TD Asset Management



Investor Knowledge 10 minutes

# The Case for Battery Storage in Canada

## How a changing power system is increasing the need for flexibility and creating new opportunities for battery storage

**Alberta, the fastest growing province in Canada[1], has become one of the most instructive power markets in North America. It is home to Canada's only deregulated wholesale electricity market and has experienced one of the fastest renewable buildouts on the continent, while also facing significant new demand from artificial-intelligence-driven data centers. Together, these changes are increasing the need for power infrastructure that can respond quickly as supply and demand fluctuate. As Alberta's electricity system evolves, battery storage is becoming an increasingly valuable tool for balancing the grid and an emerging opportunity for infrastructure investors.**

## Why Alberta is Different

Alberta's electricity market is structured differently from those in most other Canadian provinces. Beginning in 1996, the province introduced competition into electricity generation and retailing, while transmission and distribution—the wires that move electricity across the province—remained regulated. Today, the Alberta Electric System Operator (AESO) independently operates the wholesale electricity market and manages the province's interconnected electricity system.

At the center of this structure is Alberta's "energy-only" market. In simple terms, generators are paid for the electricity they sell rather than simply for having generating capacity available. When electricity is plentiful, prices tend to be lower. When the system becomes tight, because demand is high, renewable output falls or other generation becomes unavailable, prices can rise significantly.

[1] https://www.cbc.ca/news/canada/edmonton/alberta-canada-population-2026-9.7367972

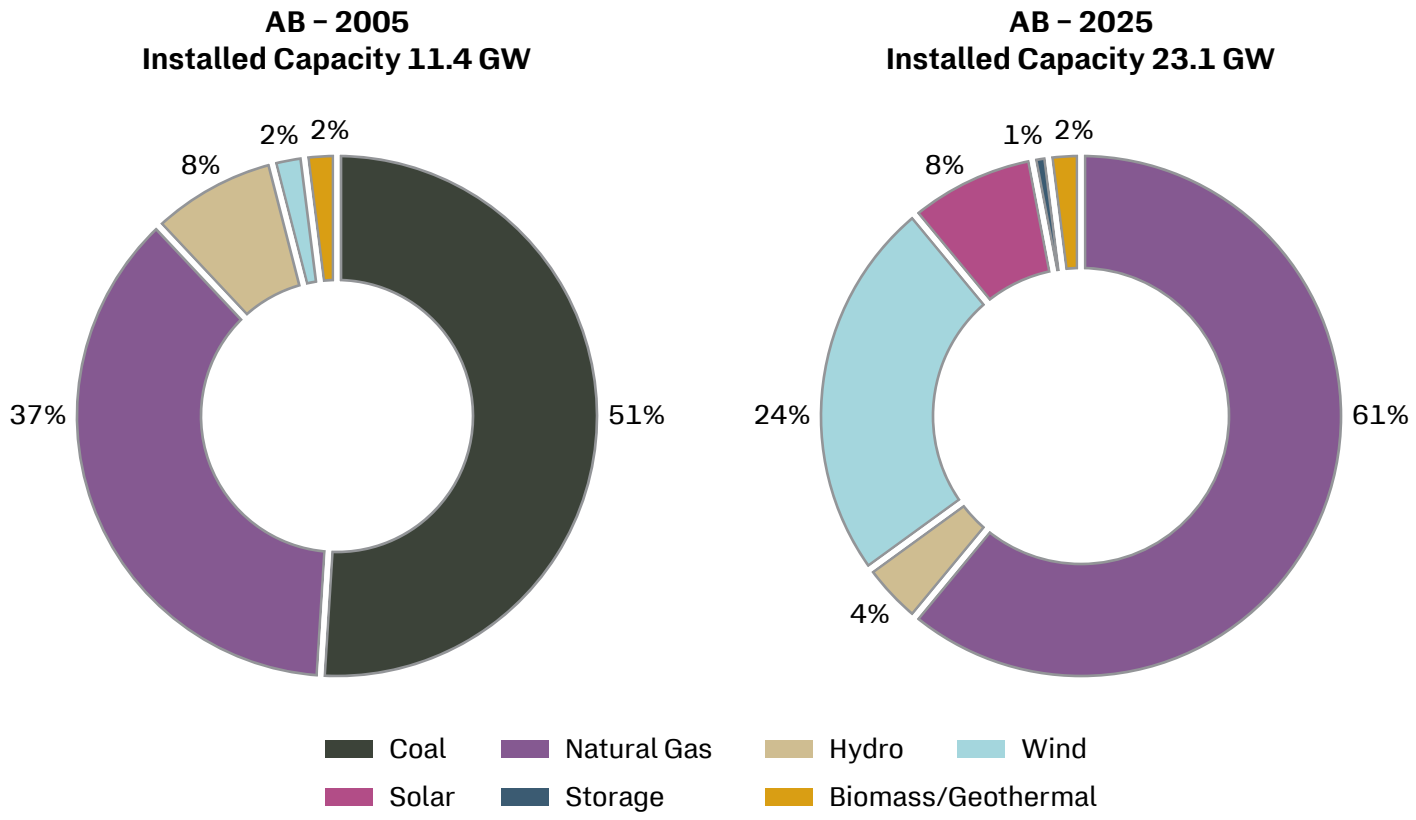
These changing prices serve an important purpose. Higher prices during periods of scarcity encourage available generators to supply power when it is most needed, while also signaling where additional investment may be required. Unlike a traditional regulated utility model, Alberta relies more heavily on private capital responding to these market signals, creating opportunities for infrastructure investors.

