Down But Not Out

A brief status update on Alberta's renewable energy industry

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Summary

Since 2023, Alberta's renewable energy sector has been faced with an unprecedented level of policy and regulatory uncertainty. The most widely reported example is the sudden moratorium on new renewable project approvals that was in place from August 2023 to February 2024. However, there is now a number of other new policies and contemplated changes that directly affect the sector.

These include outright bans and ambiguous restrictions on areas of land where wind and solar projects can be built, new requirements relating to equipment recycling and land reclamation, and changes to transmission legislation, all of which will likely add new regulatory burdens and upfront costs to renewable energy developers. It is notable that many of these new requirements are not being equally applied to other industries, including other energy sectors such as oil and gas.

At the same time, renewable energy developers — like all electricity generators in Alberta — are contending with the uncertain outcome of a wide-reaching restructuring of the province's electricity market, as well as the Government of Alberta's recently announced legal challenge of the federal Clean Electricity Regulations.

While the 2023-2024 moratorium had a quick and immediate impact, causing the cancellation of 53 renewable energy projects, what the data now shows is ongoing uncertainty and reduced investor confidence in the market, even after the moratorium was officially lifted. Our analysis shows that, in 2024, there were more project cancellations than new proposals — making it **the first year that the overall volume of projects in the Alberta Electric System Operator's (AESO's) renewable project proposal queue shrank.**

This is out of step with global trends, where interest in renewable energy remains strong. Our analysis of peer jurisdictions with comparable electricity market structures to Alberta finds that project proposal queues are healthy and growing. This shows that there is a lucrative market

that could be revived, if Alberta takes steps to demonstrate that renewables are welcome in the province once again.

Recommendations

We recommend the Government of Alberta take the following actions:

1. Clearly state an electricity system vision of a clean, resilient and affordable system, and direct regulators and government to create the rules and regulations to support this vision.
2. Encourage investment in new projects by fast-tracking development for areas where utility-scale renewable projects would be particularly well-suited.
3. Modernize electricity regulations to support energy independence and resilience by promoting the use of interties, energy storage, distributed energy generation, and demand-side management.

Background

Since 2020, Alberta has led the country in clean energy investment, installing over 6,000 megawatts (MW) of combined wind, solar and battery storage — 86% of the national total in that timeframe.[1] But this trend is starting to shift; as other provinces call for (primarily) clean power, Alberta continues to stack the deck against its once nation-leading renewable energy industry. Within the last two years, the Government of Alberta has implemented the following restrictions or requirements on renewable energy development:

- A seven-month moratorium (August 3, 2023 – February 29, 2024) on approvals for wind, solar, hydroelectric and geothermal projects.[2]
- Limiting renewable energy development from certain classes of agricultural lands, with minimal exceptions.[3]
- Banning development of new wind projects within 35 kilometres of protected areas or other "pristine viewscapes" as designated by the province.[4]
- Requiring an upfront recycling fee for wind and solar equipment but not to any other form of energy or electricity production.[5]
- Introducing new reclamation security requirements for renewable energy developers.[6]

No other industry sectors have been subjected to such onerous rules. At the same time, the Government of Alberta has made a series of interventions with regards to its electricity system that further increase the long-term investment uncertainty for renewable energy development:

- Restructuring its electricity market in a way that, according to third-party analysis, penalizes wind and solar.[7]
- Challenging the constitutionality of the federal Clean Electricity Regulations in the Alberta Court of Appeal.[8] These regulations would provide a roadmap for investment in low-carbon electricity production and accompanying grid modernization, and provide an important signal and source of long-term certainty for investors. The province continues to cite affordability and reliability concerns, despite the final version of the regulations including several flexibilities to address these.[9]
- Signalling updates to the Transmission Regulation that would increase the cost of grid access for new power plants, especially wind and solar.[10]
- Removing the requirement for the Alberta Electric System Operator to maintain zero congestion on transmission lines, increasing the likelihood that both new and existing wind and solar projects will be restricted from supplying power to the grid even when they are able to do so. This would essentially mean wind and solar plants — the majority of which are based in the same areas and rely on the same transmission lines to get their energy to the grid — would be forced to stop or reduce their power output, even when weather conditions (availability of wind and sun) are favourable to them.[11]

In recent months, Alberta has made some progress clarifying its new rules on renewable energy development. This much-needed certainty appears to be helping restore confidence in energy storage investment and is bringing more projects forward outside the southern portion of the province where historically most renewable development has focused. However, much more is needed to restore renewable energy investment to a level in keeping with the growth that is being seen in other jurisdictions, or of Alberta's previous trajectory pre-moratorium.

