



Welcome to  
Calgary Renewable Energy Meetup  
November 18, 2023

# Do Alberta Renewables need a Midcourse Correction?

*Presentation by Ken Hogg M.Eng., P.Eng.*

*Founder*

*Alberta Renewable Energy Alliance*



# Midcourse Correction to Where?



# the Goal is **Net Zero Electricity**

## Agreement on:

- Reliable
- Affordable
- Clean / Decarbonized / Net Zero

## But By When?

- 2050 ?
- 2035 ?



# Renewable Moratorium Module A

## November 22 deadline is a redirection

AESO favours gas powered generation due to reliability

AESO does not acknowledge 'clean' power

AESO does not acknowledge fugitive methane in natural gas

And what about pending Federal CER (Clean Electricity Regulations)

draft CER came out in August 2023



# The AUC MATRIX on Module A

Inquiry Questionnaire on Renewables



# What are the Matrix Questions ?

## Module A

- Answers to questions on land impact are due November 22

## Module B

- Questions on system reliability are pending

All Reports due by February 29

# Scope of the AUC's inquiry

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The inquiry will be separated into two modules (Module A and Module B) to explore the key issues identified in the Alberta government's order-in-council. The AUC issued a [notice](#) on October 3, 2023, outlining the process for Module A.

Module A will explore the land impact issues identified in the Alberta government's order-in-council, including the role of municipal governments and more specifically the following:

1. Considerations on development of power plants on specific types or classes of agricultural or environmental land.
2. Considerations of the impact of power plant development on Alberta's pristine viewscapes.
3. Considerations of implementing mandatory reclamation security requirements for power plants.
4. Considerations for development of power plants on lands held by the Crown in Right of Alberta.

Module B will consider the impact the increasing growth of renewables has to both generation supply mix and electricity system reliability.

# A few examples of AUC Module A Questionnaire

» AUC Matrix Submission Response Template

## HAVE YOUR SAY

As part of the ongoing Government of Alberta moratorium on renewable power plants, the Alberta Utility Commission is undertaking public consultation regarding power plant developments in Alberta. They have an online matrix available for Albertans to make comments on **before November 22, 2023**.

Please take a minute to complete this matrix utilizing our template responses below, and also continue to use our template letters to tell the Government of Alberta that this consultation can take place without a moratorium on renewable power plants.

Please note that all submissions to the AUC will be made public.

**1.1 SHOULD ALBERTA IMPOSE MANDATORY RECLAMATION SECURITY REQUIREMENTS ON ALL TYPES OF POWER PLANTS?**

**1.2 DO PRIVATE CONTRACTS BETWEEN PROJECT OWNERS AND LANDOWNERS PROVIDE A SUFFICIENT LEVEL OF RECLAMATION SECURITY? SHOULD PRIVATE CONTRACTS BETWEEN PROJECT OWNERS AND LANDOWNERS REGARDING RECLAMATION SECURITY BE STANDARDIZED?**

**1.3 IF NEW SECURITY REQUIREMENTS ARE IMPOSED, SHOULD THEY ONLY APPLY ON A GO-FORWARD BASIS TO NEW PROJECTS, OR SHOULD THEY ALSO APPLY TO EXISTING AND APPROVED PROJECTS?**

**1.4 WHAT TYPE OF SECURITY SHOULD BE REQUIRED (E.G., CASH,**




# Module A questions redirect from the importance of a *low carbon* grid



- AUC First sought comments on the moratorium from everyone
- Posted those submissions (600 pages of those comments)
- Added the Matrix Module A questionnaire due Nov 22
- Nov. 10 Posted four expert reports on Module A (not Module B)

Name

 Dr. Colin Mackie - Design of a Reclamation Security Program

 Ecoventure Inc - Decommissioning and Reclamation

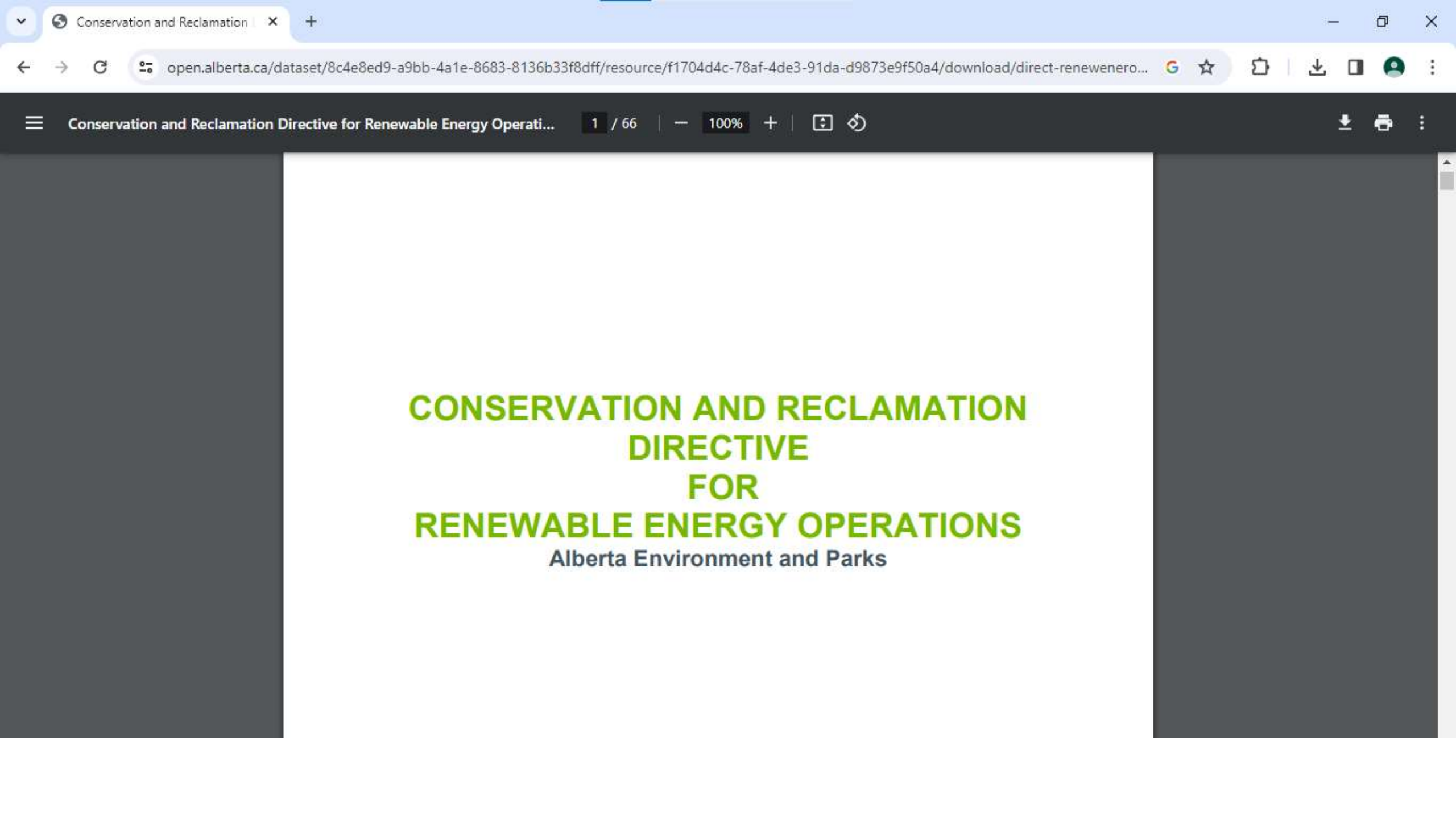
 Nichols Applied Management Inc. - Impact of Power Plant Development on Viewscapes

