




SASKATCHEWAN
CHAMBER *of* COMMERCE

BUILDING THE LOW CARBON ECONOMY

EXPLORING OPPORTUNITIES AND
CHALLENGES FOR SASKATCHEWAN





The Saskatchewan Chamber of Commerce applauds the efforts and accomplishments of the province's industries, from oil and gas to mining to agriculture to manufacturing and beyond, Saskatchewan businesses are continuously working to enhance environmental performance. Each sector has innovations, opportunities, investments, and efficiencies to develop upon. The transition to a low carbon economy is a chance for Saskatchewan to build the economy for the next generation and enhance our resiliency, something that businesses and governments must do together.

- Steve McLellan, CEO, Saskatchewan Chamber of Commerce



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INTRODUCTION

The Saskatchewan Chamber of Commerce (SCC) is pleased to present this information on the province's move to a low carbon economy. As the *Voice of Saskatchewan Business*, the SCC understands that low carbon does not mean a no carbon economy, and the vitality of the economy and the quality of life for residents in both the short and long term have equal merit. The growing world population, and rising standard of living across the globe, will require energy in all forms. Renewables and new alternative sources will increasingly supply a part of that energy mix, but oil and natural gas will be important for quite some time; therefore, investment and innovation in this sector is still required.

Saskatchewan is already home to many success stories, whether it is Mosaic Company's recognition as an S&P 500 leader for climate change transparency, EVRAZ's use of a best-in-class electric arc furnace and its scrap metal recycling efforts, Federated Co-Operatives Limited's award-winning refinery wastewater treatment plant, the widespread use of zero-till farming, or the fact that Saskatchewan's oil and gas sector is on track to mitigate emissions to at least 40% below 2005 levels by 2025. There is no shortage of green innovation happening here in the province to learn from and expand upon. Building on this success is imperative. Looking forward, Saskatchewan can develop and implement more sustainability initiatives, and indeed must, because a lower carbon economy is coming.

The Saskatchewan Chamber of Commerce applauds the efforts and accomplishments of the province's industries, from oil and gas to mining to agriculture to manufacturing and beyond, Saskatchewan businesses are continuously working to enhance environmental performance. Each sector has innovations, opportunities, investments, and efficiencies to develop upon. The transition to a low carbon economy is a chance for Saskatchewan to build the economy for the next generation and enhance our resiliency, something that businesses and governments must do together.

- Steve McLellan, CEO, SCC

Saskatchewan is dependent on the global economy – most of the province's customers and investors live beyond its borders. The preferences of these stakeholders are becoming increasingly clear; environmental sustainability and good stewardship practices are impacting choices. This changing public sentiment of corporate responsibility is being paralleled by changing legal responsibility. Saskatchewan must continue to be, and be perceived as, a clean, safe, and reliable participant in both the global economy and the global environment to attract top tier opportunities. The challenge will be to do this while keeping businesses thriving and exports competitive in the global market.

Across Canada, regulatory certainty, government support for strategic investments, research and development of new technologies, incentives to change behaviour, and workforce reskilling are recognized as the path towards a low carbon economy. All of these will be needed for Saskatchewan's transition to a lower carbon economy. This issue is too important to be addressed through partial actions. Many industries in Saskatchewan, such as potash,^a already have the lowest greenhouse gas (GHG) emission intensity in the world compared to global competitors¹; improving upon this performance will take considerable investment and resource commitment.

A significant piece of Saskatchewan's move to a low carbon economy will be executed through the province's energy production. Energy production is complicated and vital. Every source of energy has its advantages and disadvantages. Whether it is a large environmental footprint, weather dependency, technology limitations, or investment burden, building the right mix has no easy answer. The challenge falls primarily to SaskPower and other power producers in Saskatchewan to balance many internal and external pressures while executing its lower carbon mandate. Due to this significance, SaskPower has been at the forefront of the provincial government's considerations.

Nevertheless, no individual citizen, single organization, or sole government entity can create a low carbon economy for Saskatchewan alone; we will only succeed through collaboration. As the Saskatchewan Chamber of Commerce shares the information contained in this report with the hope of expanding this effort, we offer sincere gratitude to the individuals who have contributed their expertise, and to the business and government leaders that are making this conversation, and the foundational issues it represents, a shared priority.