In this report, we provide a brief update on the status of the province's renewable energy industry, including a comparison to peer jurisdictions, and outline actions that the government could take to restimulate investment in this once booming industry.

The state of renewable energy in Alberta

Cancellations signal that uncertainty persists

The Alberta Electric System Operator's project connection queue provides a high-level overview of investment interest in Alberta's electricity sector over time.[12]

As new projects are proposed, the queue grows. As projects are cancelled, perhaps because an investor has lost interest or confidence in the market, the queue shrinks. The queue also shrinks when a project starts producing power (i.e. when it is energized). A steadily growing queue, alongside steadily growing renewable energy generation and consistent or shrinking wait times for grid connections, are a sign of a healthy market where investors are confident in the trajectory of the jurisdiction's policy and regulatory outlook over the next few years.

Declining costs and rising corporate interest in power purchase agreements led to steady growth in wind, solar, and batteries in Alberta's queue in the early 2020's. In 2023, the queue for new wind, solar, and battery project proposals was greater than the previous two years combined (Figure 1.)

This surge in 2023 was due to a combination of factors. Firstly, it reflected the first intake for AESO's new cluster study process, where projects are batched and assessed together instead of individually — leading to several projects joining the queue at once. Secondly, in August 2023 the Government of Alberta announced a seven-month moratorium on approvals for renewable energy projects, which led many renewable energy developers to rush to get their projects into the queue in the hope they would be grandfathered under pre-moratorium rules.[13] Nevertheless, a lot of projects also left the queue in 2023, mostly due to project cancellations.

In 2024, during the second round of AESO's cluster process, new project proposals returned to pre-moratorium levels while cancellations continued to grow. As a result, the 2023 surge was effectively wiped out and, for the first time, the overall volume of renewables and batteries in the queue shrank. Where we would have expected to see continued steady growth in the queue year-on-year (as we are seeing in other jurisdictions, and as we lay out in more detail later in this report), by the end of 2024, Alberta's project queue was instead sitting at its pre-moratorium level, but with the added concerning factor of a significant number of project cancellations in the previous 12 months.[14]

This suggests that the events of the previous year and a half since the imposition of the moratorium — including the issuance of new post-moratorium rules on "pristine viewscapes"

and the start of an electricity market restructure, as outlined above — may have begun to drive investment out of Alberta and into other jurisdictions. In other words, while the moratorium has now been officially over for more than a year, Alberta's renewable electricity market continues to be characterized by significant uncertainty and dampened investor enthusiasm.

