SASKATCHEWAN
CHAMBER of COMMERCE

THE RENEWABLE ENERGY SECTOR IN SASKATCHEWAN

ISSUE IN FOCUS

Core Issue

In 2015, the Government of Saskatchewan committed to increasing its target for renewable energy generating capacity from 25 per cent to 50 per cent by 2030.[1] The goal will include increased reliance on wind, solar, geothermal, biomass, and other sources. The impact on greenhouse gas emission (GHG) reductions is projected to be 40% below 2005 levels by 2030. Saskatchewan's load growth projections, coupled with an aging generation fleet and ageing transmission infrastructure mean that significant capital investment will be required with or without the province's renewables roadmap or the Government of Canada's climate change policies.

SaskPower's procurement process per the renewables roadmap will result in private developers designing, building, and commissioning new renewable generating infrastructure. It is important to point out that private sector developers will also be responsible for the associated costs and liabilities of owning and operating these new assets, not the public via SaskPower. SaskPower will purchase power from private developers at an agreed upon price and distribute it to customers.

The renewable procurement strategy has prompted a number of important questions around how generating sources will be integrated into the electrical grid; what impacts it will have on future electricity rates; the changing role of natural gas; the pros and cons for each type of renewable generation source; and more.

The objectives of this report are threefold. The first objective is to offer a 360 degree overview of the renewable energy sector in Saskatchewan. The second objective is to identify the barriers and challenges that currently hold back the industry from reaching its full potential, as well as the business opportunities available. Third, the Saskatchewan Chamber of Commerce (SCC) recognizes that it has an important role in shaping the public discussion around renewable energy and aims to position the province's business community as a leader in the transition to a clean growth economy.

Saskatchewan's Electricity Generating Mix at a Glance

As the province's primary electricity supplier, SaskPower faces some challenges in relation to its generating capacity. The first challenge it faces is meeting the increased demand for power throughout the province. By 2019, the Crown utility will need to supply enough incremental electricity to power a city equivalent to the size of

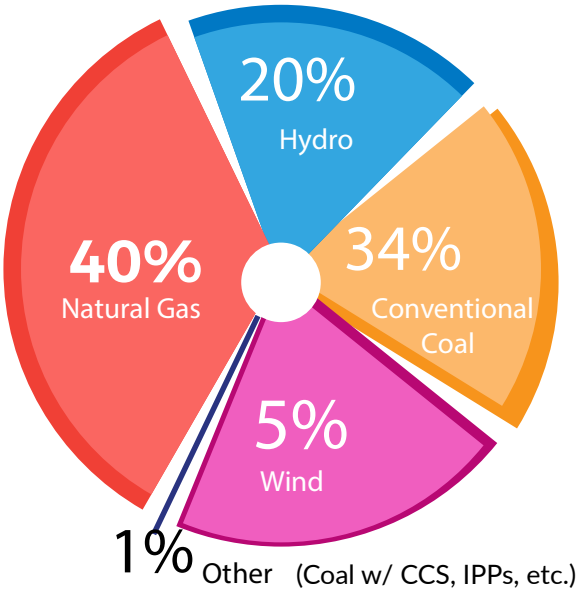
1 Note: It is important to distinguish between electricity generation and electricity generating *capacity*. Electricity generating capacity is defined as the maximum potential output under specific conditions and is typically expressed in Kilowatts (kW) or megawatts (MW). Electricity generation is the *actual* electrical output over a specific period of time, typically expressed in kilowatt hours (kWh) or megawatt hours (Mwh). Many generating sources do not operate at their full capacity all the time.

Saskatoon.[2] SaskPower reaching a new peak load record of 3792 MW in December 2017 is indicative of this larger trend.[3] The second challenge facing SaskPower has to do with recent amendments made to federal-level emissions regulations that will gradually eliminate the utility's primary source of power - conventionalcoal-fired plants.[4]

As part of the Pan-Canadian Framework, Environment and Climate Change Canada (ECCC) will accelerate the phase-out of coal by 2030.[5] SaskPower will need to consider alternatives sources, including coal with carbon capture and storage (CCS), natural gas, hydro, power imported from Manitoba Hydro, wind, solar, and geothermal to fill the gap from conventional coal being taken offline.

SaskPower currently maintains over 157,562 km of lines, manages 532,719 customer accounts, and has a total electricity generating capacity of almost 4500 megawatts (MW).[6] According to its 2017 – 2018 Annual Report, SaskPower's available generating capacity consists of natural gas (40%), coal (34%), wind (5%), and hydroelectricity (20%), with the remaining 1% comprised of coal with CCS, electricity purchased through independent power producers (IPPs), as well as through other sources. [7]

Figure 1: SaskPower Available Generating Capacity 2017-2018 (4493 MW)



2 SaskPower. *Plans for a Sustainable Power Future: Saskatchewan Renewable IPP and Supplier Information Session Regina, Saskatchewan*. November 27, 2016.

3 SaskPower. *Saskatchewan Breaks Power Use Record During Holiday Cold Snap*. News Release. January 2, 2018. Retrieved Online at: https://wcms.saskpower.com/about-us/media-information/news-releases/2018/03/saskatchewan-breaks-power-use-record-during-holiday-cold-snap

4 SaskPower. *Plans for a Sustainable Power Future: Saskatchewan Renewable IPP and Supplier Information Session Regina, Saskatchewan.*

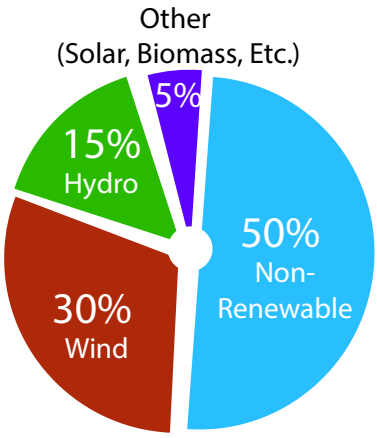
5 Ibid.

