

# Energy market restructuring

Pembina Institute comments and recommendations

Submitted to Alberta Electric System Operator

Regarding: Restructured Energy Market Design – Intertie Participation and Shorter Settlement

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August 2024

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## Pembina Institute comments and recommendations

### Summary

Pembina Institute welcomes the Alberta Electric System Operator's (AESO) energy market restructuring efforts as an opportunity to begin modernizing Alberta's electricity system. Its new rules should enable new technologies such as demand-side management and battery energy storage to bring emission reductions, flexibility, and reliability to the grid. Furthermore, it provides an opportunity to set the foundation for a managed transition to a clean, affordable, and reliable system.

Interjurisdictional transmission lines (interties) are crucial for operating a reliable and affordable electricity grid and will play an important role in helping Alberta achieve net-zero emissions by mid-century. As the United States builds out a continental electricity grid as part of its grid modernization efforts, and as Alberta becomes a net-exporter of electricity, it is timely for the AESO to reevaluate the ways in which existing interties can participate in its electricity market, setting the framework for future developments.

Advances in digital communications and computation technologies are now enabling a transition towards shorter settlement periods in the electricity market. Doing so is a critical step to enable and incentivize demand-side resources and a fairer market through better reflecting real-time conditions.

## Intertie participation

### Context

The Pembina Institute welcomes the opportunity to provide input on the participation of interties in Alberta's restructured electricity market (REM). Interties have consistently — in studies and in practice — been shown to be a critical element of ensuring a cost-effective

pathway to decarbonizing and expanding electricity grids to support economy-wide emission reductions. In the United States, the ongoing progress to build a continental grid,<sup>1,2</sup> the release of the U.S. Federal Energy Regulatory Commission's (FERC) new rules for 20-year regional transmission planning,<sup>3</sup> and further bipartisan legislative proposals for advancing projects of national interest<sup>4</sup> set a new precedent for efficient long-term intertie planning.

The Alberta Electric System Operator's (AESO's) engagement on interties is therefore timely, not only in the context of Alberta's own market modernization, but also in presenting an opportunity to coordinate with neighbouring jurisdictions as they move to decarbonize their own economies.

The AESO has proposed four options for future intertie participation in Alberta's electricity market:<sup>5</sup>

- Option 1: Status Quo
- Option 2: Priced Interties
- Option 3: Intertie Optimization
- Option 4: The AESO Joins Another Market (EDAM, Markets+)

This interties discussion is important to explore how Alberta can make more efficient use of its existing interties to support the Government of Alberta's own net-zero by 2050 goal. These decisions will also provide the framework within which new interties that will be required for grid modernization will interact with the market.

At present, Alberta is nearly an electricity island, but it does have existing interties that could be more effectively utilized. This includes two of its three interties (to British Columbia and Montana), which have Available Transfer Capability that is currently derated to less than half of their Total Transfer Capability.<sup>6</sup> Furthermore, according to the AESO, Alberta is set to become a net electricity exporter in 2024.<sup>7</sup>

Strengthening connections to adjacent grids is long overdue. Given the importance of interties in maintaining affordability and reliability during the energy transition, and given the long lead times for project development and construction of large infrastructure projects, restoration of (and later, maximizing the utilization of) the British Columbia/Montana lines must be made an urgent priority. At a continental level, regional interties could bring net benefits of US\$60-180 billion (2018).<sup>8</sup> Locally, the expected benefits of restoring the Alberta-B.C. intertie to 1,000 MW is on the order of \$150 million per year.<sup>9</sup>

## Planning for the long term

Planning ahead matters. Limitations to the AESO's Long-term Outlook process to date have hindered the Long-term Transmission Planning process.<sup>10</sup> This has created congestion and

curtailed renewable electricity, costing Albertans millions in higher-than-necessary electricity prices.<sup>11</sup> Missing the opportunities to develop a strong intertie system will similarly hurt Alberta consumers and hinder the development of a clean energy economy.

The status quo is no longer acceptable and will not achieve Alberta's stated climate-related objectives in the most cost-effective manner, if at all. Sweeping changes to its electricity market are going to be required if the province is to succeed. In this way, the AESO's option paper presents a promising step towards modernizing Alberta's electricity rules.

As governments and system operators in the United States build out a continental grid, it is important that Alberta be engaged in their efforts, especially given the reliability and economic benefits that come with collaboration between jurisdictions and markets.<sup>12,13,14,15,16</sup> The Pembina Institute believes that joining another market (option 4), such as the California Independent System Operator's Extended Day-Ahead Market (EDAM) or Southwest Power Pool's Markets+, would provide ideal long-term outcomes. However, if Alberta is not ready for such market integration, intertie optimization (option 3) is preferable so that Albertans can gain some improved affordability, reliability, and sustainability in their electricity system.

## Response to AESO questions

### What segment of the industry do you represent?

Other: Pembina Institute is a national clean energy think tank and charitable organization working to identify and promote credible policy solutions that support communities, the economy, and a safe climate.

