

# Long Term Adequacy Metrics

## May 2018



## Introduction

The following report provides information on the long term adequacy of the Alberta electric energy market. The report contains metrics that include tables on generation projects under development and generation retirements, an annual reserve margin with a five year forecast period, a two year daily supply cushion, and a two year probabilistic assessment of the Alberta Interconnected Electric System (AIES). The Long Term Adequacy (LTA) Metrics provide an assessment and information that can be used to facilitate further assessments of long term adequacy. This report is updated quarterly in February, May, August, and November. Inquiries on the report can be made at [forecast@aeso.ca](mailto:forecast@aeso.ca).

## Summary of Changes since Previous Report

### New Generation and Retirements Metric

#### *Projects completed and removed from list:*

- Cenovus Christina Lake Phase 1F
- Fortis Brooks DER Solar
- Suncor Fort Hills 1
- Suncor Fort Hills 2

#### *Generation Projects moved to “Active Construction”:*

- N/A

#### *Generation projects moved to “Regulatory Approval”:*

- Fortis Buffalo Atlee Cluster 1 WAGF
- Fortis Buffalo Atlee Cluster 3 WAGF
- RESC McLaughlin WAGF
- Capital Power Halkirk 2
- Imperial Oil Edmonton 95S Cogen

#### *Generation projects that have been added to “Announced, Applied for AESO Interconnection, and/or Applied for Regulatory Approval”:*

- Cascade Combined Cycle Phase 1
- Cascade Combined Cycle Phase 2
- BluEarth Hand Hills Wind Phase 2
- Pengrowth Cold Lake Area Energy Centre
- FortisAlberta Willesdengreen DER Gas Turbine
- FortisAlberta Taber 83S DER Solar
- FortisAlberta Empress 394S DER Solar
- TransAlta Windrise MPC Wind
- TransCanada Saddlebrook Solar
- Algonquin Willow Ridge Wind
- TransAlta Ardenville Expansion Wind
- ATCO Vilna 777S DER Solar
- FortisAlberta Bullshead 523S DER Solar 1

- FortisAlberta Bullshead 523S DER Solar 2
- Imperial Oil Edmonton 95S Cogen
- FortisAlberta Namaka 428S DER Solar
- ATCO Three Hills 770S DER Solar 1
- ATCO Three Hills 770S DER Solar 2
- ATCO Michichi Creek 802S DER Solar
- E.ON Grizzly Bear Wind Phase 2
- Four Rivers Four Rivers Wind
- Horseshoe Power GP Ltd Gull Lake Cogen

***Generation projects that have been removed:***

- Gengrowth Dunmore Wind
- Gengrowth Hilda Wind
- Invenergy Kirkcaldy Solar
- Fortis Fort MacLeod DER Solar
- Fortis Taber DER Solar
- TransAlta Ardenville Expansion Wind

***Other changes to generation projects:***

Project	Change
Joss Wind – Jenner Phase 2	New ISD of May-2019 from Dec-2018
Joss Wind – Jenner Wind	New ISD of Sep-2019 from Mar-2019
Pteragen – Peace Butte	New ISD of Dec-2019 from Mar-2019
Alberta Wind Energy – Windy Point	New ISD of Sep-2019 from Mar-2019
EDF EN – Red Rock WAGF	New ISD of May-2019 from Dec-2020
EDP Renewables – Sharp Hills Wind	New ISD of Aug-2019 from Jun-2020
BowArk Energy – Queenstown Power Plant	New ISD of Oct-2020 from Nov-2019
Capital Power – Genesee 4	New ISD of Feb-2020 from Jun-2019
EDF EN – Cypress WAGF	New ISD of Mar-2019 from Dec-2021
Inter Pipeline – Strathcona Cogeneration	New ISD of Aug-2020 from May-2019
Naturener – Wild Rose 2	New ISD of Sep-2019 from Jul-2019
Kineticor – Peace River Power Generator	New ISD of Sep-2021 from Jan-2020

Joss Wind – Northern Lights	New ISD of Nov-2020 from Oct-2019
BowArk Energy – Lanfine WAGF	New ISD of May-2020 from Apr-2020
Fortis – 421S Hays DG PV	New ISD of Jun-2019 from Jul-2018
Fortis – 257S Hull P/V	New ISD of Jun-2019 from Mar-2019
Fortis – 158S Vauxhall DG PV	New ISD of Jun-2019 from Oct-2018
Fortis – Bullshead 523S Solar DER	New ISD of Jul-2019 from Jul-2018
Suncor – Hand Hills	New ISD of Sep-2019 from Oct-2019
Alberta Wind Energy – Old Elm & Pothole Creek	New ISD of Jun-2020 from May-2019
Fortis – Spring Coulee 385S Solar DG	New ISD of Nov-2018 from Dec-2018
BowArk Energy – Drywood Gas Generator	New ISD of Apr-2019 from Dec-2018
Kineticor – Peace River Power Upgrade	New ISD of Sep-2021 from Aug-2018
Fortis – Stavelly 349S DER Solar Part 1	New ISD of Jul-2018 from Oct-2019
Fortis – Krafte 257S Hull DER Solar	New ISD of Nov-2018 from May-2019
TransCanada – Scoria 318S Cogen	New ISD of Jan-2019 from Sep-2020
ENGIE – Duchess Solar	New ISD of Jun-2020 from Jul-2019
Suncor – Forty Mile Granlea WAGF	New ISD of Sep-2019 from Jan-2019
Capital Power – Halkirk 2	New ISD of Dec-2020 from Feb-2018
Fortis – Conrad DER Solar	New ISD of Dec-2018 from Apr-2020
Fortis – Vauxhall Solar DER	New ISD of Nov-2018 from Apr-2020
RealPart – Calgary Area Solar	New ISD of Nov-2019 from May-2019
Fortis – Empress DER Solar	New ISD of May-2019 from May-2019
Fortis – Conrad DER Solar 2	New ISD of Jul-2019 from Jan-2019
NextEra – Buffalo Trail Solar	New ISD of Dec-2019 from Mar-2020