# A Power System in Transition

In Alberta, several significant changes are now occurring simultaneously. First, Alberta completed its transition away from coal-fired electricity generation in 2024 (see **Figure 1**). While some coal facilities were converted to natural gas, the transition reduced the amount of traditional synchronous generation on the system. These large generators historically helped stabilize the grid when electricity supply and demand suddenly moved out of balance. As they have been replaced by more variable sources of generation, the need for resources that can respond quickly to changes in grid conditions has increased.

Second, renewable generation has expanded rapidly (see **Figure 1**). Wind and solar have added significant new electricity supply, but their output varies with weather conditions and time of day. A wind facility cannot increase production when the wind is not blowing, nor can a solar facility generate after the sun goes down. As these resources make up a larger share of Alberta's generation mix, the system increasingly needs flexible assets that can absorb electricity when supply is plentiful and provide it back to the grid when supply falls.

## Figure 1: Installed Capacity in Alberta




Source: Alberta Electric System Operator, Alberta Electricity Prices in Context, October 2025.

Alberta's reliance on interties with neighboring provinces British Columbia and Saskatchewan as well as Montana in the U.S. adds another consideration. These connections allow the province to import electricity when needed, but if a large import suddenly trips offline, the system can lose a meaningful amount of supply within seconds. That creates a need for resources capable of responding almost immediately.

Finally, demand is now poised to increase. One hyperscaler has committed more than C$13 billion to an AI-optimized data center in Sturgeon County, requiring approximately 1 GW of power initially, with the potential to scale toward 1.8 GW[2]. For context, 1 GW is equivalent to nearly 8% of Alberta's 2025 peak demand of 12.8 GW. More broadly, proposed data-center connection requests totaled approximately 19.6 GW as of July 2026, roughly one-and-a-half times the province's current peak demand[3]. Not all these projects will ultimately proceed, but the scale of the queue is significant relative to Alberta's existing electricity system and illustrates the potential magnitude of new demand.

Together, these forces are changing what Alberta's grid requires. Electricity supply is becoming more variable while the system is being asked to carry more load, increasing the need for flexible resources that can respond quickly when conditions change.

## Why Battery Storage Matters

A grid-scale battery is relatively simple in concept: it stores electricity when it is available and returns it to the grid when it is needed.

One source of value comes from moving electricity across time. A battery can charge when electricity is abundant and prices are lower, then discharge when supply is tighter and prices are higher, a strategy known as energy arbitrage.

But batteries can provide another service that is increasingly important to Alberta's grid: speed. If a generating facility or major source of imported electricity suddenly goes offline, batteries can begin supplying power in fractions of a second. That response time helps stabilize the grid while slower resources react. Battery owners can be compensated for keeping this capacity available through operating reserves, fast frequency response and other reliability services.

This means the economics of a battery are not simply based on how much electricity passes through it. A battery can earn revenue by being available to respond when the grid needs it, even if it is not continuously charging and discharging. In this respect, the service can be thought of as similar to an insurance product: the grid pays for dependable capacity to be available in case it is needed, while the battery may also earn revenue when it is called upon.

