New Opportunities in the **Alberta Electricity Market**

A BLG Overview

April 2017

Borden Ladner Gervais

THE NEW ALBERTA ELECTRICITY OPPORTUNITY

Renewable power will account for 30% of Alberta's generation by 2030 – likely over 7,000 MW.

Forced closure of coal plants – 6,300 MW to be taken out of service.

Government financial support for 5,000 MW of new renewable power development – $10.5 billion of new investment is expected.

Other new power plants will be required to firm the renewables – opportunity for new gas-fired, hydro, geothermal and energy storage projects.

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INTRODUCTION TO ALBERTA AND ITS ELECTRICITY MARKET

Alberta and its Recent Electricity Policy Changes

Alberta is Canada's fourth largest province, with a population of over 4 million people, and a land mass of 660,000 sq kms – about twice the size of Germany.

The electricity market, composed of its generators, transmitters, distributors, retailers, electricity consumers, and wholesale electricity market, (the Alberta Electricity Market) recently hit a new peak load of 11,458 MW, but daily peak load generally averages about 10,000 MW. It is predominantly (>60%) an industrial load due to Alberta's large oil and gas industry. The load is currently 90% serviced by thermal generation that is coal and natural gas based, with renewables generating only about 10% of the required electricity in Alberta. This is about to change.

In late 2015, the Government of Alberta announced a number of policy changes that will impact the fuel mix for the Alberta Electricity Market. Generators in Alberta will be forced to utilize lower-carbon natural gas and zero-carbon renewable forms of generation. Alberta is one of the last provinces in Canada to mandate a change in its fuel mix for generating power. The new Alberta policy changes require that:

1. There will be no pollution from coal-fired power generation in Alberta by 2030, as all coal-fired plants (approx. 6,300 MW) will either be phased out or be pollution free by then.
2. Two-thirds of the current 6,300 MW of coal-generating capacity (approx. 4,200 MW) will be replaced by renewable energy, and one-third (approx. 2,100 MW) by natural gas.
3. Beginning in 2018, all coal generators will pay $30 per tonne of CO^2 on emissions above what Alberta's cleanest gas plant would emit to generate the same quantity of electricity.
4. Renewable power will account for 30% of Alberta's electricity by 2030 – the "30 by 30" Alberta power policy.

These 2015 policy announcements were followed up in 2016 by a number of other changes to the Alberta Electricity Market, including that:

1. Alberta will hold its first renewable power procurement in 2017 for 400 MW – it will be the first of many procurements as Alberta has committed to provide the financial support required for 5,000 MW of new renewable capacity to be added in Alberta by 2030.
2. Alberta will transition from an energy-only market to have both an energy market and a capacity market. This is being done for supply adequacy reasons because, in addition to the 5,000 MW of renewables, Alberta will require over 9,000 MW of new non-renewable power to be built in the province. Alberta concluded that a capacity market was required in order provide the sufficient and reliable cash flows necessary to incent developers and their financiers to build that additional generation.

In total, the Province estimates that $20-25 billion will need to be spent between now and 2030 in Alberta to change the generation fleet from one now dominated by coal to one dominated by renewables and cleaner natural gas.

ALBERTA

More than **26,000 km** transmission

Interties B.C., Sask. and Montana

Over 230 generating units

11,450 MW system peak

About **200 market participants**

16,300 MW Installed Capacity

A Few Caveats

A few caveats are in order – BLG is a law firm after all. First, as is clear from the number of recent electricity policy announcements, the Alberta Electricity Market is constantly changing. This overview is also of a general nature, provided for background information only, and should not be regarded as legal advice.

Also, any market or price forecasts in the overview have been gathered from publicly available sources and have not been verified by BLG. Finally, while every effort has been made to ensure that this overview is accurate at the time of publication, the Alberta Electricity Market will evolve and we urge you to seek legal advice regarding your particular business activities in the Alberta Electricity Market.

Not surprisingly, Borden Ladner Gervais LLP (BLG) and our Electricity Markets Group have seen a rise in the number of new project developers from outside Alberta who are seeking legal and business advice in this area. In this regard, we are periodically asked by potential entrants into the Alberta Electricity Market to provide an overview of the Alberta Electricity Market to assist them to better understand (i) the structure of the Alberta Electricity Market, (ii) the applicable legislation, regulations and governing agencies, (iii) the existing characteristics of Alberta's load and its generation mix, (iv) the way in which electricity prices are determined in Alberta, and, most importantly, (v) the recent developments that have occurred to create business opportunities for them in the Alberta Electricity Market.

We concluded that this general advice is something that would be of benefit to every new entrant into the Alberta Electricity Market, whether they are a prospective power project developer, investor, lender, constructor, operator or other participant in the market.

AlbertaPowerMarket.com

In addition to this resource, we encourage you to also visit our website AlbertaPowerMarket.com and to follow us on Twitter @ABPowermarket. We regularly publish our own articles on new developments that are important for stakeholders in the Alberta Electricity Market.

Our Law Firm

BLG gives clients access to a fully integrated national network of superior legal talent. We offer the collective strength of more than 700 lawyers, intellectual property and other professionals across Canada. Our specialized practice groups understand the challenges you face and the needs of the electricity sector. We know what it takes to give you timely, integrated solutions for the local, national and global electricity marketplace.

Our Electricity Markets Group

BLG has a national Electricity Markets Group, composed of over 40 lawyers in offices across Canada. We have extensive electricity industry experience acting for existing generators, new project developers, transmitters, distributors, lenders, retailers, major consumers, industry associations and other electricity industry stakeholders. In Alberta, we have been active since 1996, when our Calgary-based team advised one of the then principal Alberta utilities on market design issues when the Alberta power market was first established, and then on the power purchase procurement design that occurred in Alberta in 2000. Since 2000, our experience has been ongoing and has included, among other things, advising project proponents, investors, contractors and lenders on new renewable and natural gas electricity generation projects, advising both owners and buyers under Alberta's legacy coal power purchase arrangements, advising Alberta's largest transmission company on an array of Alberta transmission, rates and energy market matters, and advising competitive retailers in Alberta, including on the preparation of their electricity contracts with customers.

Contact

For a more detailed description of our law firm and our services in the electricity sector, please visit our website at **blg.com**. For more detailed information about the Alberta Electricity Market please contact the following members of our Electricity Markets Group who are based in our Calgary Office:

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We would be honoured to represent you with respect to your business activities in the Alberta Electricity Market.

CURRENT STRUCTURE OF THE ALBERTA ELECTRICITY MARKET

History and Evolution

Alberta's Electricity Market is unique in Canada. Its uniqueness is best understood through the historical context from which it developed.

Unlike most other provinces in Canada, Alberta did not form one province-wide vertically integrated utility to generate, transmit and deliver electricity when the Province was initially electrified. Instead, the majority of Alberta's electricity infrastructure was developed and owned by either investor-owned or municipally-owned entities.

These entities have now either been taken over or evolved into some of the players that currently operate in the Alberta Electricity Market. For example, in Southern Alberta the Calgary Power Co. Ltd. generated 99% of Alberta's power at one time. It subsequently changed its name to TransAlta, a large generator in today's Alberta Electricity Market. In the City of Calgary, the distribution of power was done by Calgary's municipal power authority that later became ENMAX, another large player in today's market. In the City of Edmonton, the City formed Edmonton Power to generate and distribute power within that city until it became EPCOR, which was later separated into publicly traded Capital Power for generation and municipally-owned EPCOR Utilities for transmission and distribution. Rural Alberta was serviced mostly by Canadian Utilities Limited until 1980, when it was taken over by ATCO. We say this simply to point out that many of the big existing participants in today's Alberta Electricity Market, like TransAlta, EPCOR, Capital Power, ENMAX and ATCO, have, like BLG, a long history and deep roots in the Alberta Electricity Market.

By 1995, on the generation side, Alberta was serviced mainly by three large vertically-integrated utilities, namely TransAlta, ATCO (then Alberta Power), and EPCOR (the Big 3), that collectively generated 90% of Alberta's then 8,600 MW of generation capacity. Of that total, 75% was generated by large baseload coal facilities, with the rest split between hydro and natural gas facilities. The Big 3 operated within specific service areas under a cost-of service regulatory model. Electricity prices in Alberta at that time were set by a central regulatory body.