6 SaskPower. *Making a Powerful Commitment: 2017 – 2018 Annual Report. pp. 9 – 10.*

7 Ibid.

Fast-forward to 2030, SaskPower estimates that its total generating capacity will increase to 7000 MW, with the non-renewable share accounting for 50% or 3500 MW, of the total amount.[8] The remaining 50% of generating capacity will consist of wind (30%), Hydro (15%), with solar, biomass, geothermal, and other sources rounding out the remaining 5%.[9]

Figure 2: SaskPower Generating Capacity by 2030 (7000 MW)



It is important to point out that natural gas will play an increasingly prominent role in the non-renewable mix for a few reasons. Due to the variable[10] nature of wind and solar resources, these generation types are not always available to be dispatched to the grid when required by SaskPower. As a result, natural gas will be required to backup green generating sources.[11]

With the gradual phase-out of conventional coal, natural gas will make up a larger part of the baseload and the renewable need will be incremental on top of that. Some advantages of natural gas generation include lower carbon emissions compared to conventional coal, and shorter build times for combined cycle gas plants. TransGas' transmission infrastructure will require updating in light of the expanded role that natural gas will play in replacing SaskPower's ageing coal generation fleet as baseload power, and due to the renewable-related needs referenced above.[12]

SaskPower Renewables Roadmap

SaskPower has plans to add a total of 60 MW of solar generating capacity by 2021 and have 30% wind power generating capacity by 2030. The development of wind and solar projects will be accomplished primarily through IPP builds. Biomass and geothermal are expected to play an important, albeit much smaller role, in the province's renewables strategy. SaskPower has chosen to bring these renewables online in a staggered approach to ensure the grid has time to adapt to these new,

8 Ibid.

9 Ibid.

10 The term 'variable' is used instead of "intermittent' as the former is currently used by those working in the renewable industry.

11 Saskatchewan Rate Review Panel. *2013 SaskPower Rate Application Report.* Retrieved Online From: http://www.saskratereview.ca/docs/saskpower2013/saskpower-rate-application-report.pdf

12 Note: TransGas Limited is a wholly-owned subsidiary of SaskEnergy. TransGas Limited is responsible for managing the natural gas pipeline infrastructure that collects gas from well sites in the province. TransGas delivers the gas to SaskEnergy, who then deliver it to customers

variable sources of power.[13]

Doug Opseth, Director of Generation Asset Management and Resource Planning for SaskPower, says adding renewable sources to the electrical grid in a slower, more measured approach was designed to minimize rate increases, as it was estimated that the current plan costs $1.5 billion more than growing generating capacity through purely non-renewable means.[14] It is worth emphasizing that electricity rates for ratepayers are anticipated to rise due to the costs associated with an ageing electrical system and needed infrastructure renewal. This would occur with or without renewable sources being added to the system.

Figure 3:[15]

Renewable Source	Dispatchability	Cost Rating ($)	Environmental Impact
Wind	Low	Low	Low
Solar	Low	High	Low
Hydroelectricity	High	High	Low
Biomass	Medium	High	Low

RFQ & RFP Process

Informing SaskPower's procurement process for renewables are three overarching principles:

1. **Economics** - Renewable power is to be procured at the best possible value on behalf of ratepayers, while simultaneously reducing greenhouse gas emissions.
2. **Environment** - Projects must be environmentally sound and low-risk.
3. **System Approach** - Renewables being brought online must be accommodated with existing distribution and transmission capacity and operating capabilities. Interconnection costs are factored in.[16]

Other important considerations include:

- A fair, open, and transparent procurement process.
- Ensuring good value for money is obtained.
- Projects make sense to stakeholders.
- Projects are a good fit for the communities in which they are located.

13 David Baxter. "SaskPower Says 50 Percent Renewable Capacity on Track for 2030". *Global News*. Retrieved April 16, 2018. https://globalnews.ca/news/4148480/saskpower-not-expected-to-reach-50-per-cent-renewable-generation-by-2030/

14 Ibid.

15 Note: The term 'dispatchability' is used in place of 'reliability' since reliability is a feature of an electrical system, not power generation. Dispatchability here refers to electrical generating sources that can be used on demand and dispatched at the request of SaskPower.

16 SaskPower. Wind and Solar RFQ/RFP Process: Saskatchewan Renewables IPP And Supplier Information Session Saskatoon, Saskatchewan. November 17, 2016.

- Projects help contribute to SaskPower's goal of greening the electrical grid.[17]

During pre-procurement consultations, SaskPower reached out to a wide array of stakeholders throughout 2016, including ratepayers, rural municipalities, project proponents, vendors and service providers, Indigenous groups, environmental groups, industry associations for both wind and solar, as well as the Government of Saskatchewan.[18] Throughout February 2017, SaskPower organized a series of workshops in four communities across the southern part of the province. The workshops were done in partnership with Dr. Brett Dolter, an Economist studying climate change from the University of Regina.

The purpose of *Let's Talk Solar* was to seek input from the general public on how to best support solar power generation for households and small and medium-sized businesses. SaskPower's intention was to use the input gleaned from the four workshops to inform the development of its in-house programs.

SaskPower's renewables strategy consists of a two-stage competition process. The first stage is a Request for Qualifications (RFQ). In the RFQ stage, proponents are screened against specific criteria to develop a shortlist for the *Request for Proposal* (RFP) stage. The RFP stage is where projects from prospective proponents are thoroughly vetted based on competition-specific criteria. Proponents are offered an opportunity to ask questions of SaskPower after each RFQ and RFP. To ensure fairness, the evaluation of potential projects is carried out by a multi-disciplinary team within SaskPower.[19]

Wind Energy Procurement

The competition for up to 200 MW of utility scale wind capacity is currently underway. To place this figure into context, 200 MW is enough energy to power roughly 80,000 homes. In 2016, SaskPower originally scheduled the RFQ and the RFP to be issued in January 2017 and mid-May 2017 respectively. SaskPower's goal was to award the project by the end of 2017 with a targeted in-service date of Q2 2020.

The criteria under consideration for the competition included:

- Accepting proposals broken down into 100 or 200 MW projects.
- A maximum of two proposals are allowed per proponent.
- Proposed projects must be located in Saskatchewan.
- Projects must be designed, sited, built, commissioned, and operated by the successful proponent on proponent-chosen sites.[20]

Other important criteria outlined in the wind RFQ included the proponent having

17 Ibid.

18 Ibid.

19 Ibid. o

20 Ibid.

prior experience with utility-scale wind projects, having the financial capability to carry out the project, being required to maintain a minimum level of equity, and showing proof of site control.[21] Other factors taken into consideration by SaskPower during the RFP phase include pricing[22], demonstrated community engagement, onsultation with Indigenous groups, compliance with the Ministry of Environment's Site Suitability Guidelines, and sustainability considerations. [23]

The Power Purchasing Agreement (PPA) for the wind competition features a 25 year contract window, with pricing and escalation outlined in the agreement. A major advantage of this kind of PPA for the successful project proponent is stability – a predicable cash flow is realized throughout the entirety of the contract, making these kinds of projects favourable to financing arrangements.

