Central East Transfer-out (CETO) Review | Reaffirmation Study Assumptions

Stakeholder Session

February 23, 2022 v2

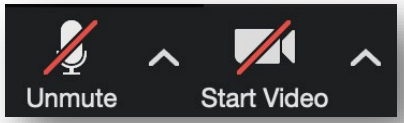
Notice

In accordance with its mandate to operate in the public interest, the AESO will be audio recording this session and making the session recording available to the general public at www.aeso.ca. The accessibility of these discussions is important to ensure the openness and transparency of this AESO process, and to facilitate the participation of stakeholders. Participation in this session is completely voluntary and subject to the terms of this notice.

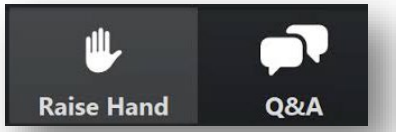
The collection of personal information by the AESO for this session will be used for the purpose of capturing stakeholder input for the Evaluation of MSSC sessions. This information is collected in accordance with Section 33(c) of the *Freedom of Information and Protection of Privacy Act*. If you have any questions or concerns regarding how your information will be handled, please contact the Director, Information and Governance Services at 2500, 330 – 5th Avenue S.W., Calgary, Alberta, T2P 0L4, by telephone at 403-539-2528, or by email at privacy@aeso.ca.

Using Zoom – asking questions

- All attendees join the webinar in listen-only mode. Cameras will be disabled, and microphones muted



- Two options to ask questions via **computer or smartphone**:
  1. Click the "Q&A button" at any time
     - Type your questions into the Q&A window. You're able to up-vote questions that have been already asked
  2. During the Q&A session
     - Click the icon to raise your hand and the host will see that you have raised your hand
     - The host will unmute your microphone and you, in turn, will need to unmute your microphone and then you can ask your question
     - Your name will appear on the screen, but your camera will remain turned off



- To ask questions using a **phone**
  - To raise your hand, on your phone's dial pad, press *9; the host will be notified
  - To toggle between mute and unmute, on your phone's dial pad, press *6

AESO Stakeholder Engagement Framework

Introduction

Session purpose and objectives

- The AESO will conduct a reaffirmation study to provide an updated congestion forecast to confirm if CETO Stage 1 construction should proceed
- Present key assumptions for the reaffirmation study
- Discussion on project need, alternative selection, or other topics in the CETO NID application previously approved by the AUC, are out of scope
- Seek stakeholder feedback on key assumptions by Friday, Feb. 25, 2022 (preferably today)