Creation of the Power Pool – 1996

With the coming into force of the *Electric Utilities Act* (EUA) on January 1, 1996, Alberta moved away from cost-of-service regulation on the generation side. Instead, it established the Power Pool through which all electricity, whether generated in Alberta or imported, in Alberta's Interconnected Electrical System (AIES) or grid would be dispatched competitively in a fair, efficient and openly competitive manner. The Power Pool was Canada's first competitive open-access market for the exchange of electricity.

All electricity that is generated and not consumed on site in Alberta must pass through the Power Pool. The Power Pool itself does not buy or sell electric energy, but acts only as a trading platform with financial settlement. Currently, it is also "energy only" in that generators only receive payments for the electrical energy delivered into the AIES. They do not receive payments for capacity. We say currently because, as we describe below in the section titled "Transition to a Capacity Market," Alberta has announced that it will bring in a capacity market with Alberta's first capacity procurement to occur in 2019.

The EUA also mandated open access to all transmission facilities in order to support competitive generation. It also put in place financial mechanisms or hedges intended to protect the then existing generation investments of the Big 3 from the new competitive market, while at the same time preventing them from exercising their concentrated market pricing power. The result was that, though developers of new generation were exposed to the risks of the Power Pool and low prices, the existing generation of the Big 3 was protected in 1996, and effectively continued as if it was still operating under the old cost-of-service regulatory model.

Power Purchase Arrangements – 2000

The next big change in the evolution of the Alberta Electricity Market came when Alberta mandated that the existing generation facilities owned by the Big 3 when the EUA was enacted be deregulated and exposed to the risks of Power Pool prices. To do this, Alberta removed the financial mechanisms or hedges that it had put in place when it passed the EUA. They were replaced with a forced auction, whereby the rights to the power from the output from the generation facilities of the Big 3 were sold to qualified bidders. This avoided the Big 3 being forced to divest themselves of their facilities.

The auction was completed using Power Purchase Arrangements (PPA or PPAs). Note the use of the word "Arrangement," as distinguished from the word "Agreement" that we typically equate with the acronym PPA. In fact, the PPAs are not negotiated contracts – they are statutory instruments determined by Alberta, and enacted by the Alberta Government as Alberta Regulation 175/2000, with "quasi-contractual" characteristics.

The PPAs were used as a way to introduce competition into the Power Pool. The PPAs were intended to allow the "Owners" of the generation facilities the opportunity to recover their fixed and variable costs while transferring the right to offer the output from those generation facilities into the Power Pool to the "Buyers" who were successful in the auction.

The PPAs were, in a sense, a virtual divestiture of the power generated by the existing facilities of the Big 3. They left the ownership and operation of the plants with the Owners, but gave the Buyers of the PPAs the right to offer the electricity into the Power Pool at prices determined by each of the Buyers. The PPAs require that the Buyers pay the Owners their remaining fixed and variable costs, plus a reasonable return on assets – the PPAs mimic the historic cost-of-service model. Accordingly, the Buyers take market risk, and make money if the Power Pool prices exceed the amount they are required to pay to the Owners under the PPAs, but lose money if the Power Pool prices do not exceed the amount they are required to pay to the Owners under the PPAs.

The main PPA auction of 12 PPAs occurred in August of 2000, though only 8 PPAs were sold in that auction. Additional auctions for the unsold PPAs or power contracts/strips under those unsold PPAs were held later in 2000, and again in 2002-2003, and in 2005-2006. The approximate $3-billion of proceeds received from these sales was returned by the Province to electricity consumers in Alberta as a refund on their bills.

Any unsold PPA was held and managed by a government entity called the Balancing Pool, with it acting as the Buyer under that PPA who offers the electricity from that PPA into the Power Pool. The Balancing Pool is required to manage the PPAs in a commercial manner, which includes managing associated payments, forecasting revenues and expenses, and participating in appropriate regulatory, dispute resolution or other proceedings.

The PPAs expire on the earlier of December 31, 2020 (20 years) or the then estimated end of plant life for the applicable facility. At the end of the term of the PPA the right to the output from the facility reverts back to the Owner. The Owner will then decide whether to decommission the facility or continue to operate it, either as a coal plant or, in the light of Alberta's new policy changes, after converting it to a gas plant.

Currently, there are seven PPAs for coal facilities that have not expired and remain in effect in Alberta:

As a result of changes in Alberta's climate change laws, in 2016 the Buyers under the PPAs set out in the table exercised their right to terminate their obligations under these PPAs. This right of termination (really just a turnover to the Province's Balancing Pool) was challenged in court by the Alberta Government. As of December 2016, the Government of Alberta has settled this matter with all of the Buyers other than ENMAX. The settlement resulted in the PPA terminations being accepted, and those PPAs turned over to the Balancing Pool with the Balancing Pool now being the Buyer that offers most of Alberta's existing coal-fired power into the Power Pool.

Retail Market Competition – 2001

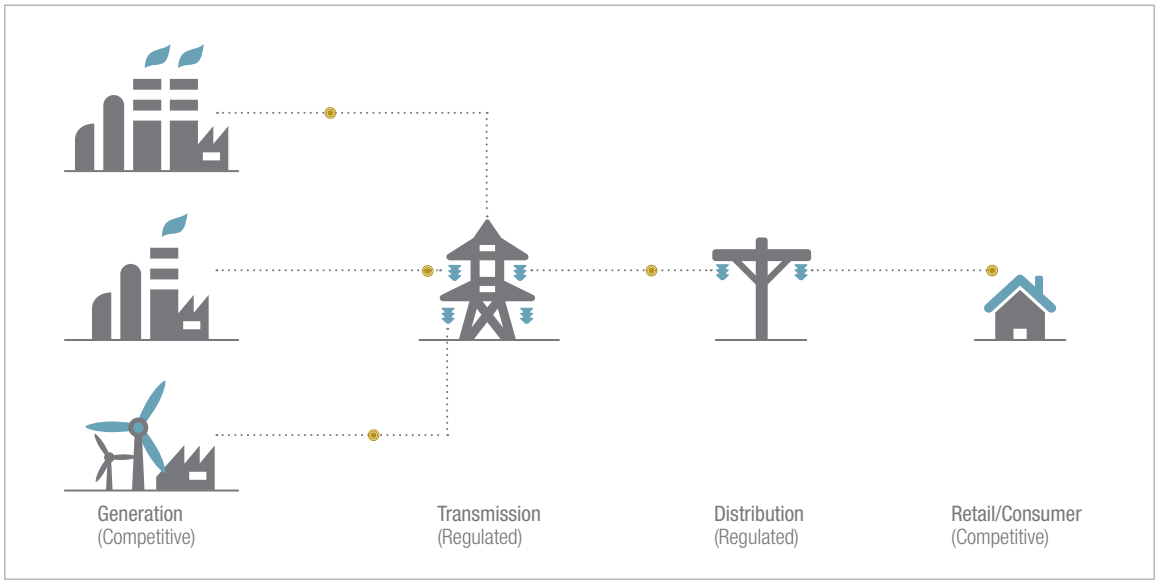
Effective January 1, 2001, Alberta also permitted competition to occur in the retail component of the Alberta Electricity Market for residential and small commercial customers. This permits independent non-regulated companies to retail electricity to customers in the form of fixed-price contracts, flow-through contracts, dual fuel contracts (natural gas and power), green power or on-site generation (e.g. roof top solar). Retailers also provide billing and consumer services to these customers.

Any residential and small commercial customer who does not choose a retailer is provided a regulated rate option (RRO) at a price that is set by the Alberta Utilities Commission (AUC) for most of the RRO providers. RRO was meant to be a temporary option until more retailers could penetrate the market, but RRO has been repeatedly extended to provide an alternative for these small customers.

Facility	Buyer (Pre-Termination)	MWs	Owner
Battle River 5	ENMAX	368MW	ATCO
Genesee	Balancing Pool	762MW	Capital Power
Keephills	ENMAX	766MW	TransAlta
Sheerness	TransCanada Energy	756MW	TransAlta/ATCO
Sundance A (Units 1 and 2)	TransCanada Energy	560MW	TransAlta
Sundance B (Units 3 and 4)	TransCanada Energy and AltaGas Pipeline	706MW	TransAlta
Sundance C (Units 5 and 6)	Capital Power	710MW	TransAlta

The Alberta Electricity Market Today

This evolution has created the current Alberta Electricity Market with the usual four components.



1. Generation

Generation is an openly competitive component of the Alberta Electricity Market. The generators choose the form of energy they will convert into the electricity they offer into the "energy only" Power Pool. If dispatched, the generators are paid the competitively determined Pool Price for the hour in which they are delivering their electricity into the AIES. New generation is built with private capital that takes the investment risk over the life of the project. This risk has to be managed because it is not backstopped by customers. There is also no central planning of generation in Alberta – at least there wasn't until Alberta announced its new climate change policies.