21 Ibid.

22 Note: Evaluated pricing will be based on the bid price plus the interconnection costs into the grid. On SaskPower's competition scorecard, pricing is the factor weighted the heaviest.

23 SaskPower. *Wind and Solar RFQ/RFP Process: Saskatchewan Renewables IPP And Supplier Information Session Saskatoon, Saskatchewan.*

Solar Energy Procurement

The current competition for solar aims to procure a total of 60 MW of capacity by 2021. Both the RFQ and RFP for the solar competition were announced in September 2016 and December 2016 respectively.[24] The procurement process for 60 MW of utility-scale solar is comprised of three parts. The first part is a competitive bid process for the first 20 MW of capacity. This will take the form of two, 10 MW projects. Successful proponents will design, build, commission, and operate a 10 MW fixed-panel photovoltaic facility. SaskPower will also cover some of the associated grid interconnection costs on behalf of the IPP up to a defined maximum amount.

The winning bid for the first 10 MW of utility-scale solar was announced by SaskPower on June 19, 2018. The successful developer is Saturn Power Inc. a renewable energy company based out of Baden, Ontario. The proposed site for the Highfield Solar Project will be located in the R.M. of Coulee, just east of Swift Current. The project is anticipated to go online sometime at the end of 2019.[25] The competition for the next 10 MW of solar is scheduled to commence sometime in early 2019.

The second phase will see SaskPower procure power from the First Nations Power Authority (FNPA). Per the ten year Master Agreement, SaskPower and FNPA will develop at least 40 MW of renewable energy projects. Twenty MW will be through solar power generation and another 20 MW will be through flare gas generation.The Agreement allows for opportunities in wind, biomass and geothermal development through FNPA.[26] SaskPower is not likely to recommend a site for FNPA projects. SaskPower agreeing to pay up to a defined maximum amount to connect FNPA projects to the grid will also be maintained in this round.[27]

The third and final round of planned procurement for the last 20 MW of solar will see SaskPower procuring power through community-based projects.

This phase of the solar procurement process contains the most details that still need to be determined – both in terms of the overall approach and the project size. Unlike the arrangement in the first two phases, the project proponent in this case will propose the site and related interconnection costs will be determined as the program is developed.[28]

Much of the same criteria found in the wind RFQ/RFP process (prior experience with utility-scale projects, financial capacity, minimum equity, proof of site control, etc.) are required in the solar competition, along with competitive pricing, demonstrated engagement with the community, consultations with Indigenous peoples, and compliance with existing environmental regulations.

Some criteria specific to the solar competition include an emphasis on optimal solar intensity, the availability of infrastructure, low risk to the environment, low land values, and a requirement that the proposed project be 200 metres away from an occupied residence.[29]

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24 Ibid.

25 SaskPower. *Saturn Power to Build Province's First Utility-Scale Solar Project.* June 19, 2018. Retrieved Online From: https://www.saskpower.com/about-us/media-information/news-releases/saturn-power-to-build-provinces-first-utility-scale-solar-project

26 D.C. Fraser. Province Approves Wind Projects. *Regina Leader Post*. September 20, 2018.

27 Ibid

28 Ibid

29 Ibid.

Luckily, satisfying this component should not be too difficult, since the southern portion of the province is a photovoltaic hotspot that enjoys some of the sunniest days in Canada.[30]

Price and escalation terms are also addressed in the solar competition PPA, but the contract window is only 20 years. Successful developers will also enjoy stable, predictable cash flow, which lends itself to favourable financing arrangements. One advantage for developers is the costs associated with developing solar have decreased significantly in recent years, making it a more cost-effective option than ever before. Solar projects can also be a better fit for smaller, less experienced developers compared to wind. This is because solar projects tend to be less operations and maintenance-intensive, involve lower regulatory hurdles, and offer better site availability.

Net-Metering Program

In addition to the RFQ/RFP process for solar, SaskPower also offers programming available to Saskatchewan businesses and residents. The Net Metering Program is available to all customers of SaskPower capable of generating up to 100 kW (dc) of capacity. Essentially, SaskPower will apply a credit for the electricity that is self-generated against the amount of electricity drawn from the grid by the participant. Program participants can bank unused power in their SaskPower account for up to one year. Any credits left over are reset to zero in March of the calendar year.

Offered in tandem with the Net-Metering Program is a one-time only rebate worth 20% of up-front equipment and installation costs, up to a maximum of $20,000. The rebate expires on November 30, 2018. Participants cannot earn money through this program. In addition to solar panel projects, wind, biogas, biomass, flare gas heat recovery, and low-impact hydro projects are also eligible. SaskPower is planning to undertake a review of this program and has yet to identify what a future net-metering

30 Note: According to a study by Natural Resources Canada (NRCan) entitled, *Canada's Sunniest Cities: Ranking of Photovoltaic Potential,* Regway, SK was the highest ranking municipality in terms of annual photovoltaic (PV) potential with 1384 kWh/kW. Regina was the highest ranking of Canada's major municipalities with 1361 kWh/kW.

program will look like. As of June 2018, almost 400 residences and another 400 rural acreages have switched over to self-generation.[31]

Small Power Producers Program

The Small Power Producers Program was offered by SaskPower to both individual customers and corporate entities. The Program was designed to accommodate eligible participants who wished to generate a maximum of 100 kilowatts (kW) of power for the purpose of either selling all the power generated back to SaskPower or offsetting power that would otherwise be purchased from SaskPower. Eligible participants could only choose one of the two options available and once a choice was made, they could not alter the scope of their PPA with SaskPower.