 Tannas Conservation Services Ltd. - Agricultural Land Analysis

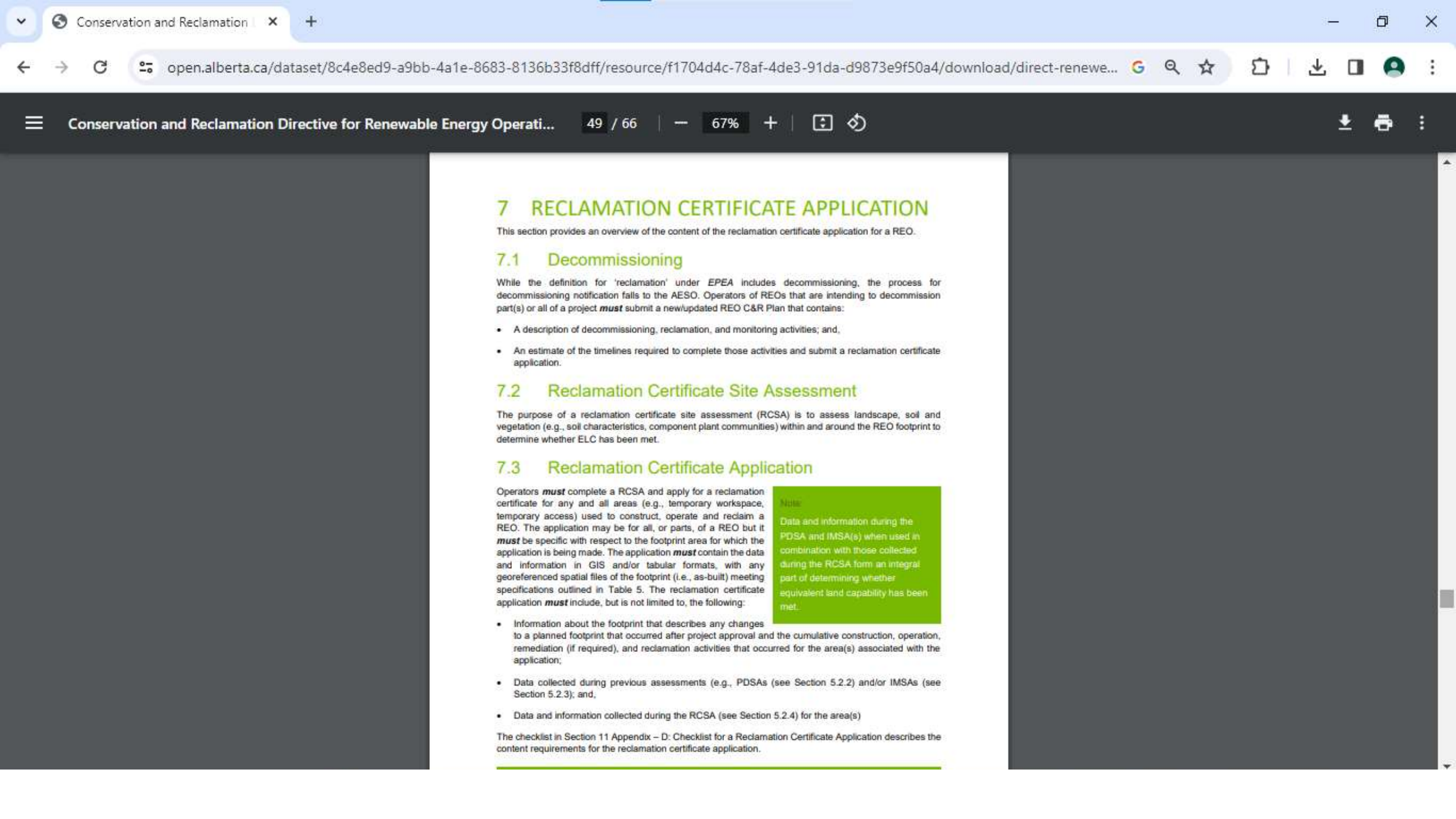


But Alberta already has  
Guidelines for  
Renewable Energy  
Operations  
promulgated  
September 14, 2018  
by the NDP  
Alberta Environment  
and Parks

A screenshot of the Alberta Government Open Government Publications website. The browser address bar shows "open.alberta.ca/publications/9781460141359". The page header includes the "Alberta Government" logo and a search bar. Below the header, there are navigation links for "Resources" and "Interact", and sub-links for "Open Data", "Publications", and "Documentation". A breadcrumb trail reads "HOME / OPEN GOVERNMENT / PUBLICATIONS". Social media icons for Facebook, Twitter, LinkedIn, Email, and RSS are visible. The main content area features a red-bordered box around the title "PUBLICATIONS Conservation and reclamation directive for renewable energy operations". Below this, there are tabs for "Summary" and "Detailed information". The "Summary" tab is active, showing a "DESCRIPTION" that outlines conservation and reclamation requirements for renewable energy operations (wind, solar, and geothermal) producing renewable electricity. It also shows the "UPDATED" date as "September 14, 2018" and a list of "TAGS" including "conservation", "land reclamation", "reclamation", "renewable energies", and "renewable energy operations". A "RESOURCES" section contains a link to the document. At the bottom, there are buttons for "MORE INFORMATION" and "DOWNLOAD", and a "DOWNLOADS: 13/17" indicator.



**CONSERVATION AND RECLAMATION  
DIRECTIVE  
FOR  
RENEWABLE ENERGY OPERATIONS**  
Alberta Environment and Parks



## 7 RECLAMATION CERTIFICATE APPLICATION

This section provides an overview of the content of the reclamation certificate application for a REO.

### 7.1 Decommissioning

While the definition for 'reclamation' under *EPEA* includes decommissioning, the process for decommissioning notification falls to the AESO. Operators of REOs that are intending to decommission part(s) or all of a project **must** submit a new/updated REO C&R Plan that contains:

- A description of decommissioning, reclamation, and monitoring activities; and,
- An estimate of the timelines required to complete those activities and submit a reclamation certificate application.

### 7.2 Reclamation Certificate Site Assessment

The purpose of a reclamation certificate site assessment (RCSA) is to assess landscape, soil and vegetation (e.g., soil characteristics, component plant communities) within and around the REO footprint to determine whether ELC has been met.

### 7.3 Reclamation Certificate Application

Operators **must** complete a RCSA and apply for a reclamation certificate for any and all areas (e.g., temporary workspace, temporary access) used to construct, operate and reclaim a REO. The application may be for all, or parts, of a REO but it **must** be specific with respect to the footprint area for which the application is being made. The application **must** contain the data and information in GIS and/or tabular formats, with any georeferenced spatial files of the footprint (i.e., as-built) meeting specifications outlined in Table 5. The reclamation certificate application **must** include, but is not limited to, the following:

**Note**  
Data and information during the PDSA and IMSA(s) when used in combination with those collected during the RCSA form an integral part of determining whether equivalent land capability has been met.

