Electricity Regulations, Pre-Published in *Canada Gazette Part 1* on August 19, 2023

On behalf of our member companies, Fertilizer Canada would like to thank you the opportunity to provide feedback and recommendations for the proposed *Clean Electricity Regulations (CER),* pre-published for 75-day public consultation in *Canada Gazette Part 1* on August 19, 2023.

Fertilizer Canada represents manufacturers and producers, wholesalers and retail distributors of nitrogen, phosphate, potash, and sulphur fertilizers. The Canadian fertilizer industry accounts for 12 per cent of the global fertilizer supply, contributing approximately $24 billion annually to Canada's economic activity and supporting the employment of over 76,000 individuals throughout the supply chain.

Canadian fertilizer manufacturing and production facilities are some of the most technologically advanced, energy efficient, and safest facilities in the world. Our industry has world-class, sustainable operations resulting from early action to reduce its environmental footprint and maximize operational efficiency. Our industry is committed to high standards for environmental sustainability, and we support science-based policy that achieves environmental objectives while also protecting our competitiveness in a global market. As part of our commitment, we have recently completed a Technology Roadmap Study: *Greenhouse Gas Emission Reductions in the Canadian Fertilizer Production Sector.* The Technology Roadmap study was completed with financial support from Natural Resources Canada and presents an analysis of the available decarbonization "step-change" technologies most applicable to Canada's fertilizer manufacturing sector, including nitrogen and potash production. This report covers an overview of the sector, available technology solutions, pathways to implementation, and lastly the necessary government support required for sector decarbonization.

Fertilizer Canada has participated in the previous consultations from Environment and Climate Change Canada (ECCC) throughout the development of the CER including the Discussion Document and Proposed Frame in 2022. Our comments and recommendations here expand on the feedback we

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provided previously. We have included general feedback below, as well as detailed feedback on the Regulatory Impact Analysis Statement (RIAS) and draft regulatory text (Appendix A). These have been provided directly through Fertilizer Canada's online comments to the *Canada Gazette Part 1*.

Our fertilizer production and manufacturing sector is dependent on a continued reliable and affordable source of electricity for our members' facilities. Canada is home to nine ammonia manufacturing facilities producing ammonia and other nitrogen fertilizers, and ten potash mines. Our members manufacture 4.8 million tonnes of ammonia each year, and produce over 20 million tonnes of potash, a critical mineral in Canada.[1] Six of Canada's nitrogen facilities are located in Alberta, and all Canadian potash is extracted in Saskatchewan. Both Alberta and Saskatchewan currently have a relatively high electricity grid carbon intensity that has a significant impact on indirect emissions from electricity consumption. While we appreciate the emphasis ECCC has put on reliability and affordability in the CER development, we continue to have concerns that the burden to transition to a net-zero electricity grid will be disproportionately felt in Saskatchewan and Alberta. While other grid intensities are currently lower and compliance burden with the CER is less at the moment, the infrastructure changes put in place to proactively create these greener grids already place burden on manufacturing and have done so for many years.

We urge the federal government to work with the provinces to ensure adequate time and provide financial support to support the transition to a net-zero electricity grid. The fertilizer production sector has a significant footprint in Saskatchewan and Alberta, and we are particularly interested in the regional impacts of the proposed CER on these two provinces given the fact that currently the majority of the electricity sector's GHG emissions across Canada come from Saskatchewan and Alberta (46 MT of the total 62 MT CO2e).[2] In Ontario, we are also concerned with the upcoming need for refurbishment and planned asset retirement for the province's nuclear infrastructure. We anticipate that natural gas consumption for electricity generation will have to increase in Ontario to offset nuclear generation, as the province faces increasing demand.
More than half of the world's population depends on food grown with the use of fertilizers, a number which will only continue to grow. Canada is well positioned to support the nutrient demands of a growing global population but will require a competitive business environment to successfully transition to a low-carbon future. Canadian fertilizer producers and manufacturers are competing in a global market with disproportionate environmental regulations, and no premium market for sustainably produced products. As reported in our Technology Scan study, the implementation of step-change decarbonization technologies with 50 per cent reduction of GHG emissions or greater will require at least five to ten years to implement, and could cost upwards of $1 billion per facility based on similar publicly announced projects.[3] The ability for the fertilizer production sector to decarbonize also relies heavily on investments in infrastructure outside our fence-line including access to a clean (low intensity), affordable, and reliable electricity grid.