Applicants were required to submit a request for a preliminary interconnection study, along with a cheque or money order for $315 plus GST made payable to SaskPower to cover the costs of the interconnection study. Also required in the application package was a map displaying the location of the generating site, a detailed electrical diagram, and a specification sheet from the applicant's supplier on the generation equipment needed. Eligible participants were responsible for all connection, commissioning, and meter installation-related costs.

The program price paid to power producers in 2017 was 10.82¢ /kWh with price escalation at 2% a year after that. As of July 2018, the Program is no longer accepting any additional applications, as it reached its customer generating capacity limit of 7.5 MW. The Program is reviewed on an annual basis.[32]

Status of Wind and Solar RFQ & RFP Process Today

In February 2017, SaskPower issued its RFQ to identify prospective IPPs for the first stage of the wind competition. Twenty-three IPPs participated in the RFQ stage for wind. Initially, eight of the twenty-three IPPs were shortlisted for the RFP stage. However, in August 2017 the shortlist for the RFP stage was expanded to include fifteen. The rationale provided by SaskPower was to expand its pool of qualified suppliers. As of July 2018, the shortlist of 15 developers from the RFQ stage has not changed. The response from developers to the first stage of wind procurement was very strong. The deadline for proponents to submit bids for the RFP stage was originally May 28, 2018, but got moved to March 1, 2018.

The RFQ/RFP stage for wind is now closed. The evaluation of proposals and recommendations from the evaluation will be reviewed by SaskPower's Board of Directors. Information on the number of submissions and the number of IPPs that submitted proposals is available now that the successful proponent has been announced. Algonquin Power and Utilities Corporation was approved for a 177 MW wind project. The Blue Hill Wind Energy Project is located south of Herbert and will feature 56 wind turbines. Construction is planned for 2019 with an in-service date for 2021.[33]

31 Jenn Sharp. "Solar Powering Saskatchewan." *Industry West.* Spring 2018. Issue 1 Vol 2. P. 32-33.

32 SaskPower. *Small Power Producers Program*. Retrieved Online From: https://www.saskpower.com/efficiency-programs-and-tips/generate-your-own-power/self-generation-programs/small-power-producers-program

33 D.C. Fraser. Province Approves Wind Projects. *Regina Leader Post*. September 20, 2018.

For the competition around the first 10 MW of solar, SaskPower issued its RFQ in September 2016 to identify qualified IPPs. Thirty-four proponents moved onto the RFP stage when it was announced in February 2017. The window for proponents to submit bids in the RFP stage closed in September 2017.

Hydro Procurement

Hydro generally has high up-front costs and is more expensive to build than natural gas plants, but on the upside has the longest lifespan, relatively low operating costs, and is not exposed to volatile fuel prices. Currently SaskPower operates five hydroelectric power stations that generate a total of 889 MW of capacity.[34] Aside from the existing hydroelectric facilities in operation, there were plans by SaskPower to build a hydroelectric project in the northern part of the province on the Black Lake First Nation near Stony Rapids.[35]

In July 2017, the 50 MW, $630 million project was put on hold indefinitely due to lower-than-expected demand for electricity in the region. The anemic demand was a result of decreased mining activity in the North. The project was structured as a joint venture between SaskPower and the Black Lake First Nation and was expected to generate $1.3 billion over the asset's estimated 90-year lifespan. SaskPower is currently in the process of reevaluating the economic case for the project. [36]

SaskPower continually assesses its various generation options throughout the province, including its hydro options. According to information provided by SaskPower, the Crown utility is not actively working to develop any new hydro generation assets in the south of the province. In 2015, SaskPower signed a 20-year deal with Manitoba Hydro to purchase a minimum of 100 MW of electricity starting in 2020.

Aside from the 80 km long, 230,000-volt transmission line scheduled to be built between the two provinces, Manitoba Hydro is reluctant to build additional transmission interties. A challenge for SaskPower is attempting to balance often competing objectives - if the Crown utility increases its reliance on electricity purchased from Manitoba Hydro or elsewhere, it serves to undermine the self-sufficiency component of its mandate.

Geothermal Procurement

Geothermal power generation is a natural power source that harnesses energy from pools of heated water called geothermal reservoirs deep below the Earth's surface. In May 2017, SaskPower signed a PPA with Deep Earth Energy Production (DEEP), a geothermal developer as a part of the utility's efforts to double its renewable

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34 Note: A breakdown of SaskPower hydroelectric stations and their capacity – Athabasca Hydroelectric System (23 MW); Island Falls Hydroelectric Station (111 MW); Manitoba Hydro Northern Power Purchase Agreement (25 MW); Nipawin Hydroelectric Station (255 MW); E.B. Campbell Hydroelectric Station (289 MW); Coteau Creek Hydroelectric Station (186 MW).

35 Thomas Piller. "SaskPower Puts Northern Saskatchewan Hydroelectric Project on hold." *Global News.* September 25, 2017. Retrieved Online From: https://globalnews.ca/news/3768355/saskpower-hydroelectric-northern-saskatchewan-black-lake-first-nation/

36 Ibid.

generating capacity.[37] This is the first PPA ever issued in either Saskatchewan or Canada for a geothermal facility. DEEP is hoping to build a 5 MW capacity, zero-emissions power plant in southeastern Saskatchewan near Estevan.

This part of the province was chosen because it sits on an aquifer at the base of the Williston Basin that is sufficiently deep at 3.5 km.[38] It has been estimated this particular aquifer could support 200 MW of capacity. If this is the case, there is a possibility the Williston Basin aquifer could provide enough capacity for a total of 20 power plants at a generating capacity of 5-10 MW per plant.[39] DEEP's first geothermal project is estimated to be completed in two years.

One of the advantages of geothermal compared to other renewable sources, (like wind and solar) is that geothermal can serve as a baseload power supply, providing continuous energy 24 hours a day, seven days a week.[40] One disadvantage is geothermal projects face large start-up costs and investors typically experience longer payback periods, compared to investments made in other energy development projects. Tougher ROI conditions for investors can dissuade interest. Geothermal sites are also subject to fluctuations in wellhead pressure, making projects site-specific in nature. These factors can create challenges for the development of geothermal sources.