^a Canadian potash products are made with approximately 50 per cent fewer greenhouse gas emissions than global competitors in places such as Belarus, Russia, and China (Cheminfo/The Mosaic Company).

WHAT WE NEED: EXECUTIVE SUMMARY OF THE SASKATCHEWAN CHAMBER OF COMMERCE'S RECOMMENDATIONS

After almost a hundred conversations, eleven expert submissions, and an extensive research effort, the Saskatchewan Chamber of Commerce is certain of three things: the move to a low carbon economy is inevitable in Canada, decarbonization efforts will have uneven impacts across stakeholders, and the Saskatchewan business community cannot successfully transition to a low carbon economy alone.

From a business perspective, climate change is fundamentally about risk, both direct and indirect. Direct risks associated with climate change include weather related unpredictability. Indirect risks include lower economic growth and competitive disadvantage related to the ongoing social license to operate from consumers, communities, and governments, particularly as credit rating agencies rely upon ESG (Environmental, Social, and Governance) indicators to determine creditworthiness and credit ratings. Accounting for and managing these risks makes good business sense, but not at the expense of business competitiveness, which would ultimately result in closure. Driving corporate investments and production to jurisdictions where greenhouse gas (GHG) emissions are not regulated (a.k.a. carbon leakage) does not help global climate change, the Saskatchewan people, nor the Canadian economy. Nevertheless, inaction will not benefit anyone either. The *Economist Intelligence Unit's* (EIU) Climate Change Resilience Index measured the preparedness of the world's 82 largest economies and found that based on current trends, the fallout of warming temperatures would shave off three per cent of global GDP by 2050.²

Saskatchewan has built its high standard of living and comparative advantage by producing energy-intense, trade-exposed commodities with some GHG emissions

while utilizing energy sources with relatively high GHG emissions. Reducing emissions significantly through investment in Saskatchewan's energy production grid will certainly play a significant and inescapable role, impacting the entire provincial economy beyond those typically classified as 'large emitters'.

As such, the province's transition toward a low carbon economy, while possible, will be difficult and expensive. In September 2020, the Institute for Sustainable Finance released *The Capital Mobilization Plan for a Canadian Low Carbon Economy*, which concluded that Canada requires an estimated investment of \$128 billion over the next 10 years to achieve its 2030 emission reduction targets (see Table 1).³ However, this report also went further and looked at the required investment by Saskatchewan. According to this analysis, the province's total required investment will be roughly \$12.4 billion over the next 10 years. Alternatively put, Saskatchewan will require over 9.6% of Canada's investment into a low carbon economy despite being home to only 3.1% of its population. Nevertheless, when measuring the projected cost of inaction (both GDP loss and weather unpredictability related human suffering) against the cost of action, it is clear that efforts towards the low carbon economy transition need to be taken in a prompt, planned, and productive manner.

With all these considerations in mind, the Saskatchewan business community, especially those whose products are exported, cannot develop a low carbon economy unaided; support is needed from the federal and provincial governments. There is no one policy solution. Instead, several pieces are needed in the following areas to simplify, accelerate, and mitigate the impacts of Saskatchewan's move to a low carbon economy.

