MOVING FORWARD REPORT

SOUTHEAST ALBERTA RENEWABLE ENERGY STRATEGY

City of Medicine Hat – Box Springs Wind Farm

April 2018

An initiative of the Southeast Alberta Energy Diversification Strategy (SEEDS) group

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SE ALBERTA ENERGY DIVERSIFICATION STRATEGY
Our region. Our jobs. Our communities.

The **Southeast Alberta Energy Diversification Strategy (SEEDS)** group is focused on engaging with the renewable energy industry to determine how we can support the industry to grow and thrive in Southeast Alberta.

www.seedsalberta.ca @SEEDSAlberta info@seedsalberta.ca

The SEEDS group is comprised of the following organizations in Southeast Alberta:

Alberta Labour
APEX Regional Innovation Network of Southeast Alberta
City of Brooks
City of Medicine Hat
Community Futures Entre-Corp
County of Newell
Economic Development Alliance (EDA) of Southeast Alberta
Medicine Hat College

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Contents

EXECUTIVE SUMMARY

The **Southeast Alberta Renewable Energy Strategy** will support the renewable energy industry in SE AB. Based on stakeholder input, this strategy provides a framework for coordinating activities, collaborating with other stakeholders and partners, raising awareness and education, providing resources and support, marketing and promoting, and fostering further development and innovation for the renewable energy industry in Southeast Alberta (SE AB).

The **Southeast Alberta Renewable Energy Strategy** is comprised of the following four reports:

1. **Industry Report**
2. **Workforce Report**
3. **Innovation and Supply Chain Report**
4. **Moving Forward Report**

This **Moving Forward Report** is the final report in the strategy. It summarizes the following three reports and looks at renewable energy projects planned for the SE AB region moving forward.

As of December 31, 2017, the AESO Connection Project List listed 127 planned projects in Alberta over 1MW for solar (66) and wind (61) energy; **61 of those projects are in SE AB**.

- **48%** of all proposed **WIND AND SOLAR** projects in Alberta **are in SE AB** (61 out of 127 total);
- **53%** of proposed **SOLAR** projects in Alberta **are in SE AB** (35 out of 66 total); and
- **43%** of proposed **WIND** projects in Alberta **are in SE AB** (26 out of 61 total).

If all these projects went ahead, over the next two decades they would equate to:

- **$12.8 billion** in capital project investment;
- nearly **30,000** temporary FTE construction jobs;
- almost **900** permanent operations and maintenance jobs;
- **$1.2 billion** in landowner lease payments (over 20 years); and
- $**1.25 billion** in municipal tax revenues (over 20 years).

Additional takeaways from the reports in this strategy for moving forward to develop the renewable and clean energy industries in SE AB are:

- Alberta's emerging renewable energy industry is **bringing new opportunities** to SE AB.
- SE AB has **abundant solar and wind resources**, and **ample interest from developers**.
- SE AB's already has a **skilled energy workforce** that could work in renewable energy.
- **Greater awareness** on renewable energy and its impacts is needed in the region.
- There are **few opportunities for regional industries to interact** with the renewable energy industry.
- **SE AB is a region marked by innovation** in agriculture, unmanned vehicle systems, and oil and gas.
- SE AB has a **strong support network** for facilitating innovation and entrepreneurship.
- **Stronger support of the renewable energy and clean technology industries** is needed from community and regional leaders to attract and promote renewable energy investment and development in the region.
- SE AB can be ***Alberta's Opportunity Corner*** for renewable energy and clean technology development.

FOREWORD

The **Southeast Alberta Renewable Energy Strategy** is comprised of four reports focused on the renewable energy industry, workforce, and related economic development in SE AB. These include:

1. Industry Report
2. Workforce Report
3. Innovation and Supply Chain Report
4. Moving Forward Report

This final **Moving Forward Report** is focused on summarizing the previous three reports in this strategy and explores potential renewable energy and clean technology developments in SE AB. This report was developed from input collected for the **Industry Report** and additional input from various stakeholders. In total for this strategy, we engaged with over 50 stakeholders from the renewable energy industry and business community in SE AB, and over 20 community and government stakeholders.

This **Moving Forward Report** is the third report in a series of four included in the **Southeast Alberta Renewable Energy Strategy**. It focuses on summarizes the following three reports and looking at renewable energy projects planned for the SE AB region moving forward.

The first report in the strategy- the **Industry Report** – focused on providing a framework - from renewable energy stakeholders in SE AB, primarily industry stakeholders - for growing a thriving renewable energy industry in SE AB.

Based on input from stakeholders the **Industry Report** provided five recommendations:

1. Establish the SE AB Energy Diversification (SEEDS) group as a regional industry coalition comprised of regional renewable energy industry and community stakeholders.
2. Develop a plan to market and promote renewable energy in SE AB to communities and the renewable energy industry.
3. Support the development of the renewable energy workforce and build local expertise and capability in the renewable energy industry to support and promote careers in renewable energy to traditional and non-traditional pools of labour.
4. Provide resources and support to develop a better understanding of the renewable energy industry in SE AB and the impact it has on regional businesses and economic development.
5. Foster a renewable energy market in SE AB that supports and attracts both large-scale and small-scale renewable energy development, innovation, investment, and research.

This final report in the strategy – the **Moving Forward Report** – provides an overview of the potential economic impacts of proposed renewable energy projects in SE AB over the next two decades and summarizes the preceding three reports in the **Southeast Alberta Energy Diversification Strategy**.

BACKGROUND

As has been shown in each of the preceding reports over the past decade, clean/renewable energy has become a global priority. In late 2015 most of the countries in the world signed on to the *Paris Agreement*, a global action plan for decreasing emissions and addressing climate change. Many countries have also created their own climate action plans, such as Canada's *Pan-Canadian Framework on Clean Growth and Climate Change*. Many Canadian provinces are also developing plans to mitigate climate change and reduce emissions. Alberta's Climate Leadership Plan is a made-in-Alberta strategy for reducing carbon emissions, diversifying the economy, and creating jobs.

It is not just governments who are investing in clean energy. Many global corporations are investing in renewable energy to power their factories and stores - IKEA, Google, Facebook, Intel, Microsoft, and Walmart. Even oil and gas companies are diversifying their operations into renewable energy. Large oil and gas companies like Exxon, Chevron, Total, Suncor Energy, Enbridge, and TransCanada have invested heavily into renewables.

As global energy demands continue to increase, additional sources of energy will be required. A diverse energy mix is good for both the environment **and** the economy. Hence, the aim of the reports in the **Southeast Alberta Renewable Energy Strategy** is to develop a better understanding of the emerging renewable energy industry in SE AB from the perspective of industry, workforce development, and innovation and supply chain.