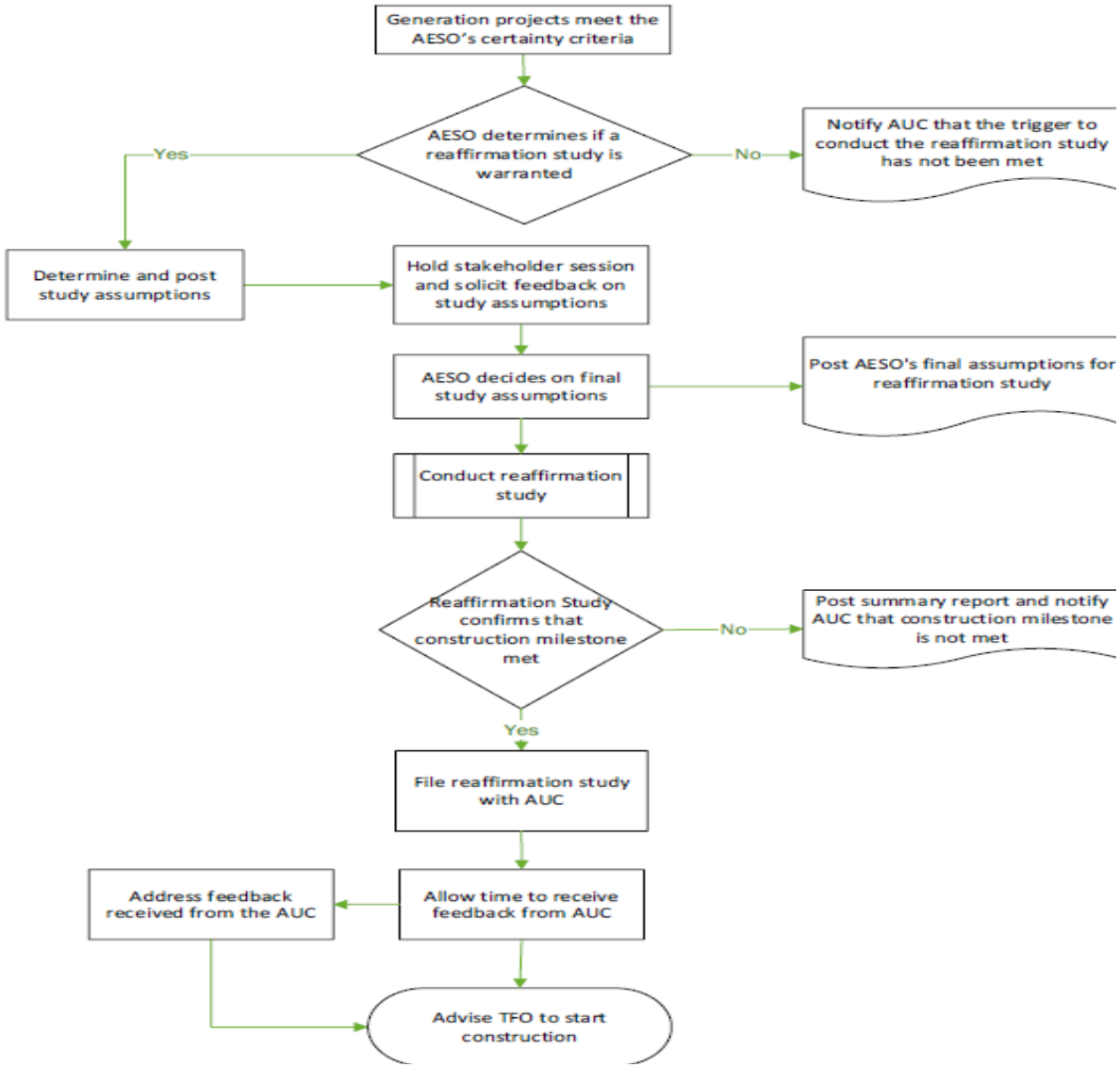
Background for reaffirmation study

- The AESO's Needs Identification Document and the transmission facility owners' Facility Applications were approved by the Alberta Utilities Commission in August 2021

- The CETO milestone upper limit (generation projects met certainty criteria) was reached as of October 2021

- The AESO will perform the reaffirmation study using the most up-to-date information to provide an updated forecast of congestion
  - Process steps will be shown in the next slide

CETO reaffirmation process (as filed)



CETO Reaffirmation Study – Key Assumptions

System assumptions

- Study Area includes Central East (CE) and Southeast (SE)
- Years 2024 and 2030 will be studied
  - The earliest in-service date for CETO is anticipated to be 2024 timeframe
  - Year 2030 will be assessed only when the 2024 study (with sufficiently certain projects) confirms that CETO needs to be triggered
- 2021 Long Term Outlook Reference Case load forecast will be used
  - Five correlated hourly load and renewable profiles
- System project
  - Provost-to-Edgerton and Nilrem-to-Vermillion (PENV) will be included to align with CETO application; sensitivity will be performed without PENV
- Facility ratings

Transmission Line	Voltage Class (kV)	Summer Rating (MVA)	Winter Rating (MVA)
912L	240	507	624
9L20	240	489*	540
174L	138	120	145
701L	138	119	146

*: TCM works required

Thermal generation

- Thermal generation, i.e., Battle River / Sheerness, impacts the potential congestion in the CE transmission system
- The Battle River / Sheerness units have transitioned to gas, and the anticipated retirement year of these units would be 2030 or beyond
- Sensitivity scenario assuming the retirement of all BR/SH units will be considered

