

#How to PPA

Simon Baines

Partner, Energy

Jessica Kennedy

Associate, Regulatory, Environmental, Aboriginal and Land

Shaun Wrubell

VP, General Counsel & Corporate Secretary BluEarth Renewables

Overview

- Private power purchase agreements (PPA) in the US and Canada
- Alberta regulatory regime
- Why enter into a PPA?
- Key commercial terms of a PPA

Introduction

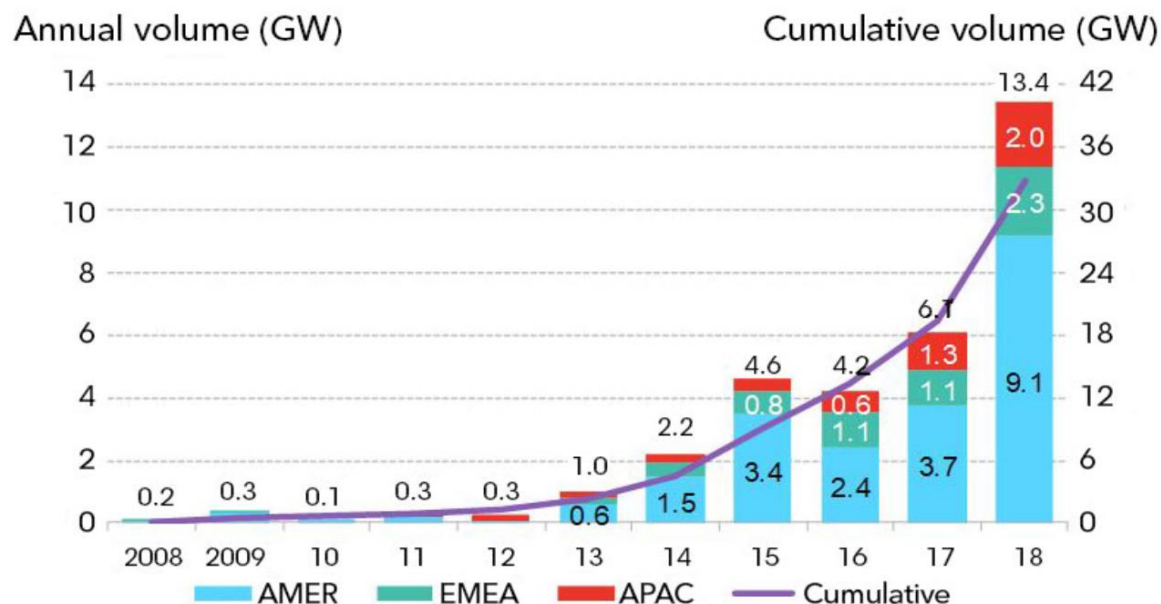
What is a PPA?

- A PPA is a long-term contract where a business notionally buys electricity directly from an energy generator
- In Alberta, renewable PPAs are structured as either a financial PPA or a physical PPA:
 - Financial PPA:
 - Contract for difference
 - No physical exchange of electricity
 - Buyer continues to pay and seller continues to receive the pool price
 - Parties calculate the difference between the floating pool price and the contract price and settle the difference between themselves
 - “Physical” PPA:
 - No physical exchange of electricity
 - Parties must register a Net Settlement Instruction (NSI) with the AESO
 - AESO subtracts the NSI volume from the buyer’s and seller’s actual metered volumes
 - Parties settle between themselves for the volume subject to the NSI at the contract price

Power Purchase Agreements in the US

- An increasing number of corporations, educational institutions and cities are entering into PPAs.
- In 2018, approximately 13.4 GW of renewable energy contracts were signed by 121 corporations in 21 countries.

