Investment Impact of Alberta's Renewable Energy Moratorium

Factsheet

by Jason Wang, Will Noel | August 24, 2023

Summary

The Pembina Institute supports the responsible development of natural resources that includes management of environmental impacts and stakeholder concerns. But the abrupt announcement of an unnecessary seven-month moratorium on renewable energy development in Alberta has created uncertainty for investors in a growing economic sector. Public data shows that 118 projects are currently in development and are either waiting for permitting approval or could submit an approval application within the next few months. These projects represent at least $33 billion of investment and more than 24,000 job-years.

Background

Alberta's proven, economic, and available wind and solar resources position it to become Canada's renewable energy capital. In fact, three-quarters of renewable energy projects built in Canada last year were in Alberta.[1] At a time when the investments are trending towards renewable energy growth globally,[2] accelerating the buildout of renewables in the province is a no-regrets economy-building decision. Renewable energy reduces electricity costs, creates jobs, and has been a growing source of investment in Alberta. Since 2019, projects have drawn nearly $5 billion in investments, creating close to 5,500 jobs.[3]

[1] Canadian Renewable Energy Association, "NEWS RELEASE: Canada added 1.8 GW of wind and solar in 2022," January 31, 2023. https://renewablesassociation.ca/news-release-canada-added-1-8-gw-of-wind-and-solar-in-2022/

[2] International Energy Association, "Overview and key findings," *World Energy Investment 2023* (2023). https://www.iea.org/reports/world-energy-investment-2023/overview-and-key-findings

[3] Business Renewables Centre, *Deal Tracker (Q2 2023)*. https://businessrenewables.ca/deal-tracker

But **on August 3, 2022, the Government of Alberta announced a seven-month pause on approvals for renewable energy projects over 1 megawatt (MW)** – including wind, solar, and geothermal, though excluding microgeneration.[4]

Natural resources should be developed responsibly with care to mitigate environmental impact and address stakeholder concerns. However, there are several measures in place already for the responsible development and reclamation of renewable energy resources in Alberta. In addition, renewable projects are only developed with interested landowners.[5] There are improvements that can be made to the measures in place, but they can be undertaken without hampering the industry and stakeholders involved in project development.

We reviewed the Alberta Electric System Operator's (AESO) list of electricity generation projects in development in relation to their approval status from the Alberta Utility Commission (AUC) to determine how many projects are impacted by Alberta's renewable energy development moratorium and what this means for investments, revenues, and jobs in the province.

Results

At the time of writing, there are 118 projects impacted by the moratorium on renewable energy development. The projects are comprised of 12.7 gigawatts (GW) of solar, 5.3 GW of wind, and 1.5 GW of battery energy storage (as part of solar projects) and have been proposed by 64 different development companies or partnerships. **The total investments supporting the projects are estimated to be just over $33 billion, with an additional $263 million per year of revenue from municipal taxes and land leases spanning 27 different municipalities.** The planning, development, and construction of these projects would generate an estimated 24,000 full-time job-years.

Impacts by municipality

Due to its high-quality wind and solar resources, southern Alberta is a popular location for renewable energy development. As such, the impact of the moratorium is unevenly distributed throughout the province.

On average, a 100 MW renewable energy project generates between $125 and $175 million in project development and construction investments, $1.5 million in long-term, annual municipal revenues and up to 300 full-time jobs during construction. For example, our

[4] Microgeneration refers to renewable or alternative electricity generation that is located on a user's property, is no larger than 5 GW in power capacity, and produces no more than the customer's annual electricity consumption.

[5] E. Wilson, "The well-regulated West," *Canadian Renewable Energy Association*, March 21, 2023. https://renewablesassociation.ca/the-well-regulated-west/

estimates show that projects proposed in the Medicine Hat area would generate up to $44 million in annual tax and land lease revenues while creating significant opportunity for local employment. A distribution of the municipal revenue impact of the moratorium by region is shown in Figure 1.

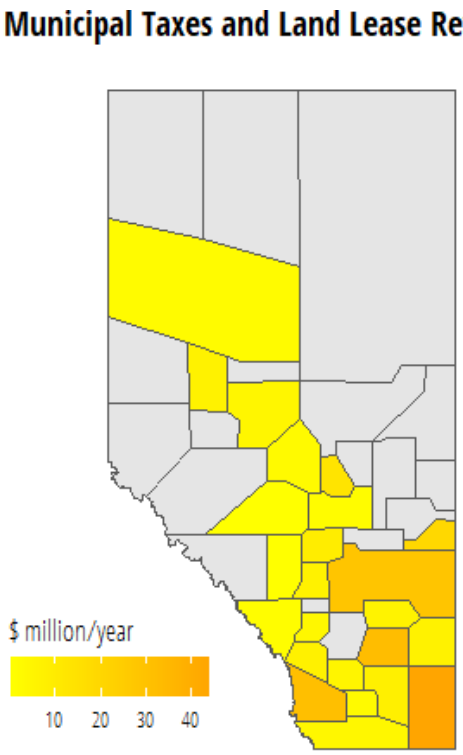

Figure 1. Estimated municipal and land lease revenue for projects impacted by the Alberta moratorium

Impacts by project

Results for each of the individual projects can be found in Table 1.