Reaffirmation Study

Facility	Capacity (MW)	Scenario 1 (all units in service)		Scenario 2 (all units retired)	
		2024	2030	2024	2030
BR4	155	Dual fuel (peaking)		Retired	
BR5	385	Gas fired steam (peaking)		Retired	
SH1	400	Gas fired steam (peaking)		Retired	
SH2	400	Gas fired steam (peaking)		Retired	

CETO NID

Facility	Capacity	2023	2024	2025	2026	2027	2028	2029
BR3	149	New gas-fired generation Baseload unit						
BR4	155	New gas-fired generation Baseload unit						
BR5	385	Baseload unit						
SH1	400	Baseload unit						
SH2	390	Baseload unit						
Total (MW)	1,479	1,479						

(a) Baseload Scenario

Facility	Capacity	2023	2024	2025	2026	2027	2028	2029
BR3	149	Retired						
BR4	155	Peaking unit			Retired			
BR5	385	Peaking unit						
SH1	400	Peaking unit						
SH2	390	Peaking unit						
Total (MW)	1,479	1,330			1,175			

(b) Peaking Scenario

Battle River/Sheerness assumptions

Value		Unit	BR4 (CtG)	BR5 (CtG)	SH1 (CtG)	SH2 (CtG)
Capacity	Zero Dollar Capacity	% of Nameplate	20%	24%	20%	20%
	Incremental Capacity	% of Nameplate	80%	76%	80%	80%
Emission Intensity	Zero Dollar Capacity Emission Intensity	t/MWh	0.82	0.75	0.73	0.73
	Incremental Capacity Emission Intensity	t/MWh	0.58	0.59	0.55	0.55
Offer Strategy	Zero Dollar Offer Strategy	Block 0	$0 Block	$0 Block	$0 Block	$0 Block
	Incremental Capacity Offer Strategy	Block 1	32% at (1.15 x Variable Cost)	28% at (1.15 x Variable Cost)	30% at (1.26 x Variable Cost)	29% at (1.26 x Variable Cost)
		Block 2	21% at (1.3 x Variable Cost)	12% at (1.25 x Variable Cost)	13% at (1.38 x Variable Cost)	11% at (1.38 x Variable Cost)
		Block 3	10% at (1.5 x Variable Cost)	13% at (1.45 x Variable Cost)	12% at (1.54 x Variable Cost)	13% at (1.54 x Variable Cost)
		Block 4	17% at (2 x Variable Cost)	12% at (1.5 x Variable Cost)	8% at (1.64 x Variable Cost)	10% at (1.64 x Variable Cost)
		Block 5		11% at (2 x Variable Cost)	9% at (1.7 x Variable Cost)	5% at (1.7 x Variable Cost)
		Block 6			8% at (2 x Variable Cost)	12% at (2 x Variable Cost)
Other	Initial Simulated Capacity Factor in 2023		6%	19%	34%	30%
	Full Load Heat Rate (gross)	GJ/MWh	10.45	10.37	10	10
	VO&M	2019 $/MWh	4.17	4.17	4.17	4.17
	Fixed O&M	2019 $/kW	31.09	31.09	31.09	31.09

Other assumptions

- Natural gas
  - 2023-2030: $2.30/GJ to $2.96/GJ
- Carbon price and policy
  - 2022-2030: $50/tonne to $170/tonne
  - TIER with benchmark of 0.37t/MWh
- Generation outside of Study Area
  - Only existing generation and generation projects meeting certainty criteria included
  - For the SW area:
    - Installed renewables generation totaling 1,900 MW
    - Generation projects meeting certainty criteria totaling 400 MW