Figure 1: Global corporate PPA volumes



Power Purchase Agreements in Canada (1)

- Predominantly government-run competitive procurement programs designed to encourage participation in renewable energy generation
- Public procurement in Alberta has been under the Renewable Energy Program (REP)
 - REP Round 1 - \$30.90 to \$43.30 (weighted avg \$37.35/MWh)
 - REP Round 2 - \$36.99 to \$38.97 (weighted avg \$38.69/MWh)
 - REP Round 3 - \$38.60 to \$41.49 (weighted avg \$40.14/MWh)

Power Purchase Agreements in Canada (2)

- REP successful bidders

Round	Project Owner	Project	MW
1	EDP Renewables Canada Ltd.	Sharp Hills Wind Farm near Oyen	248.4
1	Enel Green Power Canada, Inc.	Riverview Wind Farm near Pincher Creek	115
1	Enel Green Power Canada, Inc.	Phase 2 of Castle Rock Ridge Wind Power Plant near Pincher Creek	30.6
1	Capital Power Corporation	Whitla Wind near Medicine Hat	201.6
2	EDF Renewables Canada Inc.	Cypress Wind Power Project near Medicine Hat	201.6
2	Potentia Renewables Inc.	Stirling Wind Project near Lethbridge	113
2	Capstone Infrastructure Corporation	Buffalo Atlee Wind Farm 1 near Brooks	17.25
2	Capstone Infrastructure Corporation	Buffalo Atlee Wind Farm 2 near Brooks	13.8
2	Capstone Infrastructure Corporation	Buffalo Atlee Wind Farm 3 near Brooks	17.25
3	TransAlta Corporation	Windrise Wind near Pincher Creek	207
3	Potentia Renewables Inc.	Jenner Wind Power Project near Brooks	122.4
3	Potentia Renewables Inc.	Jenner Wind Power Project 2 near Brooks	71.4

Power Purchase Agreements in Canada (3)

- Alberta also initiated a solar specific procurement to source approximately 55% of the government's electricity requirements
 - In February 2019, three contracts announced for a total of 94 MW of solar power with an average contracted price of \$48.05/MWh
- Little information is available regarding private PPAs being entered into in Alberta and across Canada

Bull Creek Wind Facility (1)

- The Alberta Schools Commodities Purchasing Consortium ran a formal competitive process to select a wind development partner to pursue its power purchasing strategy to reduce exposure to volatile energy costs
- BluEarth Renewables was selected to complete the Bull Creek Wind Facility
 - BluEarth led all development, finance and construction activities
 - BluEarth continues to own and operate the Project

Bull Creek Wind Facility (2)

- Project has 26 separate PPAs with entities that do not hold any credit rating
- BluEarth led the drafting of the PPAs and ancillary agreements
- Despite the challenging commercial structure, BluEarth was able to finance on competitive terms
- Challenges
 - Following the initial competitive procurement the Project was re-sized without a change in PPA price