Flare Gas Capture and Use

While flare gas capture and use is not a renewable energy source in and of itself, it does fit into SaskPower's larger decarbonization strategy and should be included in this discussion. According to *Canada's National Inventory Report 1990 – 2015* published in 2017, emissions from Saskatchewan's oil and gas sector account for the largest share (32%) of the province's total reported annual emissions for the year 2015. Saskatchewan's total reported annual emissions from all economicsectors in 2015 was measured at 75 megatonnes (Mt) of C02e.[41]

Of the 24 Mt of emissions produced by the oil and gas sector in 2015, about 13 Mt were classified as fugitive emissions. Of that 13 Mt of fugitive emissions, about 9 Mt were associated with flaring and venting activities. The remaining 4 Mt or so of fugitive emissions were due to system leakages as a result of industrial activities.

Roughly 1 billion cubic meters of gas is vented or flared into the atmosphere each year in the province. This figure represents more than 30% of the gas produced in Saskatchewan with an estimated unrealized value of $100 million.[42] The capture and use of vented or flared gas represents a tremendous business opportunity in the province.

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37 Adam MacVicar. "SaskPower Exploring Geothermal Power Plant in Efforts to Reach 2030 Targets." *Global News*. December 9, 2017. Retrieved Online From: https://globalnews.ca/news/3905709/saskpower-geothermal-power-plant-renewable-electricity-deep-corp/

38 Ibid.

39 Deep Earth Energy Production. Retrieved Online From: https://www.deepcorp.ca/about/

40 Ibid.

41 Note: The Saskatchewan Chamber of Commerce would like to thank Mitch Carlson, P.Eng., Principal of MCE Consulting for sharing with us his expertise in relation to the capture and use of vented or flared gas, and the associated economic opportunities.

42 Ibid.

SaskPower continues to evaluate and implement flare gas capture projects as an option for small to medium-sized oil and gas producers to utilize their waste gas in alignment with the S-10 Directive under the *Oil and Gas Conservation Act* and the related Oil and Gas Conservation Regulations.[43] Recently the Saskatchewan Ministry of Environment (SMoE) drafted new regulations related to upstream oil and gas emissions. These regulations will eventually supersede the S-10 directive.

As of June 2018, SaskPower has successfully interconnected two projects to the electrical grid for a total of 1.75 MW capacity. The initial contract base rate is $41.28 / MWh in 2017 pricing with an escalation rate of 2% per year. A fee of $1,725 plus GST, along with an application is required to participate in the program. Changes to the existing Flare Gas Power Generation Conservation program are currently underway. This will likely generate more interest in flare capture and use projects moving forward.

SaskPower and the FNPA currently have an agreement in place to develop a 20 MW capacity flare gas power project worth $300 million over a 20 year period.[44]

43 Directive S-10 is known as the *Saskatchewan Upstream Petroleum Industry Associated Gas Conservation Directive* and provides regulatory requirements for reducing, flaring, incinerating, and venting of associated gas in the province.

44 Paul Huber. "Saskatchewan First Nationas Leading the Way in Renewable Energy." *Industry West*. Summer 2018. Issue 2, Vol. 1. P. 27.

Overview of In-Service Wind Projects

In-Service Projects

SaskPower's five existing wind farms account for 5% of generating capacity today with the expectation that it will grow to 30% of the province's total generating capacity by 2030.[45] Today this translates into a total of 221 MW of installed capacity spread across 143 turbines.

The five operational wind projects in Saskatchewan include the following:

- Cypress Wind Power Facility - Located near Gull Lake, SK; Commissioned in 2002; Net generating capacity: 11 MW; Owner: SaskPower [46]
- Sunbridge Power Facility - Located near Gull Lake, SK; Commissioned in 2002; Net generating capacity: 11 MW; Owners: Suncor and Enbridge[47]
- Centennial Wind Power Facility - Located near Swift Current, SK; Commissioned in 2006; Net generating capacity: 150 MW; Owner: SaskPower, developed under the Green Portfolio Program[48]
- Morse Wind Facility - Located in Morse, SK; Commissioned in 2015; Net generating capacity: 23 MW; Owner: Algonquin Power
- Red Lilly Wind Energy Facility - Located near Moosomin, SK; Commissioned in 2011; Net generating capacity: 26 MW; Owner: Concord Pacific[49]

Federal Regulatory Process

Under the current *Canadian Environmental Assessment Act, 2012* (CEAA), wind energy projects do not fall under the "designated project" category as defined in the section of the Act around regulations designating physical activities.[50] However, less complex or lower-risk projects on federal lands, including First Nation reserve lands must comply with all applicable federal laws, requirements, and permits per the *Responsible Resource Development Plan*. Under this process, the project proponent submits a Project Description to the Federal Government and the relevant Federal regulatory agency determines the level of environmental review necessary.[51]

45 SaskWind. *Location of Sask Wind Farms.* Retrieved Online From: https://www.saskwind.ca/location-of-sk-wind-farms
46 Ibid.
47 Ibid.
48 SaskPower. *Powering Saskatchewan: Centennial Wind Power Facility*. https://www.saskpower.com/our-power-future/our-electricity/electrical-system/system-map/centennial-wind-power-facility
49 SaskWind. *Location of Sask Wind Farms.*
50 Innergex. *Development Opportunities in Saskatchewan.* Retrieved Online From: http://www.innergex.com/en/development-opportunities-in-saskatchewan/
51 Ibid.

The Government of Canada has recently tabled new legislation around the environmental assessment process that seeks to broaden the scope of the assessment process from focusing squarely on the bio-physical environment to including larger socio-political concerns, like climate change, gender-based analysis, and the impacts of development projects on Indigenous communities.[52] Bill C-69, *An Act to enact the Impact Assessment Act and the Canadian Energy Regulator Act*, to *amend the Navigation Protection Act and to make consequential amendments to other Acts* is currently before the House of Commons and had its first reading in the Senate on June 20, 2018.