The first report in the strategy - the **Industry Report** - was developed from two stakeholder engagement sessions hosted by the SEEDS group and independently facilitated. This input, combined with additional stakeholder input was collected from various industry, business, and community stakeholders in SE AB to develop the other two reports in the strategy – the **Workforce Report** and the **Innovation and Supply Chain Report**. This final report – the **Moving Forward Report** – explores the impacts planned large-scale projects could have on our region and discusses the next steps for moving forward on this strategy by reviewing the recommendations and suggested activities outlined in the **Industry Report**.

LARGE-SCALE RENEWABLE ENERGY PROJECTS IN SE AB

As stated in the **Industry Report**, SEEDS began in 2016 with a mandate to explore renewable energy in SE AB. In 2017, the *Southeast Alberta Energy Diversification Report: Our Region, Our Jobs, Our Communities*[1] report was released at the Southeast Alberta Energy Diversification Symposium. This symposium, held at Medicine Hat College on March 2 and 3, 2017, was one of SE AB's first introductions to renewable energy and large-scale projects planned for the region.

The **Industry Report**, which can be found on the SEEDS website[2], explored the large-scale (over 1MW) solar and wind projects that were proposed for development in Alberta. Of the 85 projects on the Alberta Electric Systems Operator (AESO) Connection List as of December 31, 2016, 35 – or 41% - of all planned large-scale solar and wind projects were in SE AB.

If all these projects were to come to fruition, **over the next two decades** they could bring extensive economic impacts into the SE AB region. Using formulas from the Canadian Wind Energy Association (CanWEA) and the Canadian Solar Industries Association (CanSIA), the 2017 SEEDS report estimated that these projects would result in:

- $7.8 billion in investment
- 10,875 temporary construction jobs
- 397 permanent maintenance and operations jobs
- $580 million in lease payments to landowners
- $765 million in property tax revenue from municipalities.

[1] Moore, Sandra. (2017). *Southeast Alberta energy diversification report: Our region, our jobs, our communities*. Economic Development Alliance of Southeast Alberta: Medicine Hat, Alberta.
[2] www.seedsalberta.ca

The SEEDS report was the first time the potential impacts of diversifying the region's energy industry and growing the renewable energy industry in SE AB were explored. This 2017 SEEDS report provided baseline data for comparing the growth of the renewable energy industry in the region yearly or on a regular basis.

One year later, this **Moving Forward Report** provides an analysis of planned projects on the AESO Connection List **as of the end of December 31, 2017** and a comparison to the previous years' numbers in the 2017 SEEDS Report.

2017 Planned Solar and Wind Projects for Southeast Alberta

As with the 2017 report, though there are numerous types of renewable energy projects currently operating in, or proposed for, Alberta (geothermal, biomass, co-generation, etc…), this report will focus on the **61**-planned solar and wind energy projects over 1MW in SE AB as identified on the AESO *Connection Project List* **as of December 31, 2017**. A summary of these 61 wind and solar projects is provided in Appendix A.

As of December 31, 2017, the AESO Connection Project List listed 127 planned projects over 1MW for solar (66) and wind (61) energy throughout Alberta; **61 of those projects are in SE AB.**

- **48% of all proposed WIND AND SOLAR projects in Alberta are in SE AB** (61 out of 127 total);
- **43% of proposed WIND projects in Alberta are in SE AB** (26 out of 61 total); and,
- **53% of proposed SOLAR projects in Alberta are in SE AB** (35 out of 66 total).

The number of solar and wind projects over 1 MW planned for Alberta and SE AB as of the end of 2017 increased from 2016 (Table 1).

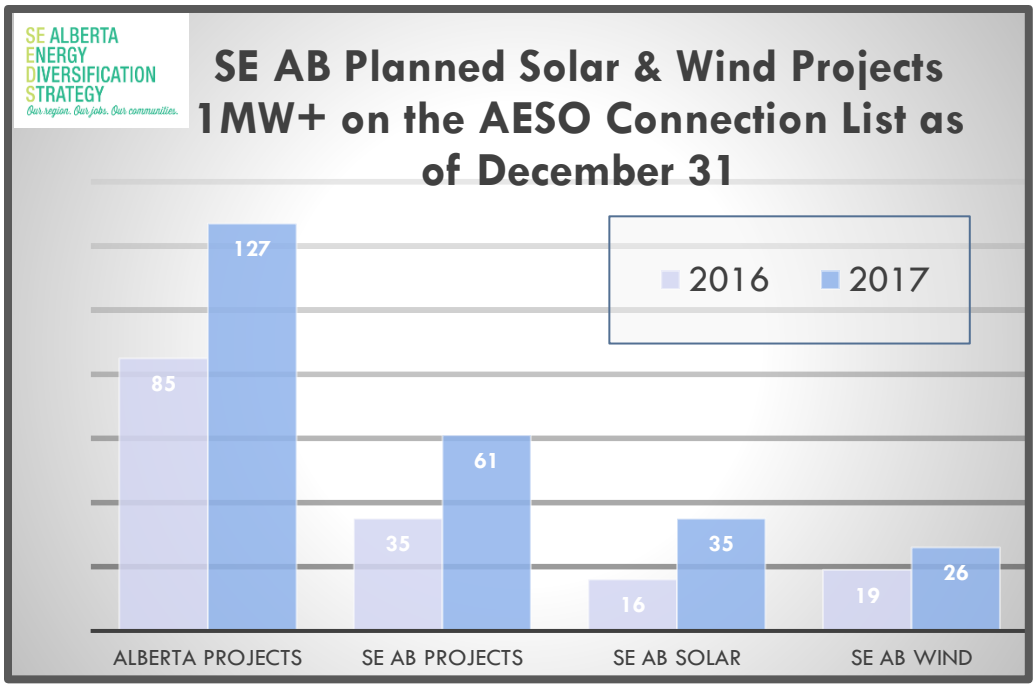

Table 1. Planned Solar & Wind Projects Over 1MW on the AESO Connection Project List as of December 31 – 2016 vs. 2017

The boundaries of the geographical region referred to as SE AB are defined using the four Alberta Electric System Operator (AESO) planning areas:

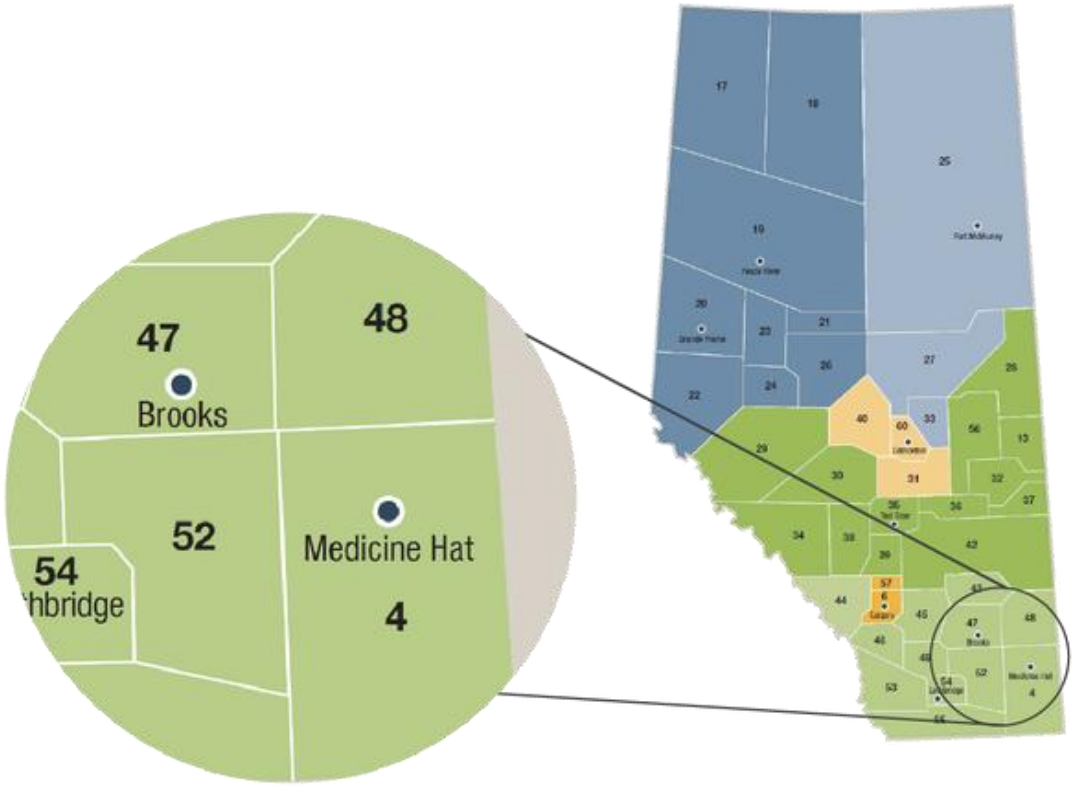

Figure 1. AESO Planning Areas – SE AB[3]

SE ALBERTA ENERGY DIVERSIFICATION STRATEGY	AESO Connection List Planned Large Scale (1MW+) Projects in SE AB As of December 31, 2017	
Planning Area	**Solar**	**Wind**
Area 4 includes Medicine Hat, Schuler & Seven Persons	6	19[4]
Area 47 includes Brooks & Bassano	7	0
Area 48 includes Jenner & Oyen	2	5
Area 52 includes Vauxhall, Burdett, & Bow Island	20	2

Table 2. 2017 AESO Connection List Planned Large Scale (1MW+) Projects in SE AB as of Dec 31, 2017

More information on the location, size, and planned in-service date of each of the projects proposed for SE AB on the AESO Connection List as of December 31, 2017 can be found in **Appendix A**.

[3] SEEDS. (2018). Region. www.seedsalberta.ca
[4] Project #1800 is classified as 2 projects

The potential MW generation capacity associated with the planned projects on the AESO Connection List as of December 31 has also increased from 2016 to 2017 (Table 3).

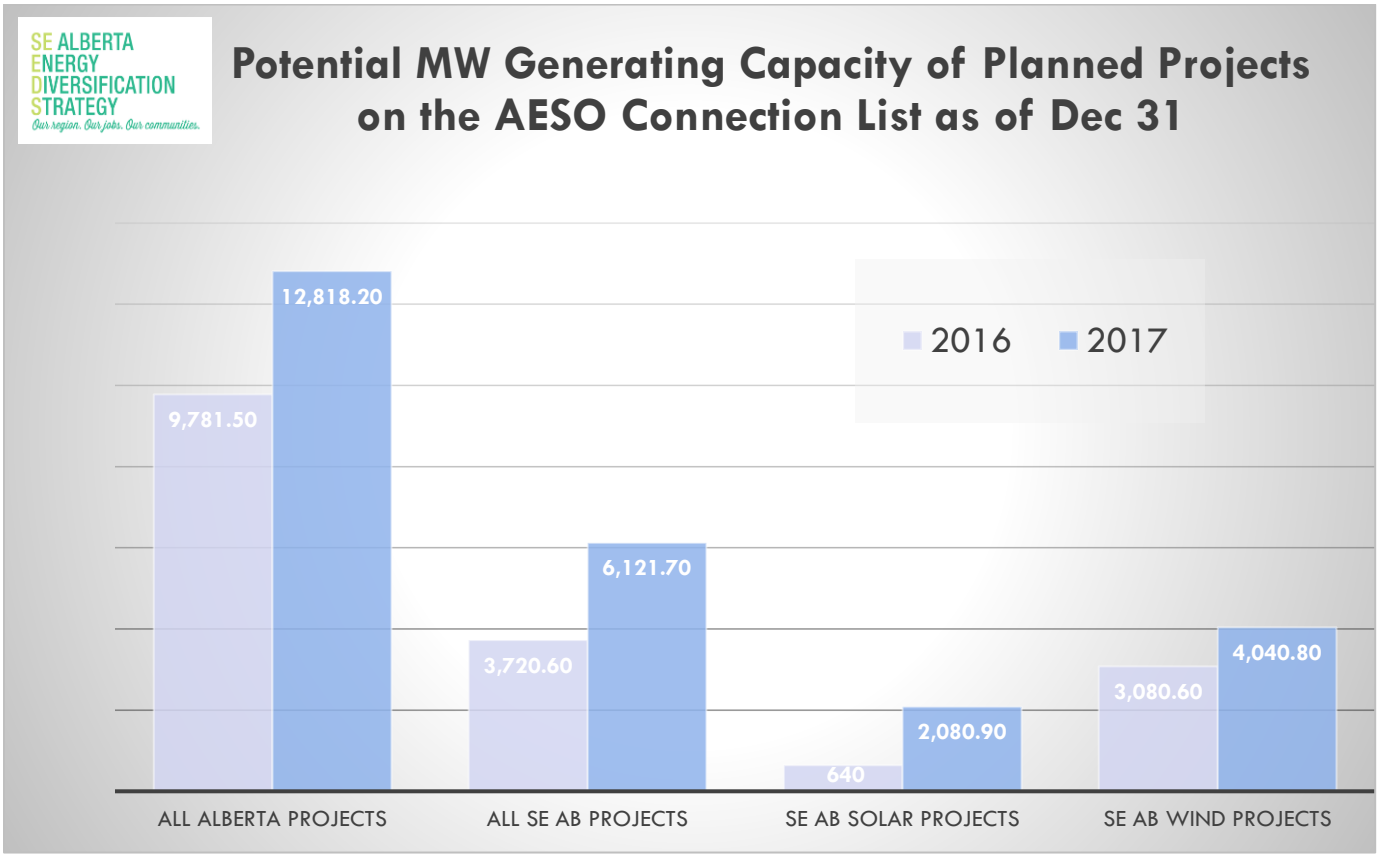

Table 3. Potential MW Generating Capacity of Solar & Wind Projects Over 1MW on the AESO Connection Project List as of December 31 – 2016 vs. 2017

In Alberta, a total of **12,818.2 MW** of energy could be generated from these 127-proposed solar (3,754.1 MW) and wind (9,064.1 MW) projects**.**

In SE AB, a total of **6,121.7 MW** of energy could be generated from these 61-proposed solar (2,080.9 MW) and wind (4,040.8 MW) projects.