- Information about the footprint that describes any changes to a planned footprint that occurred after project approval and the cumulative construction, operation, remediation (if required), and reclamation activities that occurred for the area(s) associated with the application;
- Data collected during previous assessments (e.g., PDSAs (see Section 5.2.2) and/or IMSAs (see Section 5.2.3); and,
- Data and information collected during the RCSA (see Section 5.2.4) for the area(s)

The checklist in Section 11 Appendix – D: Checklist for a Reclamation Certificate Application describes the content requirements for the reclamation certificate application.



# 2018 Comprehensive Directive on Renewable Generation

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# Module A questions redirect from the importance of a *low carbon grid*



- **Module B** will have the question on **GRID RELIABILITY**
- **BUT WHAT ABOUT A ‘CLEAN’ LOW CARBON GRID ? !**
- **AESO’s SCARE ABOUT FREEZING IN THE DARK IS DISENGENOUS**
  
- Example of no acknowledgement of need for emission reduction:
- Kineticor Cascade 900 MW CCGT
- Approved quickly with no stringent GHG emission controls
- close to commissioning 2024



The federal government's proposed [Clean Electricity Regulations](#) (CER) unfairly disadvantage Alberta and impose an unfeasible timeline to decarbonize the province's power system, says the operator of Alberta's electricity grid.

The CER as it's written now will lead to higher energy costs for Alberta consumers and businesses and the risk of "brownouts," or temporary electricity shortages, in parts of the province, the Alberta Electric System Operator (AESO) said in [media briefing](#) last week.



This warning of brownouts due to a clean grid is disingenuous

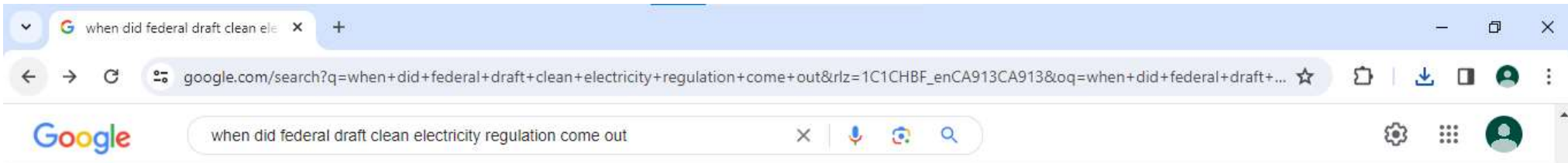
Michael Law (*photo at right*), chief executive of the AESO, told reporters the CER's binding requirements and conditions to transition to a carbon-neutral electrical grid by 2035 aren't feasible and will cost about \$118 billion more than Alberta's goal to decarbonize by 2050.

"Our analysis and engineering assessment is that there will not be sufficient supply [of electricity] in the province post-2035 to meet the demands of the province," Law said.

Alberta relies on natural gas-fired power generation for baseload power and to meet peak power demands, with 72 per cent of the province's electricity provided by gas-fired power last year, he said. The remaining coal-fired power, amounting to 12 per cent, is to be phased out early next



<https://www.alberta.ca/system/files/epa-government-of-alberta-submission-on-draft-federal-electricity-regulations.pdf>



**Alberta**  
<https://www.alberta.ca/system/files/epa-go...>

**Government of Alberta Submission to ...**  
Nov 3, 2023 — This ruling should have resulted in ECCC pausing all work on the **federal electricity regulations ... Federal Draft Clean Electricity Regulations** — ...

**Environmental Defence**  
<https://environmentaldefence.ca/2023/08/10/statem...>

**Statement on the Federal Government's Draft Clean ...**  
Aug 10, 2023 — The first **draft** of the **Clean Electricity Regulations**, released today, will deliver significant emissions reductions.

**BNN Bloomberg**  
<https://www.bnnbloomberg.ca/federal-government-r...>

**Federal government releases new draft regulations on ...**  
Aug 10, 2023 — The government **has** set a target of making the **electricity** grid net-zero by 2035, and the **regulations** are meant to help guide the way. The ...

**McCarthy Tétrault**  
<https://www.mccarthy.ca/canadian-energy-perspectives>

**Canada Releases Vision for Transforming Electricity Sector ...**

This is the **only** 'public' indication of Rebecca Schulz's November 3, 2023 letter to Steven Guilbeault



# November 3, 2023 UCP comments on CER

[alberta.ca/system/files/epa-government-of-alberta-submission-on-draft-federal-electricity-regulations.pdf](https://alberta.ca/system/files/epa-government-of-alberta-submission-on-draft-federal-electricity-regulations.pdf)

ELECTRICITY

By [rdnewsNOW](#) Staff

## Alberta government responds to federal electricity regulations

Nov 3, 2023 | 4:27 PM

Alberta's government says it has submitted a detailed analysis showing why proposed federal regulations will threaten the province's electricity grid.

Provincial officials say Alberta is rapidly reducing emissions and targeting a carbon-neutral grid by 2050. The government says electricity emissions have declined by 53 per cent since 2005 and the province will have phased out all coal generation by early 2024.

However, in August, the federal government released its draft Clean Electricity Regulations, which the Alberta government says proposes rigid rules to try and achieve net-zero electricity by 2035.

## Federal Draft Clean Electricity Regulations

Government of Alberta Technical Submission





ALBERTA

ENVIRONMENT AND PROTECTED AREAS

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*Office of the Minister*

Dear Minister Guilbeault:

In no way does the attached technical submission alter Alberta's position that the draft regulations are unconstitutional. Legislating and regulating the development of electricity explicitly falls within the jurisdiction of the provinces as per the *Constitution Act, 1867* (92A (1) (c)). The responsibility to power Alberta's electricity grid is the province's exclusive area of jurisdiction.

I would also encourage you to carefully review the October 13, 2023, Supreme Court of Canada ruling on the *Impact Assessment Act*. This ruling confirms the unconstitutionality of the federal government's ongoing efforts to interfere with electricity and natural resource sectors of all provinces. This ruling should have resulted in ECCC pausing all work on the federal electricity regulations – it is disappointing to see the federal government disregard this decision and continue with these regulations.



Our technical submission will outline the severe consequences that your electricity regulations will impose on Albertans. In Alberta, your regulations will increase power bills, lead to job losses, compromise the grid, and impose health and safety risks when blackouts occur. The federal electricity regulations are simply unworkable and I encourage you to scrap them entirely, before it is too late.

Instead of pursuing these flawed and unworkable regulations, I would encourage you to endorse Alberta's approach. Our plan will work to achieve carbon neutrality by 2050, while maintaining energy affordability and reliability.

The attached technical submission outlines key information and evidence supporting Alberta's position, including:

1. Alberta's plan and approach to achieve carbon neutrality by 2050 while maintaining energy affordability and reliability, and lessons learned from Alberta's significant reduction in emissions from the electricity sector;
2. Comprehensive list of flaws with the federal electricity regulations;
3. List of concerns related to faulty and inadequate federal modelling and impact assessments; and
4. Failure of the federal government to offer adequate funding in reducing emissions.

As when we first met, I'll reiterate that this is a time to put politics aside and use common sense as we look to ensure affordable and reliable electricity and energy for Canadians. This is why we entered bilateral discussions with your government in good faith.

Alberta is confident that the many of issues raised in this document are shared by other provinces and industry leaders, both within the electricity sector and beyond. We sincerely hope that the federal government responds to this evidence with the only reasonable course: completely scrapping the federal electricity regulations.