EPCOR – WSI DG Solar	New ISD of Jan-2019 from Nov-2020
Eolectric – Welsch Wind	New ISD of Dec-2019 from Mar-2019
Pattern Development – Lanfine South Wind	New ISD of Apr-2020 from Jan-2020
Fortis – Coaldale Cogen DER	New ISD of Feb-2020 from Aug-2020
Capital Power – Whitla Wind Power - Phase 2	New ISD of Sep-2020 from Jan-2019
FortisAlberta – Strathmore 151S DER Solar 1	New ISD of Nov-2019 from Sep-2020
FortisAlberta – Strathmore 151S DER Solar 2	New ISD of Nov-2019 from Mar-2019

### **Reserve Margin Metric**

The reserve margin has been updated to reflect changes to the project list.

### **Supply Cushion Metric**

The forecast supply cushion has been updated to reflect the new time period.

### **Two Year Probability of Supply Adequacy Shortfall Metric**

New values for the metric have been calculated with Total Energy Not Served equaling 91 MWh. This value is below the 1,600 MWh threshold.

## New Generation Projects and Retirements Metric

The New Generation Projects and Retirements Metric is a summary of generation at various stages of development in Alberta and is shown in Tables 1 to 4 below. In Alberta's deregulated electricity market competitive forces determine the location, magnitude and timing of new generation additions. Information on prospective generation additions and retirements provides context for the future market in Alberta. The information is drawn from a variety of public sources and includes new generation, changes to existing generation and the retirement of generating units. Changes in project in-service dates (ISDs) and regulatory stages occur as projects move forward and/or market conditions change. Current information on connection project ISDs can be found in the [AESO Project List](#) and information on power plant applications can be found at the [Alberta Utilities Commission](#) website.

**Table 1: Generation Projects under Construction**

Sponsor(s)	Project Name	Fuel	Unit Capacity*	ISD*
Medicine Hat	CMH 16	Gas	43	May-2018
BluEarth Renewables	Brooks JBS	Gas	15	Oct-2018
<b>Total (MW)</b>			<b>58</b>	

*\*Unit Capacity – Expected MW capacity; ISD – Estimated in-service date*

**Table 2: Generation Projects with Regulatory Approval**

Sponsor(s)	Project Name	Fuel	Unit Capacity	ISD
Fortis	Genalta Bellshill	Gas	5	Jun-2018
Enbridge	WhiteTail Peaking	Gas	200	Oct-2018
NextEra	Heritage Wind	Wind	291	Oct-2018
EDF EN	Vulcan Solar PV - Phase 1	Solar	55	Dec-2018
EDF EN	Vulcan Solar PV - Phase 2	Solar	23	Dec-2018
Fortis	Buffalo Atlee Cluster 1 WAGF	Wind	18	Mar-2019
Fortis	Buffalo Atlee Cluster 3 WAGF	Wind	17	Mar-2019
Imperial Oil	Edmonton 95S Cogen	Gas	46.5	Mar-2019
Maxim Power	HR Milner Expansion Gas	Gas	90	May-2019
BluEarth Renewables	Burdett DG PV	Solar	20	May-2019

BluEarth Renewables	Yellow Lake DG PV	Solar	19	May-2019
Fortis	498S Tilley DG PV	Solar	22	Jun-2019
Fortis	895S Suffield DG PV	Solar	22	Jun-2019
Fortis	275S Jenner Solar DER	Solar	23	Jun-2019
Fortis	158S Vauxhall DG PV	Solar	16	Jun-2019
Fortis	421S Hays DG PV	Solar	23	Jun-2019
Naturener	Wild Rose 1	Wind	218	Jul-2019
BluEarth Renewables	Hand Hills Wind Farm	Wind	80	Sep-2019
E.ON	Grizzly Bear	Wind	120	Sep-2019
Suncor	Hand Hills	Wind	80	Sep-2019
ATCO	Three Hills 770S DER Solar 1	Solar	25	Sep-2019
Joss Wind	Jenner Wind	Wind	120	Sep-2019
Alberta Wind Energy	Windy Point	Wind	50.4	Sep-2019
Naturener	Wild Rose 2	Wind	192	Sep-2019
Mustus Energy	Mustus Biomass	Biomass	41	Sep-2019
ATCO	Heartland Power Station 1	Gas	510	Nov-2019
Enel	Castle Rock Ridge - Phase 2**	Wind	30.6	Nov-2019
Pteragen	Peace Butte	Wind	120	Dec-2019
RESC	McLaughlin WAGF	Wind	47	Dec-2019
Eolectric	Welsch Wind	Wind	69	Dec-2019
Fortis	Coaldale Cogen DER	Gas	6	Feb-2020
Three Creeks	Three Creeks Unit 1	Gas	230	Jun-2020
Three Creeks	Three Creeks Unit 2	Gas	230	Jun-2020
Three Creeks	Three Creeks Unit 3	Gas	230	Jun-2020