Of the total 127-proposed wind and solar projects in Alberta as of December 31, 2017, the 61-proposed **SE AB projects account for:**

- 48% of the total MW generation for all proposed Alberta **SOLAR AND WIND** energy projects.
- 55% of the total MW generation for all proposed **SOLAR** projects in Alberta.
- 45% of the total MW generation for all proposed **WIND** projects in Alberta.

Potential Economic and Employment Impacts

Using the following CanSIA and CanWEA formulas (Table 4) from the original SEEDS report,

CANWEA & CANSIA FORMULAS TO ESTIMATE EMPLOYMENT & ECONOMIC IMPACTS ASSOCIATED WITH EVERY 150 MWs OF WIND & SOLAR ENERGY		
	WIND (per 150 MW)	**SOLAR (per 150 MW)**
Investment	$316,000,000	$310,000,000
Direct full-time equivalent (FTE) construction jobs	140	1,875
Permanent direct jobs in operations and maintenance	10	45
Lease payments to rural landowners (over 20 years)	$17,000,000	$54,000,000
Property tax payments to rural municipalities (over 20 years)	$31,000,000	$30,000,000

Table 4. CanWEA and CanSIA Formulas for Estimating Impacts of Wind & Solar Development[5]

the **61**-proposed SE AB solar and wind projects (over 1MW) listed on the AESO *Connection Project List* as of December 31, 2017, could result in the following **estimated** potential employment and economic impacts (**Table 5**).

POTENTIAL IMPACTS OF PROPOSED SOLAR & WIND PROJECTS ON THE AESO PROJECT LIST FOR SE AB AS OF DECEMBER, 31 -2016 vs 2017 Comparison						
SE ALBERTA ENERGY DIVERSIFICATION STRATEGY Our region. Our jobs. Our communities.	**2016 SOLAR 16 projects = 640 MW[6]**	**2017 SOLAR 35 projects = 2,080.9 MW**	**2016 WIND 19 projects = 3,080.6 MW[7]**	**2017 WIND 26 projects = 4,040.8 MW**	**2016 TOTAL SOLAR & WIND 35 projects = 3720.6 MW[8]**	**2017 TOTAL SOLAR & WIND 61 projects = 6,121.7 MW**
Investment	$1,332,666,667	**$4,300,526,667**	$6,489,797,333	**$8,512,618,667**	$7,822,464,000	**$12,813,145,334**
Direct FTE temporary construction jobs	8,000	**26,011**	2,875	**3,771**	10,875	**29,782**
Permanent direct jobs in operations	192	**624**	205	**269**	397	**893**
Lease payments to rural landowners (over 20 years)	$230,400,000	**$749,124,000**	$349,134,667	**$457,957,333**	$579,534,667	**$1,207,081,333**
Property tax payments to rural municipalities (over 20 years)	$128,000,000	**$416,180,000**	$636,657,333	**$835,098,667**	$764,657,333	**$1,251,278,667**

TABLE 5. 2016 vs 2017 Comparison Estimated Impacts of Large-Scale Solar and Wind Projects

[5] CanWEA & CanSIA. (2015). Submission to the Alberta Climate Change Advisory Panel. https://solaralberta.ca/sites/default/files/canwea_-_cansia_final_submission_sept_30.pdf

[6] To use the **CanSIA formula** outline in **Table 3.**, the total MW for SE AB proposed **solar** projects 640 was divided by 150 = 4.266666666666667. E.g. every 150 MW of installed solar energy = $310 million investment. 4.266666666666667x 316,000,000 = $1,332,666,667

[7] To use the **CanWEA formula** outline in **Table 3.**, the total MW for SE AB proposed **wind** projects 3,080.6 was divided by 150 = 20.53733333333333. E.g. every 150 MW of installed wind energy = $316 million investment. 20.53733333333333 x 316,000,000 = $6,489,797,333

[8] Totals for this column resulting from adding each wind and solar line together.

As was stressed in the March 2017 SEEDS report[9], **it is important to note that these estimated numbers,**

- are **general formulaic estimates** that do not consider individual project realities or community contexts.
- **assume that all these projects will be developed** and will proceed as they are currently proposed on the AESO Connection Project List.
- indicate estimated impacts over multiple years from multiple proposed projects. **Even if all the 61 solar and wind projects proposed for SE AB on the AESO list progressed as planned they would not all occur at the same time.** Each of these proposed projects is at a different stage of development on the AESO queue, and many are years away from development.

In addition, these estimated numbers **do not include the indirect impacts** these projects have on communities from increased activity as well as **corporate donations and sponsorships** from the development companies and their sub-contractors.

NEXT STEPS

Four reports exist in this strategy focused on developing a better understanding of what is needed to support the development of the renewable energy industry in SE AB. These reports focus on Industry, Workforce, Innovation and Supply Chain, and this Moving Forward report.

Takeaways from these reports include:

- Alberta's emerging renewable energy industry is bringing new opportunities to SE AB.
- SE AB has abundant solar and wind resources, and ample interest from developers.
- SE AB's already has a skilled energy workforce that could work in renewable energy.
- Greater awareness on renewable energy and its impacts is needed in the region.
- There are few opportunities for regional industries to interact with the renewable energy industry.
- SE AB is a region marked by innovation in agriculture, unmanned vehicle systems, and oil and gas.
- SE AB has a strong support network for facilitating innovation and entrepreneurship.
- Stronger support of the renewable energy industry is needed from community and regional leaders to attract and promote renewable energy investment and development in the region.
- SE AB can be ***Alberta's Opportunity Corner*** for renewable energy and clean technology development.

As our energy systems continue to diversify in SE AB, opportunities and challenges will emerge. Throughout the reports in this strategy, stakeholders have shared what they see as opportunities and challenges. Challenges will inevitably arise as more renewable and clean technology development occurs in SE AB. Logistic concerns, such as transmission and grid load, will be inevitably be brought up; as will other regulatory and workforce concerns.

[9] Moore, Sandra. (2017). *Southeast Alberta energy diversification report: Our region, our jobs, our communities*. Economic Development Alliance of Southeast Alberta: Medicine Hat, Alberta.