[1] Government of Canada – Critical minerals: an opportunity for Canada
[2] Table 1, Regulatory Impact Analysis Statement, Canada Gazette Part 1 Clean Electricity Regulations
[3] https://sencanada.ca/content/sen/committee/421/ENEV/Briefs/ShellCanada_e.pdf

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Fertilizer production is energy-intensive, and as a globally traded commodity Canada's fertilizer sector must balance reducing emissions and remaining competitive with countries who don't face the same environmental policies and regulatory barriers, such as Russia and China. Canada provides farmers with sustainably produced fertilizer and our industry is committed to working with government to develop and strengthen policies and regulations that incentivize investment and safeguard against production moving to other jurisdictions that don't face the same climate policies. Protecting domestic production of sustainable Canadian fertilizer defends against carbon leakage that could increase global GHG emissions.

It is imperative that the Government of Canada recognize and address the cumulative impacts of environmental regulations to mitigate carbon leakage and ensure Canadian industries remain competitive in a global market. This transition can not be done in isolation. The CER must recognize the importance of long-term economic prosperity for Canada's future while meeting emission reduction targets, and must find alignment with existing regulations and strategic goals, such as those within the Hydrogen Strategy for Canada, Canada's Carbon Management Strategy, and Canada's Critical Minerals Strategy.

Thank you again for the opportunity to engage and provide input on the development of the CER. Fertilizer Canada and our member companies know that achieving our shared goals for economic and environmental sustainability requires transparency and cooperation between government and industry, and we stand ready to work with ECCC and the Government of Canada. Please contact us should there be any questions related to the comments outlined in this submission.

Sincerely,

Nadine Frost
Senior Director, Scientific and Regulatory Affairs

cc:

The Honourable Steven Guilbeault, P.C., M.P., Minister of Environment and Climate Change Canada

Jean-Francois Tremblay, Deputy Minister of Environment and Climate Change Canada

The Honourable Jonathan Wilkinson, P.C., M.P., Minister of Energy and Natural Resources Canada

Michael Vandergrift, Deputy Minister of Energy and Natural Resources Canada

The Honourable Chrystia Freeland, P.C., M.P., Deputy Prime Minister and Minister of Finance

Chris Forbes, Deputy Minister of Finance Canada

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The Honourable Francois-Philippe Champagne, P.C., M.P, Minister of Innovation, Science and Industry

The Honourable Dan Vandal, P.C., M.P., Minister for Prairies Economic Development Canada

Diane Gray, President, Prairies Economic Development Canada

The Honourable Mary Ng, P.C., M.P., Minister of Export Promotion, International Trade and Economic Development

The Honourable Danielle Smith, Premier of Alberta

The Honourable Scott Moe, Premier of Saskatchewan

The Honourable Wab Kinew, Premier of Manitoba

The Honourable Doug Ford, Premier of Ontario

Veronica Gelowitz, Deputy Minister Environment, Government of Saskatchewan

Ashley Metz, Deputy Minister Intergovernmental Affairs, Government of Saskatchewan

Blair Wagar, Deputy Minister Energy and Resources, Government of Saskatchewan

Kent Campbell, President and CEO, CIC, Government of Saskatchewan

Rupen Pandya, President and CEO, SaskPower

Mark Guillet, President and CEO, SaskEnergy

Kasha Piquette, Deputy Minister Environment and Protected Areas, Government of Alberta

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APPENDIX A:

Objective:
The fertilizer sector is dependent on access to a reliable and affordable electricity grid.

Reliability is critically important as our manufacturing and production facilities operate on a continuous basis. If a fertilizer facility experiences an unplanned outage due to a failure in the electricity grid supply, there are significant economic and environmental impacts associated with the shutdown and subsequent re-starting of the facility. Unplanned outages at a facility can impact the environmental performance through process venting and increased potential for unplanned releases, as well as increasing the risk of incidents that could lead to personnel injury.

