

PLANNING A STRONGER RENEWABLE SECTOR IN CANADA

The industry in Canada added 2.3 GW of new installed capacity in 2023 — that includes wind, solar, and storage. (Courtesy: Siemens Gamesa)

Despite a few challenges, Canada is still determined to meet its net-zero carbon goals, but to do so will require a strong electricity game plan to drive economic growth, create jobs, and position the country as a leader in the global-energy transition and a good place to do business.

By **KENNETH CARTER** ▸ Wind Systems editor

Although Canada did see a relatively good year for renewable growth in 2023, the country fell short of the trajectory needed to meet its net zero targets. That's not to say the year was disappointing; it just didn't meet expectations.

However, there has been good news to report in the world of Canadian renewables.

"The industry in Canada added 2.3 GW of new installed capacity in 2023 — that includes wind, solar and storage," said Vittoria Bellissimo, president and CEO of the Canadian Renewable Energy Association (CanREA). "Of that 2.3 GW, more than 1.7 GW was new utility-scale wind. So, Canada now has a total installed capacity of more than 21.9 GW of wind, solar, and storage, including 20.4 GW of utility-scale wind and solar energy nationwide."

CHALLENGES

Those gigawatt tallies are impressive to be sure, but progress has been uneven across the Canadian landscape: Renewable energy challenges in several provinces have served to slow the country's original net-zero goals, according to Bellissimo.

"Alberta paused applications of new renewable projects back in August of 2023," she said. "They've since resumed the applications, but with additional requirements, and began redesigning the structure of the electricity market. All this has created market uncertainty."

But, Bellissimo said, other provinces have managed to pick up the pace since last year.

"British Columbia, for example, is running a procurement right now for 3,000 GWh/year, and they'll be running subsequent procurements after this," she said. "Saskatchewan has ongoing activity, as it looks to acquire 3 GW by 2035. Manitoba is looking to figure out ways to build more renewables. Ontario has just finished running the largest battery storage procurement in North America, and they are looking at buying energy now."

In Quebec, there is a need for 150 to 200 TWh of additional energy supply, and Bellissimo said that will come from renewables.

"Hydro-Québec will be building large facilities in Northern Quebec, and they'll be running procurements as well," she said. "Atlantic Canada is also really interesting right now, with onshore renewables as well as offshore on the table with real potential, as well as green hydrogen potential. For the last two years, our annual industry data reports were dominated by growth in Alberta. Two years ago, Alberta represented 75 percent of the country's growth, and last year it was over 90 percent, but now the growth is becoming really diversified across Canada."

CONTINUING DEVELOPMENT

In addition to policy uncertainty, other challenges facing the advancement of renewables in Canada include the changing face of the market structure, revenue streams, incentives, and supply chain constraints, according to Bellissimo. These challenges certainly aren't unique to Canada, as the U.S. also is facing similar hurdles in its continued development of renewable energy.

"With the need for a more robust grid infrastructure, we will come up against limits on interconnections," she said. "The windiest areas of the country aren't necessarily the areas with the best access to transmission, so we need to start looking at that: Where are we going to build projects, going forward? Do we have the transmission capacity to get that power to market?" Global supply chain issues also have affected availability and cost components for wind and solar projects and storage, according to Bellissimo.

"Developing North American manufacturing and supply networks can help mitigate this risk, so we're watching closely," she said. "We need to manage tariff implementation in a way that offers supports to industry to make sure we don't slow the energy transition. And we need investments in grid modernization — and energy storage in particular — to facilitate the integration of more renewables and to ensure higher levels of renewable penetration and reliability."

THE NEED FOR INTEGRATION

Although technical advances in renewables manufacturing are important, Bellissimo said advancements in integration are even more so.

"I default to Alberta examples, because I'm based in Alberta, but what we need to be able to do here is manage the ramp rates on our system," she said. "We need to be able to forecast better and integrate that forecasting into system approaches. And we need to match the tools that system operators have in their toolkits with the real conditions on the ground. If we need more ancillary services to integrate more renewables, we have to figure out a way to incentivize those." Even with Alberta beginning to embrace more renewable energy projects, the province is in need of more energy storage than it has today, according to Bellissimo.

"This province has 190 MW right now, and we will need more," she said. "Alberta has had a lot of renewables growth in recent years, so we need some energy storage to help make the integration of renewables quite a bit easier. Alberta recently approved a tariff structure called Demand Opportunity Service that will allow energy storage facilities to receive a reduced rate for transmission service, as long as they can prove a business case."



In June, Canada passed the Clean Energy Tax Credits law, which should provide a significant boost to Canada's renewable energy sector. (Courtesy: Jaq Murillo)

This new tariff structure is expected to reduce barriers to entry for transmission-connected energy storage facilities in Alberta, which is needed to manage everything from ramping to ancillary services, according to Bellissimo.

“On the wires side, it will help reduce costs to customers,” she said. “In my opinion, though, it’s not enough to spur the type of development we need. What I’ve been saying in Alberta is that we need to be able to stack revenue options. If there is stackable revenue — with it being an open market in Alberta — maybe a storage facility gets a certain amount of revenue from ancillary services and is able to get a certain amount of additional money from arbitraging the energy market. The barriers to entry are reduced because we have a tariff that’s no longer cost prohibitive. That’s what storage needs to get off the ground in Alberta.”

Unfortunately, Bellissimo said it’s not the same in other provinces.