Sincerely,

A handwritten signature in black ink, appearing to read "Rebecca Schulz". The signature is fluid and cursive, with the first name "Rebecca" written in a larger, more prominent script than the last name "Schulz".

Rebecca Schulz  
Minister of Environment and Protected Areas

cc: Honourable Danielle Smith, Premier  
Honourable Nathan Neudorf, Minister, Alberta Affordability and Utilities  
Paul Wynnyk, Deputy Minister, Alberta Intergovernmental Relations  
Kasha Piquette, Deputy Minister, Alberta Environment and Protected Areas  
Tim Grant, Deputy Minister, Alberta Affordability and Utilities  
Kate Rich, ADM, Policy, Alberta Environment and Protected Areas  
Andrew Buffin, ADM, Utilities, Alberta Affordability and Utilities



# Nov. 3, 2023 submission from Minister Rebecca Schulz on draft CER

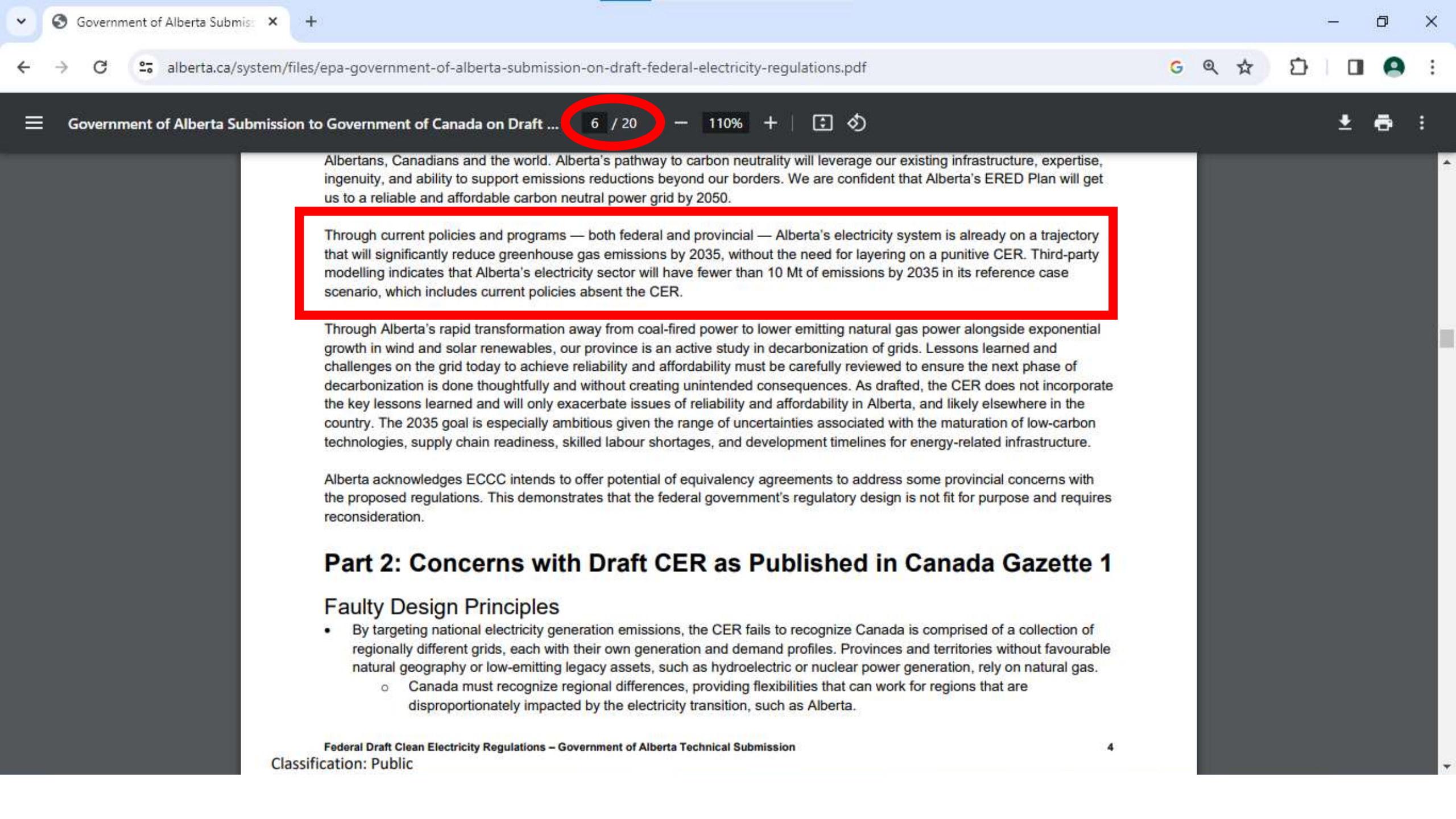
20 page dissertation on  
Alberta's Emission  
Reduction Plan

Concerns with draft CER

AESOs Analysis

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Albertans, Canadians and the world. Alberta's pathway to carbon neutrality will leverage our existing infrastructure, expertise, ingenuity, and ability to support emissions reductions beyond our borders. We are confident that Alberta's ERED Plan will get us to a reliable and affordable carbon neutral power grid by 2050.

Through current policies and programs — both federal and provincial — Alberta's electricity system is already on a trajectory that will significantly reduce greenhouse gas emissions by 2035, without the need for layering on a punitive CER. Third-party modelling indicates that Alberta's electricity sector will have fewer than 10 Mt of emissions by 2035 in its reference case scenario, which includes current policies absent the CER.

Through Alberta's rapid transformation away from coal-fired power to lower emitting natural gas power alongside exponential growth in wind and solar renewables, our province is an active study in decarbonization of grids. Lessons learned and challenges on the grid today to achieve reliability and affordability must be carefully reviewed to ensure the next phase of decarbonization is done thoughtfully and without creating unintended consequences. As drafted, the CER does not incorporate the key lessons learned and will only exacerbate issues of reliability and affordability in Alberta, and likely elsewhere in the country. The 2035 goal is especially ambitious given the range of uncertainties associated with the maturation of low-carbon technologies, supply chain readiness, skilled labour shortages, and development timelines for energy-related infrastructure.

Alberta acknowledges ECCC intends to offer potential of equivalency agreements to address some provincial concerns with the proposed regulations. This demonstrates that the federal government's regulatory design is not fit for purpose and requires reconsideration.

## Part 2: Concerns with Draft CER as Published in Canada Gazette 1

### Faulty Design Principles

- By targeting national electricity generation emissions, the CER fails to recognize Canada is comprised of a collection of regionally different grids, each with their own generation and demand profiles. Provinces and territories without favourable natural geography or low-emitting legacy assets, such as hydroelectric or nuclear power generation, rely on natural gas.
  - Canada must recognize regional differences, providing flexibilities that can work for regions that are disproportionately impacted by the electricity transition, such as Alberta.