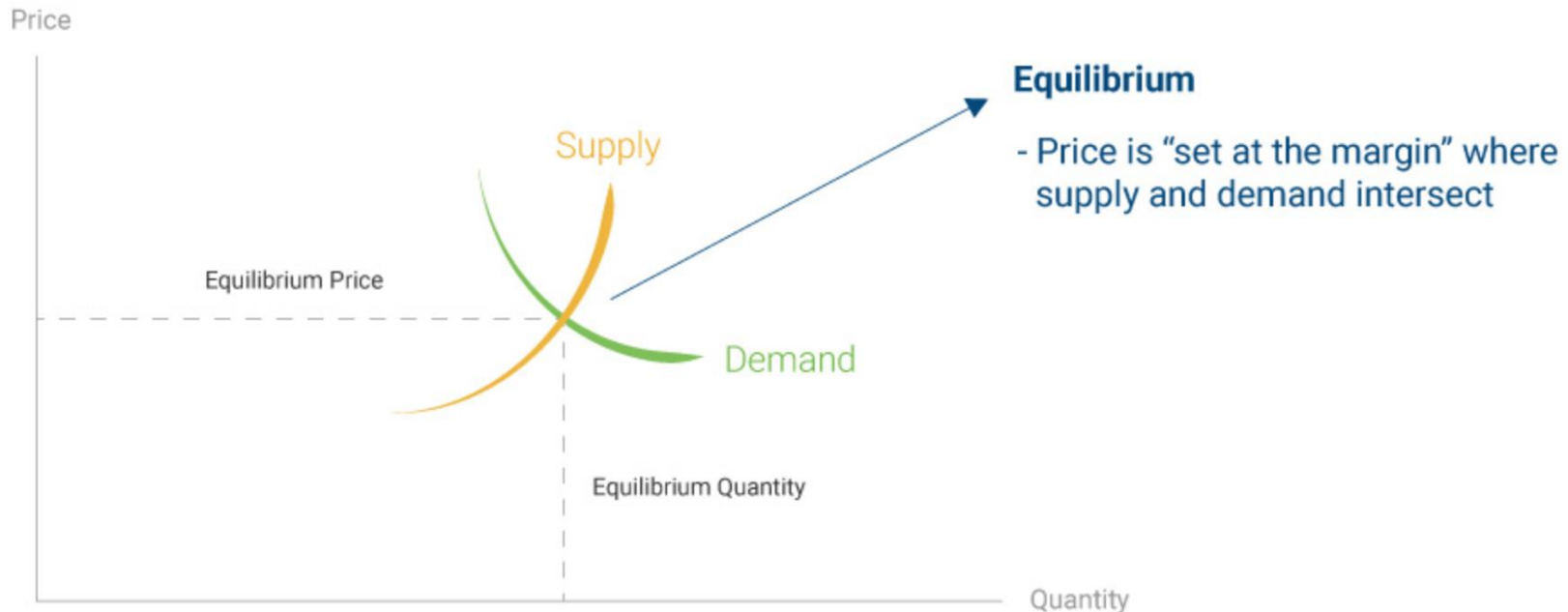
Alberta Regulatory Regime

Alberta Regulatory Regime (1)

- PPAs are often restricted to power produced in competitive electricity markets
 - Alberta's deregulated market allows generators to enter into contracts directly with other private parties
- The *Electric Utilities Act* establishes a power pool structure
 - All power entering or leaving the Alberta Interconnected Electric System must be exchanged through the power pool
 - The Independent System Operator (ISO) carries out the financial settlement for all electric energy exchanged through the power pool at the pool price
- Alberta is an “energy-only” market (for now)

Alberta Regulatory Regime (2)

- Pool Price
 - Every generating unit with a maximum capacity of 5 MW or more must submit an offer to sell electric energy for each hour
 - ISO creates a merit order (sorting offers from lowest to highest)
 - Last offer dispatched from the merit order to meet demand sets the system marginal price (SMP)



Capacity Market

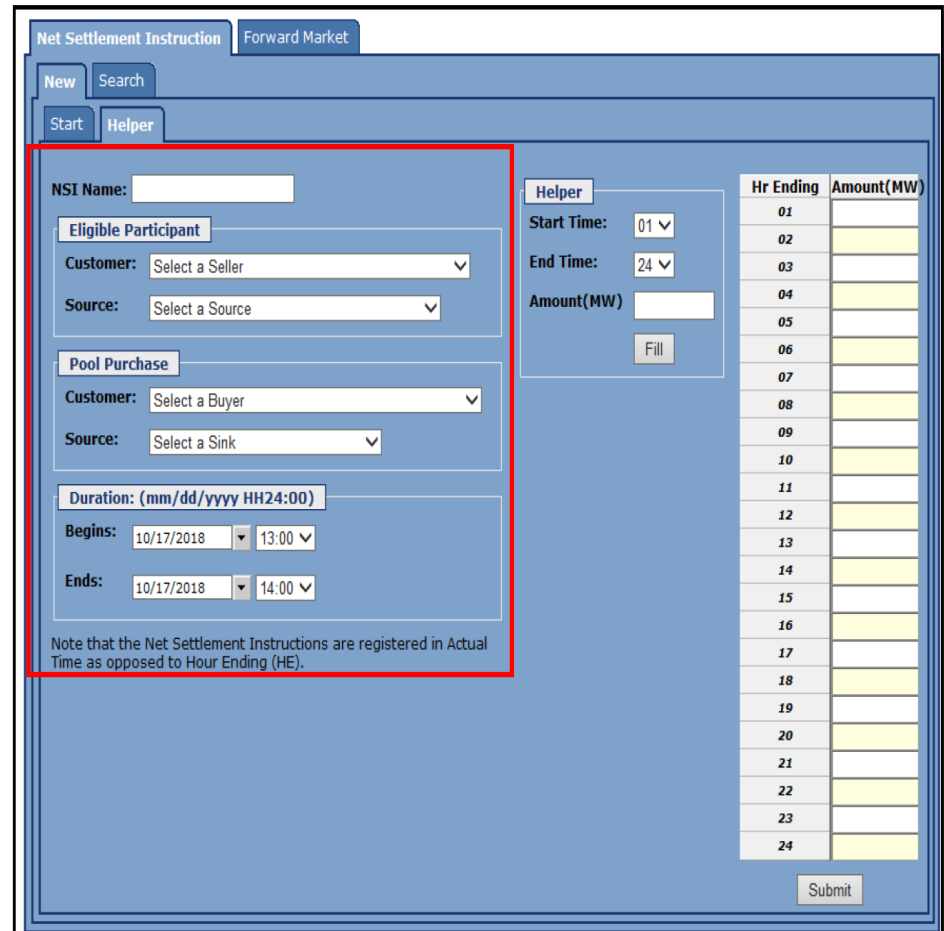
- May 2015 – NDP elected
- November 2015 – Climate Leadership Plan
- October 2016 – ISO recommends capacity market
- November 2016 – Government endorsed ISO recommendation
- 2017 – 2021 – Implementation of capacity market



