BUSINESS
RENEWABLES
CENTRE
CANADA

FORUM 2024

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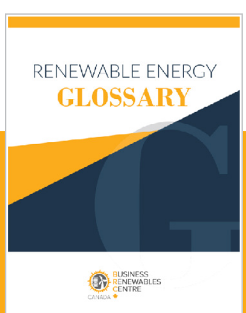


RENEWABLE ENERGY GLOSSARY

If you're brand new to the industry, or just catching up, you may find our **Renewable Energy Glossary** a handy reading companion.

1. INTRO

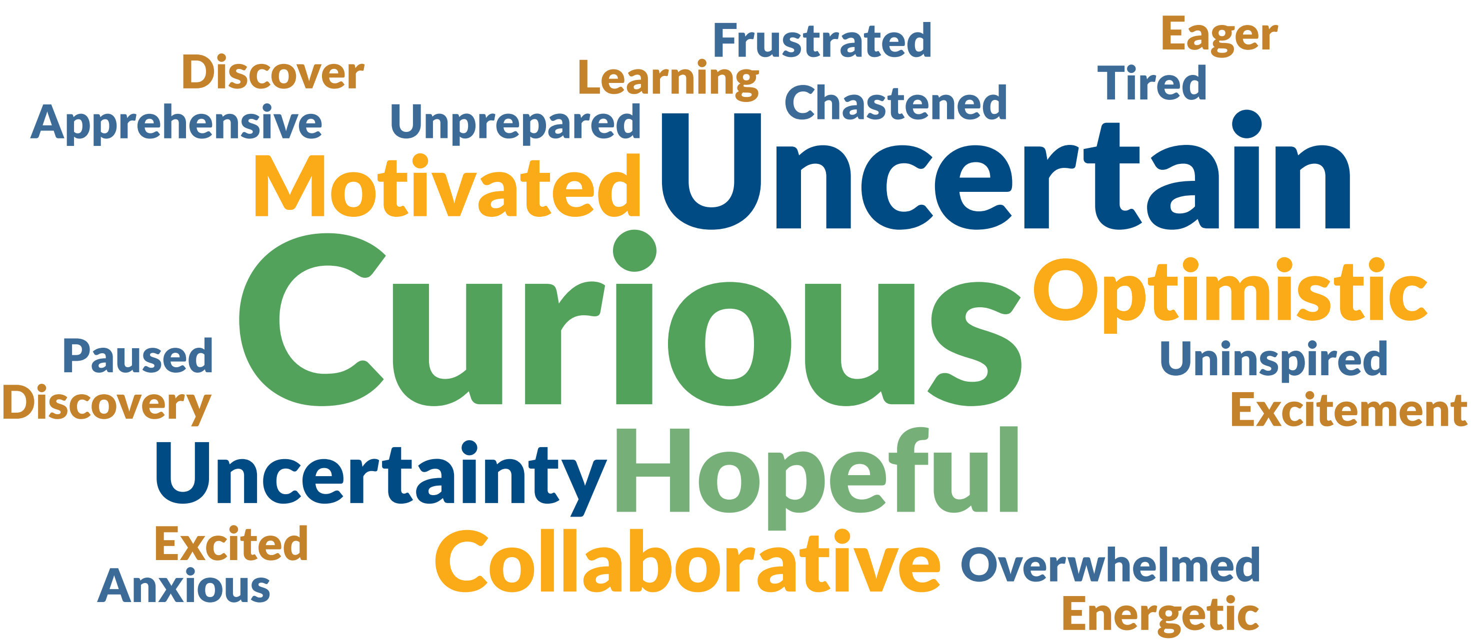
The Business Renewables Centre-Canada held its 2024 Forum in Calgary on November 12. This year's forum was set against the backdrop of ongoing market challenges. "Don't let this deter you," experienced buyers told attendees via video at the forum's outset. The BRC-Canada community can combine voices and purchasing power to prove to the market and regulators the depth of interest in power purchase agreements (PPAs) in Canada. We can collectively advocate for market reform. Together we can drive the positive business and environmental, social and governance (ESG) outcomes that we all strive towards.