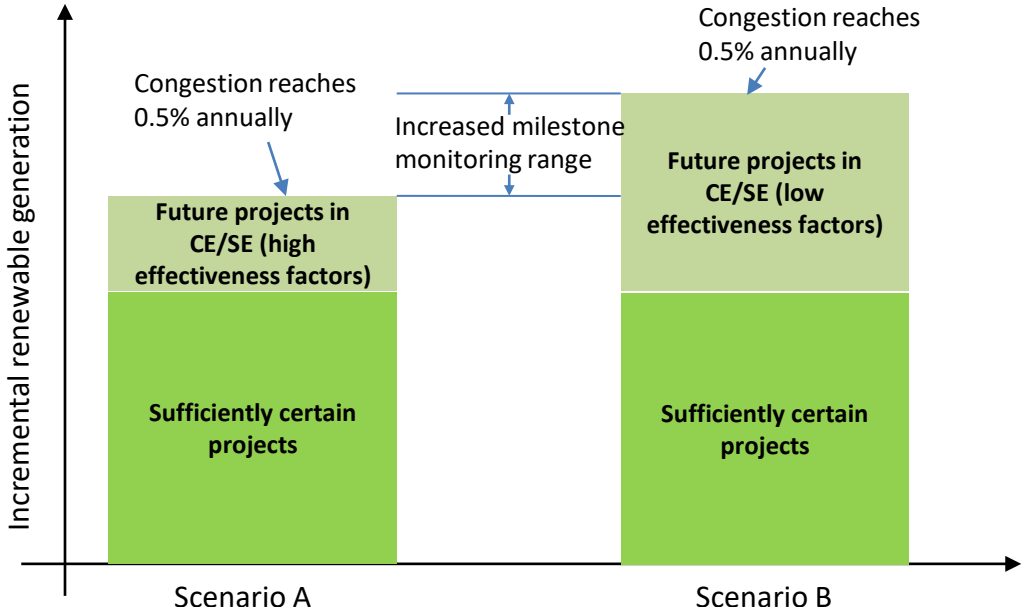
Renewables generation assumptions

- Use generation information as of Jan. 2022
  - Installed renewables generation in the CE and SE totaling 1,100 MW
  - Generation projects that met inclusion criteria totaling 1,400 MW
- Future scenarios to examine congestion trend and to inform updated milestone monitoring range if required
  - Additional 2,400 MW generation
  - Technology and location split are based on project list

Renewables generation assumptions

- Future renewables generation projects will be added based on actual projects in AESO's connection list
  - Sufficiently certain: projects meeting inclusion criteria
  - Incremental 1: the proponent has indicated its commitment to advance the project by securing required financing
  - Incremental 2: the proponent has indicated it is in the final stages of securing its required financing
- Should sufficiently certain projects not trigger the construction, new milestone monitoring range will be established based on project effectiveness factor

Scenario	Future Renewable Generation in CETO Study Area		
	CE (MW)	SE (MW)	Study Area Total (MW)
Sufficiently certain	350	1057	1407
Incremental 1 (in addition to sufficiently certain projects)	610	975	1585
Incremental 2 (in addition to Incremental 1 scenario)	60	705	765