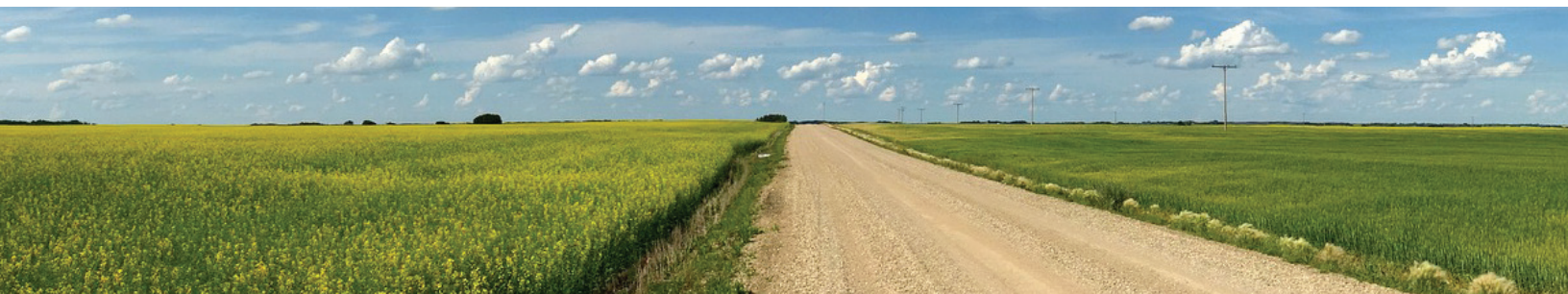


TABLE 1

Total Weighted Average Abatement Cost Breakdown

SECTOR	PROPORTION (%)	AVERAGE COST (\$/T CO ₂ EQ)	ABATEMENT REQUIRED (MT. CO ₂ EQ)	REQUIRED INVESTMENT (\$ MILLIONS)
Oil & Gas	27	126	209	26,329
Transportation	24	283	186	52,656
Buildings	11	123	88	10,847
Electricity	10	214	76	16,252
Heavy industry	9	126	75	9,391
Agriculture	9	88	74	6,455
Waste & others	5	139	41	5,660
Land use & Forestry (LULUCF)	5	14	39	545
TOTAL			789	128,125

Source: Simon Martin and Ryan Riordan, "Capital Mobilization Plan for a Canadian Low-Carbon Economy." Institute for Sustainable Finance (September 2020)

IMPROVE REGULATORY PRACTICALITY AND CERTAINTY

Add More Flexibility in Carbon Pricing

Businesses operating in a jurisdiction with carbon pricing will experience a higher price on all their carbon producing inputs, not just on direct emissions. These incremental cost increases, in addition to the compliance costs associated with operating in a highly regulated environment, can often overwhelm businesses, especially those in the competitive export market unable to pass increased costs along to the final customer. These costs will drive industry out of the province/country and move it to countries with fewer or more lenient environmental laws (i.e., carbon leakage). The federal government has in the past not appropriately recognized that there are some industry activities that have fixed, unavoidable carbon emissions with no proven, commercially available, low carbon alternatives to production processes in the near term. Both the federal and provincial government need to do a better job of recognizing and evaluating the impact of carbon pricing systems. Specifically, the federal government needs to reevaluate the structure and broad imposition of the carbon tax to address the lack of complete market control needed to make such taxes work without carbon leakage, the current technology limitations, and the lack of viable low carbon alternatives available to specific industries, processes, and regions.

Thoroughly and Consistently Evaluate the Cumulative Impacts of Environmental Legislation and Regulation

The Government of Canada has unleashed numerous initiatives to accelerate the transition to a low carbon economy. However, the federal government appears to have given very little consideration to the combined impact of its environmental policies. These climate policies are being designed as if they will be imposed in isolation, but that is not how they are operating once implemented. Saskatchewan and Canadian companies are facing significant cost increases due to this cumulative regulatory and taxation burden, which can drive industry to other countries with unregulated carbon environments. Another risk of regulatory stacking is the inability to attract global investment, which will have long term consequences for the economy. The federal government needs to consider the unintended consequences of too much regulation on competitiveness. Specifically, the federal government should focus on enhanced environmental performance while protecting the competitive position of Saskatchewan businesses and the attractiveness of the provincial/national investment climate. The Saskatchewan Chamber of Commerce recommends that the federal government conduct a thorough evaluation of the impacts of current environmental legislation and regulation to identify opportunities for harmonization and streamlining as well as the ultimate amounts of, and opportunities to reduce, the government-imposed cost to business.



Consistent Timeframes for Action

The innovation capacity of Saskatchewan's business community is vast and diverse. Channeling this resource appropriately will be vital to the province's success. The move to a low carbon economy will not be quick, both the federal and provincial government appear to understand this and have designed policies with longer-term, although still ambitious, time horizons. The deadline for achieving the Government of Saskatchewan's climate change objectives as outlined in *Prairie Resilience* and the Government of Canada's net zero mandate are ten and thirty years away, respectively. These goals are already going to stretch capacity, innovation, and technology beyond known levels. Under no circumstances should the federal government make targets more challenging or change the standards businesses are measuring success against. Providing industry with adequate adaptation time and consistent goals must be the primary consideration of all climate change policy and planning going forward.