- The CER is unnecessarily punitive with jail time for non-compliance.
- **The CER has abandoned the existing efficient, economical, flexible and effective carbon pricing approach to reduce emissions.**

## The Vital Role of Natural Gas Generation in Alberta

- Alberta relies on natural gas baseload, supplemented with intermittent renewable generation and a small amount of hydro and geothermal generation, to provide affordable and reliable power to Albertans. Unlike provinces with abundant hydroelectric resources, Alberta's grid reliability is maintained through natural gas generation to backup and balance intermittent sources of power such as wind and solar.
- This baseload is critical to annual and hourly reliability in Alberta's electricity grid, supplying capacity, frequency, voltage, inertia, and more.
  - The AESO's 2023 [Reliability Requirements Roadmap](https://www.aeso.ca/future-of-electricity/reliability-requirements-roadmap/)<sup>1</sup> notes the decline of coal and natural gas generation at the same time as increased inverter-based wind and solar has created urgent frequency response issues requiring active management and expansion of new services such as fast frequency response. Wind and solar with some battery storage do not contribute to voltage support, which is required to maintain system strength. Real-time balancing of supply and demand is also challenged with the introduction of more intermittent

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<sup>1</sup> <https://www.aeso.ca/future-of-electricity/reliability-requirements-roadmap/>

## Removing 40% of Alberta's Generation by Targeting Industrial Cogeneration

- Both CCUS and hydrogen can maintain roles for natural gas, addressing emission reductions.
- Approximately 40 per cent of the generation in Alberta comes from cogeneration at industrial facilities.
  - Electricity **exported** from these facilities to the grid accounts for approximately 25 per cent of the total grid generation.
  - The availability of reliable and affordable electricity from cogeneration in Alberta is essential to maintaining grid reliability.
  - Industrial cogeneration operators produce electricity as a secondary activity to their primary activity in oil and gas, forestry, petrochemical or other areas. If the CER introduces strictly punitive actions towards their export to the grid, they are likely to reduce or cease all exports. This loss of generation capacity from cogeneration on the Alberta grid would have devastating consequences to reliability and affordability.
- Cogeneration in Alberta is driven by the demand for industrial heat, the demand for which will remain regardless of the implementation of the CER.
  - Should the CER be enforced on cogeneration as drafted, there is a real possibility that industry will opt to replace their cogeneration units with conventional boilers, resulting in poorer emissions performance.
- The CER assumes that all cogeneration that currently provides net electricity to the grid will undertake the necessary modifications to comply with the CER standards. This is a false assumption.
  - The CER policy package is unlikely to drive cogeneration to invest in CCUS and maintain their key supply necessary to maintain reliability.
  - Many cogeneration units are embedded in industrial settings where the physical space required to install CCUS is not available.



# UCP/AESO Reliance on Cogen (page 8 of 20)

1/3 ?

In Alberta, cogeneration currently constitutes over half of our natural gas supply and is critical to maintaining reliable and affordable electricity in the province. Cogeneration provides the lowest greenhouse gas (GHG) intensive baseload power in Alberta, with cogeneration having approximately one-third lower GHG intensity than the most efficient natural gas combined cycle units (370 kg CO<sub>2</sub>e/MWh). This has resulted in cogeneration achieving significant emissions reductions in other sectors, including oil and gas and forestry.

- As such, cogeneration is a critical feature that is unique to Alberta's electricity supply where 40 per cent of electricity generated in Alberta is from cogeneration.
- There is a significant co-benefit of cogeneration to emissions reductions in industrial sectors (e.g., oil and gas, forestry, petrochemical). The CER design should not jeopardize cogeneration in Alberta, nor business competitiveness (generally energy-intensive and trade-exposed industries).
- Moreover, if the cogeneration stops providing electricity to the grid because they choose to for business operation and economic reasons, or if they cannot physically comply, Alberta's reliability is jeopardized.
  - Per AESO modelling, impaired cogeneration could result in 830,000 MWh in 2038 of expected unserved energy.

AREA's July 2023  
comments on cogen  
in Alberta



Welcome to  
Calgary Renewable Energy Meetup  
July 22 ,2023

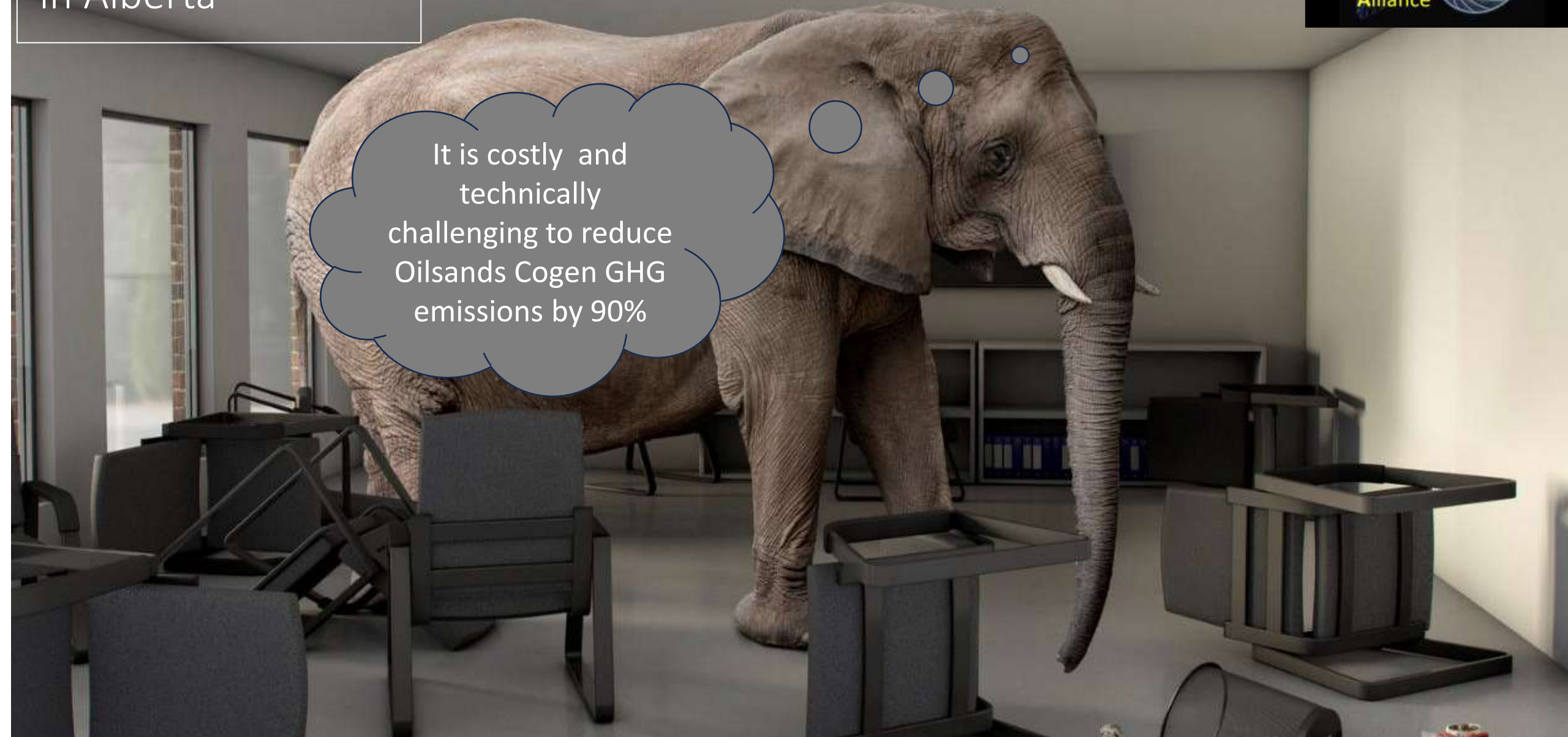
## Net Zero Power in Alberta by 2035 ?