Bolstered by this encouragement, the audience dug into a set of interactive sessions intended to unlock the potential of PPAs. Both novice and experienced buyers collaborated with developers and a diverse group of intermediaries to optimize work in current market conditions. There was a mutual expression of frustration among participants. But possible paths forward were revealed.

The audience greatly appreciated the event — 100% of those who completed the survey at the end declared they would attend again!

This report tidily summarizes the conversations and outcomes for those who attended and an overview for those who missed out entirely. (The exception is the procurement strategies discussions, which will be pulled out into a resource for our community in the new year!) Thoughts were shared freely at the forum under a modified Chatham House Rule, which means this summary captures the ideas expressed without noting a speaker's identity or affiliation.

In summary, forum attendees are frustrated by the regulatory risks the Alberta electricity market continues to experience and the impact on PPAs. Attendees at the forum realized they aren't alone and that many clever minds are keen to solve the challenges. Determination to persevere with PPAs was strong and the question remains: which province will benefit from that potential investment?



At the 2024 BRC-Canada Forum, which took place November 12, 2024, in Calgary, participants were asked to give one word that describes "how you are feeling as you come in to today's meeting."

2. ALBERTA MARKET CHALLENGES

The Alberta renewable energy market has been undeniably challenging over the last 18 months. First, there was that surprising approvals pause in August 2023 and subsequently the provincial government layered on multiple types of regulatory review.

Developers and buyers at our forum split market uncertainties into a list of challenges, then ranked them according to the level of most concern when considering PPAs.

The issues ranked as follows, from highest concern to lowest:

1. **Transmission cost allocation**
2. **Day-ahead market**
3. **Congestion management**
4. **Negative pricing**
5. **Transmission build planning standard**
6. **Ancillary services cost allocation**
7. **Line loss calculation**

The group went into a detailed discussion surrounding the top four issues identified in table-top discussions. The following summarizes discussions on the top four issues.

1. TRANSMISSION COST ALLOCATION

The government has indicated it will create an approach to pass transmission costs on to developers, but details are still unknown. Pricing projects with unknown or highly variable costs is always challenging. Given that transmission costs can be significant/material to a project, the challenge is exacerbated, developers explained. Buyers, in turn, worry these costs would be passed through to them using the most conservative planning/forecast scenarios.

Developers would be naive to not incorporate some forecast costs, otherwise they may find a project becomes uneconomic. But if the forecast costs are too high, the PPA price may be unattractive to buyers. Participants noted that buyers who are seeking projects in a particular area without existing transmission should be aware that additional costs could occur. Attendees proposed a way forward: buyers and developers agree to share the cost proportionally ahead of time using a formula to give each other some certainty in an uncertain environment.

2. DAY-AHEAD MARKET

The day-ahead market (DAM) can be a physical or financial market where market participants purchase and sell electric energy for the following day. Participants fear this new market system may harm the industry if implemented incorrectly. This concern is forcing market participants to adopt a wait-and-see approach as details are finalized.

It was suggested that developers are likely best suited to manage this risk because they can optimize decisions around bidding. However, concerns linger that they will need to inflate prices because they can't predict costs. It was noted, though, that the latest version of the restructured energy market (REM) design released by the Alberta Electric System Operator (AESO) has shifted to deemphasize the DAM.

3. CONGESTION MANAGEMENT

When a portion of a transmission grid is supplied with more electric power than it can manage, congestion results. Congestion management processes are enacted to prevent damage to the grid. Many management options exist. The debate among attendees was: which will the AESO choose to employ?

Developers noted the critical importance of equitable sharing of risk because ultimately a buyer won't benefit if a project becomes uneconomic under financially punishing congestion management costs. Another interesting point raised was the need to find a way for energy storage to earn value out of relieving congestion.

One attendee noted that the "back half" of PPAs has evolved into a substantial focus of transactions and now features congestion management costs. This increases the importance of clauses in a PPA contract that reduce risks like congestion. One suggestion presented as a possible path forward is to incorporate a clause in contracts around the anticipated number of hours in curtailment, a congestion management tactic, within a specific time period.

4. NEGATIVE PRICING

Negative pricing occurs when offer prices drop below $0/megawatt hour (MWh) and project owners are paying to have their electricity dispatched. Supply is expected to balance demand when the pool price within the market falls below zero to avoid curtailment. Negative pricing is a tool to manage congestion to improve market efficiency. However, shut down and restart costs are often significant for traditional generators and a short period of negative pricing could be financially preferrable.

