Stakeholder Comment Matrix – June 2020

2021 Long-term Outlook Stakeholder Feedback

Period of Comment: June 4, 2020 through July 6, 2020	**Contact:** Justin W. Rangooni, Executive Director
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Instructions:

1. Please fill out the section above as indicated.
2. Please respond to the questions below and provide your specific comments.
   Email your completed comment matrix to forecast@aeso.ca by **July 6, 2020**

The AESO is seeking comments from Stakeholders with regard to the following matters:

	Questions	Stakeholder Comments
1.	**Long-term Outlook** a. What information do you find most useful within the Long-term Outlook? Is there additional information you would like to see? b. Do you use the Long-term Outlook data file? Which information within the Long-term Outlook data file is most useful to you? What additional data would you like to see within the data file? c. What delivery format of the data file would you find most useful? (Excel file, web query and download, interactive web-based data visualization tool, other)	• The LTO provides a helpful and informative view of the outlook of the Alberta electricity market. The data provided is a beneficial resource for proponents to use in determining future opportunities in Alberta, in addition to being able to identify risks for existing or planned assets. • Examples of hourly consumption data by region (or area) for the different planning scenarios would be a useful addition to the data file. Energy storage resources perform energy arbitrage and understanding where gaps may form is important. • Excel is the preferred format for input into internal models.

2.	**Macroeconomic variables** a. The economic outlook could range from a V-shape recovery by Q2 2021 to a longer-term recovery by 2023, with some permanent load loss in the commercial and industrial sectors going forward. What is your view on the Alberta GDP over the medium- (next 5 years) and long-term (5+ years)? b. Oil sector production capacity is expected to increase in 2023 with the completion of pipeline projects (e.g., Keystone XL, etc.). I. The 2019 CAPP Crude Oil Forecast released in June 2019[1] had oilsands forecast growth from 3.2MM bbls/d in 2020 to 3.6MM bbls/d in 2025 and then 3.9MM bbls/d in 2030. a. What is your view on oil production in Alberta over these time periods given the market changes over the last year? What is your view post 2030? b. Do you expect new oil production developments to be in situ or mining, or a combination of both? c. Do you expect domestic condensate growth, required for transport, to meet the incremental oilsands growth? Will domestic condensate displace imported condensate? II. What is your view on further oil sector investments over the same timeframe? III. What kind of oil price or other environment would allow for further cogeneration development in the oilsands and/or petrochemical sectors? d. Current forward gas prices are in the $2.25/GJ range. Post	• No comment

[1] Canadian Association of Petroleum Producers https://www.capp.ca/resources/crude-oil-forecast/

	5 years, do you see gas prices remaining at this level, decreasing, or increasing beyond inflation?	

3.	**Policy** a. What are your expectations of carbon prices in the future? Do you expect any change from a $30/t rising to $50/t, inflated by 2% thereafter? b. Other than policy on carbon pricing, what coming policies or policy scenarios do you see impacting load growth and generation development?	• No comment
4.	**Impact of the COVID-19 pandemic** a. What is your expectation on behaviour changes (e.g., work-from-home practices, online shopping, etc.) and the way Albertans consume electricity going forward? b. How are near-term costs and future generation projects being impacted by covid-19? Do you anticipate long term impacts to generation development?	• COVID-19 has reduced the debt financing rate in general. Lower debt financing is beneficial for long-term capital investments such as renewable generation. The change in cost of capital is expected to support the development of renewables and indirectly benefit energy storage resources that will be used to integrate more renewables onto the power system.
5.	**Load growth and modifiers** a. Where do you think load growth will be concentrated –at the System Load (all metered demand) level, or at the Alberta Internal Load (system load plus load served by on-site generating units) level? b. Under what conditions could Alberta see sustained negative system load growth? c. In the 2019 Long-term Outlook, the AESO had a number of economic and technological advances that are expected to impact the load growth in the province (see section 4 of the 2019 LTO and "New Load Modifiers" tab of the 2019 LTO data file). What is your view on load growth and the impact of the following modifiers within the next 5 years, from 5 to 10 years, and after 10 years for: i. Distributed energy resources:	• Distributed energy resources (DERs) can offer end-use customers optionality in managing their electricity needs. The cost of many DERs continues to fall (e.g., solar generation, energy storage), potentially leading to most customers serving part or all of their electricity needs using behind-the-meter DERs. Under this situation, Alberta could see a sustained negative system load growth as existing load is offset by DERs. • Energy storage is an emerging and innovative technology that will have a significant impact on the electricity system. From a load growth and modifier viewpoint, energy storage can reduce peak demand needs and change daily load