On the other hand, stakeholders identified multiple opportunities for individuals, companies, communities, and post-secondary institutions in SE AB to capitalize on renewable energy and clean technology development in the region. Increased renewable energy and clean technology investment and innovation in the region will result in the creation of new jobs and supply chains and additional revenues for some landowners and communities in the region. These emerging industries, and projects like the Sharp Hills Wind Farm near Oyen (Figure 2), will diversify SE AB's energy economy, sources, and workforce.

Figure 2. EDP Renewables Sharp Hills Wind Farm (near Oyen)[10]

Likewise, the largest municipality in SE AB, the City of Medicine Hat, demonstrates a continued interest in staying up-to-date on emerging technologies for future implementation at a commercially economic scale by:

- participating in CanWEA (Canadian Wind Energy Association) and CanSIA (Canadian Solar Industry Association) to remain engaged in the trends of those industries with a view to leveraging wind and solar technologies at a utility scale if and when appropriate for the community;
- collaborating with Medicine Hat College and other key partners in a Renewable Energy Microgrid to explore new renewable energy technologies, including an Electric Vehicle charging station;
- Entering a Regional Partnership to build Electric Vehicle high-speed charging stations as part of a larger network across southern Alberta; and
- Cultivating a relationship with Alberta Innovates.

The City continues efforts to encourage customer education through its Knowledge Saves Power campaign, including promotion of the HatSmart program and its related relationship with Energy Efficiency Alberta (including funding for customer implementation of PV panels). This knowledge allows customers to optimize their usage.

[10] EDP Renewables. (2018). Sharp Hills Wind Farm. http://sharphillswindfarm.com/#gallery

As outlined in other reports in this strategy, City of Medicine Hat investments made in renewables to date include the concentrated solar demonstration project, Box Springs Wind energy purchase, and solar panels for various City owned facilities such as the Family Leisure Centre and Library. The City of Medicine Hat Utilities department is committed to innovation and seeking new ways to provide value to their energy customers. The department continues to explore next generation strategies and demand side management inclusive of applications of new technologies such as smart grids.

The purpose of the four reports in the **Southeast Alberta Energy Diversification Strategy** is to help stakeholders within SE AB better understand the emerging renewable and clean technology industries in the region. The reports provide a general overview and background on renewable energy and clean technology initiatives from global, national, provincial, and regional perspectives. The reports also identify input from stakeholders on the challenges and opportunities they perceive for renewable energy and clean technology industries in SE AB. This input was compiled and analyzed to provide the following five recommendations, and suggested activities, for moving forward.

Recommendations and Suggested Activities for Moving Forward

Each of the reports that make up this strategy provide a framework for accelerating the development of a vibrant and innovative renewable energy industry in SE AB guided by five initial recommendations. Implementation of the recommendations, and suggested actions, are dependent on stakeholder interest, available funding, and available resources.

Hence, the **first recommendation of formalizing the SEEDS group to be an industry coalition/committee/network** is helpful for ensuring the **Southeast Alberta Renewable Energy Strategy** is utilized as a resource to help guide the growth of renewable energy and clean technology in SE AB.

RECOMMENDATION	SUGGESTED ACTIVITIES
1. Establish the SE AB Energy Diversification (SEEDS) group as a regional industry network or committee comprised of regional renewable energy industry and community stakeholders.	The current SEEDS group should play a key leadership role in developing a formalized network or committee, with renewable energy industry stakeholders in SE AB. The **SEEDS Association**, under the leadership of a director and elected board of directors, will: • **Use the SEEDS developed strategies as a framework for moving forward** and creating additional long-term action and communication plans. • Serve as the main point of contact for industry stakeholders, communities, businesses, individuals, and government interested in learning more about the emerging renewable energy industry in SE AB. • Act as an advocate for the renewable energy industry in SE AB. • Provide an opportunity for regional industry stakeholders to meet regularly to collaboratively identify needs, share information, and discuss opportunities and challenges pertaining to the industry. • Provide learning opportunities for community stakeholders. • Contribute to the development of industry guidelines, standards, and ethics. • Organize industry and community networking events. • Share best practices and promote renewable energy projects in SE AB.

	• Identify opportunities and pursue funding and collaborations to conduct activities identified within the strategy and from the SEEDS membership.
2. Develop a plan to market and promote renewable energy in SE AB to communities and the renewable energy industry.	• Create dedicated social media channels to target and share renewable energy information and resources with regional businesses, communities, landowners, governments, and investors (e.g. website, Twitter, etc…). • Provide up-to-date resources and tools for diverse stakeholders (industry, communities, landowners) to help them understand and navigate the renewable energy industry. • Raise community awareness and understanding of the impacts of renewable energy projects through awareness campaigns and social media, work with local media as well. • Participate in community events to raise awareness of RE in SE AB (e.g. Pecha Kucha, trade shows, etc…). • Develop and provide resources to help communities create individual strategies, bylaws, and policies for attracting and working with renewable energy project developers. • Create an online directory of companies looking to work in the region and communities that are ready for renewable energy development. • Develop an interactive online map showing where all proposed, planned, current, and decommissioned renewable energy projects are in SE AB. • Encourage strategic community partnerships and planning for renewable energy projects. • Showcase renewable projects in SE AB to help the region gain recognition as a leader in renewable energy both provincially and nationally. • **Encourage the addition of renewable energy information into Alberta's classrooms, support organizations that promote renewable energy careers in classrooms.**
3. Support the development of the renewable energy workforce and build local expertise and capability in the renewable energy industry to support and promote careers in renewable energy to traditional and non-traditional pools of labour.	• Create occupational profiles for the renewable energy industry. • Make recommendations and advocate for formalized standardization or certification of workers in the renewable energy industry. • Explore labour market demand and supply forecasts for the renewable energy industry. • Build SE AB's capacity as provincial education and training hub for renewable energy by creating pilot training programs to create a highly-qualified, regionally-based workforce for the renewable energy industry. • Create tools and resources that help attract, develop, and retain qualified workers (occupational profiles, career maps, labour market data, marketing materials, online employment and training, etc…). • Share these tools with job seekers, employers, career practitioners from schools to employment agencies, job fairs, and training institutions.