The fertilizer sector in Canada is dependent on access to reliable and abundant sources of clean electricity to effectively implement decarbonization technologies in the coming decades. However, a net-zero electricity grid will do nothing for our sector unless it is affordable. Our members' companies produce and manufacture critical minerals and fertilizers in a competitive global market, and are unable to pass down compliance costs. If electricity costs increase significantly, that erodes our competitiveness and further inhibits the necessary investment in Canada's fertilizer industry to decarbonize.

Recommendation: The Objective of the proposed CER should reflect the need for a reliable and affordable electricity supply in all Canadian jurisdictions, in addition to the transition to a net-zero grid to support Canada's ambitious climate targets.

Description:
Application:
Fertilizer Canada and its member companies have reviewed the description of the proposed Regulations including the criteria for units captured by the proposed 30t/GWh performance standard.

With respect to the proposed Regulations applying to units greater than 25 MW capacity, we appreciate the clear description and examples ECCC provided through the National Webinar held on Sept 13, 2023, including illustrative examples of how units are defined under the draft Regulations. However, we are concerned the CER has not aligned with the federal or provincial Output-Based Pricing-System (OBPS) by defining a small MW threshold at 50 MW or higher. We recognize ECCC conducted the RIAS sensitivity analysis with a less stringent threshold of 50 MW and noted the concern that a 50 MW threshold would promote a "build-out" of units just under 50 MW to avoid regulatory requirements. Additionally, the RIAS states that they would not expect the same scenario to occur with the 25 MW threshold, due to the inherent inefficiencies associated with multiple, smaller capacity units.

We are concerned that the rationale for selecting the 25 MW threshold is introducing a higher degree of inefficiency. If the proposed CER is intended to reduce sector emissions and be technology agnostic, the increased 50 MW threshold should be considered to align with the existing OBPS Regulations, and increase efficiency, instead of continually tightening standards before suitable technologies are available to bridge the gap.

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Recommendation: ECCC to align MW threshold with federal and provincial Output-Based Pricing-Systems by defining a small MW threshold at 50 MW or higher.

Emission performance standards:
With respect to the emission performance standard for units commissioned on or after January 1, 2025, it is our understanding that these "end-of-prescribed-life" (EoPL) flexibilities built into the draft CER are intended to minimize stranded assets. We are concerned the January 1, 2025 cut-off date for units being in operation to meet the EoPL provisions are too rigid. Using a 20-year EoPL will require many units to shut down (or add CCS) well before their typical 30- to 50-year lifespans end.

With the CER on schedule to be published in *Canada Gazette Part II* in 2024, that leaves an extremely short window of time for units to be constructed. Given the uncertainty of construction and supply chain delays, the proposed timelines appear unreasonable. For example, in Saskatchewan the Great Plains Power Station started construction in 2021 as a measure to replace existing coal facilities and is scheduled to be completed in 2024; however, if any of the above delays are encountered, this puts the project at risk of not being commissioned prior to 2025. Plants like this are critical for providing affordable and reliable power during the "transitional" years towards a net-zero grid. Any currently contemplated natural gas facilities have likely been waiting for the CER to be finalized prior to sanctioning project work. Therefore, there are significant concerns related to the timelines of the cut-off date not offering sufficient flexibility for the life of a new asset. We have provided recommendations to add an additional degree of flexibility to the EoPL provisions while still upholding the intent.

Recommendation: If the January 1, 2025 cut-off date is maintained, we recommend ECCC adjust the project status requirement to add flexibility. Suggestions on amendments to add flexibility include:

- *Amend the EoPL provisions in Section (4) to replace "commissioning date on or after January 1, 2025" with "has construction commenced on or before January 1, 2025".*
- *Introduce a sliding-scale for the construction commencement date to trigger the 20-year EoPL, with an option to introduce a final cut-off date of January 1, 2029 to ensure a 20-year EoPL by 2050.*
- *Replace the cut-off date with a date based on the registration of the CER, e.g. construction commenced within one calendar year of the date of registration of the final CER, to account for uncertainties in regulatory timelines.*