Inter Pipeline	Strathcona Cogeneration	Gas	96	Aug-2020
BowArk Energy	Queenstown Power Plant	Gas	80	Oct-2020
Maxim Power	Deerland Peaking 1-Phase 1	Gas	186	Dec-2020
Capital Power	Halkirk 2	Wind	150	Dec-2020
ENMAX	Zephyr Wind Farm	Wind	200	Dec-2020
Capital Power	Genesee 4	Gas	525	Mar-2021
Kineticor	Peace River Power Generator	Gas	98	Sep-2021
Enmax	Calgary Energy Centre Peaking	Gas	150	Dec-2021
Capital Power	Genesee 5	Gas	525	Mar-2022
C&B Alberta Solar	Newell Solar Project	Solar	13	TBD
Altagas	Kent Generation-Phase 1	Gas	100	TBD
Enmax	Bonnybrook	Gas	168	TBD
TransCanada	Saddlebrook	Gas	350	TBD
TransAlta	Sundance 7	Gas	850	TBD
Syncrude	Mildred Lake (Base Plant)-Phase 1	Gas	85	TBD
PetroChina	Mackay-Phase 1	Gas	85	TBD
Maxim Power	Milner 2 Phase 1	Gas	260	TBD
Maxim Power	Milner 2 Phase 2	Gas	260	TBD
Nexen	Long Lake South	Gas	85	TBD
Imperial Oil	Kearl - Phase 2	Gas	100	TBD
Imperial Oil	Kearl - Phase 3	Gas	35	TBD
Kronos Solar	Oyen Solar Park	Solar	10	TBD
NAT3	Jenner DG	Gas	20	TBD
<b>Total (MW)</b>			<b>7,726</b>	

**Table 3: Generation Projects that have been Announced, Applied for AESO Connection, and/or Applied for Regulatory Approval**

Sponsor(s)	Project Name	Fuel	Unit Capacity	ISD
Fortis	255S Vulcan Faribault Farms P/V	Solar	13	Jul-2018 (A)
Fortis	Tilley 498S DG Gas	Gas	22	Jul-2018 (A)
Fortis	Coaldale 254S DG Gas Part 1	Gas	11	Jul-2018 (A)
Fortis	Coaldale 254S DG Gas Part 2	Solar	11	Jul-2018 (A)
Fortis	Monarch 492S DG Gas Part 1	Gas	11	Jul-2018 (A)
Fortis	Monarch 492S DG Gas Part 2	Solar	11	Jul-2018 (A)
Fortis	Stavelly 349S DER Solar Part 1	Gas	10	Jul-2018 (A)
Fortis	Stavelly 349S DER Solar Part 2	Solar	9	Jul-2018 (A)
NextEra	Ghost Pine Battery ES System	Other	30	Sep-2018 (A)
Fortis	Gleichen DG Solar	Solar	17	Oct-2018 (A)
Fortis	GP Joule Canada Cluny DG	Solar	5	Oct-2018 (A)
Fortis	Burdett 368S DG P/V	Solar	10	Oct-2018 (A)
Fortis	Spring Coulee 385S Solar DG	Solar	29	Nov-2018 (A)
Fortis	Stirling 67S DG P/V	Solar	17	Nov-2018 (A)
Fortis	Krafte 257S Hull DER Solar	Solar	25	Nov-2018 (A)
Fortis	Vauxhall Solar DER	Solar	22	Nov-2018 (A)
Fortis	Namaka DER Solar	Solar	20	Nov-2018 (A)
NextEra	Red Deer Battery Energy Storage	Other	40	Dec-2018 (A)
Fortis	Warner 344S DER Solar	Solar	20	Dec-2018 (A)
Fortis	Conrad DER Solar	Solar	23	Dec-2018 (A)
Sequoia Energy	Oyen WAGF	Wind	100	Dec-2018 (A)