Apart from a price cap ($999.99) and a price floor ($0), outcomes in the real-time Power Pool are determined solely by the forces of competition. Participants are free to engage in unilateral strategies in an attempt to mitigate the Pool Price risk, as long as they do not impede competition or physically withhold generation from the market. Generators with plants of 5MW or more must also comply with the "must offer, must comply" rule, which requires them to offer all of their power that they do not consume on site to the AIES through the Power Pool. The physical withholding of supply is therefore prohibited, although it can currently be priced in the supply offer at the discretion of the generator subject to the price cap and the price floor. This pricing flexibility that permits economic withholding by a generator is currently being reconsidered as part of the creation of a new capacity market in Alberta.

In order to sell or buy power through the Power Pool, one must become a Power Pool Participant. A Power Pool Participant must sign an agreement to abide by the ISO Rules (sometimes called the Pool Rules) and the Pool Codes, meet the Power Pool's prudential, technical control, and communication requirements, pay an annual Power Pool Participant fee, and arrange for transmission or distribution access.

Under the EUA, offers to supply power into the Power Pool and bids to purchase power from the Power Pool determine in a spot market, on an hourly basis, the wholesale market price for electricity in Alberta. We explain in more detail below how this works in the section titled "Determining the Pool Price."

2. Transmission

Transmission (high voltage from 72KV to 500KV) is generally regulated in Alberta under a cost-of-service model. Customers (commercial and residential), through the AESO, pay the owners of the transmission systems (Transmission Facility Owners or TFOs) their capital and operating costs, plus a reasonable rate of return.

The TFOs are generally large corporations that operate to transmit electricity long distances in franchised service territories. The use of dedicated service territories in Alberta is slowly changing for new stand-alone transmission projects. For example, Alberta recently used a competitive process to contract for a new transmission line called the Fort McMurray West Transmission Project that will run from Wabamun (west of Edmonton) to Fort McMurray, Alberta.

There are currently four main TFOs in Alberta, namely AltaLink, ATCO, EPCOR and ENMAX.

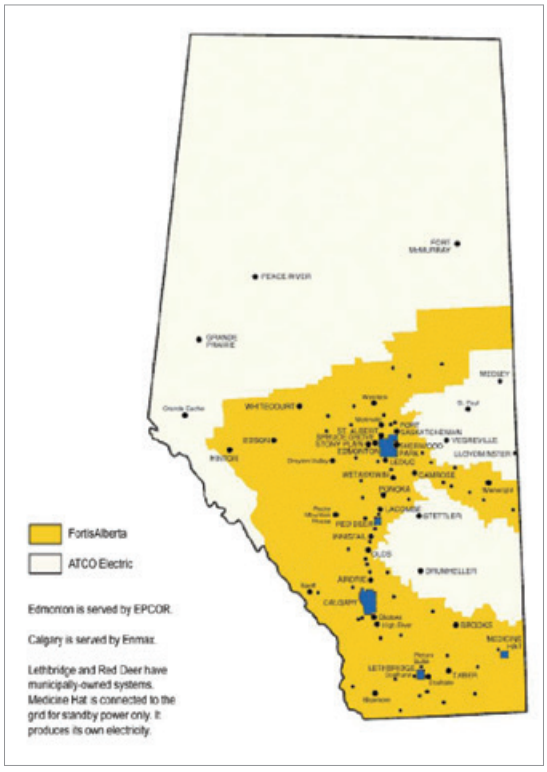
Notwithstanding that the TFOs own the transmission system in Alberta, the AESO oversees the design and use of Alberta's transmission system to ensure non-discriminatory access for market participants and the safe and reliable operation of the AIES. It provides system access for market participants to the transmission system within the constructs of the Western Electricity Coordinating Council or WECC that governs the interconnected systems of Alberta, British Columbia, and 14 of the western United States. Though the AESO determines and develops a need application for transmission upgrades, it is actually the AUC that approves the AESO need application work and authorizes a transmission project. The AESO then assigns the project to a TFO. The AESO pays the TFO based on a cost-of-service model. The transmission tariff setting out the costs that the TFO will charge the AESO for the use of its transmission assets must be approved by the AUC. The transmission rate in Alberta is "postage stamp."

As noted above, system access to the transmission system owned by the TFOs is controlled by the AESO. Accordingly, new Alberta generation that will be transmission connected will have to follow the interconnection process that the AESO has designed in order for that new generation to be built and connected to the Alberta transmission system.

3. Distribution

Electricity distribution (low voltage of less than 25 KVs) at the local load centres is also regulated under a cost-of-service model. Customers (commercial and residential) pay the owners of the distribution systems (Distribution Facility Owners or DFOs) their capital and operating costs, plus a reasonable rate of return.

The DFOs deliver electricity to most consumers in Alberta – all except for very large industrial consumers which are connected directly to the transmission lines. These DFOs include ATCO, FortisAlberta, EPCOR (Edmonton), ENMAX (Calgary), approximately 30 Rural Electrification Associations (REAs) that are cooperatives that distribute electricity to rural areas of Alberta, and municipalities like Red Deer and Lethbridge. The DFOs operate within specific service areas.



Source: Alberta Utilities Commission (AUC)[1]

1 www.auc.ab.ca/about-the-auc/auc-information/Documents/AUC_Information/AUC_information_electricityAndtheAUC_02.pdf

The AUC approves the distribution rates in a tariff for investor-owned and certain municipally-owned DFOs. The REAs and some municipalities determine their own tariffs. These tariffs cover the cost of connecting and disconnecting customers, providing new services, operating and maintaining the distribution system and providing meter-reading services. Retailers bill this distribution tariff on consumers' bills.

Unlike the transmission system where access is controlled by the AESO, system access to the distribution system is managed by the DFOs. Accordingly, new distributed generation will have to follow the interconnection process that the DFO in that territory has designed in order for that new generation to be built and connected to its local distribution system.

4. Retail

Retail of electricity in Alberta has been deregulated and is competitive for large consumers, while small consumers (less than 250,000 kWh per annum), mostly residential, have a choice of either signing a contract with a competitive retailer or choosing a regulated rate with their default supplier. The RRO price is set by the AUC based on the Pool Price for the service areas of ATCO, FortisAlberta, ENMAX and EPCOR, while other municipalities and REAs that own distribution systems determine their own RRO price.

Alberta announced in November of last year that it will put in place a cap or rate ceiling to ensure that Albertans opting for RRO will not pay more than 6.8 cents per kWh for electricity. To provide some context, currently the RRO in Calgary is about 3 cents per kWh. It is important to note that it is the retail price charged to consumers, and not the wholesale or Power Pool Price that is paid to generators, that is being capped – yes, think government subsidy for consumers. In providing such a cap, Alberta seems to be trying to get out in front of consumer/voter fears that Alberta's phase out of coal and move to renewables will result in very high power prices for Albertans.

As noted above, the role of providing long-term fixed prices for consumers has generally been performed in Alberta by competitive retailers. Though the Province has stated that consumers are still free to contract with these competitive retailers, those opting for RRO will now have the price protection afforded by the Province's cap. Not surprisingly, many competitive retailers are wondering whether their business model has been undercut by the actions of the Province in now mitigating power price risk for residential and small commercial customers.

There are also some very large industrial customers who act as self-retailers and participate directly in the Power Pool instead of using a third party retailer.

All retailers and self-retailers buy electricity in the Power Pool.

ALBERTA TRANSITIONING TO A CAPACITY MARKET

On November 23, 2016, Alberta announced that it would transition from the energy only electricity market described above to a capacity market. The new capacity market will provide a generator with a market in which to compete to sell its electricity, like it has in Alberta today, plus a market in which to compete for payments to keep generation capacity available to produce electricity when needed, even if the generator may not be actually generating that electricity.

In reaching this decision, Alberta concluded that equity investors and project financiers required the revenue certainty provided by a capacity market for new projects to be built. Without revenue sufficiency, certainty and stability, new dispatchable power projects would simply not get built in Alberta, and Alberta needs about 9,000 MW of new dispatchable power to firm renewables and replace one-third of the coal that is being phased out in Alberta. The Province was not prepared to count on the energy-only market to send the necessary price signal in time for gas-fired and often dispatchable power plants to be built for coal's planned phase out. Those price signals would only come if power supply became tight in Alberta such that there was a reliability risk and more price volatility and price spikes during peak hours, something the policy makers did not think Alberta consumers would accept.