We are concerned that the current provisions of the CER will result in stranded assets and limited capacity and reliability in provinces that currently rely on coal-based power generation. From Example 5 provided in the ECCC National Webinar, our understanding is that currently, coal plants transitioning to natural gas are subject to the CER performance standard on a timeframe dependent on the *Natural Gas Regulations*. In Example 5, the "best case" scenario still only had an additional five years until Jan. 1, 2040 prior to being subject to the 30tCO2e/GWh performance standard under the CER. We are particularly concerned for the Saskatchewan grid reliability, as the CER provisions could inadvertently disincentivize transition from coal units to natural gas units, which would provide reliability to the grid while transitioning to a lower emitting power source.

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Recommendation: We recommend natural gas-based electricity generation be assigned a higher performance standard initially and be subject to a more gradual transition to the final CCS emissions standard allowance.

Exceptions from meeting the annual average performance standard:
With respect to the exceptions from the performance standard, our members do not see the emergency circumstances provisions, as defined, being particularly useful. The current parameters to designate an emergency circumstance as "extraordinary, unforeseen and irresistible" could be problematic. For example, foreseeable events such as long periods of extreme heat could result in the need for emergency generation, however, upkeep to maintain facilities for this reason may not be economically feasible. ECCC should provide guidance around the use of emergency circumstances, and consider removing the requirement for the event to be "unforeseen".

While we recognize this is not the focus of the CER, we must emphasize that there is no economic driver to maintain generation units solely for use under emergency circumstances or to operate under mass-based exemptions for the "peaker provisions". Running a generator plant for peak-use only (single cycle instead of combined cycle) is the most inefficient way to run a plant.

As referenced in the International CCS Knowledge Centre's recent publication, there are no current examples of commercial natural gas-fired electricity generation equipped with post combustion Carbon Capture and Storage (CCS) technology in North America.[4] As many heavy industries – including fertilizer manufacturing – assess the role of CCS in meeting emission reduction targets, it is important to ensure that prescribed values recognize the inherent variability associated with implementing emerging technologies. The 40 t/GWh performance threshold is still too stringent to implement, particularly on a technology that has no commercial-scale example to reference. We recommend that the CCS provisions be amended to reflect a final target stringency that is commensurate with proof-of-concept of the given CCS technology.

For units using CCS, the 30 t/GWh performance standard represents meeting and maintaining close to a 95 per cent carbon capture rate. This is unlikely to be feasible under normal operational conditions, and may restrict base-load power production in the medium term if facilities are unable to comply.

We noted that the Quantification methods for emissions, CCS methods include CO2 injected for the purposes of enhanced oil recovery as an eligible CCS technology. We support continued inclusion of enhanced oil recovery (EOR) to support beneficial use of CO2 through established EOR CCS facilities. However, the proposed federal CCUS investment tax credit (ITC) does not allow for EOR. In order for CCS to be viable and attract investment, ITCs are required.

Recommendations:

- *ECCC provide guidance around the use of emergency circumstances, and consider removing the requirement for the event to be "unforeseen".*

[4] https://ccsknowledge.com/pub/CCUS%20&%20Clean%20Electricity%20Regulations%20Review.pdf

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- *ECCC amend the CCS exception to reflect a final target performance standard that is commensurate with proof-of-concept of the given CCS technology. ECCC work with Finance Canada to revise the CCUS ITC to align with the CER and allow CCUS projects with an EOR component to be eligible for the CCUS ITC.*

Reporting:
We are seeking clarification on reporting requirements for industrial co-generation units that are exempt from the CER. The RIAS and proposed Regulations indicate that units that meet all applicability criteria are required to submit a registration report. We understand from clarifications provided by ECCC that there would still be a registration requirement under the CER for units that are not subject to the performance standard. However, it was unclear whether units that are subject to the performance standard in one year would continue to be required to meet the regulatory standard in subsequent years, even if they no longer meet the thresholds (e.g. not a net exporter).

Recommendation: ECCC minimize the reporting burden under the CER by ensuring that co-generation units subject to the regulatory standard in one year (e.g. due to net exports) are not automatically subject to the standard in subsequent years.