Fortis	Enchant 447S DER Solar	Solar	74	Dec-2018 (A)
Fortis	West Brooks DER Solar	Solar	23	Dec-2018 (A)
FortisAlberta	Willesdengreen DER Gas Turbine	Gas Turbine	10	Dec-2018 (A)
Chiniki	Solar	Solar	40	Dec-2018 (A)
Fortis	Bassano DER Solar	Solar	10	Jan-2019 (A)
Fortis	Wainwright DER Solar	Solar	13	Jan-2019 (A)
Fortis	Provost DER Solar	Solar	16	Jan-2019 (A)
Fortis	Killarney Lake DER Solar	Solar	16	Jan-2019 (A)
Seven Generations	Gold Creek Gas Plant	Gas	32	Jan-2019 (P)
Horseshoe Power	Gull Lake Cogen	Gas	6	Jan-2019 (P)
EPCOR	WSI DG Solar	Solar	12	Jan-2019 (A)
Fortis	Hays 421S DER Solar	Solar	10	Jan-2019 (A)
TransCanada	Scoria 318S Cogen	Gas	46	Jan-2019 (A)
Archer	Piikani Solar	Solar	40	Jan-2019 (A)
Enterprise	Prosperity WAGF	Wind	175	Mar-2019 (A)
EDF EN	Cypress WAGF	Wind	250	Mar-2019 (A)
ATCO	Coronation 802S Solar DG	Solar	10	Mar-2019 (A)
ATCO	Vilna 777S DER Solar	Solar	22.7	Mar-2019 (A)
FortisAlberta	Bullshead 523S DER Solar 1	Solar	20	Mar-2019 (A)
Enterprise	Bighorn WAGF	Wind	325	Mar-2019 (A)
Fortis	Coaldale 254S DG P/V	Solar	20	Mar-2019 (A)
Fortis	Coaldale 254S DER Solar 2	Solar	20	Mar-2019 (A)
Fortis	Duchess DER Solar	Solar	16	Mar-2019 (A)
Kronos Solar	Heisler Solar Park	Solar	20	Mar-2019 (P)

Kronos Solar	Veteran Solar Park	Solar	10	Mar-2019 (P)
BowArk Energy	Drywood Gas Generator	Gas	38	Apr-2019 (A)
Joss Wind	Jenner Phase 2	Wind	180	May-2019 (A)
Fortis	Empress DER Solar	Solar	23	May-2019 (A)
Fortis	Provost DER Solar	Solar	23	May-2019 (A)
Fortis	Metiskow DER Solar	Solar	23	May-2019 (A)
Fortis	Burdett DER Solar 1	Solar	8	May-2019 (A)
Fortis	Burdett DER Solar 2	Solar	16	May-2019 (A)
Fortis	Taber DER Solar 1	Solar	12	May-2019 (A)
Fortis	Taber DER Solar 2	Solar	22	May-2019 (A)
Fortis	Fincastle DER Solar	Solar	20	May-2019 (A)
Fortis	Killarney DER Solar	Solar	22	May-2019 (A)
ATCO	Michichi DER Solar	Solar	75	May-2019 (A)
ATCO	Monitor DER Solar	Solar	10	May-2019 (A)
FortisAlberta	Taber 83S DER Solar	Solar	16	May-2019 (A)
FortisAlberta	Empress 394S DER Solar	Solar	15.6	May-2019 (A)
Keyera	West Pembina 359S Gas Turbine	Gas	12	May-2019 (A)
EDF EN	Red Rock WAGF	Wind	250	May-2019 (A)
Suncor	Forty Mile WAGF	Wind	200	Jun-2019 (A)
Suncor	Forty Mile P/V	Solar	80	Jun-2019 (A)
Enel	Riverview Wind Farm**	Wind	115	Jun-2019 (A)
Fortis	257S Hull P/V	Solar	16	Jun-2019 (A)
RESC	Forty Mile WAGF	Wind	400	Jun-2019 (A)
RESC	Oyen Wind Power Project	Wind	350	Jun-2019 (A)

Irma	Wainwright Wind Project	Wind	90	Jul-2019 (A)
Greengate Power	Wheatland Wind	Wind	120	Jul-2019 (A)
Greengate Power	Stirling Wind	Wind	115	Jul-2019 (A)
Invenergy	Schuler Windfarm	Wind	100	Jul-2019 (A)
Imperial Oil	Aspen SAGD Project	Gas	30	Jul-2019 (A)
Fortis	Bullshead 523S Solar DER	Solar	18	Jul-2019 (A)
NextEra	Red Deer River Solar	Solar	150	Jul-2019 (A)
Fortis	Conrad DER Solar 2	Solar	22	Jul-2019 (A)
Fortis	Jenner 275S DER	Gas	24	Jul-2019 (A)
Fortis	Carseland Solar	Solar	12	Jul-2019 (A)
Greengate Power	Paintearth Wind Farm	Wind	150	Jul-2019 (A)
Renewable Energy	Rattlesnake Wind	Wind	100	Jul-2019 (A)
EDP Renewables	Sharp Hills Wind**	Wind	300	Aug-2019 (A)
Fortis	Brooks DER Solar	Solar	22	Aug-2019 (A)
Capital Power	Whitla Wind Power - Phase 1**	Wind	201.6	Sep-2019 (A)
TransAlta	Garden Plain Wind	Wind	130	Sep-2019 (A)
Altagas	Glenridge Wind	Wind	150	Sep-2019 (A)
Acciona Energy	Glenwood Area Wind	Wind	120	Sep-2019 (A)
Suncor	Forty Mile Granlea WAGF	Wind	200	Sep-2019 (A)
ATCO	Kneehill	Solar	25	Sep-2019 (P)
ATCO	Three Hills 770S DER Solar 2	Solar	25	Sep-2019 (A)
ATCO	Michichi Creek 802S DER Solar	Solar	25	Sep-2019 (A)
NaturEner	Buffalo Trail WAGF	Wind	100	Sep-2019 (A)
NaturEner	Ross Creek WAGF	Wind	100	Sep-2019 (A)