### Do you agree that the objectives of intertie participation align with the overall objectives of REM (affordability, reliability, decarbonization by 2050, and reasonable implementation)?

Yes. It is critical for Alberta to recognize that interties — both existing and new — not only align, but greatly enhance Alberta’s ability to meet its stated objectives. Interties provide more options to maintain system reliability and facilitate the maximum use of fuel-saving resources such as wind, solar, and hydroelectric energy, which in turn reduces prices and emissions.

### Are there any additional objectives that should be considered for intertie participation?

Increased clarity and certainty on the rules and processes for intertie participation will provide proponents of new interties — including provincial governments — with the information required to make informed decisions about economics and viability associated with such investments.

### Do you agree with the descriptions of the four categories of intertie participation options?

Yes, the categories outlined by the AESO, ranging from status quo (option 1) to external market integration (option 4) fully encompass the possibilities of intertie participation.

### Do you have any comments on the intertie participation options?

The status quo is no longer acceptable for maintaining a reliable and affordable electricity system. More significant changes (options 3 or 4) are needed to enable the long-term robustness and resilience of Alberta’s system. Further clarification is provided in the questions below.

## How would you evaluate the 'Status-quo: Self-scheduled offers/bids are price takers' option against the overall objectives of the REM?

As indicated by the AESO, as you move from option 1 to option 4, implementation becomes incrementally more challenging, but at the same time, reliability, affordability, and decarbonization outcomes are likely to incrementally improve. In this way, the status quo (option 1) would provide the least amount of benefit for the least amount of work, option 4 the most benefit for the most work, and options 2 and 3 lie somewhere in between. Given the effort that the AESO is already putting into redesigning the electricity market, choosing option 1 would be a lost opportunity to make step change improvements in intertie policy.

## How would you evaluate the 'Priced Interties: Economic offers/bids' option against the overall objectives of the REM?

Continuing from question seven, it follows then that priced interties (option 2), while preferable to the status quo with respect to affordability and reliability, falls short on incentivizing decarbonization by mid-century.

## How would you evaluate the 'Optimized intertie scheduling between ISO footprints' option against the overall objectives of the REM?

Given that the AESO has determined that joining another market (option 4) will not be considered at this time, intertie optimization (option 3) provides a good balance of reasonable implementation (cost), affordability (benefit), decarbonization by 2050 (benefit), and reliability (benefit). However, we encourage the AESO to continue to monitor progress made in external markets (EDAM, Markets+), remain open to joining one in the future, and where feasible, implement regulatory and market mechanisms that will make increased market integration easier in the future.

## Rank the intertie participation options in terms of meeting the overall objectives of the REM (with 1 being most preferred and 4 least preferred).

1. Option 4
2. Option 3
3. Option 2
4. Option 1

## Do you agree with identified interdependencies between inertia participation and other aspects of the REM design?

Yes, we commend the AESO for identifying and drawing attention to these interdependencies.

## Are there additional interdependencies that should be considered?

We further submit that the AESO should recognize the same seven benefits of inertia and planning as identified in FERC Order 1920:<sup>17</sup>

1. Avoid or defer reliability transmission infrastructure replacement
2. Reduce loss of load probability or planning reserve margin
3. Increase production cost savings
4. Reduce transmission energy losses
5. Reduce congestion due to transmission outages
6. Mitigate extreme weather events and unexpected system conditions
7. Increase capacity cost benefits by reducing peak energy losses

# Shorter settlement period

## Response to AESO questions

### What segment of the industry do you represent?

Other: Pembina Institute is a national clean energy think tank and charitable organization working to identify and promote credible policy solutions that support communities, the economy, and a safe climate.

### The Options Paper outlines the implementation of considerations and benefits of each of the shorter settlement options. Are there other implementation considerations and benefits that weren't captured in this Options Paper?

As the options paper points out, a shorter settlement period reflects the electricity market more efficiently and will help to unlock the most cost-effective pathways to reducing emissions on Alberta's grid while retaining reliability. For example, demand-side management, energy storage, virtual power plants, and transmission alignment and optimization — important sources of flexibility and resilience for a modern grid — all benefit from shorter settlement periods.<sup>18,19</sup>

Therefore, while weighing the costs of shorter settlement periods, it is also important to recognize that transitioning to a shorter settlement interval can also bring many savings to the electricity system.

### In recognition that there is a drive to modernize the electricity market to align with the energy transition, which option(s) can be advanced in a manner that progresses towards a shorter settlement interval that keeps costs and timelines reasonable, and sets up the electricity market for the future?

It is preferable for the public benefit for both load and generators to move towards shorter settlement periods.