“In Ontario, storage was procured, so there are government-backed, long-term contracts to provide energy storage,” she said. “In Alberta, we rely on the energy-only market, so there’s no long-term contracting available. So, it is a challenge. We have lots of work to do, but I do think there’s much more interest than there has been in the past, and I look forward to seeing more of it come online.”

CLEAN ENERGY TAX CREDITS LAW

But there is hope on the horizon. In June, Canada passed the Clean Energy Tax Credits law, which should provide a

significant boost to Canada’s renewable energy sector, according to Bellissimo.

“It encourages more investment and accelerates the transition to a low-carbon economy,” she said. “We at CanREA have been at the table with Finance Canada since August of 2022, advocating for a Canadian response to the Inflation Reduction Act in the United States. The Clean Technology ITC allows companies investing in renewable energy and energy storage projects to recoup between 20 and 30 percent of their capital costs as a refundable tax credit. With this bill, the government has put Canada on track to stay economically competitive in what we see as a rapidly digitizing and electrifying economy. And it will give investors confidence that Canada will remain competitive in the long term. This Clean Tech ITC will remain available until 2034, which is good for long-term incentives and understanding what the market will look like going forward.”

ENHANCING CANADA’S COMPETITIVENESS

The new tax credits serve to enhance Canada’s competitive position in global markets as well as attract investments, according to Bellissimo.

“We need a strong renewables sector, and we need a strong electricity game plan to drive economic growth, create jobs, and position Canada as a leader in the global energy transition and a good place to do business,” she said. “We need policy certainty. I think that’s something that some provinces are doing a good job of demonstrating, and others need

to work on it. No investor wants to be putting money down while the ground beneath their feet is moving. We need to be very, very clear that this is what the market looks like going forward. So, for jurisdictions that are buying renewables on behalf of their ratepayers, what's really helpful is predictable procurement schedules."

The other piece to that puzzle, according to Bellissimo, is the corporate PPA.

"You've seen a lot more of this in the U.S. than we have in Canada, where the only province that allows customers to buy their own renewable electricity is Alberta," she said. "Some other Canadian markets are looking to come up with their own type of mechanism to enable a version of a corporate PPA, but we haven't got that perfected yet. We are working hard to try to set up market structures where customers can make their own decisions on electricity."

WEATHER EVENTS

With the threat of climate change increasing, driving Canada toward a net zero carbon future becomes even more paramount, especially in the face of recent weather events.

On July 16, an unprecedented amount of rainfall caused a blackout in Toronto.

"There was more rain in one day than what Toronto sees in an average month," Bellissimo said. "There was some flooding at a Hydro One transmission station. Originally, 3,300 customers were out of power. Eventually 167,000 customers were out of power. One of the things we can learn from this — and not just this but any other extreme weather event — is we're seeing more of them in the age of climate change, so we need much more resilience on our grid. And that resilience can come from things like effective distributed energy resources: They don't rely on large-scale transmission to get their power to market — the supply is located closer to the load, and I think we'll see more and more of that."

But catastrophic climate events haven't been limited to Toronto, Bellissimo said they are happening across the country.

"I'm Albertan; we've seen a lot of wildfires, and it's scary, and it impacts everything," she said. "We've also seen significant hail and flooding. We need more resilient electricity systems going forward. We're going to all need to work together to look at that. When CanREA ran our Operations Summit, which is the biggest get-together for wind, solar, and storage operators in Canada, we focused on the theme of 'operating in a changing climate,' because that's what operators do: They are on the front lines, and they are the ones seeing how it's playing out."

MORE WORK TO DO

To that end, Canada definitely has a lot of balls in the air when it comes to meeting the country's net-zero carbon targets, but even that is in flux a bit, according to Bellissimo.

"Canada is planning to have a carbon-free economy by 2050, and right now, there's a regulation looking to decarbonize the electricity grid by 2035 that hasn't been passed



The windiest areas of the country aren't necessarily the areas with the best access to transmission. (Courtesy: Siemens Gamesa)

yet but is in discussions, called the Clean Electricity Regulations," she said. "The CER has allowances for fossil fire generation, if it's needed, to facilitate the transition. We will see what happens with that regulation as it moves forward."

In addition to that, Bellissimo said there are a lot of jurisdictions across Canada that are benefiting from legacy hydro assets, which already have predominantly clean grids.

"British Columbia, Manitoba, and Quebec have very, very clean, hydroelectric dominated grids, and Ontario has been very clean historically," she said. "It used to be about 92 percent clean. They're running more gas now, so it's gone down to about 87 percent, but still comparatively fairly clean. The grids that'll have the most difficulty decarbonizing are in the Prairies, Saskatchewan, and Alberta, which predominantly rely on fossil fuels. In Atlantic Canada, Nova Scotia and New Brunswick will also have larger challenges as they go forward."

To meet those goals and to continue to battle climate change will take a lot of commitment, as Canada faces both headwinds and tailwinds to achieve that target date, according to Bellissimo.

"It's a long laundry list, but I think the momentum is in our favor," she said.

ELECTRICITY TRANSFORMATION CANADA

As part of that commitment, CanREA is hosting Electricity Transformation Canada, its annual electricity conference, October 21-23 in Calgary.

"It's the largest electricity conference in the country," Bellissimo said. "Last year, we had more than 2,500 people. Participants include renewable energy companies, energy storage companies, utilities, system operators, governments and sectors that are undergoing electrification, as well as a wide variety of energy thought leaders and professionals. It's always a really good show. It's where deals are done in Canada." ✌

MORE INFO

[electricity-transformation.ca](https://www.electricity-transformation.ca)