RESC	McLaughlin Phase 2	Solar	40	Sep-2019 (A)
TransAlta	Cowley Ridge 1 Wind	Wind	21	Sep-2019 (A)
FortisAlberta	Namaka 428S DER Solar	Solar	25	Sep-2019 (A)
EDF EN	Hand Hills WAGF	Wind	200	Oct-2019 (A)
ENMAX	Taber Wind Farm	Wind	21	Oct-2019 (A)
FortisAlberta	Bullshead 523S DER Solar 2	Solar	20	Oct-2019 (A)
Suncor	Hand Hills Solar	Solar	80	Oct-2019 (A)
Suncor	Schuler Solar	Solar	80	Oct-2019 (A)
Suncor	Schuler Wind	Wind	80	Oct-2019 (A)
Suncor	Hand Hills Phase 2	Wind	80	Oct-2019 (A)
Suncor	Braconnier Wind	Wind	80	Oct-2019 (A)
Suncor	Huxley Wind	Wind	50	Oct-2019 (A)
FortisAlberta	Strathmore 151S DER Solar 1	Solar	18	Nov-2019 (A)
FortisAlberta	Strathmore 151S DER Solar 2	Solar	22.5	Nov-2019 (A)
RealPart	Calgary Area Solar	Solar	150	Nov-2019 (A)
Spirit Pine	Lone Pine WAGF	Wind	173	Dec-2019 (A)
NextEra	Buffalo Trail Solar	Solar	70	Dec-2019 (A)
Sequoia Energy	Schuler WAGF	Wind	100	Dec-2019 (A)
Northland	Buffalo Trail	Wind	100	Dec-2019 (A)
Soventix	Forestberg Area Solar	Solar	40	Jan-2020 (A)
Turning Point Gen	Canyon Creek PHES	Other	125	Jan-2020 (A)
Pengrowth	Cold Lake Area Energy Centre	Gas	100	Mar-2020 (A)
Aira	Forty Mile Wind	Wind	125	Mar-2020 (A)
Solar Krafte	Vauxhall	Solar	150	Apr-2020 (A)

Solar Krafte	Brooks	Solar	400	Apr-2020 (A)
HEP Capital	Alderson Solar	Solar	100	Apr-2020 (A)
Pattern Development	Lanfine South Wind	Wind	140.4	Apr-2020 (A)
BowArk Energy	Lanfine WAGF	Wind	145	May-2020 (A)
Four Rivers	Four Rivers Wind	Wind	450	May-2020 (A)
E.ON	Grizzly Bear Wind Phase 2	Wind	30	May-2020 (A)
TransCanada	Saddlebrook Solar	Solar	100	Jun-2020 (A)
Alberta Wind Energy	Old Elm & Pothole Creek	Wind	60	Jun-2020 (A)
Perimeter	Sunset Solar	Solar	250	Jun-2020 (A)
Perimeter	Claresholm Solar	Solar	150	Jun-2020 (A)
ENGIE	Duchess Solar	Solar	90	Jun-2020 (A)
EDF EN	Fort Saskatchewan WAGF	Wind	300	Aug-2020 (A)
Capital Power	Whitla Wind Power - Phase 2	Wind	97.2	Sep-2020 (A)
City of Calgary	Bonnybrook Cogen Expansion	Gas	10	Sep-2020 (P)
Algonquin	Willow Ridge Wind	Wind	180	Oct-2020 (A)
TransAlta	Ardenville Expansion Wind	Wind	40	Oct-2020 (A)
Joss Wind	Northern Lights	Wind	400	Nov-2020 (A)
TransAlta	Red Rock Wind	Wind	65	Nov-2020 (A)
TransAlta	Windrise MPC Wind	Wind	220	Nov-2020 (A)
Solar Krafte	Rainier	Solar	450	Nov-2020 (A)
Greengate	Lathom Solar	Solar	120	Dec-2020 (A)
Greengate	Travers Solar	Solar	400	Dec-2020 (A)
Suncor	Forty Mile Granlea Solar	Solar	100	Dec-2020 (A)
BluEarth	Hand Hills Wind Phase 2	Wind	121.8	Dec-2020 (A)

Cascade	Combined Cycle Phase 2	Combined Cycle	500	Jan-2021 (A)
Suncor	Cogen Project	Gas	700	Jul-2021 (A)
Kineticor	Peace River Power Upgrade	Gas	125	Sep-2021 (A)
Cascade	Combined Cycle Phase 1	Gas	400	Jan-2022 (A)
AHP Development	Amisk Hydroelectric Project	Hydro	330	Dec-2023 (C)
<b>Total (MW)</b>			<b>14,374</b>	

\* - (P):Power Plant application filed with AUC, (A): AESO application in process, (C): Corporate announcement

\*\* - Denotes a project that was successful in the first Renewable Electricity Program competition. Companies successful in this round were awarded a Renewable Electricity Support Agreement and receive support through an Indexed Renewable Energy Credit in exchange for the project's renewable attributes.