Evaluate the Implications of Border Carbon Adjustments

As first mentioned in Canada's 2020 Fall Economic Update, and repeated since, the federal government is exploring the possibility of border carbon adjustments. These could be penalties imposed on imports from countries that do not have similar carbon control requirements. These penalties can be used to address the cost of production disadvantage producers face in a carbon pricing environment. This concept has the potential for both positive and negative impacts, so proper design is of the utmost importance. The design of border carbon adjustments needs to consider their implementation

costs, their impacts on diverse sectors, their impacts on and potential harmonization with international partners, and compatibility with Canadian and international trade law. The Saskatchewan Chamber of Commerce strongly recommends the federal government consult with diverse industries and regional representatives prior to the implementation of border carbon adjustments. The Saskatchewan Chamber of Commerce also recommends that Canada closely examine the development of a carbon border adjustment mechanism currently underway in other jurisdictions and incorporate developments as needed to protect Canada's international trade position.

Release Timely, Useful Data

Data from Environment and Climate Change Canada's (ECCC) *National Inventory Report (NIR)*, the *National Pollutant Release Inventory (NPRI)*, and the *Greenhouse Gas Reporting Program (GHGRP)* lags two to three years behind (2018 and 2017 data is represented as current in late 2020). Industry collects and reports this information annually on June 1 of the next year. Since the federal government has repeatedly stressed the importance of emission control to industry and the general public, they should focus appropriate resources towards ensuring accurate, timely, and useful data is available for decision-making by the end of the year following the reported year. Moreover, the Intergovernmental Panel on Climate Change (IPCC) for the United Nations and the Government of Canada differ in their approach to classifying economic sectors, creating inconsistency for stakeholders. A harmonized approach would be considerably more beneficial than the present strategy.

INCENTIVES TO CHANGE BEHAVIOUR – FEDERAL GOVERNMENT

Simplify Funding Access and Requirements

Throughout the COVID-19 pandemic, the Government of Canada has proven that it is possible to distribute funding without overreaching information requests, onerous reporting requirements, and layers of bureaucratic red-tape. It is essential that the same sense of urgent support be provided to businesses advancing to meet the government's net zero targets. In the past, Saskatchewan businesses have expressed hesitancy when accessing government funding/programs because of the onerous requirements associated with accessing the funding or the excessively narrow scope of program eligibility. The federal government has imposed upon Saskatchewan businesses an almost impossible goal of achieving net zero; now is not the time for it to abuse its position to extract private information or create barriers. The federal government needs to be a true partner by making this process simple and easy.

Accessible and Expedient Energy Efficiency Aid

Energy efficiency is the quickest and easiest way to reduce emissions. The federal government's *A Healthy Environment and a Healthy Economy* plan, released in December 2020, promises significant support for community spaces and homeowners to enhance energy efficiency. Additionally, in October 2020, the government announced the three-year Canadian Infrastructure Bank's Growth Plan committing \$2 billion to large-scale building retrofits to increase energy efficiency, which is repaid by businesses over time. With previous federal support for energy efficiency⁴, the helpfulness of the programming, such as the Climate Action Incentive Fund, was limited as large up-front costs still posed a barrier to increased uptake, especially for significantly costly projects or smaller businesses with limited capital investment cash flow. Coming out of the challenges posed to businesses by COVID-19, the federal government needs to develop programming with accessibility at the forefront and it needs to recognize that this group of projects will likely be more complex and expensive than earlier investments. Incentives for energy efficiency building retrofits can help act as a stimulus to rebuild the post-COVID-19 economy by creating work for tradespeople. As such, the Saskatchewan Chamber of Commerce supports, along with improved accessibility, expediting the funding for energy efficiency projects.

Expand Activities Funded Under Canada's Low Carbon Economy Fund

Over the last decade, many of the simplest and easiest energy efficiency improvements have been made by businesses. However, in some circumstances there are still upgrades available that can make an impact and be incentivized. It has been demonstrated that most buildings could reduce their electrical consumption and greenhouse gas emissions by 10-30% through the implementation of data driven energy management systems.⁵ At present, real-time energy measurement and management services tied to energy efficiency projects are ineligible for funding under the Government of Canada's *Low Carbon Economy Fund (LCEF)*. The federal government should start including these options in the LCEF.