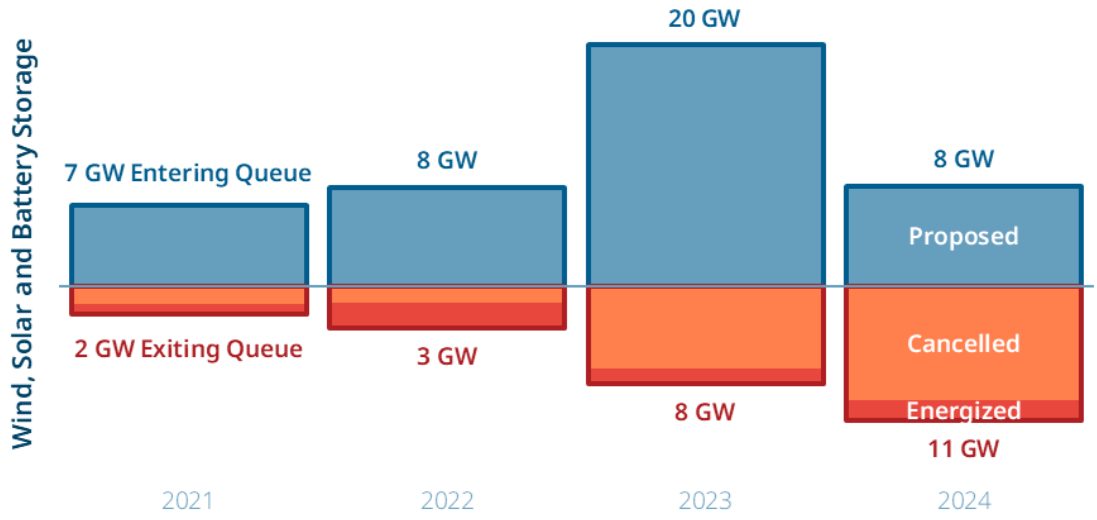

Figure 1. Annual renewable energy and energy storage project proposals, cancellations, and energizations in Alberta, 2021-2024

Data source: Alberta Electric System Operator[15]

Leading jurisdictions' project queues continue to grow while Alberta's stagnates

What appears to be happening in Alberta is the opposite of global trends, where investment interest in renewables continues to gain momentum. According to the International Energy Agency, two-thirds of global energy investment in 2024 went towards clean energy, rather than fossil fuel projects.[16]

Although every jurisdiction has a unique electricity market and grid, it is worthwhile to compare Alberta's renewable energy project queue with those of jurisdictions with similar market rules and regulations over the same period. In this case, we have analyzed queue data from Texas (where the electricity market is five times the size of Alberta),[17,18] and South Australia (where it is only one-sixth the size of Alberta).[19] These regions have been national leaders in wind and solar integration and provide valuable lessons for Alberta's grid.[20]

As Figure 2 shows, all three jurisdictions saw growth from 2021-2024. Only Alberta has seen that trajectory alter in the last 12 months. This underscores that interest in renewables and

energy storage investment has not declined in general and that those dollars are in theory still available to Alberta. To attract them, it must take steps to more clearly communicate to renewable energy proponents that their projects are welcome in the province and will not be subjected to further prohibitive regulatory uncertainty.

Texas and South Australia both already have much higher proportions of their electricity demand met by wind and solar, currently 32% and 71% respectively, than Alberta does (18%).[21] Investor interest in new renewables, and especially energy storage projects, continues to grow as Texas and South Australia grow and modernize their energy systems.