Table 1. Renewable projects impacted by the Alberta renewable moratorium

Company Name(s)	Project Information			Project Benefits		
	Name	Planning Area	Size (MW)	Investment ($ million)	Land Lease and Local Taxes ($ million/year)	Jobs (job-year)
369966 Alberta Inc.	The Rock Solar	Didsbury	466	697	6.52	578
Abacus Power	Three Hills DER Solar	Hanna	14	21	0.20	17
ABO Wind Canada	Fox Meadows Wind	Provost	150	244	1.80	183
	Smoky River Wind	Peace River	160	260	1.92	195
Acestas Power ULC	Duchess DER Solar Battery	Brooks	16 (+7 storage)	49	0.33	29
	East Camrose DER Solar Battery*	Wetaskiwin	19 (+8 storage)	56	0.38	33
Aira Wind Power Inc.	Aira Solar	Medicine Hat	450	673	6.30	496
Algonquin Power	Willow Ridge Wind Battery	Fort Macleod	250	407	3.00	305
Alpin Sun	Sol Aurora Solar	Fort Saskatchewan	200	299	2.80	248
	Airport City Solar	Edmonton	120	179	1.68	149
AltaGas	Glenridge Wind**	Empress	150	244	1.80	183
Archer Cleantech Inc.	Archer Piikani Solar**	Fort Macleod	40	60	0.56	50

ATCO	Anderson DER Solar	Sheerness	10	15	0.14	12
Aura Power Renewables	Metiskow DER Solar	Provost	22 (+23 storage)	66	0.44	39
	Killarney Lake DER Solar/Battery	Provost	18 (+23 storage)	54	0.36	32
	Peace Butte Solar Battery	Medicine Hat	230 (+100 storage)	686	4.60	407
	Provost DER Solar	Provost	21	31	0.29	26
BluEarth	Prairie Yarrow Wind	Provost	200	325	2.40	244
	Bindloss Solar Battery**	Empress	100 (+20 storage)	298	2.00	177
Boralex	Old Elm Wind***	Glenwood	60	98	0.72	73
Cache Island	Rising Sun Solar	Provost	125	187	1.75	155
Canwest Solar and Starlight Energy	Castor West Solar	Hanna	47	70	0.66	58
	Legal Solar	Edmonton	125	187	1.75	155
	Spruce Grove North Solar	Edmonton	220	329	3.08	273
	Heritage Wind	Fort Macleod	300	488	3.60	366
Capital Power	Whitla Solar	Medicine Hat	132	127	1.23	109
	Aldersyde Solar	High River	299	289	2.80	248

Capital Power and Public Services and Procurement Canada	Halkirk 2 Wind	Alliance/Battle River	244	237	1.80	183
Capstone Infrastructure	Buffalo Atlee Cluster 1	Empress	20	19	0.15	15
	Buffalo Atlee Cluster 3 DER	Empress	7	7	0.06	6
	Kneehill Solar	Hanna	673	650	6.30	558
Capstone Infrastructure and Maxim Power	Buffalo Atlee Cluster 2	Empress	22	22	0.17	17
Chiniki First Nation	Chiniki Solar**	Seebe	40	60	0.56	50
City of Lethbridge	Chinook DER Solar	Lethbridge	9	13	0.12	11
Canadian Pacific	Rolling Hills Wind	Provost	190	309	2.28	232
DP Energy	Saamis Solar Park	Medicine Hat	325	486	4.55	403
EDF Renewables Canada	Bull Trail Wind	Medicine Hat	300	488	3.60	366
	Bull Trail 2 Wind	Medicine Hat	200	325	2.40	244
EDP Renewables	Blue Bridge Solar	Empress	150	224	2.10	186
	Sounding Creek Solar Battery*	Hanna	200 (+50 storage)	597	4.00	354
Elemental Energy	EER Foothills Solar	High River	150	224	2.10	186
	High River DER Solar Battery	High River	17 (+19 storage)	51	0.34	30