INCENTIVES TO CHANGE BEHAVIOUR – PROVINCIAL GOVERNMENT

Restructure and Expand Demand-Side Management Programs

The Government of Saskatchewan also has a role to play in improving energy efficiency. Saskatchewan administers demand-side management (DSM) programs within the utilities, SaskPower (electricity) and SaskEnergy (heating). This creates an obvious financial conflict as they are both selling energy to their customers and then incentivizing them to reduce consumption. Additionally, the current DSM programming and energy efficiency incentives are being offered by SaskPower, SaskEnergy, and by the provincial government proper in a fragmented and piecemeal fashion which reduces the ability of businesses to understand what is available and how to access the supports. The Saskatchewan Chamber of Commerce recommends that DSM programs be housed within an independent, third-party entity, employing a delegated authority model to reduce financial conflict while offering clarity and specialized supports.

Address the Energy Efficiency Split Incentive

Another persistent barrier to realizing progress on energy efficiency has been the conflicting priorities among different stakeholders and split incentives. Decisions, particularly related to building construction, are driven by project owners who have a strong need to control up-front construction costs.⁶ This often results in inadequate investment in the project design and planning stage early in the process and is a lost opportunity to improve

the full lifecycle energy performance of a building from the outset. Provincially, modified building standards for new developments and supports for private enterprises making energy efficiency adjustments are essential early components to build a low carbon economy. The Saskatchewan Chamber of Commerce recommends that, after extensive industry consultation, enhanced building codes, standards, and practices be developed to support and expand energy efficiency.

Expand Property Assessed Clean Energy (PACE) Programming

Property Assessed Clean Energy Programming helps facilitate investments in energy efficiency upgrades by transferring the repayment responsibilities to those benefiting from the technology. This is done by attaching loan repayment to property taxes. The Saskatchewan Chamber of Commerce was pleased the provincial government amended the *Municipalities Act* to grant municipalities the authority to establish this type of programming. In early 2021, the City of Saskatoon took a leadership role in the province by proposing a PACE program. However, the provincial government and other stakeholders need to actively engage with Saskatchewan's municipalities to expand PACE programming to other regions in the province.

STRATEGIC GOVERNMENT INVESTMENTS

Increased Investment in Government Assets

For Saskatchewan, *Prairie Resilience* outlines several government actions around climate change, including the retrofitting of government-owned buildings to improve energy performance. Here lies a unique opportunity for the provincial government to lead by example on climate action initiatives and stimulate economic activity. As the owner/ lessee of a significant amount of commercial/ industrial space, the province needs to establish a quick and effective energy efficiency transition within its internal spaces. The Saskatchewan Chamber of Commerce recommends that the government prioritize this action.

DIVERSE ENERGY PRODUCTION

Allow Competition

Saskatchewan's current power generation sources are significantly coal and natural gas fired, so decarbonizing Saskatchewan's carbon-intensive electrical grid will be no small feat. Independent Power Producers (IPPs) will need to play a significant role if Saskatchewan is going to achieve the federal government's goal of net-zero by 2050. Previous forms of energy production, coupled with Saskatchewan's rural and remote population, justified the use of an energy transmission and distribution monopoly. However, the rapid evolution of energy production technology has changed this environment. SaskPower's current mandate and quasi-monopoly status comes between large industrial users of power looking for cleaner sources and prospective IPPs. Nearly all renewable development needs to occur through SaskPower's existing process and because SaskPower has a legislated monopoly on transmission and distribution under *The Saskatchewan Power Corporation Act*, their exclusive authority over transmission right-of-way makes it virtually impossible for a prospective IPP to sell power directly to a large industrial user.⁷ Saskatchewan needs to enable private companies to find clean energy sources without needing Crown corporation involvement under a structure that does not cause a significant upward impact on rates for other SaskPower customers.

Enable Trade of Renewable Energy

The Government of Canada has focused a significant portion of its emission reduction agenda on the prospect of electrification. This is currently a significant disadvantage to Saskatchewan because of its emissions heavy electricity generation, especially when compared to provinces with large clean energy resources that are already developed (e.g., hydroelectricity). Strengthening transmission interties across Canada and into the United States, along with stable trade and interjurisdictional export regulations that enable trade of renewable energy east-west and north-south, will create a more robust renewable energy industry in Saskatchewan and help to achieve a low-carbon energy system. The Saskatchewan Chamber of Commerce was pleased to see the federal government include this consideration in its *A Healthy Environment and A Healthy Economy* plan and will continue to advocate for this recognition to turn into action.