Accordingly, Alberta will now transition to an electricity market that has two separate markets – one for energy and one for capacity. Once implemented, generators will have a stream of revenue for capacity and another stream of revenue for the electricity that they sell in the market. Alberta will have a capacity market like the PJM Market, NYISO, ISO-NE and Great Britain.

The AESO will plan, determine, approve and administer the capacity contracts to procure the capacity required to meet Alberta's electricity demands according to the following timetable:

2017	**Stakeholder engagement to determine design;**	**2019**	**First procurement begins; and**
2018	**Incorporation of design into ISO rules, contracts and/or legislation as required;**	**2020-21**	**First contracts awarded.**

APPLICABLE LEGISLATION AND GOVERNING AGENCIES

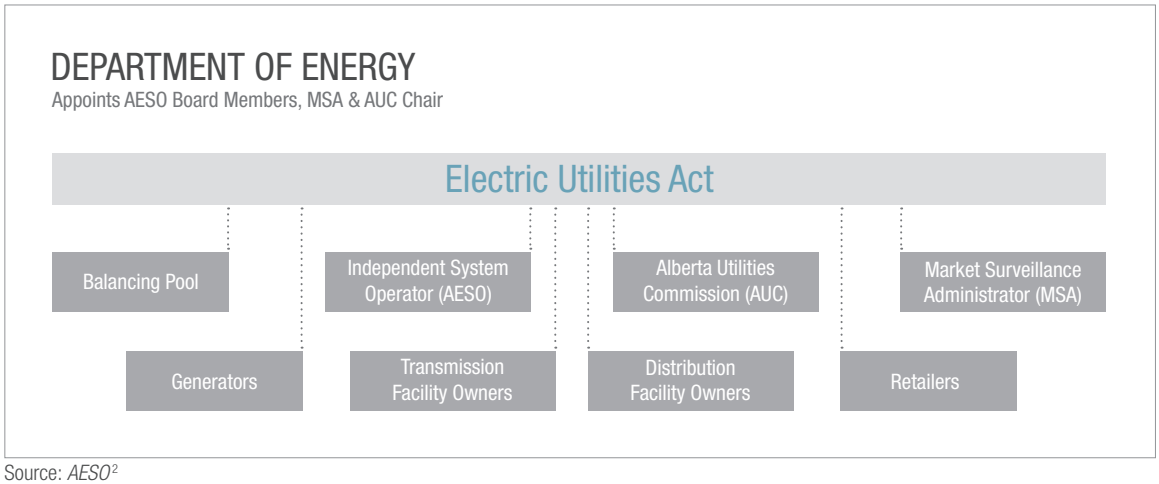
Applicable Legislation

The Alberta Electricity Market is regulated by three primary statutes and a number of substantive regulations enacted under these statutes:

1. *Electric Utilities Act*: The EUA is the main piece of legislation that governs the Alberta Electricity Market. Among other things, the EUA:
    a. Defines the structure of the Alberta Electricity Market, including the competitive aspects of generation and retail, and the regulated aspects of transmission and distribution.
    b. Establishes the Independent System Operator (the Alberta Electric System Operator or AESO) and the Balancing Pool and sets out their roles and powers.
    c. Creates the Power Pool and provides for the making of rules by the AESO that define the fair, efficient and openly competitive (generally referred to as FEOC) functioning of the Power Pool. The AESO is given authority to make ISO Rules in accordance with Section 20 of the EUA and that authority also requires market participants to comply with the ISO Rules. The AESO has made extensive ISO Rules (over 250 pages of them) that govern the Power Pool, including its operation, exchange of energy, transmission system planning and load settlement.
    d. Permits small consumers to have choice on whether to choose a retailer or choose the RRO.
    e. Provides for the continuation of the PPAs.
    f. Grants broad oversight powers to the AUC, especially with respect to the amounts charged by, and terms of service for, the TFOs, DFOs and the AESO.

Regulations passed under the EUA govern matters such as the role of the Balancing Pool in administering the PPAs, the content of customer bills, codes of conduct for market participants, the distribution tariff, the FEOC obligation, payments in lieu of taxes to be paid by non-taxable market participants (i.e. municipalities), the RRO, distribution connected micro-generation of less than 5 MW, and the regulation of transmission.

2. *Hydro and Electric Energy Act* (HEEA): HEEA is the primary piece of legislation that governs how the AIES or grid is built. It ensures that generation, transmission and distribution facilities are constructed in an economic, orderly, efficient and safe manner that is in the public interest. To construct and connect new generation, transmission and distribution facilities, certain approvals under HEEA must be obtained from the AUC. There is only one regulation that has been enacted under HEEA and it deals with the requirement of generators and transmitters to provide certain statistical information about their operations.
3. *Renewable Electricity Act* (REA): REA is a brand new statute that was recently enacted to enshrine in legislation Alberta's commitment that at least 30% of the electric energy produced in Alberta will be from renewable energy sources by 2030. It also sets out the general structure to be used by the AESO to procure renewables, and to provide the financial support necessary for new renewable electricity projects to be constructed in Alberta to meet that commitment.



Source: *AESO*[2]

2 www.aeso.ca/29864.html

Governing Agencies

In addition to the Department of Energy for Alberta, the Alberta Electricity Market has four key not-for-profit quasi-government agencies that play a significant role in regulating Alberta's Electricity Market.

The roles of the AESO and Balancing Pool have already been previously explained in some detail. The AESO is the public body that plans, develops and controls access to the transmission system, directs the operation of the AIES, and designs and operates the Power Pool that determines the Pool Price. The Balancing Pool is the public body that manages any PPAs for which there is no independent buyer, and also acts as a backstop for the other PPAs in the event of force majeure or termination by Buyers. Any profit or loss of the Balancing Pool from these PPAs is passed on to Alberta consumers.

The AUC is an independent, quasi-judicial agency of the province. The AUC is responsible for implementing the legislation, regulations and policies of the Department of Energy for Alberta. In addition, it is responsible for generation facility oversight; ensuring each facility is built, operated and decommissioned in an efficient and environmentally responsible manner. The AUC does not generally regulate REAs, municipally owned utilities (with the exception of EPCOR in Edmonton and ENMAX in Calgary), or competitive retailers.

The Market Surveillance Administrator (MSA) is a public agency created under the Alberta Utilities Commission Act whose mission is to take action to promote effective competition and a culture of compliance and accountability in the Alberta Electricity Market. The MSA undertakes surveillance and investigation to ensure that market participants are conducting themselves in accordance with the FEOC (fair, efficient and openly competitive) obligation, the EUA and its regulations, and the ISO Rules.

As an example, in 2015, the MSA initiated a prosecution of TransAlta before the AUC for breaching FEOC obligations. The proceeding resulted in a finding by the AUC that TransAlta had manipulated electricity prices and used non-public outage records to trade, after which TransAlta agreed to disgorge profits in the amount of $26,920,814.31, pay an administrative penalty of $25,000,000 and reimburse the MSA for all of its costs relating to the proceeding.

The AUC's Decision also confirmed for the first time that individual market participants may be personally responsible for regulatory offences under the EUA. BLG acted as counsel to the MSA in this landmark decision.

Other non-profit agencies that participate on behalf of their members in shaping the Alberta Electricity Market include the Independent Power Producers Society of Alberta, the Industrial Power Consumers Association of Alberta, Alberta Direct Connect Consumer Association, Alberta Federation of Rural Electrification Associations, Canadian Wind Energy Association and the Canadian Solar Industries Association.

All of these public agencies and non-profit associations have websites that also provide useful background information about the Alberta Electricity Market.