Enel Green Power	Plains Solar Battery	Medicine Hat	200 (+150 storage)	597	4.00	354
Enerfin Energy Company of Canada	Winnifred Wind Modification	Medicine Hat	60	98	0.72	73
	Big Rock Solar Battery	High River	100 (+40 storage)	298	2.00	177
ENGIE Development Canada	Duchess Solar	Brooks	90	135	1.26	112
	Buffalo Trail North Wind	Medicine Hat	200	325	2.40	244
	Buffalo Trail South Wind**	Medicine Hat	200	325	2.40	244
ENMAX	Taber Solar	Vauxhall	45	67	0.63	56
Evolugen	Sunrise Solar***	Fort Macleod	75	112	1.05	93
Fortis	Red Deer DER Solar	Red Deer	18	27	0.26	23
	Taber DER Solar 1	Vauxhall	16	24	0.23	20
	Taber DER Solar 2	Vauxhall	15	22	0.21	18
	Taber DER Solar 3	Vauxhall	12	17	0.16	15
	Taber DER Solar 4	Vauxhall	13	20	0.19	17
	Blackmud DER Solar	Edmonton	20	30	0.28	25
	Leduc DER Solar	Edmonton	62	93	0.87	77
	Devon DER Solar	Edmonton	20	30	0.28	25
	Stony Plain DER Solar	Wabamun	12	18	0.17	15

	Buford DER Solar	Wetaskiwin	15	23	0.21	19
	Acheson DER Solar**	Edmonton	9	13	0.12	11
	Burdett DER Solar Battery Storage**	Vauxhall	18 (+18 storage)	52	0.35	31
	West Brooks DER Solar**	Brooks	22	33	0.31	27
Four Rivers Renewables	Four Rivers Wind**	Medicine Hat	450	732	5.40	549
Greengate	Luna Solar Battery	Brooks	465 (+80 storage)	1,387	9.30	823
	Luna 2 Solar Battery	Brooks	465 (+80 storage)	1,387	9.30	823
HEP Capital	Alderson Solar	Medicine Hat	100	150	1.40	124
	Bullshead DER Solar	Medicine Hat	22	33	0.31	28
Hive Energy	Bullpound DER Solar	Sheerness	14	21	0.20	18
Horus Solar Alberta Ltd.	Kirkcaldy Solar	Stavely	350	523	4.90	434
Joss Wind	Northern Lights	Swan Hills	400	650	4.80	488
Kiwetinohk Energy	Homestead Solar	Fort Macleod	400	598	5.60	496
	Granum Solar	Fort Macleod	400	598	5.60	496
	Phoenix Solar	Red Deer	299	447	4.19	371
	Springbrook Solar	Red Deer	300	449	4.20	372

Neoen Renewables	Jumbo Solar Battery	Fort Macleod	218 (+75 storage)	650	4.36	386
	Sweetgrass Solar Battery	Fort Macleod	315 (+150 storage)	940	6.30	558
Neyaskweyahk Group of Companies	Ermineskin Cree Nation Solar	Wetaskiwin	80	120	1.12	99
Northland	Bow City Solar**	Brooks	400	598	5.60	496
PACE Canada LP	Sundre DER Solar	Caroline	13	19	0.18	16
	Mannix Solar Battery	Alliance/ Battle River	59 (+34 storage)	176	1.18	104
	Harvest Sky Solar Battery	Hanna	40 (+14 storage)	119	0.80	71
Paul First Nation	PBC Paul Band Solar***	Wabamun	37	55	0.52	46
Potentia Renewables	Prominence Solar	Lethbridge	80	120	1.12	99
Proteus	Hays DER Solar 1	Vauxhall	19	28	0.27	24
	Hays DER Solar 2	Vauxhall	21	31	0.29	26
	Hays Solar 2 Battery	Vauxhall	185 (+60 storage)	552	3.70	327
Pteragen	Peace Butte Wind	Medicine Hat	120	195	1.44	146
RealPart	Calgary Area Solar**	Calgary	150	224	2.10	186
	Oyen Wind	Hanna	250	407	3.00	305

Renewable Energy Systems Canada	Nova Solar	Strathmore/Blackie	150	224	2.10	186
	Forty Mile Wind Phase 2	Medicine Hat	134	218	1.61	163
	Oyen Wind Phase II*	Hanna	216	351	2.59	264
	Western Solar*	Calgary	150	224	2.10	186
Saturn Power Inc.	Springbrook West Solar*	Red Deer	29	30	0.28	25
Solar Krafte	Solar Krafte Vauxhall	Vauxhall	60	90	0.84	74
	Rainier Solar	Brooks	450	673	6.30	558
Spirit Pine Energy	Lone Pine Wind	Hanna	466	758	5.59	569
St Albert Solar Stl Inc	St. Albert Solar	Edmonton	400	598	5.60	496
Suncor	Forty Mile Granlea Modification	Medicine Hat	28	46	0.34	73
Sunset Solar Inc	Sunset Solar**	Vauxhall	60	90	0.84	74
SWITCH Power	Cypress North DER Solar*	Empress	15	22	0.21	18
TransAlta	Riplinger Wind	Glenwood	300	488	3.60	780
	Tempest Wind	Lethbridge	100	163	1.20	260
	Red Rock Wind	Medicine Hat	100	163	1.20	260
	Sunhills Solar	Wabamun	130	194	1.82	169
	Willow Creek 1 Wind***	Fort Macleod	70	114	0.84	85
	Willow Creek 2 Wind***	Fort Macleod	70	114	0.84	85