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<sup>1</sup> White House, "Fact Sheet: The Biden-Harris Administration Advances Transmission Buildout to Deliver Affordable, Clean Electricity," November 18, 2022. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/11/18/fact-sheet-the-biden-harris-administration-advances-transmission-buildout-to-deliver-affordable-clean-electricity/>



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- <sup>2</sup> White House, “Fact Sheet: Biden-Harris Administration Announces Key Actions to Strengthen America’s Electric Grid, Boost Clean Energy Deployment and Manufacturing Jobs, and Cut Dangerous Pollution from the Power Sector,” April 25, 2024. <https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/25/fact-sheet-biden-harris-administration-announces-key-actions-to-strengthen-americas-electric-grid-boost-clean-energy-deployment-and-manufacturing-jobs-and-cut-dangerous-pollution-from-the/>
- <sup>3</sup> FERC, “FERC Takes on Long-Term Planning with Historic Transmission Rule,” May 13, 2024. <https://www.ferc.gov/news-events/news/ferc-takes-long-term-planning-historic-transmission-rule>
- <sup>4</sup> U.S. Senate Committee on Energy & Natural Resources, “Manchin, Barrasso Release Bipartisan Energy Permitting Reform Legislation,” July 22, 2024. <https://www.energy.senate.gov/2024/7/manchin-barrasso-release-bipartisan-energy-permitting-reform-legislation>
- <sup>5</sup> Alberta Electric System Operator, *REM Intertie Participation Options Paper* (2024). <https://www.aesoengage.aeso.ca/44223/widgets/186005/documents/134912>
- <sup>6</sup> In 2023, the average Available Transfer Capability for imports from British Columbia and Montana was 477 MW, less than half the 1,091 MW Total Transfer Capability of those lines. Alberta Electric System Operator, “Annual Market Statistics Reports: Annual market statistics data file,” July 26, 2024. <https://www.aeso.ca/market/market-and-system-reporting/annual-market-statistic-reports/>
- <sup>7</sup> Alberta Electric System Operator, “AESO 2024 Long-Term Outlook: Results, reference case,” (2024), 13. <https://www.aeso.ca/assets/Uploads/grid/lto/2024/2024-LTO-Reference-Case.pdf>
- <sup>8</sup> National Renewable Energy Laboratory, *North American Renewable Integration Study (NARIS)* (2021). <https://www.nrel.gov/analysis/naris.html>
- <sup>9</sup> Sam Harrison, *The value of interprovincial transmission for a net-zero future: Examining the BC-Alberta Intertie*, (Navius Research, 2023), 13. <https://www.naviusresearch.com/wp-content/uploads/2023/05/Electricity-camp-presentation-Sam-Harrison-2023-05-26-public.pdf>
- <sup>10</sup> Jason Wang and Karambir Singh, *Transmission Policy in Alberta* (Pembina Institute, 2023). <https://www.pembina.org/reports/2023-11-30-pembina-institute-transmission-policy-submission.pdf>
- <sup>11</sup> Will Noel, Jason Wang, and Scott MacDougall, *Forecasting matters for grid planning* (Pembina Institute, 2024). <https://www.pembina.org/pub/forecasting-matters-grid-planning>
- <sup>12</sup> A. Kanduth and J. Dion, *Electric Federalism: Policy for aligning Canadian electricity systems with net zero* (Canadian Climate Institute, 2022). <https://climateinstitute.ca/wp-content/uploads/2022/05/Electric-Federalism-May-4-2022.pdf>
- <sup>13</sup> James Maloney, *Strategic Electricity Interties: Report of the Standing Committee on Natural Resources* (House of Commons Standing Committee on Natural Resources, 2017), 9-12. <https://www.ourcommons.ca/Content/Committee/421/RNNR/Reports/RP9335660/rnnrrp07/rnnrrp07-e.pdf>
- <sup>14</sup> Jan Gorski, Binu Jeyakumar, and Spencer Williams, *Connecting provinces for clean electricity grids* (Pembina Institute, 2021). <https://www.pembina.org/pub/connecting-provinces-clean-electricity-grids>
- <sup>15</sup> Tom Green and Stephen Thomas, *Shifting Power: Zero-Emissions Electricity Across Canada by 2035* (David Suzuki Foundation, 2022). <https://david Suzuki.org/science-learning-centre-article/Shifting-Power-Zero-Emissions-Electricity-Across-Canada-by-2035>
- <sup>16</sup> U.S. Department of Energy, *National Transmission Needs Study* (2023). <https://www.energy.gov/gdo/national-transmission-needs-study>
- <sup>17</sup> Federal Electricity Regulatory Commission, “Explainer on the Transmission Planning and Cost Allocation Final Rule.” <https://www.ferc.gov/explainer-transmission-planning-and-cost-allocation-final-rule>
- <sup>18</sup> Blake Shaffer and Frank A. Wolak, “Market Design for the 21<sup>st</sup> Century: Recommendations for Alberta’s Power Market,” *University of Calgary School of Public Policy Research Papers* 17, no. 2 (2024), 30. <http://dx.doi.org/10.55016/ojs/sppp.v17i1.78356>
- <sup>19</sup> IRENA, *Increasing Time Granularity in Electricity Markets* (2019). [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Feb/IRENA\\_Increasing\\_time\\_granularity\\_2019.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Feb/IRENA_Increasing_time_granularity_2019.pdf)