Regulatory Development:

Interested parties' concerns:
Fertilizer Canada has expressed concerns with technology readiness and reliability in previous submissions to ECCC during earlier consultations on the CER development. In the RIAS, the Department indicates that while they recognize limitations for some technologies (such as CCS not being available in all provinces), they feel that they have adequately captured this through the included flexibilities and provisions to account for concerns with technology readiness.

However, technology readiness must also account for the significant regulatory timelines and infrastructure requirements for the technologies. Notably, in Fertilizer Canada's recent Technology Roadmap study, CCS / CCUS has a high degree of technology readiness (TRL 9 for process CO2; TRL 7 for flue gas CO2), but the implementation timeline is still five to ten years in length. This is based on regulatory approval timelines and financial / infrastructure barriers including having access to pipeline infrastructure for CO2 storage.

Further, as indicated in previous comments, it is our assessment that the 40t/GWh performance threshold is still too stringent to implement on a technology that does not have a commercial-scale example to reference. We recommend the CCS provisions be amended to reflect a final target stringency that is commensurate with proof-of-concept of the given CCS technology. This would encourage innovation in the sector, and align with the first priority from Canada's newly released Carbon Management Strategy[5] to accelerate innovation, research and development.
Small modular reactor (SMR) technology was also assessed as a potential decarbonization technology for the fertilizer sector, applicable both to nitrogen fertilizer manufacturing and potash production

[5] Canada's Carbon Management Strategy, 2023

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facilities. However, there are no commercially available SMR technologies currently available as they remain in demonstration phase (TRL 6). The regulatory and permitting timelines alone are expected to be upwards of 10 years, in addition to public and stakeholder engagement. Further, given the early stages of this technology, SMR is expected to face challenges in building a skilled labour workforce, and establishing reliability in the required infrastructure and supply chain.

While decarbonization solutions are often site-specific, many heavy industries are looking to technologies such as CCS / CCUS as a viable interim solution for meeting emission reduction targets, which puts significant pressure on the skilled workforce and labour availability of an emerging and quickly growing industry. As noted in the International CCS Knowledge Centre's publication, estimates from the CER supporting documentation indicate that upwards of 35 per cent of current emitting units (an estimated 40 projects) will implement CCS to meet the CER requirements.[6] In combination with pressures from other sectors and international incentives, this is expected to result in dramatic demand spikes for skilled labour and supply chain bottlenecks and delays. For example, critical equipment such as electrical transformers are already experiencing significant supply chain delays of up to three years or more. There are other trade-related factors that could limit the options that companies have when sourcing critical equipment. For example, the Canada International Trade Tribunal has provisions in place to protect against "dumping" from competing jurisdictions that are producing equipment at a much lower price. Even if another jurisdiction is able to offer equipment sooner than a Canadian supplier, companies could be subject to these trade policies effectively setting a tariff after purchase that would disincentivize purchase from competing jurisdictions.

We appreciate that ECCC has designed the proposed Regulations to avoid unintended consequences to industrial "behind-the-fence" electricity generation. Co-generation or self-generation of electricity is an effective way for steam-dependent industries, like fertilizer production, to increase efficiency and reduce carbon emissions. Industrial co-generation is critical to Canada's fertilizer sector, providing safe, reliable and efficient baseload power while providing industrial heat that is critical to our facility's processes. Some of our members have already made significant investments to implement co-generation technologies at their facilities to reduce their environmental footprint and utilize this energy to produce cleaner electricity on site, particularly in jurisdictions like Alberta and Saskatchewan where the electricity grid has a higher carbon intensity.

Of note, a facility that is a net importer from the grid that also has co-generation could potentially be a net exporter if there are emergency circumstances necessitating a facility to shed load to the grid. The calculus of "net exporter" becomes critical from this standpoint and requires significantly more clarity.