In terms of project permitting at the Federal level, wind projects being considered for development will likely require project proponents to obtain permits under the following Acts:

- *The Aeronautics Act.*
- *The Canadian Aviation Regulations and Radiocommunications Act.*
- *The Fisheries Act.*

The degree of permitting required will vary on a case-by-case basis, depending on the renewable energy source being developed. [53]

Provincial Regulatory Process

The Saskatchewan Ministry of Environment is responsible for administering the approval and permitting process for renewable energy development projects.[54] The Environmental Assessment process is formalized through *The Environmental*

Assessment Act. The environmental assessment process requires a proponent to comply with a series of legislated policy steps, as well as provide an opportunity for technical experts and the general public to review and scrutinize the project's merits.[55]

Proposal Development

The process begins at the proposal development stage. Once the proponent expresses interest in a project, the proponent must conduct a self-assessment as per the Technical Proposal Guidelines (TPG). The TPG is a guide to assessing projects and preparing proposals under The Environmental Assessment Act. The self-assessment component is used to identify whether a proposed project is likely to be classified as a 'development' under Section 2(d) of the Act, and thus require a formal environment

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52 Wm. Christopher Porter. "Professional Perspectives: Make Legal a Breeze in Renewable Energy Projects." *Industry West Magazine*. Spring 2018. Issue 1 Vol. 2. P. 34-35.

53 Christopher J. Masich. "Renewable Energy Development in Saskatchewan." *McKercher LLP*. October 2016. P. 21.

54 Government of Saskatchewan. Ministry of the Environment. Environmental Considerations for *Renewable Energy Projects in Saskatchewan* – SaskPower IPP Renewable Energy Meeting. November 17, 2016.

55 Ibid.

assessment.[56] The onus is on the project proponent to seek approval for a project that would be deemed a development under the Act.

For the purposes of the Act, development is defined as the following:

- Effects on unique, rare, or endangered features of environment.
- Substantial use of provincial resources.
- Causes emission of unregulated waste or pollutant.
- Causes widespread public concern because of environmental changes.
- Involves new forms of technology.
- Has a significant impact likely on the environment or necessitate further development likely to have significant impact.[57]

Application

At this point in the process, the project proponent would submit an application with a technical proposal to the Environmental Assessment Branch (EAB) at the Ministry of Environment for review if the project appears to be a development under the Act or if the proponent is unsure.[58] If the proponent determines through a self-assessment screening their project is not a development, the proponent would then proceed with applying for the necessary licenses and permits.

The purpose of the technical proposal is to provide a detailed overview of the project. Key areas of the technical proposal include field survey data, the site location, demonstrated engagement with the public, details around proposed mitigation plans and more.[59] Proposed wind power projects start with the technical proposal and only if it is determined to be a development would an environmental assessment be required. Generally speaking, there is a higher level of scrutiny for an environmental assessment than a technical proposal.

Screening

56 Government of Saskatchewan. Ministry of the Environment. *Environmental Assessment in Saskatchewan: A High-Level Overview of the Environmental Assessment Process for Developments within Saskatchewan under the Environmental Assessment Act.* June 2014. pp. 4-5.

57 Government of Saskatchewan. Ministry of the Environment. *Environmental Considerations for Renewable Energy Projects in Saskatchewan – SaskPower IPP Renewable Energy Meeting.*

58 Government of Saskatchewan. Ministry of Environment. *Environmental Assessment in Saskatchewan: A High-Level Overview of the Environmental Assessment Process for Developments within Saskatchewan under the Environmental Assessment Act*. p. 5.

59 Innergex. *Development Opportunities in Saskatchewan.*

After a project proponent submits their application and technical proposal to the

EAB for review, the Ministry will render a determination as to whether a proposed project falls under the definition of a development under section 2(d) of the Act. If the project is defined as a development, an environment assessment is triggered and the scoping stage of the process begins. If the Ministry determines the project is not a development, the proponent would proceed with obtaining the required licenses and permits.

Scoping

During the scoping stage, the project proponent is required to draft and submit their Terms of Reference (TOR) to the EAB. During this time, the general public is notified that an environmental assessment is underway. After the proponent's TOR and technical proposal is reviewed by the EAB and the Saskatchewan Environmental Assessment Review Panel (SEARP), the final TOR is approved by the EAB. The comments provided by the EAB and SEARP around the TOR will guide the proponent in developing an environmental impact statement (EIS) later on. After approval of the finalized TOR, the proponent must conduct an environmental impact assessment (EIA) and submit their EIS to the EAB for review. [60]

Review

Under the review stage, both the EAB and the SEARP carry out a technical review of the proponent's EIS. Should the EAB and the SEARP find the proponent's EIS to be lacking or inadequate, the EAB will notify that proponent of the deficiencies and the proponent will have an opportunity to draft and submit revisions to the EIS to the EAB. Once completed the EAB will prepare technical reviews comments (TRC) and the public comment stage will begin.

Public Comment

The initial stage of the public comment phase consist of a notice to the general public surrounding the review of the proponent's EIS and the TRCs drafted by the EAB. During this time, any member of the public can submit a written submission to the Minister within 30 days of the Minister giving public notice. The Minister can also extend the window of opportunity for public comment an additional 30 days, should they deem it necessary.

Furthermore, the Minister has the authority to request public meetings or inquiry into any and all aspects of the proposed development project at any time prior to the final decision. Once the window of opportunity for public comment is closed and comments have been received, the EAB will submit their earlier TRCs, the proponent's own EIS, submitted public comments, and inquiry findings, and recommendations to the

60 Note: An environmental impact statement (EIS) describes the impacts (both positive and negative) on the environment as a result of a proposed project, as well as offer alternative means of carrying out the project.

Minister for review.

Decision by Minister

It is at this stage where the Minister decides whether or not to approve a proposed development project. If the Minister decides not to approve the project, the proponent cannot move forward with the development. The Minister can decide to approve the development with or without conditions. If the development is approved by the Minister with conditions, the proponent can proceed with the development, provided they satisfy those conditions, as well as any other federal or provincial requirements.[61]

Permitting Requirements

In addition to the environmental assessment portion, there are also permitting requirements that proponents need to be aware of. This would include:

- Permits surrounding hazardous substances and dangerous goods, as well aquatic habitat protection found under *The Environment Management* and *Protection Act, 2010,* and *The Water Security Agency Act* respectively.
- Permits related to species detection and activity restrictions for sensitive species under *The Wildlife Act, 1998*.
- Permits pertaining to development and land-use regulations as found under both *The Heritage Property Act* and *The Planning and Development Act, 2007*.
- Permits for nearby roadside development for wind projects required under the *Highways and Transportation Act, 1997*.
- Relevant municipal zoning permits.[62]

Wildlife Siting and Adaptive Management Guidelines

In response to concerns raised by both the general public and environmental groups around some of the negative impacts of wind energy projects, the Saskatchewan Ministry of the Environment published wildlife siting guidelines for wind energy projects to help wind energy producers identify and avoid development in environmentally sensitive areas.[63] In June 2018, the Saskatchewan Ministry of the Environment published adaptive management guidelines for wind energy projects.[64]

61 Note: The information contained in the Provincial Regulatory Process section of this report was adapted from an environmental assessment process flow chart that can be retrieved from the Government of Saskatchewan's website: http://www.environment.gov.sk.ca/EAFlowProcessMap

62 Ibid.

63 Saskatchewan Ministry of Environment. 2016. Wildlife Siting Guidelines for Saskatchewan Wind Energy Project. Report No. 2016-FWB-01. Saskatchewan Ministry of Environment, 3211 Albert Street, Regina, Saskatchewan.