	• **Collaborate with regional industry associations to provide awareness sessions for how construction and trades industries are involved in renewable energy industries.** • **Develop occupational standards for renewable energy occupations to enhance safety, career development, and training.**
4. Provide resources and support to develop a better understanding of the renewable energy industry in SE AB and the impact it has on regional businesses and economic development.	• Conduct a supply chain analysis for the wind and solar industries in SE AB to contribute to a greater understanding of complementary industries and services required by the renewable energy industry. • Provide relevant renewable energy data for business planning support. • Conduct industry-specific feasibility studies for the region (e.g. land-use, solar roof mapping potential, etc…). • Conduct regional mapping to highlight major energy projects in our region, display these projects on an interactive on-line map on the SEEDS website. • Support small business innovation and growth to address the needs of the renewable energy industry. • Ensure small businesses have information and resources that allow them the opportunity to participate in the supply chain. • **Create an online supply chain map of local businesses and suppliers for industry to access.**
5. Foster a renewable energy market in SE AB that supports and attracts both large-scale and small-scale renewable energy development, innovation, investment, and research.	• Create a plan and invest in promoting SE AB as a renewable energy hub provincially and nationally for renewable energy innovation, investment, manufacturing, and distribution. • Support the development of demonstration projects in the region (e.g. promotion, assistance with development, etc… • Explore opportunities for developing a center for renewable energy training, research, and development driven by industry needs, focused on attracting students locally, nationally, and internationally. • Showcase complementary industries for the renewable energy industry. • Foster collaboration and transfer of knowledge for new research/commercialization partnerships in renewable energy technology. • Host events (e.g. conferences, seminars, lunch and learns, etc…) to help promote and raise awareness of renewable energy potential and current projects in the region.

CONCLUSION

The future depends on what we do in the present. - Mahatma Gandhi

This quote is a good way to sum up this last report in the **Southeast Alberta Energy Diversification Strategy**. In all the reports in this strategy, stakeholders have identified that the emerging renewable energy and clean technology industries will provide a unique opportunity to help SE AB diversify its

economy and workforce. The opportunity exists for the region to proactively start working together to make this happen. These reports, and the five recommendations, provide a good starting point to do that.

Guided by these reports and recommendations, the SEEDS group will be meeting in the Spring of 2018 to plan their next steps for supporting the growth of the renewable energy industry in SE AB.

The final concluding remarks in this **Moving Forward Report** are reserved for some of the SEEDS group members in response to the following question:

WHAT DO YOU HOPE TO SEE IN THE SE AB REGION MOVING FORWARD?

Sean Blewett Executive Director Community Futures Entre-Corp	There is a significant opportunity for the communities and business to benefit from the growing renewable energy industry in Southeast Alberta. I am particularly excited about the employment, supply chain and innovation prospects for students, individuals, and business. Working collaboratively as a region through Industry, Academia, and Government will be the catalyst to capitalize on the full potential of this continuously developing industry.
Theresa Hardiker Executive Director Economic Development Alliance of SE AB	As our region begins to diversify into the renewable energy sector I am excited for the economic impacts and community opportunities. This sector will come with a learning curve for our communities, but as the projects progress, there will be a significant opportunity for more education and a growth on demand for services within the rural areas. The attraction of investment and opportunity for diversification will present itself in many ways to the region's medium and small businesses.
Mark Keller Director of Advancement Medicine Hat College	The growth of the renewable energy industry offers a wide range of opportunity for southeastern Alberta. It is clear that the region offers an ideal physical environment for the industry, for example, and we will see economic gain as new projects emerge. My hopes for the industry rest in two areas. First, it is critical that we mesh the growth of the industry physically with social and community engagement. In other words, a renewable energy project must offer more to a rural community than its mere presence. Ideally, employment and economic benefit will stay close to the community as well. Second, we will be missing a significant opportunity if we do not foster the intellectual capacity required to innovate and evolve the industry. SE Alberta can and should be a place where the renewable energy industry flourishes not only due to the physical environment, but because people who call the region home have opportunity to bring their talent and ability to research and innovation in the industry.

APPENDIX A - PROPOSED SOLAR AND WIND ENERGY PROJECTS FOR SE AB – AS OF DECEMBER 31, 2017

The following **legend** explains each of the heading categories for the chart below.

Project Name & #	Name of Project and it's corresponding AESO assigned project number *if applicable*
Company	Name of main developer
Project Type	Wind, Solar, Co-Gen/CHP (combined heat and power)
Project Location	Nearest community
Queue Type	**Connection** = governed by the AESO connection process **BTF** = Behind the Fence, not governed by the AESO connection process
Stage (as outlined on the AESO website)	**CONNECTION PROJECTS** 0. **IDENTIFY PROJECT –** Stage 0 is the initiation and identification stage of the Connection and BTF Process. In this stage, the market participant identifies a request for a new project by submitting a System Access Service Request (SASR) to the AESO Customer Connections. The SASR is reviewed by the AESO for completeness and the project is initiated. **Target Timeline = 2 weeks**. 1. **CONNECTION STUDY SCOPE** - Stage 1 represents the scoping stage of the Connection Process. This stage begins with a project kick-off meeting and discussions regarding the Connection Plan and Connection Study Scope commence. Also in this stage, an assessment will be made to determine AESO, TFO, market participant/Study Consultant responsibilities and involvement for the project. **Target Timeline = 8 weeks.** 2. **CONNECTION PROPOSAL –** Stage 2 is where the connection alternatives are assessed, and the Connection Proposal is submitted. The Connection Proposal is reviewed and, if approved, accepted by the AESO. **Target Timeline = 14 weeks**. 3. **NEEDS IDENTIFICATION DOCUMENT (NID) AND FACILITY APPLICATION -** Stage 3 is where the AESO will make a determination on the filing strategy with the Alberta Utilities Commission (AUC). The AESO will direct the TFO to complete the Facility Application (FA). **Target Timeline = 32 weeks**. 4. **APPLICATION FILINGS AND AUC APPROVALS -** Stage 4 is where the AESO and the TFO file project applications with the Alberta Utilities Commission (AUC) for review. If the AUC approves the application, it issues Permit and License (P&L) for the project. **Target Timeline = 24 weeks**. 5. **CONSTRUCT AND PREPARE TO ENERGIZE** – Stage 5 is where the construction of the transmission facilities commences. The market participant and the AESO are required to sign the System Access Service (SAS) Agreement. **Target Timeline = 16 weeks**. 6. **ENERGIZE, COMMISSION AND CLOSE** - STAGE 6 marks the in-service date of the project and the final stage of the Connection Process. The TFO provides final project costs and a true-up of costs occurs so close-out can take place. **BTF PROJECTS** 0. **IDENTIFY PROJECT** - Stage 0 is the initiation and identification stage of the Connection and Behind-the-Fence Process. In this stage, the market participant identifies a request for a new project by submitting a System Access Service Request (SASR) to the AESO Customer Connections. The SASR is reviewed by the AESO for completeness and the project is initiated. **Target Timeline = 2 weeks**. 1. **BTF STUDY SCOPE** – Stage 1 is the scoping stage of the project. At the beginning of this stage, a project kick-off meeting takes place and discussions for the BTF Plan and BTF Study Scope commence. Also in this stage, an assessment will be made to determine AESO, TFO, Market Participant/Study Consultant responsibilities and involvement for the project. **Target Timeline = 8 weeks**. 2. **BTF ESR** - Stage 2 is when the BTF studies are completed. The BTF Engineering Study Report (ESR) is reviewed and, if approved, accepted by the AESO. **Target Timeline = 14 weeks**. 3. **FUNCTIONAL SPECIFICATION** - STAGE 3 & 4 is the stage where the Functional Specification is written for the project and generators file a Generator Application with the AUC. **Target Timeline = Customer Driven**. 4. See #3. 5. **CONSTRUCT AND PREPARE TO ENERGIZE** - STAGE 5 is where any equipment change, modification or maintenance occurs. The market participant and AESO are required to sign the corresponding System Access Service (SAS) Agreement. **Target Timeline = Customer Driven**. 6. **ENERGIZE, COMMISSION AND CLOSE** - STAGE 6 marks the final stage of the BTF Process.