As found in our recent Technology Roadmap study[7],co-generation is one of the five most promising "step change" decarbonization technologies that can meaningfully reduce emissions in our industry. While co-generation technologies come at a high capital cost, they are commercially available and can be implemented in a much shorter time frame than many of the other decarbonization technology

[6] https://ccsknowledge.com/pub/CCUS%20&%20Clean%20Electricity%20Regulations%20Review.pdf
[7] GHG Emission Reductions in the Canadian Fertilizer Production Sector, WSP (2023), available here: https://fertilizercanada.ca/wp-content/uploads/2023/10/Technology-Roadmap-Study-Final.pdf

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options such as CCS. Co-generation units can achieve efficiencies of over 80 percent, compared to 50 percent for conventional technologies with grid-supplied electricity and an on-site boiler.

Based on our review of the industrial co-generation provisions, we understand that industrial co-generation units operating "behind the fence" that are not typically net exporters to the regulated NERC electricity system would not be required to meet the CER performance standard. We again recommend ECCC consider increasing the exemption threshold to 50 MW to offer more flexibility for current and future co-generation units. As recognized in the RIAS sensitivity analysis, typically, larger units are more efficient than smaller units, and we would not want a 25 MW threshold to incentivize multiple smaller units configured separately rather than a more efficient, integrated co-generation approach.

Some of our members also rely on power and industrial heat from co-generation units that are over a shared fence-line, are significantly above the 25 MW threshold, and connected to the NERC grid. Our understanding is that the regulatory performance threshold would apply to these units. This is creating uncertainty around continued access to reliable power and industrial heat from these units, which has been established through long-standing (20+ years) agreements. Our members are examining all options to mitigate price volatility and availability concerns. If these existing co-generation units were to shut down due to the CER performance standard, the fertilizer facilities that currently rely on them would need to install new boilers to replace the heat imported from the co-generation units, which could result in a net increase in emissions. The associated cost impacts would include capital expenditures, in addition to increased power costs to replace current contracts with co-generation operators.

We would like clarification on the following:

- If a co-generation unit is tied into the NERC-grid but is not a net exporter, verify that it would be exempt from the CER performance standard; and confirm the nature of the reporting and audit requirements for various scenarios (e.g. if a unit reports one year due to net exports, will it be required to file a report in all subsequent years?)
- Confirm industry-specific scenarios with multiple units <25 MW in various configurations to confirm treatment as separate units under the threshold.

The RIAS signals that "behind-the-fence units will need to be addressed as Canada moves to a net-zero economy in 2050". Can ECCC provide more information on this intent?

Recommendations:

- *Ensure the CER design continues to allow co-generation at industrial operations, and does not overlap, interfere with, or duplicate regulatory requirements of federal and provincial OBPSs. Currently, emissions from industrial co-generation are already captured under federal and provincial OBPSs. We recommend that existing co-generation facilities (commissioned on or before January 1, 2025) that are captured by the CER be afforded an extended timeline to 2050 to meet the CER performance standard.*
- *Consider expanding the scope of industrial co-generation exemptions to recognize existing co-generation units that have direct links to industrial facilities through shared fence-lines, rather*

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than restricting them to only "behind the fence" units. This could be used to better reflect the diversity in facilities that have multiple units over a broader geography.

- *Increase the exemption threshold to 50 MW to offer more flexibility for current and future industrial co-generation units, and align with the OBPS Regulations 50 MW threshold.*
- *Ensure that behind-the-fence units remain exempt where covered under existing federal or provincial OBPS.*
- *Provide a clear description of how "net exporter" is calculated and defined, and consider providing an exemption for net exports during emergency circumstances.*

Regulatory Analysis:

Benefits and costs:

The costs attributed to technology adoption in the cost benefit distribution analysis is flawed. The capital costs required to implement CCS are likely not properly attributed to pre- vs. post-combustion technologies, and will be more likely to mirror costs of CCS retrofits on coal-based facilities. In the RIAS, the total capital cost of natural gas generation equipped with CCS (new build, and retrofits) is $1B. The cost of implementing CCS on Boundary Dam alone was $800M, estimated to be $105/tCO2e by the Global CCS Institute[8]. Shell Quest is another commercial-scale project, implementing carbon capture (on process emissions), storage and transportation, with a total capital cost of $1.35B[9]; however, the Government of Alberta has since estimated these costs would be 20-30 percent reduced if built today. Industries looking to CCS/CCUS as a decarbonization technology are further challenged by timelines for project approvals and implementation, as well as the limited access to a skilled workforce as many sectors look to the same new and emerging technologies in the same timeframes to meet net-zero targets.