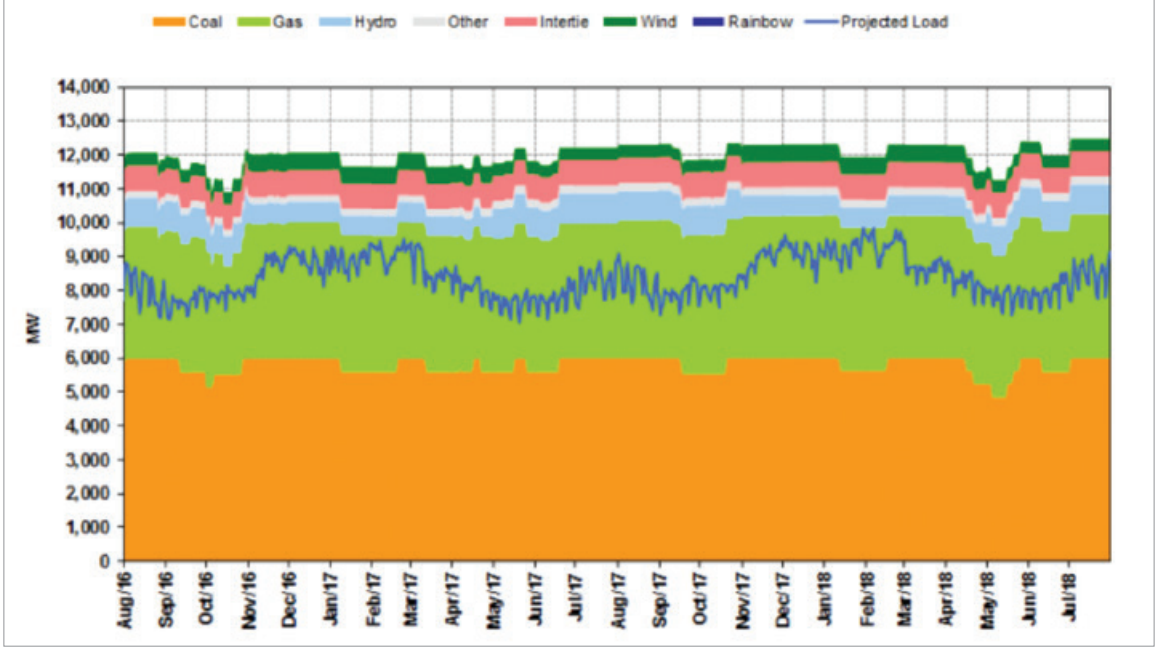
CHARACTERISTICS OF ALBERTA'S LOAD AND GENERATION MIX

Alberta's Load

Alberta's load is composed of a mix of residential, farm, small commercial and large industrial users, though it is predominantly made up of industrial consumers (>60% of the load) who demand a large baseload of power 24/7.

Demand in Alberta has peaked at 11,458 MW but daily peak now averages about 10,000 MW. Load growth has slowed from the 2% to 3% level that occurred between 2010 and the end of 2014, and is expected to remain somewhat flat, as a result of the current downturn in Alberta's oil and gas economy.

Figure 3: Alberta Interconnected Electric System (AIES) Daily Peak Demand and Available Supply, Aug 1, 2016 to Jul 31, 2018



Source: *AESO*[3]

3 www.aeso.ca/downloads/2016_08_LTA.pdf

Alberta's Generation Mix

The Alberta load is met by a supply mix of coal, natural gas, wind, hydro, biomass and other sources of fuel that have an installed capacity of approximately 16,300 MW. Of this, approximately 9,000 MW was new generation added in Alberta, at an estimated cost of $16 billion, since generation was first deregulated in 1996. The most recent significant new generation projects to come into service in Alberta were the 800 MW natural gas-fired Shepard Energy Centre in 2015, and the 300 MW Blackspring Ridge wind farm in 2014.

Alberta Installed Generation Capacity (as of June 2016)[4]

Generation	Megawatt (MW)	Capacity By Fuel
Natural Gas	7,081	44%
Coal	6,267	39%
Hydro	902	6%
Wind	1,491	9%
Biomass	424	3%
Other	97	1%
Total	16,261	100%

Due to varying capacity factors and the competitive aspects of the Power Pool, the installed capacity is not reflective of the fuel types for the generation facilities that are actually being dispatched in the Power Pool to meet Alberta's load.

2015 Alberta Electrical Generation (YE Dec 2015)[5]

Generation	Gigawatt Hour (GWh)	Generation Share By Fuel
Coal	41,378	51%
Natural Gas	32,215	39%
Hydro	1,745	2%
Wind	3,816	5%
Biomass	2,149	3%
Others	318	0%
Total	81,621	100%

We should note that the coal percentage set out in the table for 2015 declined in 2016 as carbon levy increases in Alberta resulted in more natural gas, and less coal, being dispatched to service load.

The large percentage of carbon-based generation in Alberta is a reflection of the province's wealth in carbon resources. For example, it is estimated that Alberta's remaining coal reserves stand at about 34 billion tonnes, equivalent to 1,000 years of supply at Alberta's current production rate of just over 30 million tonnes a year. Alberta is also resource rich in natural gas. It is estimated that 33 trillion cubic feet of recoverable conventional gas remains in Alberta, plus large quantities of coalbed methane and shale gas.

4 www.energy.alberta.ca/Electricity/682.asp

5 www.energy.alberta.ca/Electricity/682.asp

As part of Alberta's new climate change policy, the mix of generation in Alberta used by the AESO in its 2016 Long-term Outlook illustrates likely changes.

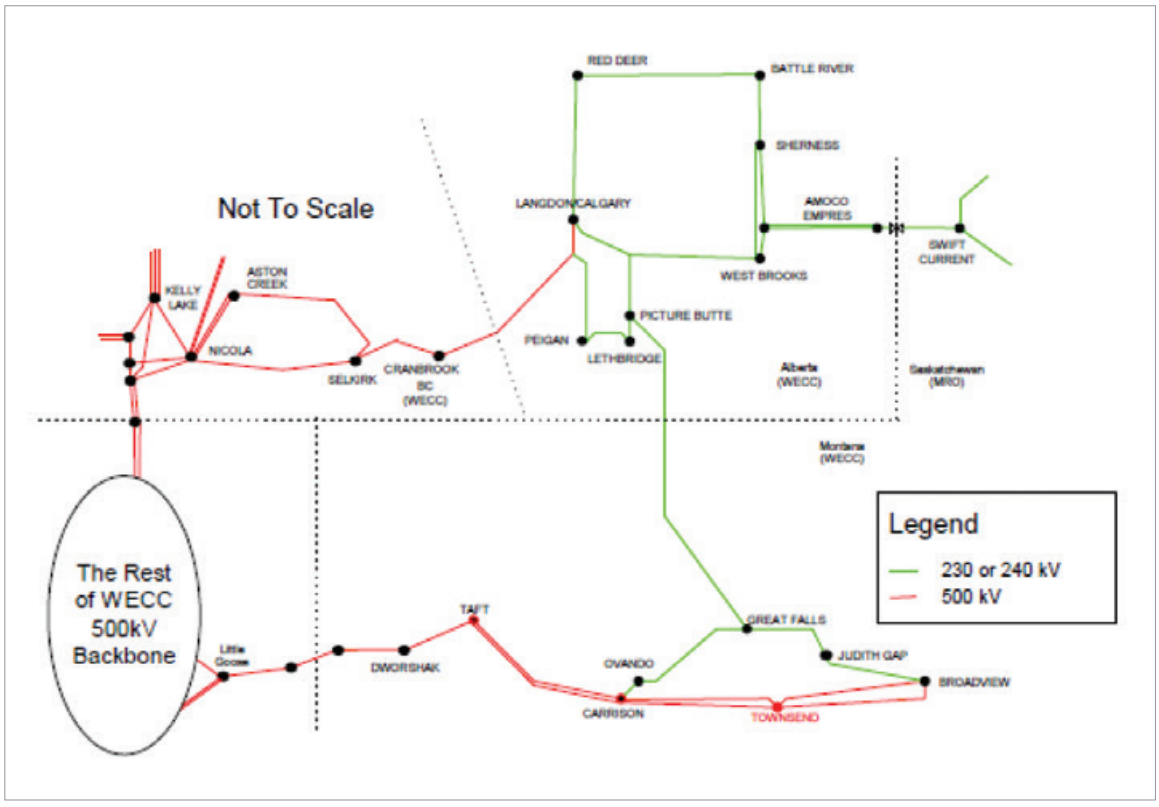
Generation Capacity Composition (forecast) for Alberta:

Existing AIL peak: 11,229 MW	2022 AIL peak: 13,701 MW	2027 AIL peak: 14,702 MW	2030 AIL peak: 15,230 MW	2037 AIL peak: 16,496 MW
				
39% Coal-fired 6,289 28% Cogeneration 4,502 11% Combined-cycle 1,716 6% Simple-cycle 996 5% Hydroelectric 894 9% Wind 1,463 3% Other 428	28% Coal-fired 5,420 27% Cogeneration 5,353 13% Combined-cycle 2,626 8% Simple-cycle 1,499 5% Hydroelectric 894 16% Wind 3,213 2% Other 469	20% Coal-fired 4,491 24% Cogeneration 5,406 20% Combined-cycle 4,446 7% Simple-cycle 1,642 4% Hydroelectric 894 22% Wind 4,963 2% Other 469	0% Coal-fired 0 24% Cogeneration 5,548 36% Combined-cycle 8,541 10% Simple-cycle 2,307 4% Hydroelectric 894 24% Wind 5,663 2% Other 469	0% Coal-fired 0 23% Cogeneration 5,690 38% Combined-cycle 9,451 11% Simple-cycle 2,877 4% Hydroelectric 894 23% Wind 5,663 2% Other 469
Total capacity 16,288 MW	**Total capacity 19,474 MW**	**Total capacity 22,311 MW**	**Total capacity 23,422 MW**	**Total capacity 25,044 MW**

Source: *AESO*[6]

Alberta's Interties[7]

Alberta also has interties with the neighbouring two provinces of Saskatchewan (150 MW) and British Columbia (1,000-1,200 MW), and with the United States through the state of Montana (300 MW), that are used to meet Alberta's load or to export power.