- April 2019 – UCP elected
- 2020 and beyond – ???

Net Settlement Instructions (NSI)

- Main distinction between the two types of PPAs in Alberta is the involvement of the ISO through a NSI → “physical” PPA
- The ISO subtracts the quantity of electricity specified in the NSI from the metered quantity of electricity delivered by the generator to the power pool and procured by the customer from the power pool
- PPA parties then settle as between one another for the quantity of electricity specified in the NSI at the price set in the PPA
- ISO will charge the buyer the pool price for any volume above the contracted amount



Net Settlement Instruction Forward Market

New Search

Start Helper

NSI Name:

Eligible Participant

Customer:

Source:

Pool Purchase

Customer:

Source:

Duration: (mm/dd/yyyy HH24:00)

Begins:

Ends:

Note that the Net Settlement Instructions are registered in Actual Time as opposed to Hour Ending (HE).

Helper

Start Time:

End Time:

Amount(MW)

Fill

Hr Ending	Amount(MW)
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
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22	
23	
24	

Submit

Why enter into a PPA?

Generator Perspective

- Provides revenue certainty
 - Absent a PPA, a generator's only option is to sell electricity at the prevailing pool price for each settlement interval
 - Price received by the generator will vary hour by hour, day over day
 - Power pool does not involve the sale of renewable attributes resulting from the project
 - Lack of certainty of sufficient revenue can make it difficult to secure financing

Customer Perspective

- Reduce exposure to energy costs by fixing those costs through power purchase contracting to obtain competitive pricing and price certainty
- Renewable energy procurement can help meet environmental regulatory obligations, achieve sustainability or social responsibility goals or targets, and meet branding objectives
- Most carbon pricing schemes allow for the purchase of renewable energy credits to offset emissions

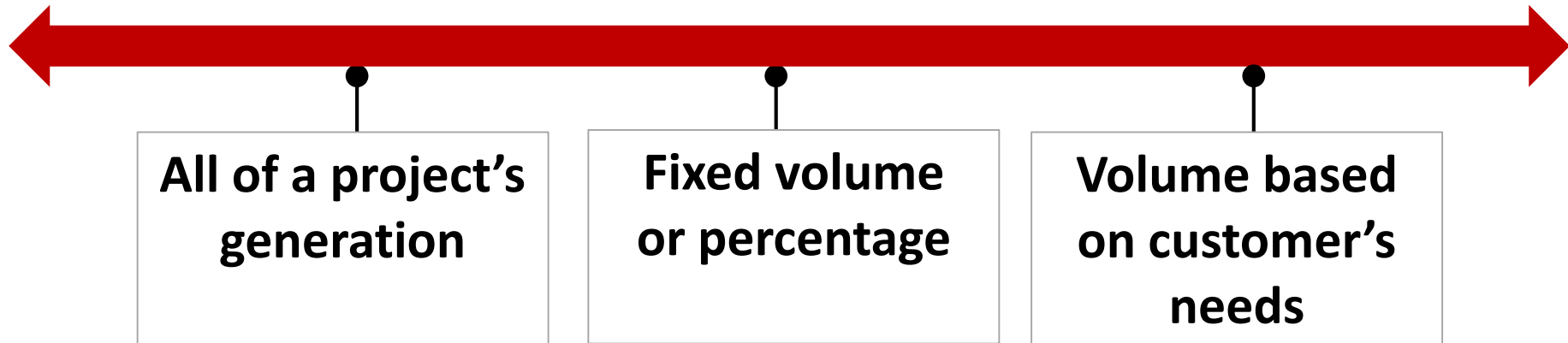
Key Commercial Terms of a PPA

Overview of Key Commercial Terms

- Subject matter
- Price and term
- Creditworthiness of counterparties
- Curtailment risk
- Change of law