Distributional analysis:

Fertilizer Canada and our member companies have significant concerns with the cost distribution analysis that was conducted for the proposed CER.

While the RIAS includes a provincial and regional assessment of projected rate increases and calls out affordability concerns in Atlantic provinces, it fails to identify and quantify the projected impacts to electricity users in other provinces. The cost distribution does not appear to adequately capture the true costs of transitioning to a net-zero grid, minimizing the capital investments needed for electricity suppliers to implement decarbonization technologies on existing fossil fuel-based generators, add new renewable capacity, etc. This all appears to be discounted as costs that "would have to happen anyway" to maintain and upgrade current electricity infrastructure. For example, the current E01 Standard energy charge rate in Saskatchewan is $0.14895/kWh[10]. The projection given in the RIAS of a $0.009/kWh price increase at peak represents a 6 percent rate increase over current prices (represented as a 3 percent increase from baseline), which is far from the signals from electricity

[8] Technology Readiness and Costs of CCS, Global CCS Institute (2021), available here: https://www.globalccsinstitute.com/wp-content/uploads/2021/03/Technology-Readiness-and-Costs-for-CCS-2021-1.pdf

[9] Quest Carbon Capture and Storage (sencanada.ca)

[10] https://www.saskpower.com/Accounts/Power-Rates/Power-Supply-Rates

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generators suggesting a 100 percent increase over the next decade. Similarly, the RIAS modelling estimates only a $0.012/kWh rate increase in Alberta, representing a 5 per cent increase from baseline.

The RIAS calculates costs for implementing the CER at $73.6B over the course of 27 years through to 2050, including $53.7B in capital costs to the electricity generation sector. However, the vast majority of the infrastructure and investment to meet the CER would have to be implemented in the next 11 years by 2035 to meet the performance standard. Ultimately, these costs are passed on to and borne by the electricity users, and we anticipate a disproportionate impact in provinces such as Saskatchewan and Alberta. In the RIAS, over 44 percent of the total capital cost expenditure is anticipated to be spent in Saskatchewan and Alberta alone. Our facilities are large industrial consumers of power in these provinces, and as price-takers in a global fertilizer market, our members are required to absorb the increased electricity costs, on top of the increasing carbon price under the federal OBPS, further eroding competitiveness for our Canadian manufacturing and production sector.

Fertilizer Canada would also like some clarification on the cost modelling for inter-provincial interties. The RIAS indicates that interties between Saskatchewan and Manitoba are included in the baseline scenario. Can ECCC provide clarification on the capacity associated with that intertie?

Recommendation: ECCC conduct a specific, targeted, and transparent assessment on the true costs anticipated to be required to facilitate this transition, as well as a broader cumulative effects analysis including regional impacts to hardest-hit provinces. We recommend this analysis would include:

- *Direct engagement and consultation with all provinces with respect to industrial electricity use, cost impacts, and demand projections. In particular, regional impact assessments in the hardest-hit provinces including Saskatchewan and Alberta should include industrial electricity use and cost impacts resulting from both the existing federal/provincial OBPS and proposed CER.*
- *Direct engagement and consultation with industry to provide transparency into the inputs and assumptions used to model the capital associated with implementing the necessary technologies to meet the CER requirements, including capital expenditures for each technology on a $ / MW basis. This should also include costs allocated to inter-provincial interconnectivity requirements. While the CER regulatory performance threshold is not set to be in place until 2035 and beyond, the burden of costs to electricity generators (and their downstream customers) will be borne before then as they make the significant capital investments required to decarbonize.*
- *A **cumulative effects analysis** on industrial power consumers, including fertilizer producers and manufacturers, modelling the additive effects of direct and indirect costs from federal environmental regulations (including pass-down costs from Scope 2 emissions) with the proposed CER.*
- *An analysis on impacts from the CER to **competitiveness and carbon leakage** risk to all EITE sectors, including nitrogen fertilizer manufacturing and potash fertilizer production. The RIAS for the OBPS Regulations in 2018/2019 did not include the pass-through from the electricity sector through industrial electricity use in their cost benefit analysis, and the more recent RIAS only accounted for the amendments to the OBPS.*