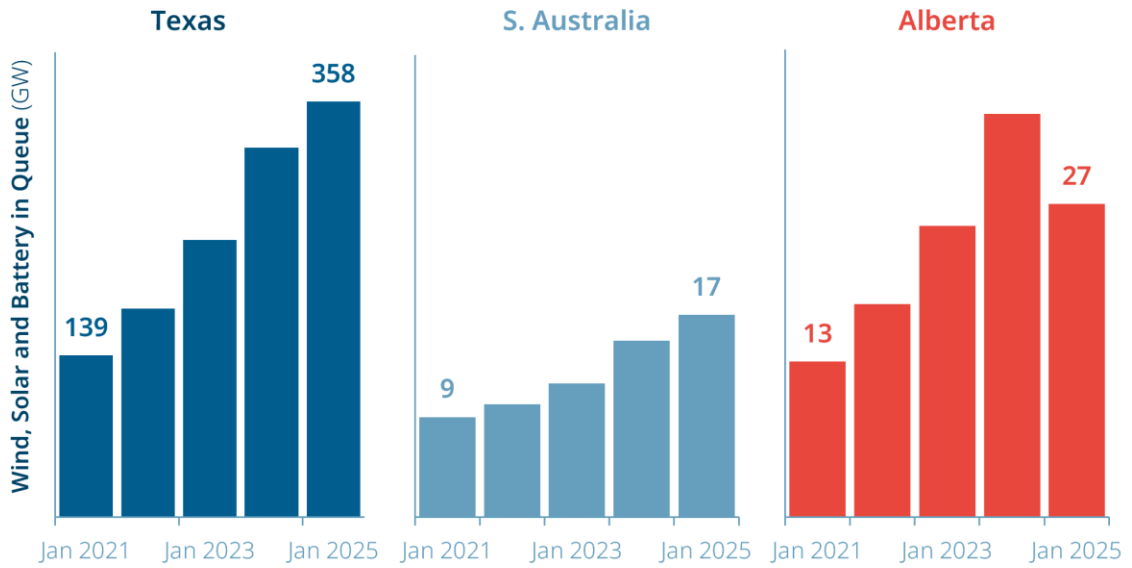

Figure 2. Wind, solar, and energy storage in project development queues for Texas, South Australia and Alberta in January of each year, 2021-2025 (y-axes on different scales)

Data source: Electric Reliability Council of Texas,[22] Australian Energy Market Operator,[23] Alberta Electric System Operator[24]

Wind installations plateau while solar grows

Of the 22 wind (and wind plus storage) projects that are currently in the queue in Alberta, only one is actively under construction; two other projects have received the necessary regulatory approvals to begin construction but (as of May 2025) have not started. As Figure 1 shows, not every project that receives approval necessarily moves to construction on the expected timeline, and any delays in this (i.e. projects that sit on their approvals without breaking ground) are another marker of investors waiting to see how the various sources of market uncertainty play out. In any case, with the estimated completion date of these facilities ranging from early 2027 to early 2028, it is likely that that we may not see any new wind projects come online for the next year and a half.

Solar, on the other hand, has a more optimistic outlook, with ten projects (~1,900 MW) currently under construction, and another fifteen (~1,200 MW) having received regulatory approval. This apparent shift in technological preference could be due to a combination of reasons, including rapid declines in solar equipment costs, which we are seeing reflected around the world. Notably, in relation to Alberta, solar projects are likely to be less vulnerable to post-moratorium restrictions (i.e. rules that protect "pristine viewscapes"). This data demonstrates that investors still want to build clean energy in this province, if they can find a way to make their project work amongst a complex and changing set of rules, restrictions and restructures. If all these projects are installed within their currently proposed timelines, Alberta's solar fleet could more than double in capacity by 2028 (Figure 3).

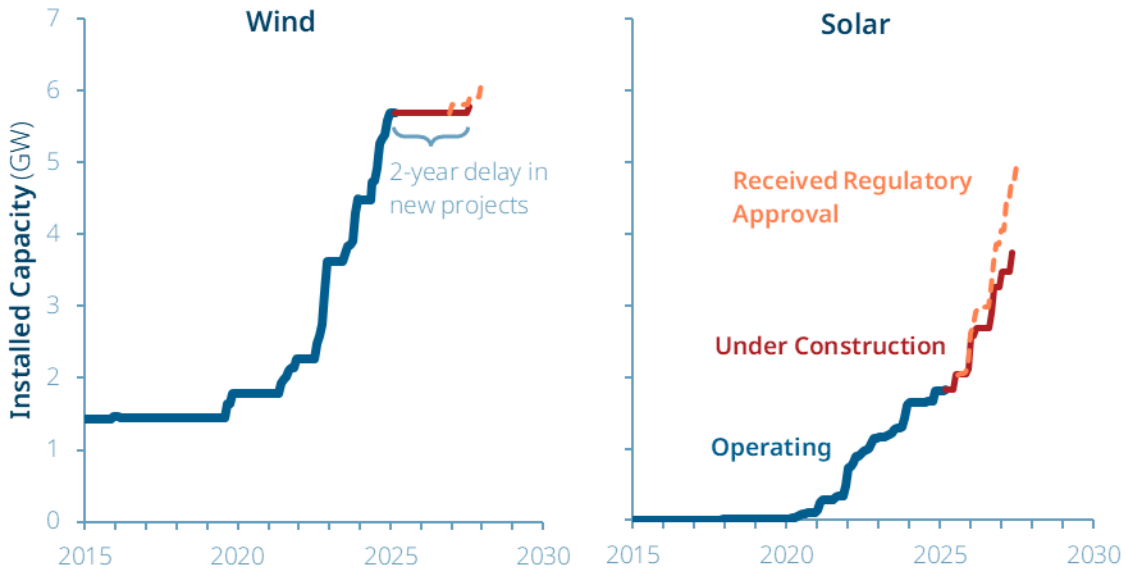

Figure 3. Wind and solar capacity in Alberta, installed and anticipated (based on regulatory approvals, construction announcements and published commissioning dates), 2015-2030