Subject Matter

- Power only, Renewable Energy Credits (RECs) only or Power + RECs?
- Quantity of Power



- Consider allocation of risk re: capacity products
- Consider ancillary services such as potential storage opportunities

Price and Term

- Price and term are two elements of a PPA that are closely connected
- PPAs are often long term contracts (10+ years)
- Longer terms can be advantageous to both parties
 - Generator secures offtake for up to life of power project
 - Customer secures power for its consumption needs and fixed price certainty for longer term
- Power price variability
 - One way to address the risk of being above or below market is through indexation

Creditworthiness

- Corporate PPA is not with government entities and bankruptcy or performance risk always present
- PPA is only as good as the potential counterparty
- Address risk by way of financial assurance and contract terms
 - Parent company guarantee
 - Letter of credit
 - Performance security and financial penalties
 - Assignment and change of control provisions

Availability/Curtailment Risk

- Availability Risk
 - Risk that a renewable energy project will generate less electricity than is contracted for
 - Seasonality, wind speed, planned and unplanned outages, timing and power levels, etc.
- Curtailment Risk
 - Risk that not all of the electricity generated by a renewable energy project can be delivered to a customer as a result of constraints on the transmission system
 - Regulatory risk neither party can control – best defence is market diligence; requirement to object to new projects

Change of Law (1)

- Change of Law and Regulatory Changes
 - Provides opportunity for parties to agree in advance how the costs or benefits resulting from such a change are to be shared by the parties
- Particularly relevant given the number of material changes in Alberta that have had profound effects on the renewable energy industry
 - On May 5, 2015, the Alberta NDP won a majority government
 - In November 2015, following delivery of the Climate Leadership – Report to Minister, the Alberta government published its Climate Leadership Plan which focuses on five key elements: (i) putting a price on greenhouse gas emissions; (ii) ending pollution from coal-generated electricity by 2030; (iii) developing more renewable energy; (iv) capping oil sands emissions to 100 megatonnes per year; and (v) reducing methane emissions by 45% by 2025

Change of Law (2)

- In June 2016, the *Climate Leadership Implementation Act* (Alberta) came into force, imposing a carbon pricing regime on all consumers which started at \$20 per tonne on January 1, 2017, increasing to \$30 per tonne on January 1, 2018 and expected to continue to rise
- In October 2016 the federal government announced that it would impose a carbon tax of \$10 per tonne (rising to \$50 per tonne in 2022) on any province that does not have its own carbon pricing regime
- In November 2016, the Alberta government announced the introduction of a capacity electricity market which is expected to have the first capacity obligation periods on 2021
- In September 2017, the request for proposals under Round 1 of the Renewable Electricity Program was launched with the winning bidders being announced in December 2017
- Effective January 1, 2018, the Alberta government replaced the *Specified Gas Emitters Regulation* under the *Climate Change and Emissions Management Act* (Alberta) with the new *Carbon Competitiveness Incentive Regulation*
- In September 2018, the requests for proposals under Rounds 2 and 3 of the Renewable Electricity Program were launched with the winning bidders being announced in December 2018
- On April 16, 2019, the United Conservative Party won a majority government and, pursuant to UCP leader and Premier-designate Jason Kenny's promise to repeal the Alberta carbon tax, *Bill 1: An Act to Repeal the Carbon Tax* was introduced on May 22, 2019.
- The Alberta Utilities Commission is currently considering whether to allow the AESO to materially change the way in which the AESO tariff applies to distribution-connected generators, including many renewable projects

Conclusion

- Significant growth in the use of renewable PPAs in the US but have not seen corresponding growth in Canada
- Lack of growth despite very favourable market and regulatory regimes for private PPAs in Alberta
- Hope that potential project developers and customers will have a better understanding of what a private PPA might entail and the benefits that could result from (and the risks that could be mitigated by) such an agreement