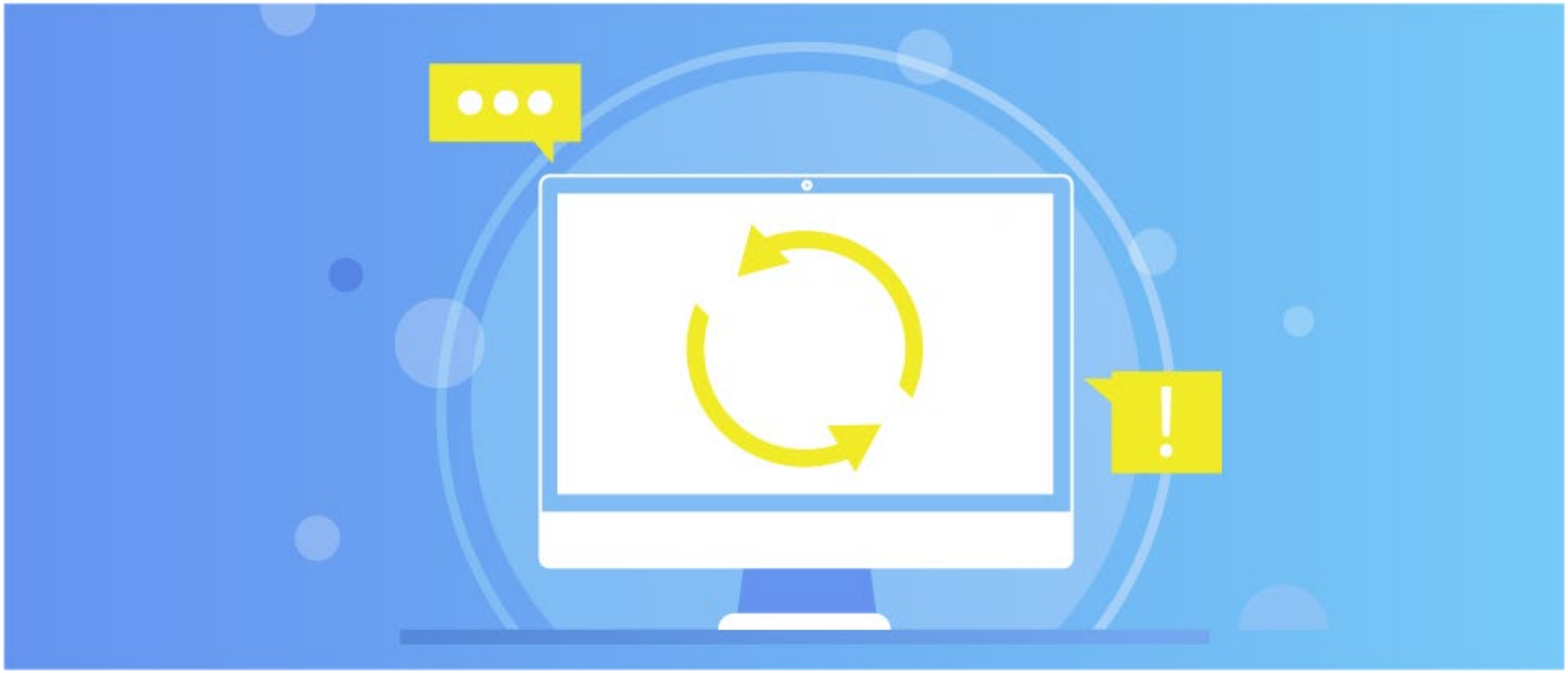


Next steps

- Stakeholder feedback on key assumptions is being sought before the AESO finalizes assumptions for reaffirmation study by Friday, Feb. 25, 2022 (preferably today)
  - Please send final comments to stakeholder.relations@aeso.ca
- The final assumptions is expected to be published on the AESO website by March 1, 2022
- The AESO expects to complete the reaffirmation study by end of Q1 2022
- The reaffirmation study results will be provided to the AUC and published on AESO website

Questions

Contact the AESO



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Thank you

Updates

Slide #	Original	New
6	Seek stakeholder feedback on key assumptions	• Seek stakeholder feedback on key assumptions by Friday, Feb. 25, 2022 (preferably today) • Discussion on project need, alternative selection, or other topics in the CETO NID application previously approved by the AUC, are out of scope

13	Only generation projects meeting certainty criteria included	• Only existing generation facilities and generation projects meeting certainty criteria included
		Following moved up from slide 14
		• For the SW area:
		  • Installed renewables generation totaling 1,900 MW
		  • Generation projects meeting certainty criteria totaling 400 MW

14	• ~~Location sensitivities between CE and SE~~	

14	*Following moved to slide 13*
	• ~~Southwest generation~~ For the SW area:
	  • Installed renewables generation totaling 1,900 MW
	  • Generation projects meeting certainty criteria totaling 400 MW
	• ~~100 MW future generation~~	