	1. Rooftop solar PV 2. Electric vehicles and charging stations 3. Gas generation 4. Wind generation 5. Energy storage 6. Energy efficiency d. What is your view on load growth and the impact of other emerging industries, sectors or technologies (e.g., bitcoin and cryptocurrency mining, cannabis facilities, petrochemical facilities, data centers, others)?	patterns as utilization of existing assets change. The 2021 LTO should consider a scenario where the deployment of energy storage, either stand-alone or paired with renewables is large to determine the potential impact on the transmission system and other system needs. • In the next 5 years, energy storage applications will be moderate and derived from pilot programs and applications supported by out-of-market payments (e.g., ERA storage projects). Beyond 5 years, the growth of energy storage could accelerate as different market participants seek to deploy the resources to meet their needs. For example, DFOs and TFOs may use energy storage to defer traditional transmission and distribution infrastructure. Large and small end-use customers may deploy energy storage to enhance power quality and manage volatile real-time energy prices. Finally, market participation rule changes within the AESO framework could encourage more hybrid projects (e.g., renewables paired with energy storage) and stand-alone energy storage projects.

6.	**Generation Technologies** a. What renewable technologies are likely to be developed by PPA's? b. What is the potential size of the corporate PPA market for renewables, being funded fully or in part, in Alberta? c. What challenges do you foresee in implementing PPA's for renewable development in Alberta? d. Recent public announcements indicate all existing coal-fired units will utilize natural gas in the near term. How do you see the operation of the converted units changing compared to operations as a coal-fired unit? e. Outside of existing generation technology in Alberta, what technology will show up in Alberta next? f. What are the challenges surrounding generation development in Alberta and what are the major factors that will determine what gets built?	• Energy Storage Canada recommends that energy storage technologies be included in the generation technologies section. There are a number of publications that the AESO can draw upon to populate energy storage attribute and cost assumptions (e.g., Lazard levelized cost of storage (https://www.lazard.com/perspective/lcoe2019)) • While levelized cost of storage can be a helpful metric, the value of energy storage depends with the specific application (e.g., peak demand reduction, ancillary service, renewable participation optimization, etc.). The AESO should consider energy storage resource applications when considering the impact of the different energy storage technologies. • Hybrid projects are especially important consideration for the 2021 LTO. Energy storage paired with renewables could offer clean, consistent energy blocks for sale into forward markets leading to a change in power market dynamics.
7.	**Future technologies** The following table contains generation technologies and specifications on potential future generation development. Do you believe that these are representative of potential future Alberta generation projects? Would you like to share views on additional technologies and specifications that are not included within the table?	• Similar to the comment above, Energy Storage Canada recommends that energy storage be included in the future technologies' category

		Facility Type | Overnight Capital Cost ($/kW) \| Fixed O&M ($ / kW-year) | Variable O&M ($/MWh) | Generator Capacity (MW) | Heat Rate (GJ/MWh) Combined-Cycle Natural Gas | 1,667 | $49.71 | $2.49 | 479 | 7.03 Simple-Cycle Natural Gas – Aeroderivative | 1,159 | $52.83 | $4.24 | 46.5 | 9.68 Solar Photovoltaic – 2021-2025 | 1,643 | $31.85 | Credit: grid intensity x carbon price | 50 | N/A Solar Photovoltaic – 2026-2030 | 1,388 | $31.85 | Credit: grid intensity x carbon price | 50 | N/A Wind Generation - 2021-2025 | 1,586 | $32.50 | Credit: grid intensity x carbon price | 50 | N/A Wind Generation - 2026-2030 | 1,105 | $29.25 | Credit: grid intensity x carbon price | 50 | N/A	
8.	**Other** a. Is there any information that you would like to share, which would contribute to the Long-term Outlook development (ie. Developing trends)? b. What do you think is likely to disrupt Alberta's electricity industry in the next 20 years and in what way?	