Planning Area	Numbered areas throughout the province https://www.aeso.ca/assets/Uploads/PlanningRegions-Nov26-PRINT.pdf SE AB is primarily located in the following planning area: • **Area 4** includes Medicine Hat, Schuler, Seven Persons • **Area 47** includes Brooks and Bassano • **Area 48** includes Jenner and Oyen • **Area 52** includes Vauxhall, Burdett, and Bow Island
Gen MW	Maximum potential energy production
Load MW	Power required to run the on-site facility
In-Service Date	Planned date to start operating the project
Date App Received	Date application received by AESO

List of Proposed Wind and Solar Projects Generating over 1MW – SE AB on the AESO Project Connection List as of December 31, 2017

* IF APPLICABLE, differing numbers from the 2016 project list are listed in smaller print below the 2017 number or date, 2017 number or date is bolded.

Project Name & Number	Company Listed Information (if available)	Project Location	Project Type	Stage	Queue Type	Planning Area	Gen MW	Load MW	Planned In-service date	Date App received
PLANNING AREA 4 = 25 Total Projects Generating **3,580.9 MW** Projects = 19 Wind (3,184.2 MW) projects and 6 Solar (396.7) projects										
Naturener Wild Rose Wind Farm #479	http://www.naturener.us/wildrose1	45 km SE of Medicine Hat and 20 km S of Irvine	Wind	5	Connection	4	210	6	**July 15, 2019** Aug 1, 2018	May 12, 2005
Naturener Wild Rose Wind Farm Phase 2 #693	http://www.naturener.us/wildrose2	Cypress County	Wind	5	Connection	4	189	6	**July 15, 2019** Aug 1, 2018	April 3, 2007
Pteragen Peace Butte Wind Farm #513	http://www.auc.ab.ca/applications/decisions/Decisions/2014/2014-166.pdf	Seven Persons	Wind	5	Connection	4	116.4	0.1	Dec 31 2018	Oct 14, 2005
Suncor Schuler Wind Project #1729		Schuler	Wind	2	Connection	4	80	0.3	**October 31, 2019** Nov 1, 2019	Jan 6, 2016
Suncor Forty Mile Maleb Solar, #1733		County of Forty Mile	Solar	3	BTF	4	80	0.3	Jun 1 2019	Jan 6, 2016
Suncor Forty Mile Maleb WAGF, #1734	http://www.suncor.com/about-us/wind-	County of Forty Mile	Wind	3	Connection	4	200	0.3	Jun 1 2019	Jan 6, 2016

	power/suncor-energy-forty-mile-wind-power-project									
Suncor Schuler Solar, #1737		Schuler	Solar	2	Connection	4	80	0.3	**October 31, 2019** Nov 1 2019	Jan 6, 2016
RESC Forty Mile WAGF #1767	http://www.fortymilewindfarm.ca	Whitla	Wind	3	Connection	4	400	0.0	**August 2, 2019** Sept 25, 2019	Mar 9. 2016
Invenergy Schuler Wind Farm #1777		Schuler	Wind	**3** 2	Connection	4	100	2.0	**July 1, 2019** Dec 1, 2018	Mar 29, 2016
Sequoia Schuler WAGF (MPC) #1786		Schuler	Wind	2	Connection	4	100	1.0	Dec 31, 2019	Apr 13, 2016
Capital Power Whitla Wind Power Facility #1800 (Divided into **two** listings – both still #1800 - on AESO List in 2017)	http://capitalpower.com/generationportfolio/CA/Pages/Whitla-Wind.aspx	Whitla	Wind	**3** 2 **3**	Connection	4	**97.2** 300 **201.6**	1.0 1.0	**Dec 1, 2020** Nov 1, 2019 **Sept 1, 2019**	May 25, 2016 May 25, 2016
Suncor Forty Mile Granlea WAGF #1812		County of Forty Mile	Wind	**3** 2	Connection	4	200	0.3	**November 8, 2019** May 1, 2020	Jul 4, 2016
HEP Capital Alderson Solar #1828		Alderson	Solar	**2** 1	Connection	4	100	1.0	**Apr 2, 2020** Apr 1, 2020	Jul 29, 2016
Fortis 895S Suffield DG PV #1838		Suffield	Solar	**3** 2	BTF	4	**22** 11	0.0	Jun 3, 2019	Aug 5, 2016
Fortis Bullshead 523S Solar DER #1845		Cypress County	Solar	3	BTF	4	14.7	0.0	Jun 1, 2018	Aug 22, 2016
NaturEner Buffalo Trail WAGF #1856	http://www.naturener.us/#projects	Cypress County	Wind	**2** 1	Connection	4	100	3.0	Sep 13, 2019	Sep 1, 2016
NaturEner Ross Creek WAGF #1857	http://www.naturener.us/#projects	Cypress County	Wind	**2** 1	Connection	4	100	3.0	Sep 13, 2019	Sep 1, 2016