Frequency

[2] https://about.fb.com/news/2026/07/breaking-ground-on-metas-first-data-center-in-canada
[3] https://www.alberta.ca/datacentres/numbers

# A Market Increasingly Rewarding Flexibility

Alberta's electricity market is now evolving in response to these same pressures. The province and AESO are implementing the Restructured Energy Market (REM)[4], a significant redesign intended to improve reliability and provide clearer signals for new investment as Alberta's generation mix and electricity demand change.

The reforms include changes to how electricity prices are established, more frequent pricing intervals, and new mechanisms for procuring capacity and reliability services. Alberta is also moving toward longer-term procurement for services such as fast frequency response.

The technical details are complex, but the investment implication is straightforward: the market is increasingly recognizing the value of resources that are available when needed and capable of responding quickly.

For storage owners, this could also change the nature of the revenue model. Alberta batteries have historically relied heavily on ancillary-service revenues, with the ability to supplement these through energy-market opportunities. Longer-term availability contracts can provide a more predictable source of revenue alongside those market-based opportunities.

The result is potentially an attractive combination for infrastructure investors: greater cash-flow visibility from contracted revenues, while retaining exposure to market opportunities when flexibility is particularly valuable.

# A Canadian Opportunity with Global Relevance

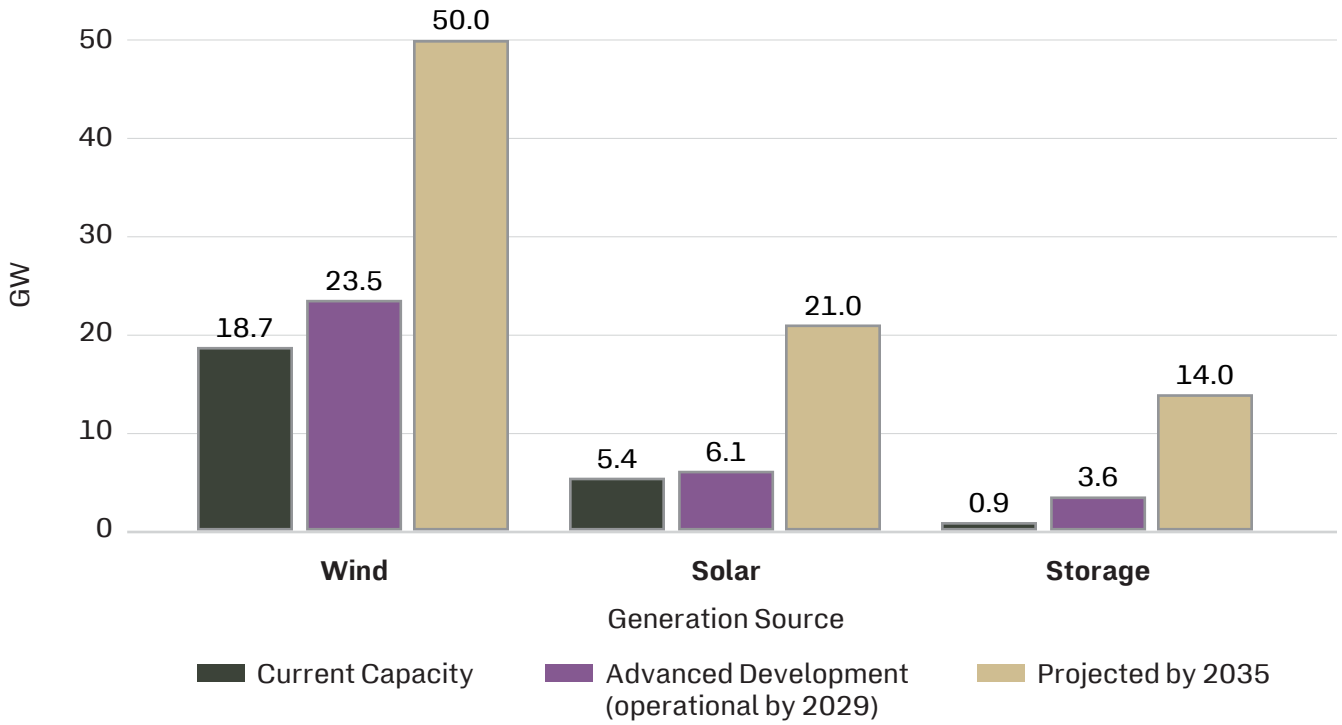
The forces reshaping Alberta are not unique to the province. Electricity systems across Canada and globally are integrating more renewable generation while simultaneously facing growing demand from electrification, manufacturing and digital infrastructure. As the balance between electricity supply and demand becomes more dynamic, flexibility is becoming an increasingly critical component of power infrastructure.