Universal Kraft	UK LS5 Solar*	Valleyview	25	38	0.35	31
	UK LS1 Solar*	Valleyview	448	670	6.27	556
Universal Kraft and Korkia	UK Solar East	Hanna	400	598	5.60	520
Unknown	Diamond Solar Battery*	Seebe	60	90	0.84	74
Voltarix Group	Fortis Moon Lake DER Solar	Drayton Valley	17	25	0.23	22
Westbridge Energy Corp	Georgetown Solar	Strathmore/Blackie	230	344	3.22	34
	Sunnynook Solar Battery	Sheerness	280 (+100 storage)	835	5.60	366
	Dolcy Solar Battery	Provost	200 (+100 storage)	597	4.00	122
	Eastervale Solar Battery	Provost	300 (+200 storage)	895	6.00	122
	Red Willow Solar Battery	Alliance/Battle River	225 (+200 storage)	671	4.50	161
Total	–	–	**17,990 (+1,549 storage)**	**33,084**	**263.40**	**24,158**

Note: most projects above are listed by the AESO as "Active." Other statuses are noted here as:

*Processed for cluster

**On hold

***In-service date is under review

Methodology

Data source

The Alberta Electric System Operator (AESO) maintains a list of electricity generation projects formally within development on their website.[6] Projects are categorized under several statuses and stages indicating how far along they are in the development process.[7] Any projects that are in stage 5 or 6 have already received the necessary approvals from the Alberta Utility Commission (AUC) and are not affected by the moratorium. As such, we consider all projects up to and including stage 4 to be "in development" and impacted by the moratorium with the understanding that the projects that are in the later stages are the most at risk. The pause in approvals creates uncertainty for developers, investors and other stakeholders involved in projects that are in all stages of development. It also is likely to have long-lasting impacts on the development decisions of prospective investors. Projects that are actively awaiting AUC approval can be found in the AUC's eFiling system.[8]

Calculating impact

The moratorium has placed a pause on all renewable energy projects including wind, solar, hydro, and geothermal. However, as a large number of solar projects are being developed in tandem with battery energy storage (i.e., hybrid batteries), we are considering those assets to be impacted as well.

Renewable energy projects are a significant source of investment, jobs, and local revenues through taxes and land lease payments. Investment impacts are estimated using overnight capital costs. This means the cost of a project if it were built and paid for overnight so that it is not impacted by interest, depreciation, or inflation. Renewable projects are often located on privately owned land, obtained through a bilateral agreement with the project developer and the landowner. Renewable projects generate revenue for both the landowner — through land lease payments — and the municipality in which they are located — through municipal taxes. Job creation is estimated using the job-year metric. That is to say, these are not peak construction jobs, but rather the equivalent of one person being employed one year full-time. The factors used to estimate the impact of the moratorium are summarized in Table 2.

[6] Alberta Electric System Operator, "Connection Project Reporting." https://www.aeso.ca/grid/transmission-projects/connection-project-reporting

[7] Alberta Electric System Operator, "Connecting to the Grid: connection process." https://www.aeso.ca/grid/connecting-to-the-grid/connection-process/

[8] Alberta Utility Commission, "eFiling System." https://www2.auc.ab.ca/_layouts/15/auc.efiling.portal/login.aspx

Table 2. Summary of investment, tax, and employment impact factors by technology

Impact Factor	Wind	Solar	Solar + Battery
Investment ($/kW)	1,626	1,495	2,983
Local Taxes and Land Lease Revenues ($/kW)	12	14	20
Jobs (job-year/MW)	1.22	1.24	1.77

Data source: CEC[9]; NRCan[10]

[9] Clean Energy Canada, *A Renewables Powerhouse* (2023). https://cleanenergycanada.org/report/a-renewables-powerhouse/

[10] Job factors have been converted from a per-gigawatt-hour basis from the original source to a per-kilowatt-hour basis using an assumed capacity factor of 45% for wind and 20% for solar. Natural Resources Canada, *Powering Canada Forward: Building a Clean, Affordable, and Reliable Electricity System for Every Region of Canada* (2023). https://natural-resources.canada.ca/our-natural-resources/energy-sources-distribution/electricity-infrastructure/powering-canada-forward-building-clean-affordable-and-reliable-electricity-system-for/25259