*Presentation by Ken Hogg M.Eng., P.Eng.  
Founder  
Alberta Renewable Energy Alliance*

# AREA's July 2023 comments on cogen in Alberta



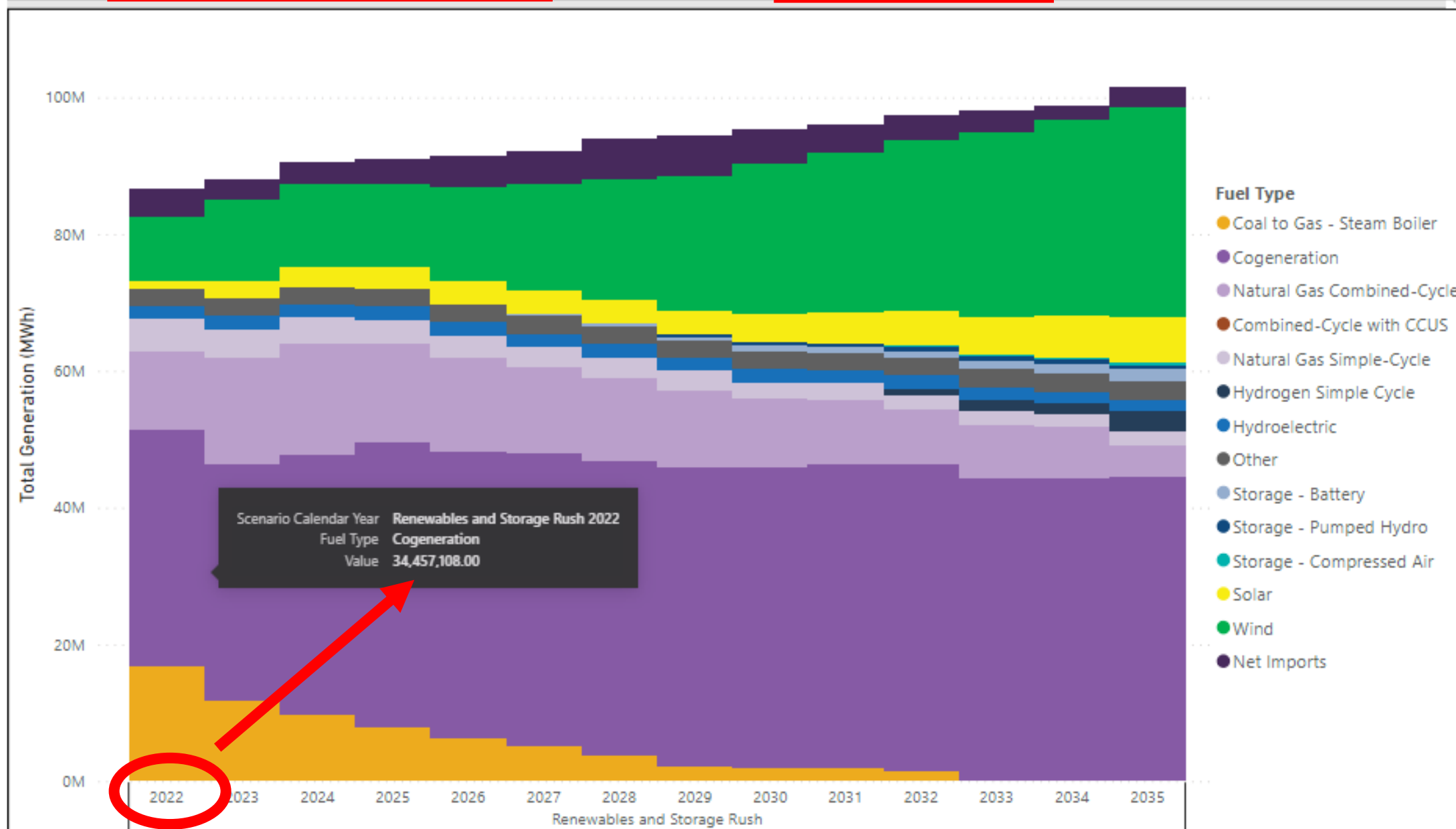
It is costly and technically challenging to reduce Oilsands Cogen GHG emissions by 90%





# AESO 2022 Dashboard

# Total Generation



Scenario

- Select all
- Dispatchable D...
- First Mover Ad...
- Renewables an...