One attendee suggested it would be difficult to find bankers that understand the risk. It was suggested that negative pricing scares bankers and may make other generation technologies more attractive.

It was also suggested that PPAs are not the place to allocate this risk, though certain buyers might be able to take on more risk based on their energy needs. It was also noted that negative pricing is found in many United States jurisdictions with functional PPA markets. A few options were presented by participants experienced in jurisdictions with negative pricing:

- Consider capping the price risk at a negotiated floor (e.g. A price cap at $0/MWh)
- Consider a contract for non-settlement, which would share the risk.
- A "cost collar" could make both parties unhappy, but it might be a solution. A collar protects against significant losses but also limits potential profits.

3. CONVERSATIONS ACROSS THE MARKET

While one group spoke about the market challenges in Alberta, the second group seized the opportunity to discuss other emerging topics around PPAs in Canada. Out of the eight topics floated among the attendees, three captured the most interest:

The free-flowing conversations touched on many challenges faced by developers and buyers currently waiting for more clarity. The following summary draws the main points from an ongoing discussion that covered all the questions above:

How are buyers and developers overcoming internal challenges?

Will we be able to undertake deals in Alberta?

What is plan B to meet ESG targets?

BARRIERS PREVENTING BUYERS FROM MAKING DEALS

Buyers require a clear view of the market and an understanding of contract options to evaluate costs and opportunities. Will the new regulations force extra costs onto PPAs compared to alternatives like renewable energy credits (RECs) and how will contract lengths impact their decisions? Developers also pointed out the persistent issue of settlement risk, which remains a concern for buyers. While buyers may hope for reduced risks over time, developers emphasized that settlement risks have always existed and will persist in different forms even with a new energy market.

But, even with increased stability, buyers could still face internal challenges in navigating the PPA process. Buyer organizations often lack familiarity with renewable energy markets, and they also face difficulty internally to convince corporate decision-makers about the impact of PPAs. It was noted that buyers gain comfort with entering into agreements when the knowledge gap is bridged.

BUYERS’ COMMITMENT TO RENEWABLE ENERGY

Buyers don’t always enter PPAs just for sustainability reasons. Even though it is driven by environmental goals and emissions reductions, economic considerations and cost allocation are a critical part of the analysis and sustainability funding is not limitless.

But exceptions exist among privately owned companies or organizations without shareholder pressure. These buyers are often motivated by a genuine interest in fulfilling their environmental goals and not just economics. They focus on the viability and integrity of the solutions rather than pure financial returns.

For some buyers, aligning their efforts with municipal or provincial sustainability goals eases the push for emission reductions. In such cases, external commitments at the regional level function as key drivers for action. Others, however, are motivated less by environmental priorities and more by peer pressure. For these buyers, avoiding the perception of falling behind competitors acts as a bigger incentive than the environmental benefits themselves.

When asked whether they would abandon the need for renewable energy, buyers insisted they would not. Despite current market challenges, they acknowledged the possibility of high-quality RECs, even from international sources, as a temporary solution.

Buyers stated that long-term emission reduction strategies remain essential to hitting their targets and adhering to frameworks like the Science-Based Targets initiative (SBTi). PPAs persist as a key component of these strategies, ensuring that buyers stay aligned with their sustainability commitments despite temporary adjustments in approach.

INTERNAL CHALLENGES AMONG DEVELOPERS

Developers are currently navigating several internal challenges regarding projects in Canada and Alberta in particular. Senior executives in North America and Europe are questioning whether to terminate projects in Alberta because of multiplying uncertainties in the market. Alberta remains the primary focus for PPA deals in Canada, but the lack of transparency undermines any justification for sustained investment.

Participants have had numerous conversations about redirecting efforts to other regions. However, given Canada's huge potential for solar and wind projects and Alberta's unique position as the only deregulated energy market in the country, participants still advocate for not moving away from the region. They are highlighting Alberta's existing operating assets and how they provide a strong foundation for future opportunities, even if clarity is lacking at the moment.