Data source: Alberta Electric System Operator,[25] Alberta Major Projects[26]

It appears, for now, that near-term growth in Alberta's renewable energy industry has not halted entirely, but investor confidence has shifted from primarily wind to primarily solar plus storage. And while accelerated growth in solar capacity is consistent with global trends, the apparent upcoming plateau in Alberta's wind installations is not, as global wind capacity continues to see steady growth of around 10% per year.[27]

The added regulatory hurdles have not changed the fact that renewables remain the lowest-cost option for new power plants. However, as discussed above, prolonged regulatory uncertainty will drive investors to look outside Alberta, potentially even those who have received approval for their projects but, for one reason or another, have yet to begin construction.

Conclusion and recommendations

Alberta is falling behind as an attractive investment market for new renewable energy development. However, it has recently made some strides to restore investment in renewables and has an opportunity to do more to revive the sector. We have three recommendations to restore investor confidence and return to leading the country in new electricity investment:

1. **Clearly state an electricity system vision** of a clean, resilient and affordable system, and direct regulators and government to create the rules and regulations to support this vision.
2. **Encourage investment in new projects** by clearly communicating not just the areas where renewable energy development will not be allowed (due to pristine viewscapes exclusions) but also those areas particularly well-suited to renewable energy projects, and where development in theory would be permitted under the new rules. This should be followed by a commitment to fast-tracking development in these areas. This model would involve undertaking proactive resource and environmental assessments, pre-approving transmission infrastructure and conditionally pre-approving power plant applications.[28]
3. **Modernize electricity regulations** to support energy independence and resilience by promoting the use of interties, energy storage, distributed energy generation, and demand-side management. Technologies such as interties and energy storage will also help reduce transmission system congestion, minimize curtailment, and expedite regulatory assessments, as is being investigated in California, Colorado, Montana, Virginia, and Maine.[29]

The Pembina Institute acknowledges that the work we steward and those we serve span across many Nations. We respectfully acknowledge the space our organization is headquartered in as the traditional and ancestral territories of the Blackfoot Confederacy, comprised of the bands Siksika, Piikani, and Kainai, the Îyârhe Nakoda Nations, including the bands of Goodstoney, Chiniki, and Bearspaw, and the Tsuut'ina Dené. These Lands are also home to the Métis Nation of Alberta — Region 3 whose Peoples have deep relationships with the Land.

These acknowledgements are some of the beginning steps on a journey of several generations. We share them in the spirit of truth, justice, reconciliation, and to contribute to a more equitable and inclusive future for all of society.

[1] Canadian Renewable Energy Association, "By the Numbers." https://renewablesassociation.ca/by-the-numbers/

[2] Government of Alberta, "Creating certainty for renewable projects," media release, August 3, 2023. https://www.alberta.ca/release.cfm?xID=887605547987E-EABF-5E23-DFF2C9F72DB845E6

[3] Government of Alberta, "Renewed path forward for renewable energy," media release, February 28, 2024. https://www.alberta.ca/release.cfm?xID=898196983D0FA-AECA-5F92-FF655CE1369C4E28

[4] Government of Alberta, "Pristine viewscapes and visual impact assessment zones," December 6, 2024. https://open.alberta.ca/publications/pristine-viewscapes-visual-impact-assessment-zones

[5] Government of Alberta, "Creating Canada's best recycling program," media release, August 13, 2024. https://www.alberta.ca/release.cfm?xID=90822FB35BB96-AAE0-1955-FDD28F87C9CADD40