64 Saskatchewan Ministry of Environment. 2018. Adaptive Management Guidelines for Saskatchewan Wind Energy Projects. Saskatchewan Ministry of Environment. 3211 Albert Street, Regina, Saskatchewan.

It is important to point out these guidelines are not new requirements but are

intended to provide developers and operators with guidance on how best to apply the requirements of all provincial policies to the operation of wind farms. Key stakeholders, including the industry associations representing both wind and solar, environmental non-governmental organizations (ENGOs), as well as rural and indigenous community groups were consulted during the development of the guidelines.

Saskatchewan Public Opinion on Renewable Energy

In May 2015, a survey was conducted by Oraclepoll Research on behalf of CanWEA to determine Saskatchewan peoples' perception of renewable energy development in the province. The survey, *Omnibus Survey Report Saskatchewan*, sampled 750 voting age residents throughout the province using telephone interviewing originating from a call centre facility. The survey was conducted using random phone number selection and was inclusive of both new landline-based phone numbers and cell phone-only residents. Surveys were conducted from May 19 – May 25, 2015. The survey contains a margin of error of ±3.6% 19 out of 20 times.[65]

Below are some noteworthy observations from the survey:

- When asked which electricity generating technologies (wind, natural gas, hydro, coal, and nuclear) should be the highest priority for Saskatchewan, 51% of respondents stated that wind was the preferred technology of choice.

- When asked how important it was that Saskatchewan improve on reducing its carbon emissions given its reputation as a high per capita emitter, 77% of those surveyed said that was important to reduce related emissions.

- When asked whether they thought the Government of Saskatchewan has done too much, just enough, or not enough to develop renewable energy source in the province, 75% of those surveyed stated that the province has not done enough. This was consistently expressed across all ages, income-levels, gender, and transcended the urban-rural divide.

- When participants were asked what their opinion was of wind energy as a source that will provide large amounts of electricity for Saskatchewan, two-thirds of respondents have a favourable opinion of wind energy in this context.

- Support for developing renewable energy sources (particularly wind energy) is widespread across the Saskatchewan political spectrum. Respondents were asked about their provincial political party preferences. Sixty-one percent of those surveyed were Saskatchewan Party voters, with 26.7% for the NDP, 4.8% for the Saskatchewan Liberal Party, 4.1% for the Green Party, and 3.7% for the Progressive Conservative Party.[66]

After the Oracepoll was conducted in May 2015, a poll surveying Saskatchewan's general voting population was carried out by Vote Compass, a civic engagement

65 Oraclepoll Research. *Omnibus Survey Report Saskatchewan*. May 2015. Commissioned by CanWEA.

66 Ibid.

platform from March 7–11, 2016 in advance of the provincial election on April 4th.

Vote Compass was developed by a team of social and statistical scientists from *Vox Pop Labs* and included a sample size of 5,253 respondents. The data was derived from a non-random sample of the population and was weighted by geography, age, gender, education level, occupation, and religion to ensure that the sample was reflective of the province's demographic makeup based on census data. When asked about renewable energy, 68% responded that there should be more investment in renewable energy, 5% stated there should be less, while the remainder said they were neutral or unsure.[67]

Challenges and Opportunities for Businesses

Opportunities to Improve the RFQ/RFP Experience for Proponents

In comparison to Alberta's electricity market which is currently in transition from a sometimes volatile energy-only market to an energy and capacity market structure, Saskatchewan has a regulated, vertically integrated market in which SaskPower as a Crown utility manages generation, transmission, and distribution. Saskatchewan also has extensive experience dealing with third-party IPPs through long-term PPAs where both parties are aware of their rights and responsibilities. This can offer an enhanced level of certainty for businesses when submitting bids to SaskPower on renewable projects.[68] SaskPower should be commended for harnessing the ingenuity of the private sector in its ambitious roll-out of utility-scale renewable power.

However, there are opportunities to improve the RFQ/RFP experience based on feedback received by the Chamber from private sector stakeholders. Some developers have commented the administrative paperwork can be overwhelming, especially for smaller, Saskatchewan-based proponents who often do not have adequate capacity in terms of time and staffing to provide the kind of detailed reporting required.

This puts small, homegrown bidders at a competitive disadvantage relative to larger companies with large portfolios coming from outside the province to bid. When smaller, homegrown developers are unable to gain the requisite experience developing renewable projects in their own backyard, it makes it difficult for those companies to expand and successfully bid on projects in other provinces, notably Alberta. To remedy this, SaskPower could create a standardized RFQ/RFP template and make it readily available to prospective developers.

In addition, some developers have expressed frustration with the lack of clarity around the non-Indigenous, local sourcing and procurement component in the scorecard that SaskPower uses as part of their RFQ/RFP process. Stakeholders have commented that some of the criteria by design eliminates developers not of a sufficient size or scale. There is also no credit given to a bidding proponent who

67 Kevin O'Connor. "Vote Compass: Sask. Cool on Carbon Pricing, High on Renewable Energy." CBC News. March 12, 2016. Retrieved Online From: http://www.cbc.ca/news/canada/saskatchewan/vote-compass-carbon-pricing-regulations-renewable-energy-environment-1.3487941

68 Chad Eggerman. "Renewable Opportunities, Risks and Rewards in Alberta and Saskatchewan." Canadian Clean Energy Conferences. P. 4. Retrieved Online From the Miller Thomson LLP website: http://www.millerthomson.com/wp-content/uploads/2017/05/ChadEggermanThoughtLeaderQA.pdf

partners with a local developer. And while it is generally understood by many that SaskPower weighs the pricing component the heaviest, there exists some confusion around *how much* the pricing component is weighted relative to other components.