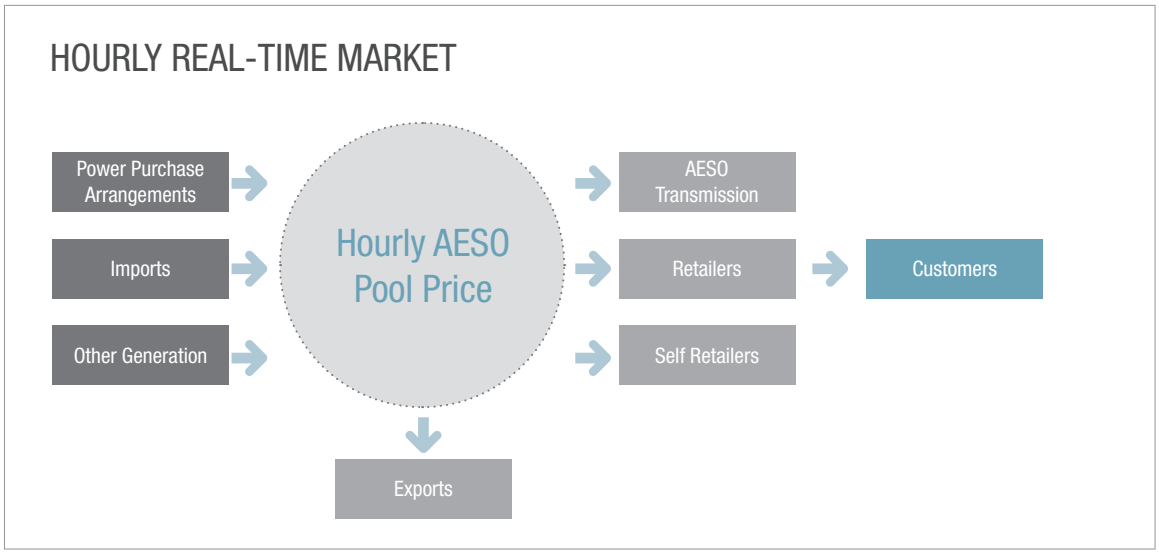
6 www.aeso.ca/downloads/AESO_2016_Long-term_Outlook_WEB.pdf

7 www.auc.ab.ca/applications/decisions/Decisions/2013/2013-025.pdf

POWER POOL PRICE

Determining the Pool Price

A general understanding of how the Pool Price is determined in Alberta is very important for anyone entering the Alberta Electricity Market. This is because it is the way in which the electricity price that Alberta generators receive, and Alberta customers pay, gets determined.



As we have noted previously, all electricity that is bought and sold in Alberta on its AIES is done so through a competitive wholesale market called the Power Pool. The AESO operates the AIES, and also operates the Power Pool that has market participants who generate, buy or sell, transmit, distribute, trade, import or export electricity in the AIES. There are over 200 participants who buy and sell power in the Power Pool.

The AESO's system controllers manage the real-time operation of the AIES. Their goal is to perfectly match supply (electricity generated/imported) with demand (electricity consumed/exported) every moment of every day. The AESO's Energy Management System (EMS) continuously collects information from generators and wholesale consumers (e.g. retailers) to ensure that generation is being dispatched or, if necessary, consumption is being reduced to ensure that the perfect match occurs.

The AESO's Energy Trading System (ETS) is part of the EMS. Market participants in the Power Pool who wish to sell electricity submit supply offers while those wholesale customers who wish to buy electricity at a maximum price submit demand bids. Loads that do not make a demand bid into the market simply pay the resulting Pool Price. In practice, loads rarely make a demand bid in the Power Pool choosing instead to pay whatever the Pool Price is for a particular hour. Offers must be done a day ahead (by noon) for each delivery hour and may be updated periodically, provided that the price in a generator's supply offer can only be changed up to two hours before the applicable delivery hour.

The ETS then sorts the supply offers and the demand bids from the lowest to the highest price and matches them to create an economic "merit order." The supply offers with the lowest price are used each minute to meet the demand until all of the demand has been satisfied. The last supply offer that is used to meet the demand in a particular minute is designated as the System Marginal Price (SMP) for that minute – it is the single equilibrium price. The last offer dispatched to meet demand sets the SMP for electricity. For example, if offers in the merit order are priced from $0 to $100, and the last offer dispatched to meet demand is priced at $60, the SMP for that minute is $60. SMP is a price that reflects the intersection of supply and demand for a minute in the electricity market. This is done in real time, and posted on the AESO website.

The Pool Price for each MWh of electricity is set by the AESO for each hour by calculating the time-weighted average of all 60 SMPs (one for each minute) for that hour. The Pool Price is also posted on the AESO website at the end of each hour.

Each generator that dispatched power into the AIES in that hour is paid the Pool Price for that hour regardless of the price specified in its supply offer. It is a one price system across Alberta – there is no locational pricing. Likewise, each wholesale consumer who used electricity from the AIES in that hour will pay the Pool Price for that hour. These receipts due to generators and payments due by wholesale consumers are facilitated by the AESO's financial settlement system.

In practice, wind generators make supply offers at $0 given that they have minimal marginal variable costs and coal generators will also bid in the minimum stable generation of their facilities at $0 to ensure that they are dispatched, yet they are both paid the same as the generator (e.g. gas-fired generator) who offered power at the highest price used to set SMP. In this regard, these wind generators and coal generators (at least for part of their generation) are described as "price takers" and the gas-fired generator is the "price maker" for that SMP.

Subject to any power purchase agreement or hedge that a generator has in place with a third party and any revenue that a generator may earn from the proposed capacity market, the Pool Price will be the generator's primary source of revenue.

Current Pool Prices

Power Pool prices are directly proportionate to the costs that generators incur to generate the electricity since the costs are the primary determinant of the price at which a generator will offer its electricity to the Power Pool.

With natural gas prices being low, the Alberta oil and gas economy struggling, and generators having an installed capacity that is greater than the average load, it is not surprising that average Pool Prices have continued to fall in Alberta. Recently, Alberta's Pool Prices have fallen below $20 per MWh, well below both historic averages in Alberta (approx $65) and the levelized replacement costs for new natural gas combined cycle, wind, solar and other types of generation.

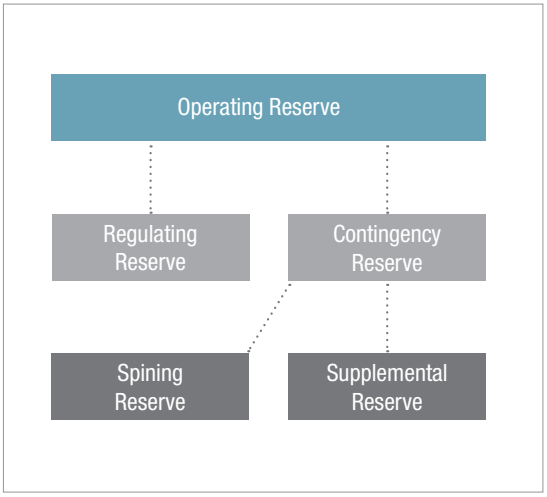
That said, there are a number of price forecasts in the market that indicate that historic low pool prices will not continue over the long term.

Ancillary Services Market

Generators may also earn revenues from Alberta's Ancillary Services Market. Ancillary services are defined under the EUA to be those services required by the AESO to ensure that the AIES is operated in a manner that provides for a satisfactory level of service, with acceptable levels of voltage and frequency.