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- *An assessment of the anticipated timelines and feasibility for Finance Canada's subsidy/incentive measures to effectively support the transition to net-zero electricity (e.g. Clean Electricity ITC).*

Sensitivity analysis:
The fertilizer sector in Canada is dependent on access to reliable and abundant sources of clean electricity to effectively implement decarbonization technologies in the coming decades. However, a net-zero electricity grid will do nothing for our sector unless it is affordable. Our members' companies produce and manufacture critical minerals and fertilizers in a competitive global market, and are unable to pass down compliance costs. If electricity costs increase significantly, that erodes our competitiveness and further inhibits the necessary investment in Canada's fertilizer industry to decarbonize.

Fertilizer Canada and its members have reviewed the electricity demand projects and associated sensitivity analysis that was presented as part of the cost benefit analysis. We are concerned that this analysis downplays the growth projection of clean electricity demand over the coming decades as many sectors – across industry but also in the transportation and housing sectors - make step-change shifts towards electrification and technologies that are dependent on large volumes of clean electricity.

There appears to be a misunderstanding of how electrification across sectors will impact peak electricity demand across residential, commercial and industrial sectors. We are concerned the growth demand projections do not accurately reflect this given the stringency of the peaking provisions proposed. We want to emphasize that the 2.5x growth projection is a much more realistic threshold to use in the analysis of the cost distribution. Recognizing this, we recommend that the sensitivity analysis that was conducted at the 2.5x growth projection is expanded to include a regional / provincial cost benefit distribution analysis. For example, Alberta and Saskatchewan are already going to need significant investment compared to other provinces just to meet the CER, but if growth in electricity demand is also intensified in these jurisdictions compared to the national average, the impacts are additive.

Fertilizer Canada's recently completed Technology Roadmap Study identifies five "step-change" technologies that have the potential to meaningfully reduce sector emissions. Certain technologies, such as Hydrogen Production through Electrolysis, and Electrification of potash mine fleets, are highly dependent on a clean, reliable electricity grid.

Hydrogen production through electrolysis is a decarbonization technology available to ammonia manufacturers, either through production on site or through purchase of clean hydrogen from a third-party. The process of producing hydrogen through electrolysis has high electricity needs, and the carbon intensity of the ammonia produced is dependent on the carbon intensity of the electricity source. From our Technology Roadmap study[11], the electricity consumption for hydrolysis requires 55 kWh of electricity to produce 1 kg of hydrogen. As a hypothetical example, if all current ammonia production

[11] GHG Emission Reductions in the Canadian Fertilizer Production Sector (2023), available here: https://fertilizercanada.ca/wp-content/uploads/2023/10/Technology-Roadmap-Study-Final.pdf

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capacity in Canada (4.8 million tonnes) was converted to a clean Hydrogen feedstock produced via electrolysis, the clean electricity capacity required for that production alone would be approximately 21,000 MW. By comparison the current power grid capacity of Alberta is 16,000 MW.

Our Technology Roadmap Study also analyses the capacity of mine fleet electrification to reduce GHG emissions at potash conventional mines. The technology is not yet available for many of the heavy-duty mine vehicles, but looking ahead in the next decade there would be increased demand for a low-carbon intensity electricity grid in Saskatchewan to maximize benefits of mine fleet electrification.

Some facilities may also have the option of electrifying large rotating equipment (e.g. compressors) which are currently run on steam. Again, this is only an option if there is affordable, clean, reliable electricity.

Implementation, compliance and enforcement, and service standards:

While the regulatory development process for the proposed CER has stretched out over several years, the January 1, 2035 timeline for the performance standard coming into force has remained static. We anticipate electricity generators will have challenges meeting environmental permitting and regulatory requirements over the next 12 years until 2035 to build out additional capacity and retrofit existing capacity to meet the performance standard.