Enhance Indigenous Involvement

Clean energy has the ability to reduce emissions while creating jobs and investment opportunities. It can also serve as one of the vehicles for the advancement of reconciliation with Indigenous peoples. Improving opportunities for First Nations is a top priority for Saskatchewan and one that can be tied directly to the transformation of the provincial energy system. Saskatchewan's Indigenous peoples have played an expanding role in provincial power generation and the energy supply chain over the last decade, particularly since SaskPower implemented an Indigenous Procurement Policy (2012). Maximizing Indigenous participation as the province undergoes its transition to a lower carbon economy is a logical way to build upon this success and growing expertise. A collaborative, Indigenous focused approach to renewable energy generation provides greater potential for own-source revenue generation opportunities for First Nation communities and businesses, thereby increasing local employment and skills training opportunities. The Saskatchewan Chamber of Commerce recommends that SaskPower, the Government of Canada and the Government of Saskatchewan continue to work with Indigenous organizations, energy producers and user groups to maintain and expand policies and practices which increase Indigenous participation in the energy supply chain.

WORKFORCE RESKILLING

Support Employer-Led Initiatives

COVID-19 in the short-term and climate change over the long-term will necessitate substantial investments in human resource development because Saskatchewan's gradual decarbonization over time will result in the displacement of workers in some carbon-intensive sectors. Historically, employers have relied on formal education and credentials as proxies for assessing skills.⁸ However, for many employers in a rapidly changing environment, formal credentials and discipline-specific knowledge are no longer enough. Saskatchewan needs to better utilize/train/upgrade its trades workers to prepare them for the workforce demands of a low carbon economy. Employer-led initiatives can help, they should be designed to promote worker reskilling and upskilling to remedy ongoing skills mismatches. This approach should be fostered through expanded public-private partnerships and co-developing curricula.

Collect and Distribute Better Labour Market Information

Post-COVID-19 planning for the low carbon economy transition should be based on accurate, up-to-date, and detailed information about relevant jurisdictions. Statistical labour market information, which serves as the basis for creating planning forecasts, is needed at a regional/community level. This is necessary to better understand the subtle nuances of regional labour markets and potential capacities across the province. The Saskatchewan Chamber of Commerce recommends that through stakeholder consultation, the Government of Saskatchewan identify specific areas of provincial data that are not currently being properly collected. An independent analysis should then be undertaken to confirm that the data collection will be worth the expense and, if so, the province should create a process to gather and disseminate useable data in those areas.

A FULL UNDERSTANDING OF NATURAL CARBON EMISSIONS AND CARBON SINKS

Account for Existing Natural Infrastructure

Canada needs to realize the full value and environmental potential of its existing natural infrastructure. The environment has naturally sequestered carbon (such as through native grasslands, wetlands, forests, soil, etc.). The value of these natural assets can be expanded and enhanced upon through intentional planning and design for greater environmental benefit. Conversely, the existing natural carbon sequestered can be a source of unmeasured emissions, for example, if wetlands are drained, or native grasslands are broken. The evaluation of natural infrastructure is the responsibility of many levels of government and a collaborated effort is needed. Here the federal government can play a leadership role. Proper carbon accounting enables the monetization of emissions with systems that support emissions trading. Existing natural assets are rarely recognized or quantified using consistent methodologies and when data is available, it is often employed in an inconsistent fashion. This issue is too important to be addressed through partial analysis and failing to account for all the benefits and opportunities offered through natural infrastructure may lead to an unanticipated and permanent loss of them. Government needs to properly evaluate and value these assets and create financial incentives to preserve and expand them.

RECOMMENDATION REFLECTION

Moving to a low carbon economy in Saskatchewan will be a challenge and not all businesses will be impacted equally. The broad stroke approach taken by the federal government across regions and industries to date has not served Saskatchewan's interests well, but this can change. By adopting and following the recommendations outlined above, both the federal and provincial government can help turn this challenge into an opportunity for Saskatchewan businesses. Getting businesses to adopt new, cleaner technologies and processes in carbon-intensive sectors, develop scalable solutions for renewable energy, embrace new technologies and automation to save energy and improve productivity, while conducting energy efficient retrofits alongside new types of training, incentives, and construction processes, will positively transform Saskatchewan's economy when completed. But Saskatchewan businesses will not be able to achieve this alone, they need governments at all levels to work as partners.