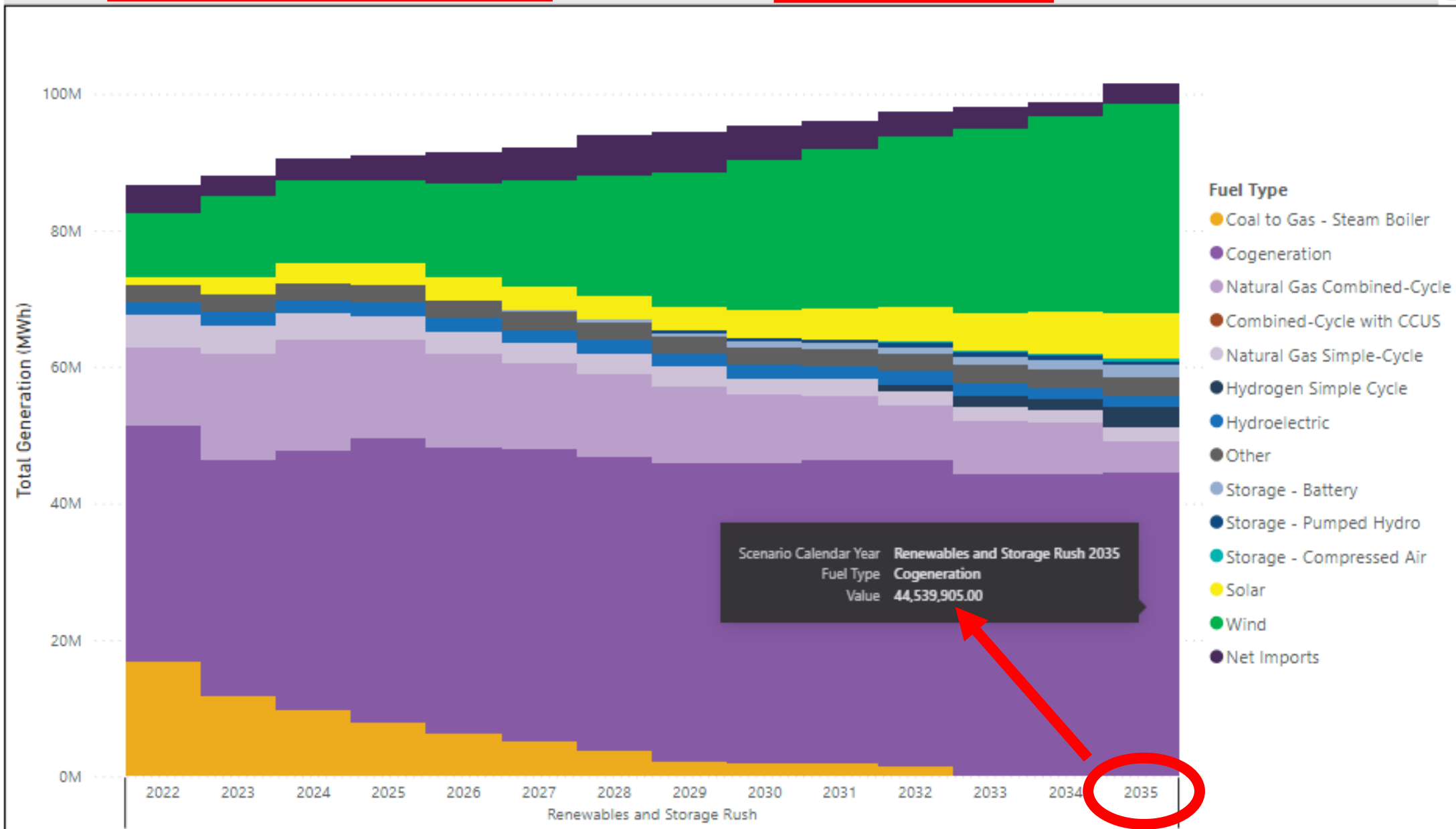
Year

- 2031
- 2032
- 2033
- 2034
- 2035
- 2036
- 2037
- 2038
- 2039
- 2040
- 2041

Note: For storage assets, energy refers to discharged energy outputted by the asset (net of losses). Net imports refers to annual

# AESO 2022 Dashboard

# Total Generation



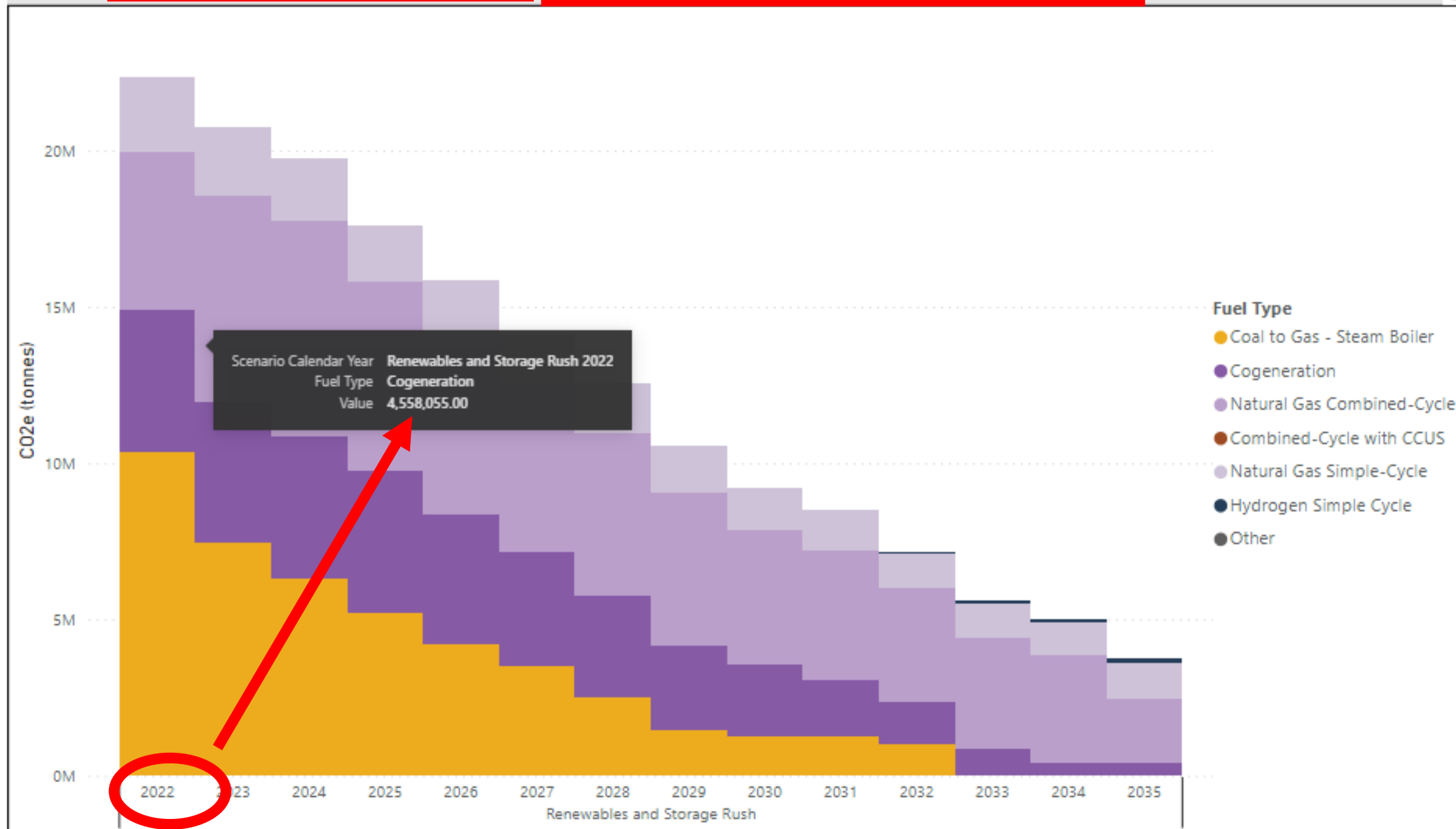
Scenario

- Select all
- Dispatchable D...
- First Mover Ad...
- Renewables an...

Year

- 2031
- 2032
- 2033
- 2034
- 2035
- 2036
- 2037
- 2038
- 2039
- 2040
- 2041

Note: For storage assets, energy refers to discharged energy outputted by the asset (net of losses). Net imports refers to annual



Scenario

- Select all
- Dispatchable D...
- First Mover Ad...
- Renewables an...

Year

- 2032
- 2033
- 2034
- 2035
- 2036
- 2037
- 2038
- 2039
- 2040
- 2041

Note : Emissions for cogeneration are restricted to those cogeneration assets that report their emissions using the NAICS code 221112.

# AESO 2022 Dashboard

# Greenhouse Gas Emissions



Note : Emissions for cogeneration are restricted to those cogeneration assets that report their emissions using the NAICS code 221112.

- Scenario
- Select all
  - Dispatchable D...
  - First Mover Ad...
  - Renewables an...

- Year
- Select all
  - 2022
  - 2023
  - 2024
  - 2025
  - 2026
  - 2027
  - 2028
  - 2029
  - 2030

Note : Emissions for cogeneration are restricted to those cogeneration assets that report their emissions using the NAICS code 221112.