EDF EN Red Rock WAGF #1875	https://www.edf-en.ca/project/red-rock-wind-power-project/	Seven Persons	Wind	**2** 1	Connection	4	250	3.6	**March 29, 2019** Mar 1, 2019	Oct 14, 2016
EDF EN Cypress WAGF #1896	https://www.edf-en.ca/project/cypress-wind-power-project/	Irvine	Wind	**2** 1	Connection	4	250	3.6	**Mar 1, 2019** Mar 20, 2019	Nov 22, 2016
Renewable Energy Systems (RES), Rattlesnake Ridge Wind #1916		County of 40 Mile	Wind	2	Connection	4	100	1.0	July 25, 2019	Feb 2, 2017
Aria Forty Mile Wind, #1985		County of 40 Mile	Wind	2	Connection	4	125	1.0	Mar 28, 2020	July 21, 2017
Suncor Forty Mile Granlea Solar #2011		County of 40 Mile	Solar	1	BTF	4	100	0.2	Dec 1, 2020	Oct 24, 2017
Gengrowth Dunmore Wind #2013		Dunmore	Wind	1	Connection	4	300	5.0	Mar 1, 2020	Oct 26, 2017
TransAlta Red Rock Wind, #2016		Cypress County	Wind	1	Connection	4	65	3.0	Nov 1, 2020	Nov 2, 2017
PLANNING AREA 47 = 7 Total Projects Generating **1,103** MW Projects - all 7 are Solar projects										
ENGIE Duchess Solar #1887		Duchess	Solar	3	Connection	47	90	0.1	Sept 15, 2020	Nov 3, 2016
FortisAlberta West Brooks DER Solar #1917		Brooks	Solar	3	BTF	47	19.2	0.0	Dec 15, 2018	Feb 6, 2017
Solar Krafte Brooks, #1927		Brooks	Solar	2	Connection	47	400	1.0	Apr 1, 2020	Mar 23, 2017
FortisAlberta Duchess DER Solar, #1974		Duchess	Solar	2	BTF	47	10.1	0.0	Mar 31, 2019	June 14, 2017
FortisAlberta Brooks DER Solar, #1976		Brooks	Solar	2	BTF	47	13.7	0.0	Aug 5, 2019	Jun 20, 2017
Solar Krafte Rainier, #1987		Rainier	Solar	1	Connection	47	450	1.1	Nov 15, 2020	Jul 26, 2017
Greengate Lathom MPC Solar, #2008	https://greengatepower.com/lathom-solar-120-mw		Solar	1	Connection	47	120	0.5	Dec 1, 2020	Oct 20, 2017
PLANNING AREA 48 = **7** Total Projects Generating 679.1 MW Projects = 5 Wind (635.6 MW) projects and 2 Solar (43.5) projects										
Joss MPC WAGF #1533	http://www.josswind.com/projects/jenner/	Jenner	Wind	**5**	Connection	48	120	0	**Dec 3, 2018**	Mar 1, 2014

				4					Oct 2, 2017	
Joss Jenner WAGF – Phase 2, #1698	http://www.josswind.com/projects/jenner/	Jenner	Wind	**5** 3	BTF	48	180	0.0	**Dec 1, 2018** Aug 1 2018	Sept 8 2015
Fortis 275S Jenner Solar D.E.R #1840		Jenner	Solar	**2** 1	BTF	48	23	0.0	**Jun 3, 2019** Jan 3, 2018	Aug 5, 2016
Fortis Buffalo Atlee Cluster 1 WAGF #1853			Wind	**2** 1	BTF	48	18.3	0.0	Mar 1, 2019	Aug 30, 2016
Fortis Buffalo Atlee Cluster 3 WAGF DER #1892			Wind	**2** 1	BTF	48	17.3	0.0	**July 23, 2018** Dec 25, 2017	Nov 15, 2016
Fortis Alberta Empress DER Solar, #1934		Empress	Solar	2	BTF	48	20.5	0.0	May 1, 2019	April 12, 2017
Gengrowth Hilda Wind, #2014		Hilda	Wind	1	Connection	48	300	5.0	March 1, 2020	Nov 1, 2017
PLANNING AREA 52 = 22 Total Projects Generating 758.7 MW Projects = 2 Wind (221 MW) projects and 20 Solar (537.7) projects										
BluEarth Burdett DG PV, #1696	http://www.blueearthrenewables.com/portfolio/burdett/	1.5km south of Burdett	Solar	**5** 2	BTF	52	15	0	**May 30, 2019** Dec 1 2017	Aug 27, 2015
Fortis BluEarth Yellow Lake DG PV, #1697	http://www.blueearthrenewables.com/portfolio/yellowlake/	19 km south of Burdett	Solar	**5** 2	BTF	52	16.8	0.0	**May 30, 2019** Dec 1 2017	Aug 27 2015
Fortis 498S Tilley DG PV #1837		Tilley	Solar	**3** 2	BTF	52	**14** 17	0.0	Jun 3, 2019	Aug 5, 2016
Fortis 421S Hays DG PV #1839		Hays	Solar	**3** 1	BTF	52	15	0.0	**July 30, 2018** Feb 12, 2018	Aug 5, 2016
Fortis 257S Hull DG PV #1841		Hull	Solar	**3** 1	BTF	52	8	0.0	**July 30, 2018** Oct 13, 2017	Aug 5, 2016
Fortis 158S Vauxhall DG PV #1842		Vauxhall	Solar	**3** 1	BTF	52	11	0.0	**July 23, 2018** Feb 12, 2018	Aug 5, 2016

Fortis Burdett 368S DG PV #1849		Burdett	Solar	**3** 2	BTF	52	9.5	0.0	Oct 31, 2018	Aug 24, 2016
Fortis Enchant 447S DER Solar #1869		Enchant	Solar	**3** 1	BTF	52	68.2	0.0	Dec 20, 2018	Oct 3, 2016
Perimeter Sunset Solar #1877			Solar	**3** 1	Connection	52	**60** 150	**0.3** 0.2	Jun 30, 2020	Oct 20, 2016
Fortis Krafte 257S Hull DER Solar #1878			Solar	**3** 1	BTF	52	24.5	0.0	**July 30, 2018** Dec 20, 2017	Oct 24, 2016
FortisAlberta Conrad DER Solar 1 #1918		Conrad	Solar	2	BTF	52	18.4	0.0	**June 28, 2019**	Feb 6, 2017
FortisAlberta Vauxhall Solar DER #1922		Vauxhall	Solar	2	BTF	52	22	0.0	Nov 30, 2018	March 14, 2017
Solar Krafte Vauxhall, #1926		Vauxhall	Solar	2	Connection	52	150	0.4	Apr 1, 2020	March 23, 2017
FortisAlberta Burdett DER Solar 1, #1944		Burdett	Solar	2	BTF	52	8.3	0.0	May 1, 2019	Apr 24, 2017
FortisAlberta Burdett DER Solar 2, #1945		Burdett	Solar	2	BTF	52	16	0.0	May 1, 2019	Apr 24, 2017
FortisAlberta Taber DER Solar 1, #1947		Taber	Solar	2	BTF	52	12	0.0	May 1, 2019	Apr 28, 2017
FortisAlberta Taber DER Solar 2, #1948		Taber	Solar	2	BTF	52	22	0.0	May 1, 2019	Apr 28, 2017
FortisAlberta Fincastle DER Solar 2, #1949		Fincastle	Solar	2	BTF	52	12.5	0.0	May 1, 2019	Apr 28, 2017
FortisAlberta Conrad DER Solar 2, #1959		Conrad	Solar	2	BTF	52	22.5	0.0	Dec 14, 2018	May 8, 2017
FortisAlberta Taber DER Solar, #1977		Taber	Solar	2	BTF	52	12	0.0	Aug 5, 2019	June 20, 2017
Enmax Zephyr Wind, #1991	https://www.enmax.com/generation-wires/generation/zephyr-wind-farm	Taber	Wind	2	Connection	52	200	1.0	Dec 1, 2020	Aug 14, 2017
Enmax Taber Wind Farm, #2000		Taber	Wind	1	BTF	52	21	0.0	Oct 1, 2019	Sept 18, 2017