The AESO currently procures four types of ancillary services from generators or consumers in Alberta:

1. Operating Reserve: electricity that can be dispatched, or load that can be reduced, on short notice to maintain system reliability if an unexpected imbalance occurs between electricity supply and demand in the AIES. Operating Reserve is composed of two types, "regulating reserve" from output that needs to be able to respond instantaneously using an automatic generation control system, and "contingency reserve" that needs to be able to respond immediately or within ten minutes at the latest.
2. Transmission Must Run Service: output that is supplied by a generator that is required to be online and operating at specific levels in parts of the AIES where local transmission capacity is unable due to congestion to meet local demand. It is a "non-wires" generation solution to a "wires" problem.
3. Load Shed Scheme Service: is supplied by large consumers who have agreed to be automatically curtailed (tripped off) to instantly reduce demand if an unexpected supply and demand imbalance occurs that requires immediate reductions in consumption.
4. Black Start Service: is supplied by generators that are able to restart their facilities with no outside power, and can be used in a system-wide blackout to start other generators and help re-energize the electric system.



Source: *AESO*[8]

The AESO procures and manages these services through a competitive process except where there is a location specific need that only certain eligible generators can meet. How the services are procured depends on the type of ancillary service. The majority of operating reserves are procured via an independent day-ahead third party platform known as Alberta's Watt Exchange Ltd. (Watt-Ex). Other ancillary services are procured using bilateral contracts. The prices paid by the AESO for ancillary services are included in the AESO's transmission tariff that is paid by all load customers.

For more information on the Alberta ancillary services market one should refer to the Ancillary Services Participant Manual published by the AESO that describes these services and how they are procured by the AESO in much more detail.

8 www.aeso.ca/29864.html

RECENT DEVELOPMENTS CREATE BUSINESS OPPORTUNITIES

There have been a number of recent developments that will change the Alberta Electricity Market and create business opportunities for companies that operate in the electricity sector.

Change in Government

On May 5, 2015, Albertans elected Premier Rachel Notley and her left-of-centre New Democratic Party government to govern the province. They replaced the Progressive Conservative government that had ruled the traditionally conservative province for over 40 years. A key promise of the new government is to tackle climate change and "green" the province that has been built mainly on an oil and gas carbon-based economy.

Similarly, Canadians elected Prime Minister Justin Trudeau and his left-of-centre Liberal Party on October 19, 2015, to govern nationally. The Liberal Party also replaced a former conservative party, and also made climate change and the environment a key pillar of its election campaign.

Not surprisingly, both the Alberta and Canadian governments were quick to attend and sign on at the 2015 United Nations Climate Change Conference (COP 21) in Paris in November 2015, making significant climate change commitments to the rest of the world. Greening Canada's, including Alberta's, electricity generation mix will be required in order to satisfy these climate change commitments.

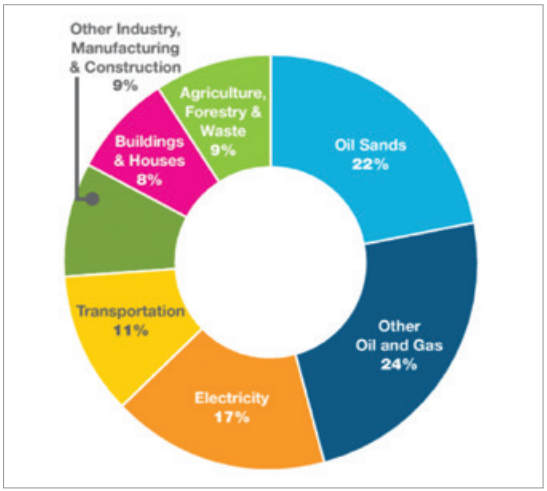
Alberta's Climate Change Advisory Panel

One of the first actions the new Alberta Government took was to appoint a Climate Change Panel to advise the Province on measures needed to reduce Alberta's greenhouse gas emissions. Though all Alberta industries were reviewed, the Panel targeted the Alberta Electricity Market given that electricity generation is the second largest emitter in Alberta and accounts for 17% of the province's greenhouse gas emissions. Also, Alberta accounts for 65% of all coal-fired power production in Canada, and therefore the new Alberta Government requires big changes from the power industry if it is going to satisfy the climate change promises it made to Albertans.

The Climate Change Panel issued its final report in early November 2015 that encompassed some Alberta Electricity Market recommendations, including that:

1. Alberta should adopt a clean power call mechanism to enable increased renewable generation based on an annual schedule.
2. The Alberta Government support should be in the form of the purchase of renewable energy credits (RECs) on long term contracts using money from Alberta's new carbon pricing regime. The Panel indicated that this incremental revenue (along with the Pool Price) should be enough to justify new renewable power project development in Alberta.
3. Contracts should be awarded to those requiring the lowest level of support using evaluation criteria and would be technology-neutral (solar, wind and geothermal to compete on level playing field).
4. Projects built with the government financial support would still offer their power into the Power Pool at the Pool Price such that the Alberta energy merchant market would continue to operate.

Alberta's Carbon Emissions Profile



Source: Government of Alberta[9]

Alberta Adopts Parts of Panel Report

The Alberta Government expressly adopted certain parts of the Panel's report, and immediately thereafter announced the following policy changes for the Alberta Electricity Market:

1. There will be no pollution from coal-fired power generation in Alberta by 2030.
2. All coal-fired plants will be phased out and replaced by natural gas and renewable power generation, or become pollution free by using technology (e.g. a coal plant adopts carbon capture and storage). All of Alberta's coal-fired plants (6,300 MW), including Alberta's newest supercritical coal units built at Genesee (2005) and Keephills (2011) with the best coal-fired technology, are likely to be gone by 2030.

9 www.alberta.ca/albertacode/images/Climate-Leadership-Discussion-Document.pdf

3. Two-thirds of the 6300 MW of coal-generating capacity (4,200 MW) will be replaced by renewable energy, and one-third (2,100 MW) by natural gas.
4. Beginning in 2018, all coal generators will pay $30 per tonne of CO^2 on emissions above what Alberta's cleanest gas plant would emit to generate the same electricity. This will provide a clear economic advantage to lower emitting and more efficient generation in the Power Pool's "merit order" and encourage its dispatch in the Power Pool. It should also cause Pool Prices to increase.
5. Renewable resources will account for 30% of Alberta's electricity by 2030 – the "30 by 30" power policy that has been enshrined in new legislation called the *Renewable Electricity Act* (Alberta) that was passed in December 2016.

AESO to Provide Financial Support for Renewables

Alberta also agreed with the Climate Change Panel's recommendation that renewables needed financial support from the Alberta Government, and that a clean power call should be held in Alberta to procure renewables. Recently, the Alberta Government stated that it was prepared to provide the financial support required to have 5,000 MW of new renewables built in Alberta between now and 2030. The Alberta Government has asked the AESO to lead this procurement which is estimated to require $10.5 billion of capital investment. This has also been enshrined in the *Renewable Electricity Act* (Alberta).

The first stage (Request for Expressions of Interest) of a three stage renewable electricity procurement process kicked off on March 31, 2017. This first procurement will be for 400 MW with winning bids to be awarded before year end. The procurement will result in winning bidders receiving financial support in the form of a 20-year Renewable Electricity Support Agreement (RESA) with the AESO. The key financial support in the RESA will be an indexed renewable energy certificate (REC) which, in essence, is a contract for differences linked to the Power Pool Price for electricity in Alberta. BLG is already advising a number of developers on the material terms that have been proposed by the AESO for the RESA. RECs will be automatically adjusted so that when Pool Prices rise, the support to be paid falls and if the Pool Price rises above the bidder's strike price, the bidder must pay the difference to the AESO. The intent is that successful bidders will not bear Alberta's Power Pool Price risk over the term of their RESA but, in return, will forego windfall profits in times of high Power Pool Prices. The RESA will be the key agreement upon which developers will seek financing for their renewable projects.

Successful bidders will ultimately be determined based solely on the economics of their respective projects and on a fuel-neutral basis, with wind, solar, hydro or other renewables all able to participate. To be eligible for support in the procurement, a renewable project will have to be (i) based in Alberta, (ii) 5 MW or greater, and (iii) be new or be an expansion of an existing project.