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[7] Energy and Environmental Economics, "Restructured Energy Market Report: Assessment of market outcomes & efficiency of the proposed REM design," March 14, 2025, 15-16. https://www.aesoengage.aeso.ca/42905/widgets/197800/documents/149190

[8] Government of Alberta, "Challenging unconstitutional net-zero legislation," media release, May 1, 2025. https://www.alberta.ca/release.cfm?xID=932197ED81F37-E197-A428-5A3AEAC4A4546B77

[9] Jason Wang, "Alberta is out of step with the global push to build modern electricity systems," media release, May 1, 2025. https://www.pembina.org/media-release/alberta-out-step-global-push-build-modern-electricity-systems

[10] Alberta Electric System Operator, "Direction Letter from Minister," July 11, 2024. https://www.aesoengage.aeso.ca/42905/widgets/185854/documents/134459

[11] "Direction Letter from Minister".

[12] Crucially, it is not an overview of actual investment, as not every project in the queue will be built.

[13] Will Noel, Jason Wang and Patrick Connolly, *Creating (Un)certainty for Renewable Projects: Review of the impact of Alberta's renewable energy moratorium one year later* (Pembina Institute, 2024), 12. https://www.pembina.org/pub/creating-uncertainty-renewable-projects

[14] There are several projects that, in the AESO's queue data, were marked as "recently cancelled" only to reappear in a later version of the queue having joined the cluster process under a new project number. In our analysis, we do not count these projects toward the total "cancelled" or "new proposals" as they are, in effect, existing proposals that have just moved to a different stage in the connection process. In total, these projects account for 3,843 MW in cluster 1 and 6,090 MW in cluster 2.

[15] Alberta Electric System Operator, "Connection Project Reporting." https://www.aeso.ca/grid/transmission-projects/connection-project-reporting/

[16] International Energy Agency, "World Energy Investment 2024: Overview and key findings." https://www.iea.org/reports/world-energy-investment-2024/overview-and-key-findings

[17] Electric Reliability Council of Texas, *2025 ERCOT System Planning: Long-term hourly peak demand and energy forecast* (2025), 11. https://www.ercot.com/files/docs/2025/04/08/ERCOT-2025-Long-Term-Load-Forecast-Report.pdf

[18] Alberta Electric System Operator, *AESO 2024 Annual Market Statistics* (2025), 7. https://www.aeso.ca/assets/Uploads/market-and-system-reporting/Annual-Market-Stats-2024.pdf

[19] Australian Energy Market Operator, *South Australian Electricity Report* (2024), 35. https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/sa_advisory/2024/2024-south-australian-electricity-report---combined.pdf?la=en

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[21] *I'll Have What They're Having*, 2.

[22] Electric Reliability Council of Texas, "Resource Adequacy: Monthly generator interconnection status report." https://www.ercot.com/gridinfo/resource

[23] Australian Energy Market Operator, "Generation Information: Key connection information." https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information

[24] AESO, "Connection Project Reporting."

[25] Alberta Electric System Operator, "Annual market statistics data file." https://www.aeso.ca/market/market-and-system-reporting/annual-market-statistic-reports

[26] Government of Alberta, "Alberta Major Projects." https://majorprojects.alberta.ca

[27] Ember, "Electricity Data Explorer." https://ember-energy.org/data/electricity-data-explorer/

[28] For further detail on this concept, known as a Competitive Renewable Energy Zone (CREZ), see appendix A of *Transmission Policy in Alberta: Pembina Institute comments and recommendations* (Pembina Institute, 2023) https://www.pembina.org/reports/2023-11-30-pembina-institute-transmission-policy-submission.pdf

[29] T. Bruce Tsuchida, Linquan Bai, S. Ziyi Tang and Jay Caspary, *Incorporating GETs and HPCs into Transmission Planning Under FERC Order 1920* (ACORE, 2025), 55-56. https://acore.org/wp-content/uploads/2025/04/Report__Incorporating-GETs-and-HPCs-Under-FERC-Order-1920__April-21-2025.pdf

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