In Canada, different markets have taken different approaches. Ontario has relied more heavily on long-term contracted procurement for storage, while Alberta has historically offered greater exposure to competitive energy and ancillary-service markets. Alberta's move toward longer-term procurement suggests those models are beginning to converge.

The opportunity is also supported by federal policy. Canada's Clean Technology Investment Tax Credit provides a refundable credit of up to 30% of eligible capital costs for qualifying clean technology property, including fixed-location electricity storage. Together, these market and policy drivers are supporting significant growth in Canadian energy storage capacity (see **Figure 2**).

[4] https://renewablesassociation.ca/wp-content/uploads/2026/02/2025-Data-Release-report-V2.pdf

## Figure 2: Canada's Projected Energy Storage Capacity, 2025–2035




Source: The Canadian Renewable Energy Association, 2025 Annual Data Release.

Similar trends are visible internationally. Markets around the world, including Texas in the U.S., Australia, the U.K., the Nordics and Chile are all integrating growing amounts of renewable generation and confronting a corresponding need for flexibility. Storage is increasingly being used not only to shift electricity from periods of excess supply to periods of scarcity, but also to provide the reliability services required to operate increasingly complex power systems.

Storage markets themselves also evolve. Early in their development, relatively small ancillary-service markets can provide attractive revenues for first movers. As additional batteries enter, those markets become more competitive and value can migrate toward other sources, including energy arbitrage, ramping services and longer-duration availability contracts. For infrastructure investors, this evolution reinforces the value of established operating platforms with the capabilities and experience to adapt as market opportunities change.

Capacity

# Enfinite: Investing Behind the Storage Opportunity

The TD Infrastructure Strategy (the "Strategy") has been investing in Alberta's power market since 2018, when it acquired 11 power generation assets in three transactions. Those assets were brought together under Enfinite, creating a Canadian power platform supported by a dedicated management team in Calgary. Having an experienced team on the ground provides both the operating capabilities to manage the existing portfolio and the ability to identify new opportunities as Alberta's power market evolved.

One of those opportunities was battery storage. As renewable generation increased and reliability and congestion challenges emerged across the grid, the Enfinite team identified a growing need for resources that could respond almost instantaneously when supply and demand moved out of balance. Beginning in 2020, the Strategy moved early into the market, ultimately developing 180 MW of battery storage across nine projects and establishing Enfinite as one of Canada's largest owners of operational battery storage.

The investment has also demonstrated the value of combining an established operating platform with strong technology and supplier relationships. Enfinite worked with Tesla to deploy Megapack technology across its storage portfolio, including becoming the first operator globally to commission Megapack 2 technology in 2023. That experience has helped establish Enfinite's capabilities in developing and operating batteries in Alberta's demanding climate, while creating relationships and expertise that can be leveraged as the platform grows.

Most importantly, the portfolio has demonstrated its value to the electricity system. Enfinite represents approximately 67% of Alberta's operational battery energy storage and has achieved response times of less than one second. During a series of grid emergencies in 2024, including the extreme cold experienced in January, Enfinite's batteries supplied more than 100 MW of reserves within seconds, helping stabilize the grid and contributing to the avoidance of rotating outages. The operating fleet has also performed ahead of initial underwriting expectations, with individual facilities generally achieving payback in approximately three years, although outcomes vary by commissioning date and market conditions.

Enfinite has submitted interconnection applications for a further 350 MW of potential battery development and is advancing an additional 100 MW opportunity, providing a broader pipeline that may support future participation in fast frequency response and other procurement opportunities.

Enfinite illustrates how the Strategy seeks to invest in structural changes in infrastructure markets: establishing platforms with experienced local management teams, identifying emerging needs early, and using operating expertise and established relationships to deploy additional capital as those opportunities develop. As electricity systems across Canada require greater flexibility and reliability, Enfinite provides an established platform through which the Strategy can continue to invest in the evolving needs of the power system. ■

# Opportunity



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