The importance of educating internal stakeholders about the long-term benefits of investing in Alberta, despite current challenges, has increased significantly. The general sentiment was that market uncertainties also bring growth opportunities. But for now, developers are holding back on expanding their commitments in Alberta, although not entirely withdrawing from the region.

THE FUTURE OF PPAs IN ALBERTA

Developers and buyers both foresee PPAs evolving significantly within the next year, with potential changes to contract structures as the market stabilizes. But both parties remain uncertain about how risks will be allocated until greater clarity emerges.

Developers appear more comfortable navigating uncertainty compared to buyers. The central question in this discussion was: How much risk are buyers able to absorb/manage? This uncertainty has slowed decision-making, as buyers are hesitant to commit without a clearer picture of future market conditions.

Some developers recommend holding off transactions in the current environment until the market morphs into something more predictable. This also raised another critical question: Once stability returns, who will make the first move — developers or buyers? This dynamic will likely define how PPAs are structured and negotiated in the future.

IS THERE A PLAN B TO MEET ESG TARGETS?

With the uncertainty in Alberta's market, discussions have shifted to exploring alternative approaches, including the use of unbundled renewable energy credits (RECs), as a potential plan B to attain ESG targets.

Buyers expressed mixed feelings about unbundled RECs. While they acknowledged the cost-effectiveness of RECs, they fail to align with many of the companies' narratives or provide additionality, a key component of ESG commitments. Also, it was highlighted that Canadian unbundled RECs, in particular, are criticized for lacking value/cost significantly more than U.S. unbundled RECs. The concept of REC swaps was also discussed. Although a viable option, it would need to be implemented with transparency and clear communication since buyers have concerns over potential reputational risks and misalignment with the company's ESG narrative.

Buyers emphasized the need for additionality to attain their ESG goals, which explains their preference for PPAs over unbundled RECs. It should be noted that the definition of additionality differs among companies, with some requiring projects in regions with "dirty grids," where renewable energy development can register the most meaningful impact. For this reason, projects in regions like British Columbia, with cleaner grids, may not satisfy some buyers' criteria despite the incentives on offer. Other companies require facilities to be located in the same grid area as a renewable project they act as offtake for (to align with their ESG strategy). Additionality drives PPA value among buyers and is forecast to persist in shaping buyer preferences. Buyers also acknowledged the possibility of paying a premium to meet additionality requirements, recognizing that limited options may necessitate increased costs.

The conversation also touched on the potential of expanding renewable energy projects into Ontario. Buyers are interested in pursuing projects if the market opens, given the concentration of manufacturing units there, but also highlighted that it would depend on the company's strategy and market structure.

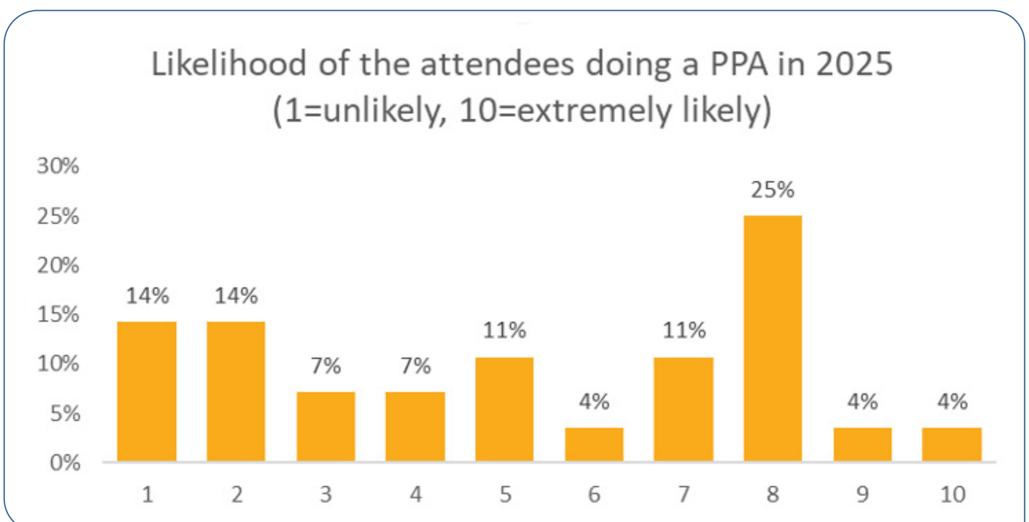


FIGURE 1

THE CURRENT APPETITE FOR PPAS

Attendees were asked how likely they were to undertake a PPA transaction in 2025. Despite the already discussed significant market challenges, almost 60% of attendee rated themselves as a 'likely' or above. This represents the inherent optimism of the BRC-Canada community and shows that interest remains strong in PPAs.