There exists a real opportunity here to provide some additional clarity around the weighting for each component in the scoreboard. SaskPower should also clarify with project proponents whether shortlisted developers in the current competition must go back to the starting line or are provided preferential treatment for the next phase of competition.

Aligning Post-Secondary Education and Training Programs with the Skills Required by the Renewable Industry

One of the challenges expressed by developers is the dearth of vocational training and educational programs offered by post-secondary institutions that teach the kinds of skills demanded by employers working in the renewables sector. These would be the types of industry-specific skillsets required of a solar panel installer or wind tower technician, for example. For Saskatchewan-based developers to grow and succeed in this sector they must have access to a highly-skilled labour pool that possess the required competencies.

The lack of industry-specific training designed with the renewable energy sector in mind is linked to a lack of clarity around the market share potential of the province. Post-secondary institutions need access to this kind of market share information when designing new programs from the ground up or tweaking existing ones. Determining market share potential will be an important first step.

In the meantime, post-secondary institutions across Saskatchewan are advised to engage with employers working in the renewable energy sector on a regular basis, if they are not already doing so. The province's Polytechnical institution could explore partnering with regional colleges on delivering training programs. Access to talent is critical.

Business Opportunities in Smaller, Less Visible Forms of Renewable Energy

While both wind and solar have attracted the lion's share of attention in relation to the procurement of renewable energy, developers should not forget about exploring investment opportunities in smaller, less visible forms of renewable generation, like biomass. Developers should be encouraged to explore partnership opportunities with pulp and paper mills in North Saskatchewan or with Indigenous communities on biomass development projects.

The development of alternative renewable energy sources should not be limited to just electricity generation. Businesses should explore opportunities in renewable natural gas (RNG) produced from organic waste originating from farms, forests, landfills, and water treatment plants. Biogas that is captured, cleaned, and injected into pipelines can be used in the same way as natural gas from conventional source. Being a first mover into less visible markets such as these could pay huge dividends in the long run.[69]

69 Ibid.

Utility-Scale Projects and the Potential for Regulatory Hurdles in Rural Areas

Until recently, Saskatchewan has not had much experience dealing with utility-scale renewable energy projects. As more projects get underway over the next decade, it is worth noting there are currently restrictions in place around who can and more importantly, who cannot own farmland under Part VI of *The Saskatchewan Farm Security Act*. Per the Act, a non-Canadian entity is technically prohibited from possessing aggregate land holdings in excess of 10 acres.[70]

Responsible for administering parts of *The Saskatchewan Farm Security Act* is the Farm Land Security Board, a quasi-tribunal body that meets regularly to carry out its duties under the Act. Because larger, utility-scale projects are often situated on rural land, such restrictions *in theory* can limit the number of acres that can be held by a non-resident prospective developer.[71] The board however has the authority to grant exemptions around farmland ownership restrictions for non-resident entities and does so regularly. While the present restrictions on farmland ownership do not pose much of an issue in practice, developers do need to have a bona fide desire to build a wind farm.

Also worth mentioning are subdivision restrictions contained in the *Planning and Development Act* that could create challenges for developers attempting to acquire rights to Saskatchewan farmland for renewable energy projects. Under the Act, those attempting to lease or acquire rights to a portion of a parcel of land are required to obtain approval from the Saskatchewan Director of Community Planning. And while there are several exemptions around the requirement to obtain permission, there are technically no exemptions carved out for the development of renewable energy projects.[72]

While the *Planning and Development Act* could create challenges for developers in the future, it is unlikely given the Government of Saskatchewan will not want to make SaskPower's procurement process more difficult than is necessary. With that said, it is important to note that IPPs will still need to comply with the Act.

The takeaway here is developers need to do their homework around which permits are required under which act and to seek legal counsel with specialized expertise in this field. Not doing so could mean the difference between a developer realizing healthy returns on a successful project versus a project being disqualified or declared invalid. The Saskatchewan Chamber of Commerce also recommends that developers engage meaningfully early on with community stakeholders, such as landowners, Indigenous communities, and rural municipalities to earn their trust and foster healthy working relations.

70 *The Saskatchewan Farm Security Act.* Statutes of Saskatchewan, 1988, P. 80 – 85. http://www.qp.gov.sk.ca/documents/English/Statutes/Statutes/S17-1.pdf

71 Wm. Christopher Porter. "Professional Perspectives: Make Legal a Breeze in Renewable Energy Projects." P. 35.

72 Christopher J. Masich. "Renewable Energy Development in Saskatchewan." P. 18.

Embracing New Utility Models

The long-standing business model for utilities has been building and operating large power plants (coal, gas, nuclear, hydro) that transmit power through an electrical grid to the end-user usually over long distances. This is referred to as *centralized power generation* and typically requires costly infrastructure. A *distributed energy model* on the other hand relies on a smaller, more decentralized power generation network in which power is typically consumed on-site or distributed through a small-scale community network.

Distributed energy systems typically employ renewable energy sources like rooftop solar photovoltaic installations, smaller combined heat and power plants, onshore wind parks, biomass, biogas, and more. As the province brings more renewable energy sources online, it is worth having a larger discussion about how traditional, utility-scale centralized power generation compares to small-scale, decentralized on-site generation in terms of grid resiliency, economics, etc. How does a future Net-Metering or Small Power Producers Program fit into this? An advantage of on-site power generation by households and small businesses is they have the ability to bypass the formal environmental assessment process.

Conclusions

To reiterate, the objective of this report was to provide an overview on the state of the renewable energy sector in Saskatchewan; identify barriers and challenges that serve to constrain the industry; bring greater awareness to the opportunities that are available; and shape the narrative around renewable energy in such a way to promote sound public policy and encourage the province's business community to take a leadership role in the transition to a clean growth economy. The Government of Saskatchewan's goal of 50% renewable generating capacity by 2030 is ambitious as well as laudable.

Some key questions remain – are we still on track to achieve that target? What else might be required to meet the goal of 3500 MW of renewable generating capacity by 2030? How can energy efficiency programming contribute to the province's emissions reductions targets? These are questions that still need to be addressed.

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