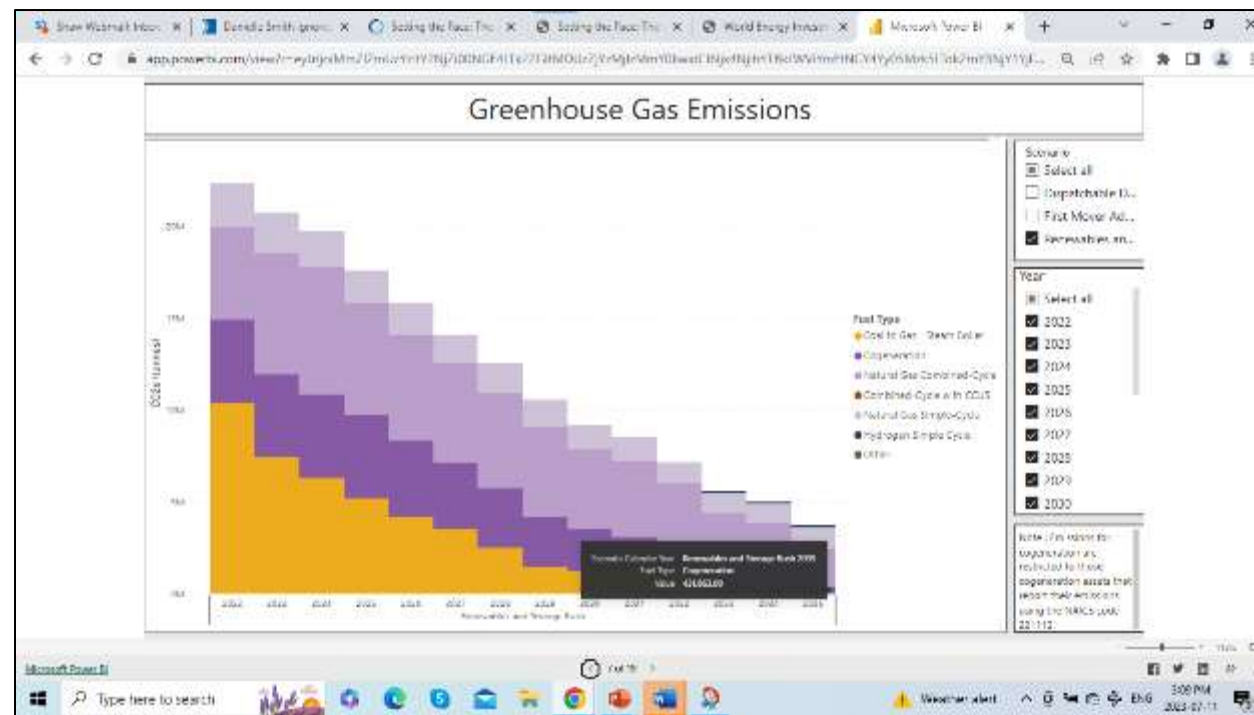
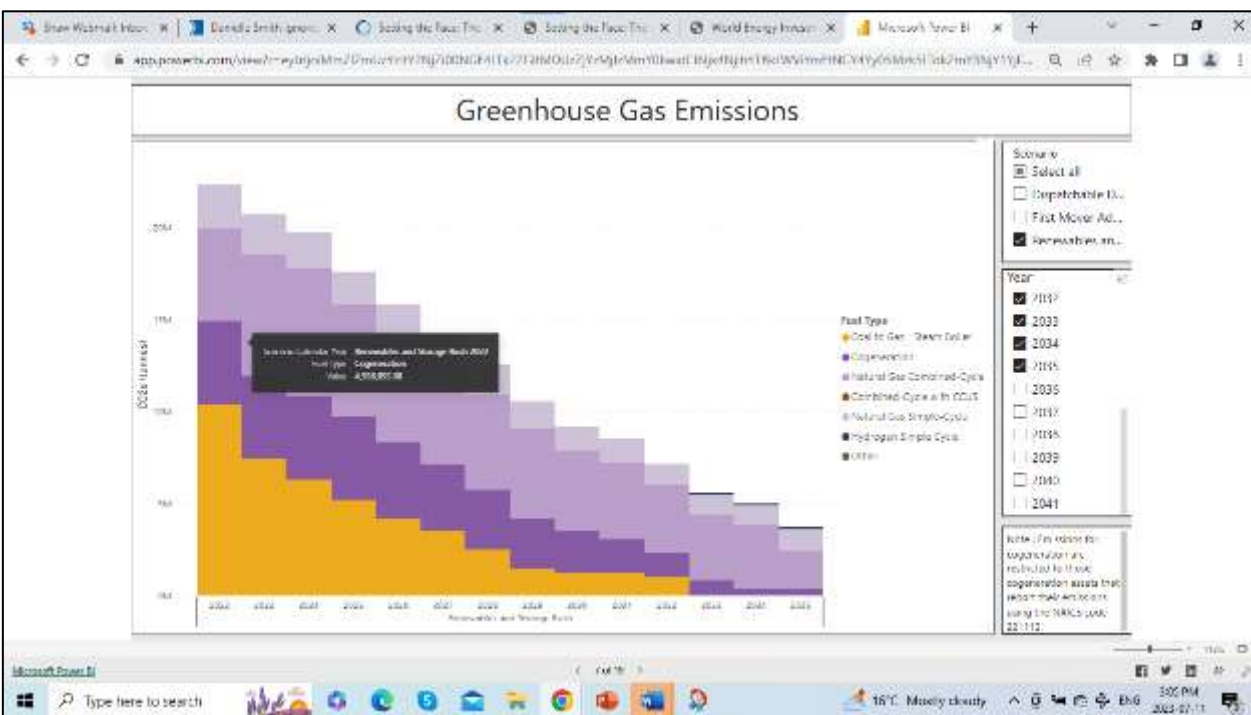
# AESO assumed Cogen GHG emissions 2022 and 2035

**2022**

**4,558,055 tnes CO<sub>2</sub>e**

**2035**

**431,863 tnes CO<sub>2</sub>e**







In the Renewables and Storage Rush Scenario AESO assumed 97% Cogen emission intensity 'improvement'.  
Is this even feasible and at what cost?

2022

2035

- 34,457,108 MWh
- 4,558,055 tnes CO2e
  
- Emission Intensity
  - 0.132 tne CO2e/MWh

- 44,539,905 MWh
- 431,863 tnes CO2e
  
- Emission Intensity
  - 0.0097 tne CO2e/MWh

This is simply WRONG. Even CAPP says cogen emission intensity is 0.25 to 0.30 tne CO2e/MWh. Pembina reports cogen is 0.299 tne CO2e/MWh

# AESO 2022 Assumptions regarding cogen

Cogeneration facilities in Alberta service the oil and gas sector, chemical production sector, pulp and paper industry and various other economic sectors. These facilities typically report greenhouse gas emissions in their primary product categories. The AESO anticipates that governments will take an economy-wide approach to emissions reductions, and that similar greenhouse gas targets will be implemented in sectors other than electric power generation to achieve reduction objectives. It is therefore plausible that pre-combustion and post-combustion carbon sequestration methods will be able to reduce carbon dioxide emissions from cogeneration facilities by 90 per cent.

To the extent that the AESO's scenario emissions forecasts contain physical emissions, the AESO has assumed that remaining emissions may need to use carbon offsets, emissions performance credits, or other regulatory mechanisms that enable net-zero emissions outcomes. However, the AESO also expects that owners of the remaining emitting facilities will explore alternatives to mitigate compliance costs, including CCS retrofits, hydrogen firing or co-firing, and efficiency upgrades. The AESO has not included the estimation of these retrofit alternatives in its cost or emissions forecast due to the complex and unique nature of individual facility constraints and opportunities. Instead, the AESO has estimated the cost of offsets or emissions performance credits, assuming a 15 per cent discount to the price of carbon.

CCUS on cogeneration....

- was conceivable by AESO in 2022
- Is inconceivable by UCP/AESO as of Nov. 3, 2023
  
- So what's the deal?

Where do we go from here?

# Notes from Meetup Discussion

- Await 'revised' draft Federal CER
- Await Federal methane mitigation regulation
- Await AUC Module B questionnaire and/or related expert reports
- Await COP28 outcomes