**Table 4: Generation Projects that have Announced to be Retired**

Sponsor(s)	Project Name	Fuel	Unit Capacity	Retire Date	Status
Transalta	Sundance 1	Coal	280	Jan-2018	Retired
<b>Total (MW)</b>			<b>280</b>		

## Federal Coal Compliance Schedule

In 2012, the federal government approved the *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations*. The regulation requires that coal-fired generation units meet a GHG emissions intensity target once it reaches end of life. The AESO has adopted the federal compliance dates as retirement dates to evaluate metrics included in this report. The decision to retire a coal unit could also be impacted by several potential drivers, including the economics of plant operations, contractual agreements, and provincial and federal legislation.

The recent Climate Leadership Plan announced by the Alberta provincial government has not impacted assumptions on retirements in this report. Announcements from the government will continue to be assessed as they are released.

**Table 5: Federal Coal Compliance Schedule**

Sponsor(s)	Project Name	Fuel	Unit Capacity	In Service Date	Federal Compliance Date <sup>1</sup>
ATCO	Battle River 3	Coal	149	1969	Dec-2019
Maxim	HR Milner	Coal	144	1972	Dec-2019
TransAlta	Sundance 2	Coal	280	1973	Dec-2021 <sup>2,3</sup>
<b>Total (MW)</b>			<b>869</b>		

<sup>1</sup> Federal Compliance Dates are based upon the applicable provisions of the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations, as set forth in the Canada Gazette Vol. 146, No.19.

<sup>2</sup> Federal regulations stipulate that all coal plants built before 1975 must cease to operate on coal by the end of 2019, which includes Sundance Units 1 and 2. Given that Sundance Unit 1 will be shut down two years early, TransAlta intends to apply to the federal Minister of Environment to extend the life of Sundance Unit 2 from 2019 to 2021. <http://www.transalta.com/newsroom/news-releases/transalta-board-approves-plan-for-accelerating-transition-to-clean-power-in-alberta/>

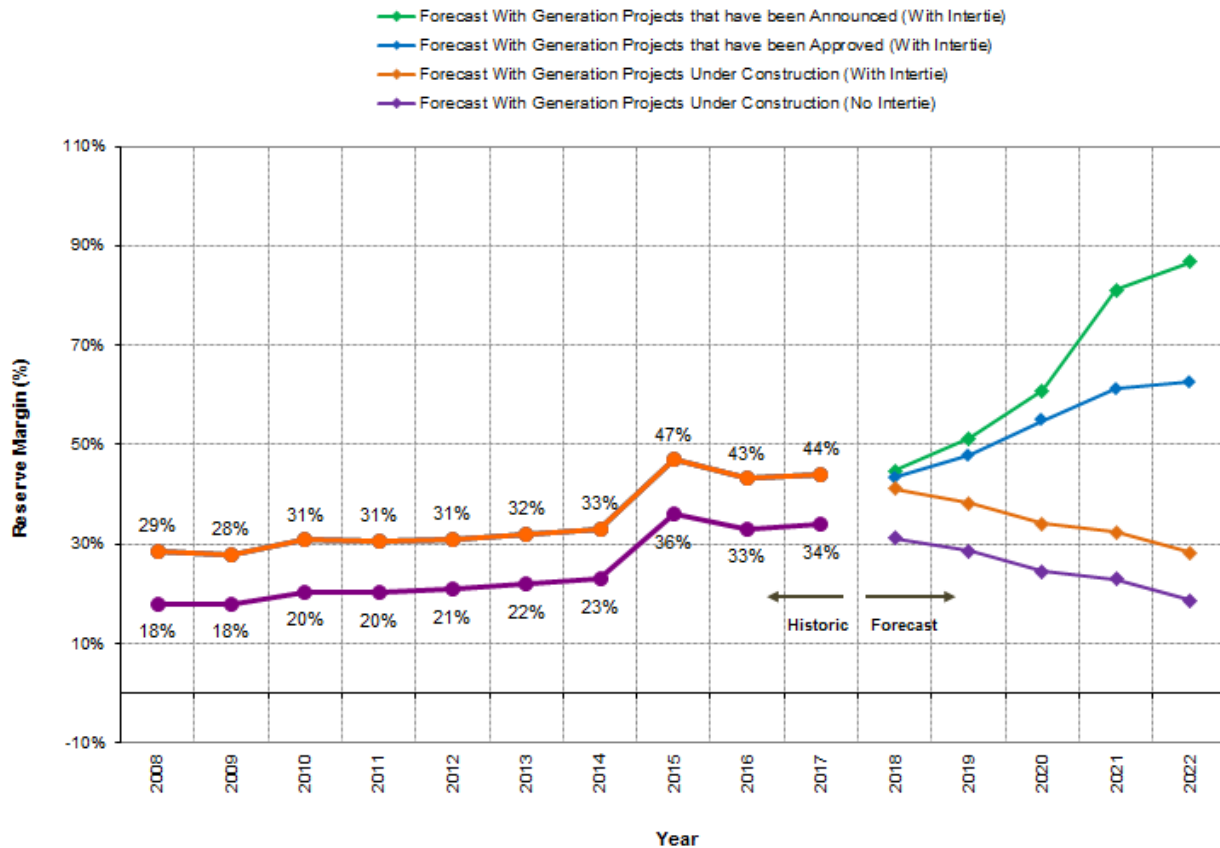
<sup>3</sup> After June 30, 2015, a unit that is permanently shut down ahead of its end-of-useful- life date may swap any leftover time to its useful life to one or many other unit(s) provided that all units have the same owner, are in the same province and the total potential electricity production over the period being swapped is equivalent. <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/regulations/coal-fired-electricity-generation.html>