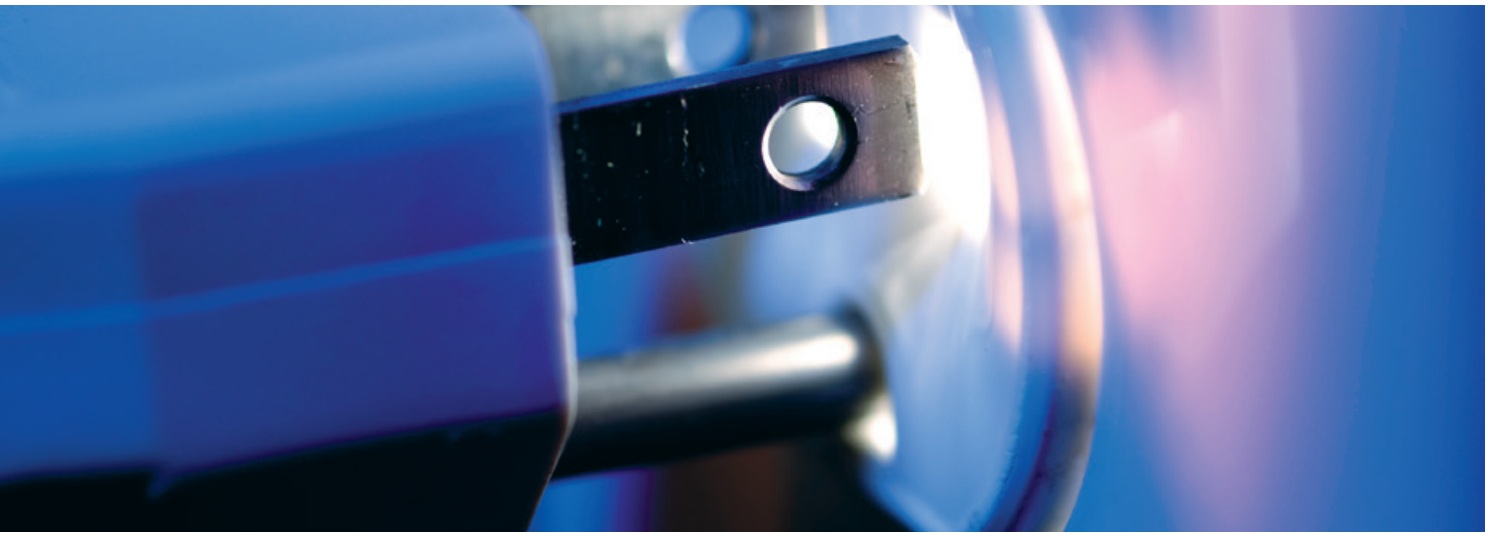
Alberta's New Capacity Market

As described above in the section "Transition to a Capacity Market," Alberta will transition from an energy only market to an energy market and a capacity market. Stakeholder consultation is ongoing in the design of this market. The goal is to complete the design and implement the structure of the capacity market by the end of 2018, to facilitate the first capacity procurement in 2019 for delivery in 2021. This is a very important development for new power project developers, especially developers who are looking to build new dispatchable power projects, as the capacity market will serve as an important mechanism for them to recover their fixed costs and a rate of return. The move to a capacity market is being done, in part, to incent these developers to construct projects by providing their investors and lenders with some revenue certainty.

Micro-generation in Alberta

Alberta brought legislation into force in 2009 to encourage micro-generation in the Province. The *Micro-Generation Regulation* (the Regulation) encourages Alberta customers to use renewable or alternative sources of energy to generate their own electricity by (i) reducing the administrative burden and interconnection costs to those customers; and (ii) permitting those customers to be compensated through "net billing" for any surplus electricity they generate and deliver to the electricity grid.

Micro-generation is distributed generation, but a micro-generation project has some tests that must be met before it can use the advantages provided in the Regulation for micro-generation. Those advantages include the obligation of the DFO to install, at no charge to the customer, a net meter. The net meter is bi-directional, and is either a cumulative or interval meter depending on the size of the micro-generation project. Larger micro-generation projects ($\geq$ 150 kW) get an interval meter – something that is important in Alberta because it allows them to be paid the higher peak power pool prices for electricity delivered to the grid in the peak periods. Smaller micro-generation projects on the other hand are paid their retailer's retail energy rate (e.g. the Regulated Rate Option rate) for all of the electricity they generate and deliver to the grid. If a project meets the tests in the Regulation, the DFO not only installs a meter, but also pays all of the customer's costs of interconnection and load settlement. Those costs are included in the DFO's tariff and passed on to all of the DFO's customers (i.e. they become system costs).



There are currently about 1,700 micro-generation sites in Alberta with generation capacity that approaches 18 MW. The vast majority of those utilize roof top solar. However, the number, type and size of micro-generation projects in Alberta are expected to shift as a result of the announcement of two major changes to the Regulation made in December 2016. The changes create greater flexibility and capacity for customers to generate and use their own electricity.

The first change relates to the maximum permitted generation capacity of a project, which increased from 1 MW to 5 MW. The second change permits the aggregation of sites being serviced by the micro-generation project. A micro-generation project may now service two or more sites that are located on property that is owned or leased by the same customer and connected by a single feeder line owned by the same DFO. In other words, there is now flexibility to construct micro-generation projects that will service adjacent sites owned or leased by the same customer. A 5 MW micro-generation project can now be constructed by a customer to provide electricity to all of the customer's buildings located around the project. Universities, hospitals, and farms are examples of organizations that may be able to take advantage of these changes.

Solar Energy Incentives

Alberta's merchant wholesale electricity market has not been kind to solar developers. This is because solar has not been able to compete on a price basis in an Alberta merchant market where "least cost" has until recently been the primary objective. Despite having one of the best solar resources in Canada, Alberta currently has only about 15 MW of installed solar capacity – compare that to more than 2,000 MW in the Province Ontario.

However, Alberta has recently rolled out a number of rebate programs to encourage solar development in Alberta. These include the Alberta Indigenous Solar Program, Alberta Municipal Solar Program, and the Farm Solar PV Program.

In March 2017, the Province took another step on the solar front and announced a new program for residential, business and non-profit customers who install solar PV. The Residential and Commercial Solar Program (RCSP) will launch this summer and fund up to 30% of the cost for residential customers and up to 25% of the cost for business and non-profit customers. The RCSP is expected to fund 75 cents for each watt of solar PV installed. The Province has set aside $36 million to fund the program, and is currently seeking a third party to administer RCSP on behalf of the Province. More details will be released by the Province in the coming months before the summer launch.

In addition, the Alberta government announced last year that it would hold a procurement for a new utility scale solar farm(s) to provide half of the power that the Alberta government consumes for its own operations. This procurement is for 135,000 MWh of solar power per year and is ongoing, with no decision yet on the winning project(s).

All of these developments demonstrate that solar power is on the rise in Alberta, especially when combined with the recent changes to the micro-generation rules described above in the section "Micro-generation in Alberta," and the financial support being provided by the AESO through the procurements described above in the section "AESO to Provide Financial Support for Renewables."

Other Developments

It seems like every week Alberta announces more policy changes that will impact the Alberta Electricity Market. For example, significant developments are occurring in the energy efficiency area where Alberta will spend $600 million over the next three years on energy efficiency initiatives and small scale renewable energy projects. It also just announced at the end of March that the AUC will study and report on how smaller-scale distributed generation can help the Province to achieve its 30 by 30 renewable electricity objective. This is sure to create more opportunity for businesses in the district energy, solar, energy storage and demand response areas of the Alberta Electricity Market.

CONCLUSION

The Alberta Electricity Market was already interesting because of its unique competitive wholesale power market. Recent elections, changes in government climate and electricity policy and the proposed addition of a capacity market have made the Alberta Electricity Market even more interesting. BLG witnessed the business opportunities that occurred in 1996, when the Alberta Electricity Market was first deregulated. We also know, first hand, the business opportunities that rapid changes in electricity policy in other national and international markets generated for our clients.

To capitalize on the Alberta electricity opportunity, prospective power project developers, investors, lenders, constructors, operators and other players need to understand how the Alberta Electricity Market operates. We hope that this overview assists in this regard and would be pleased to answer any detailed questions you may have about the Alberta Electricity Market, and this overview. BLG would welcome the opportunity to assist you with your current and proposed business activities in the Alberta Electricity Market.

Contact

For a more detailed description of our law firm and our services in the electricity sector, please visit our website at **blg.com**. For more detailed information about the Alberta Electricity Market please contact the following members of our Electricity Markets Group who are based in our Calgary Office:

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We would be honoured to represent you with respect to your business activities in the Alberta Electricity Market.

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