4. MARKET BARRIERS AND SOLUTIONS

The last exercise saw attendees identifying the most significant barriers facing corporate renewable energy procurement in Canada, with attendees noting which barriers they believe are currently hindering renewable energy procurement in Canada and a solution for the stated barrier. Solutions were scored and ranked. Four overarching categories of procurement barriers emerged:

- Regulatory
- Transmission
- Process
- Market Barriers

1. REGULATORY BARRIERS

Unsurprisingly, regulatory barriers garnered the most responses (72%). Within the group, the barrier that was highlighted 16 times centered around "Market/regulatory uncertainty" issues. With an average score of 6.3 of 10 across all the regulatory barriers identified, the highest barrier in this category ranked at 9 of 10, the identified barriers reflect the current state of renewable energy development in Alberta.

A high-ranking solution suggested to address regulatory barriers was a clear pathway from the government and government institutions to help market participants better understand the risks and impacts of transacting PPAs as changes unfold. A few solutions directly highlighted the restructured energy market (REM), and some suggestions focused on minimizing the impact of REM while others mentioned the need to accelerate its implementation, with one comment highlighting the concern that even if the market participants dislike its outcome, the certainty after implementation will empower the industry to make informed decisions. A mid-ranking solution involved purchasing unbundled RECs and postponing long-term investments until regulatory certainty evolved.

The attendees identified a few other regulatory barriers, too. Government intervention ranked 9 out of 10 and was perceived as the most overwhelming concern. The solution to this barrier, which also contributed to the rank, was the need for a clear or sustainable policy direction.

2. PROCESS BARRIERS

This category comprised 11% of the total responses and all the barriers were ranked 7 or above, out of 10, on average. The barrier with the highest rank in this category (9 of 10) was the issue of matching buyers to developers. The solution: institute a centralized marketplace. Reviewers of this issue suggested that a centralized marketplace could produce a competitive market for buyers and developers. It also highlighted that intermediaries like financial institutions would be ideal to match and aggregate both parties to help facilitate the contracting process.

Another barrier pointed at the complexity of transactions. The solution highlighted the need for continued education from BRC-Canada.

3. MARKET BARRIERS

Market barriers received 7% of the total responses. However, the two barriers identified under this category were ranked highly at 7 out of 10 that addressed the limited markets in Canada that currently enable PPAs. A suggested solution centred on enabling other procurement options for sleeve deals or other pathways between independent power producers and buyers. There was also a realization of the importance of the Alberta market and the need for more clarity, before investor interest in Canada is lost.

4. TRANSMISSION BARRIERS

This category also received 7% of the responses. The concern regarding transmission or congestion uncertainty was ranked the highest in this category, at an average of 8.5 out of 10. A suggested solution for this issue was the ability to incorporate pass-throughs up to a certain cap in PPA contract mechanisms. But the reviewers of this solution highlight that although very helpful, some buyers might prefer to avoid entering into complex contract alterations, and simply have the risk reflected in the price as the alternative option to tackle this barrier.

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ATCO

BluEarth Renewables

bullfrogpower

Capital Power

Cargill

Cassels

EDF renewables

Edmonton

edp Renewables

IBM

LevelTen Energy

Marathon Capital

Marriott International

Metlen Energy & Metals

Power Advisory

res power for good

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SILVER PARTICIPANTS

ABO WIND

AMBLE VENTURES

Bow Valley College

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Celestica

DAKOTA OJIBWAY TRIBAL COUNCIL

elemental energy

ENMAX

FNpower

gm

GIBSON ENERGY

GREENGATE

Invenergy

Labatt

low carbon powering tomorrow

MAPLE LEAF

NORTHLAND POWER

OXFORD

Pattern

PEREGRINE ENERGY

Purolator

PURPOSE

TOWN OF Banff

Town of CANMORE

transalta

Universal Kraft Canada Renewables
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