## Reserve Margin Metric

The Reserve Margin Metric, shown in Figure 1, presents a comparison of generation supply and demand in Alberta. It is a calculation of the firm generation capacity at the time of system peak that is in excess of the system annual peak demand, expressed as a percentage of the system peak. Information on the annual peak demand within the reserve margin can be found on the AESO's [Forecasting](#) web page. Firm generation is defined as installed and future generation capacity, adjusting for seasonal hydro capacity and behind-the-fence demand and generation, and excludes wind and solar capacity. Three forecast reserve margins are presented, each with different future supply additions. The supply additions correspond to the stage of the generation projects in the New Generation Projects and Retirements Metric. The metric is graphed with and without intertie capacity in one reserve margin since full import capability may not always be available at the time of system peak demand.

Capacity from Sundance 1 and 2 has been excluded from the 2011 and 2012 reserve margin. They returned to service in late 2013.

**Figure 1: Alberta Interconnected Electric System (AIES) Reserve Margin, 2008 – 2022**

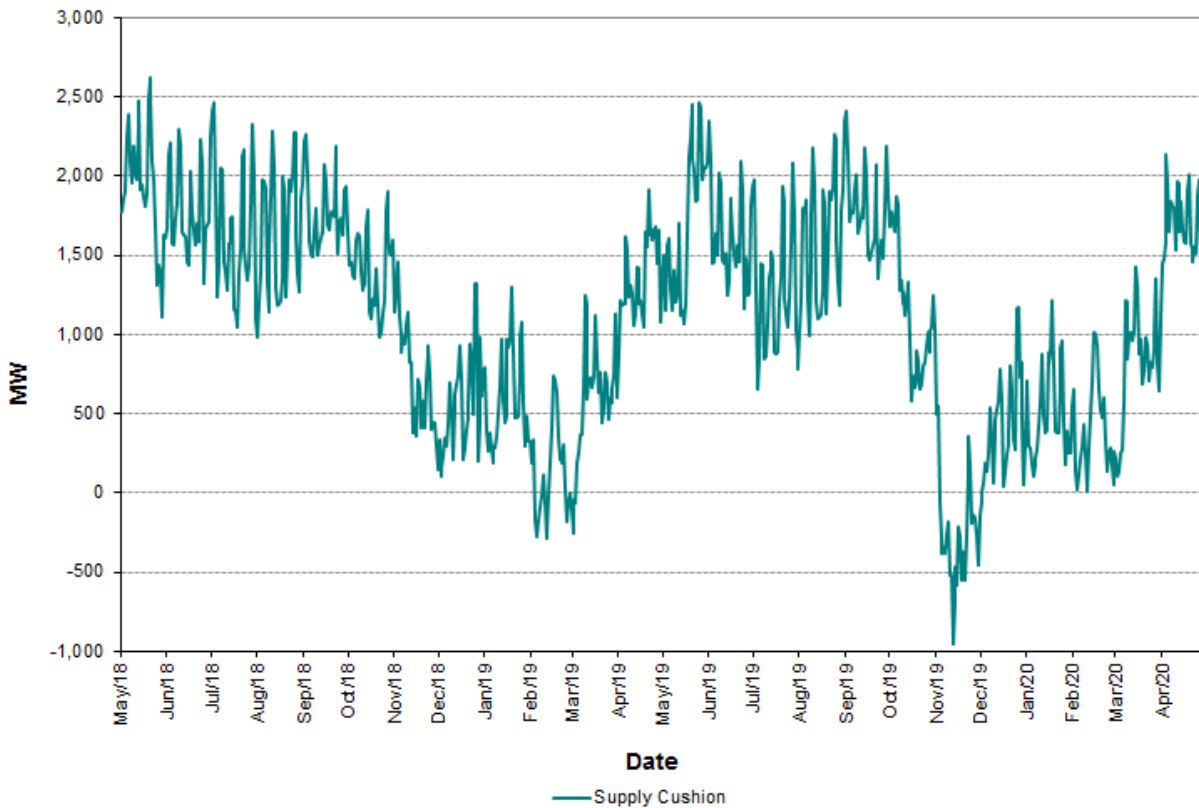




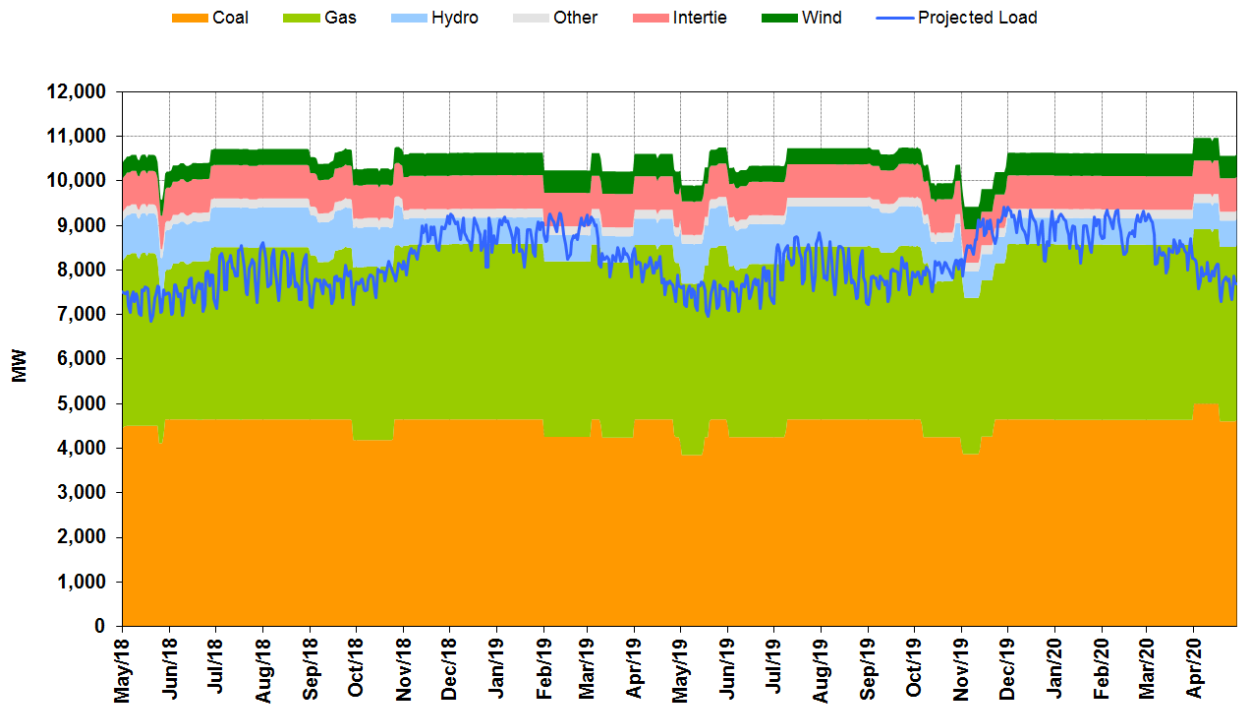
## Supply Cushion Metric

The Supply Cushion Metric provides visibility of the Alberta Interconnected Electric System’s ability to meet peak demand on a daily basis. The supply cushion is the difference between the daily available firm supply minus daily peak demand. Only existing generation and generation under construction are used within the metric. The supply cushion refines the reserve margin calculation by using daily system peak rather than annual and incorporates planned outages. Figure 2 presents the estimated daily supply cushion for the next two years. Figure 3 presents daily peak demand and firm supply by fuel type, as well as interties, wind and solar which are not included in the supply cushion calculation due to the intermittent or uncertain nature of the supply. When the supply cushion is negative in Figure 2, there is an increased level of reliance on interties and wind, as indicated in Figure 3.

**Figure 2: Alberta Interconnected Electric System (AIES) Daily Supply Cushion, May 1, 2018 to Apr 30, 2020**



**Figure 3: Alberta Interconnected Electric System (AIES) Daily Peak Demand and Available Supply, May 1, 2018 to Apr 30, 2020**



Outage information as of Apr 26, 2018

## Two Year Probability of Supply Adequacy Shortfall Metric

The Two Year Probability of Supply Adequacy Shortfall Metric is a probabilistic assessment of encountering a supply shortfall over the next two years. It builds on the Supply Cushion Metric by incorporating the probability of wind production, forced generation outages and generation derates into the calculation of hourly firm supply. The calculation estimates, on a probabilistic basis, how much load may go without supply over the next two year period. Based on extensive consultation with stakeholders, when this unserved energy exceeds 1,600 MWh in any two year period (equivalent to one hour 800 MW shortfall in each of the two years), the AESO may take certain actions to bridge the temporary supply adequacy gap while maintaining investor confidence in the market. The total energy not served shown in Table 6 does not reach the threshold.

**Table 6: Two Year Probability of Supply Adequacy Shortfall, May 1, 2018 to Apr 30, 2020**

Worst Shortfall Hour (MW)	# of Hours in Shortfall	Total Energy Not Served (MWh)
46	1	91

*Note: Values are rounded and represent average outputs*