WHAT WE DID: AN OVERVIEW OF THE SCC LOW CARBON ECONOMY STUDY

Background

Beginning in October 2019, the Saskatchewan Chamber of Commerce (SCC) Board of Directors identified Thought Leadership around the low carbon economy and what that means for Saskatchewan businesses as an area of research focus.

The SCC's efforts around the low carbon economy build upon previous research and advocacy efforts on energy efficiency that began in late 2016 and culminated with the release of the SCC's *Energy Efficiency Strategy* by its ad-hoc Energy Efficiency task force in late November 2017. The report contained nine high-level recommendations for promoting energy measures in the commercial-industrial space and was well-received by our members and officials at both the federal and provincial level. The 2017 *Energy Efficiency Strategy* serves as the cornerstone for the SCC's low carbon economy research and advocacy efforts.

Non-research and advocacy related actions that supported the SCC's Thought Leadership efforts on the low carbon economy file included the *Energy Series* tours and the *Energy on Tap* programming, which was a series of discussions across the province on a diverse range of energy-themed topics like renewable (wind and solar) energy, small modular reactors (nuclear), Indigenous-

led energy production, bioenergy, innovation in energy management, innovation in the oil and gas sector, and more. The SCC will continue its *Energy Series* in Spring 2021.

Purpose and Scope of the SCC Low Carbon Economy Study

The purpose of this study is to provide leadership on the low carbon economy by developing a body of knowledge that can inform the Saskatchewan business community and the general public, as well as all levels of government. As the *Voice of Saskatchewan Business*, the SCC needs to be aware of all the business-related opportunities, challenges, and priorities so that its members can not only survive and thrive but also meaningfully contribute to Saskatchewan's decarbonization efforts.

As a business organization, the SCC has a unique vantage point on this issue. The SCC membership is broad-based and diverse, encompassing individual businesses and industry associations that operate in high emissions activities like oil and gas, mining, manufacturing, and trucking and rail freight transport, in addition to low emissions activities such as clean energy and professional and technical services. As such, Saskatchewan's decarbonization efforts over time are likely to have uneven impacts among members and across the larger provincial economy.

The scope of this study is primarily confined to those economic activities associated with greenhouse gas emissions (GHG). While non-GHG related environmental considerations such as land-use changes, water use and intensity, as well as the relationship between food, water, and energy use, will be occasionally referenced throughout, a more substantive discussion about those topics is beyond the scope of this study. A low carbon economy study is, by definition, broader than one focused solely on energy sources and that was the approach taken here.

Written Submission Phase

In April 2020, the SCC invited select member businesses with relevant subject matter expertise to submit a written brief on behalf of their organizations. Participating members were asked to write a 750 to 1000-word submission using their expertise to address the following aspects:

- Why is this an issue for your organization?
- An overview of current provincial, national, and international landscapes
- Identify potential issues
- Identify key questions
- Identify best practices
- Offer advice for Saskatchewan businesses

Participating member businesses provided their submissions by July 5, 2020. Participation in the written submission portion of this study was entirely voluntary. The SCC received 11 written submissions from member businesses and organizations in the nine following areas of focus:

- Regulations
- Building & Construction
- Finance & Risk
- Energy Supply
- Labour Market (two submissions)
- Innovation & Technology
- Indigenous Resource Development (two submissions)
- Global Issues
- Natural Infrastructure

The Saskatchewan Chamber of Commerce appreciates and thanks each of these writers for lending their expertise and committing the time to assist with this process.

Methodology

This study opted for a *mixed methods* research design, drawing on both quantitative and qualitative sources of data. This study also utilizes both primary and secondary sources of research. The primary research component of this study includes qualitative written responses submitted by member businesses across the nine areas of focus discussed above, and the stakeholder consultations conducted by the SCC. The secondary research

component includes third-party research available in the public domain. Secondary sources are diverse and encompass peer-reviewed journal articles, international organizations, research institutes and thinktanks, along with both industry and government publications (discussion papers).

The quantitative sources of data found in this study are derived almost exclusively from secondary sources, like survey results, as well as tables, graphs, and charts assembled using government statistical tables such as Environment and Climate Change Canada's annual *National Inventory Report 1990 – 2018*. Secondary information sources were mainly used to provide context and to augment the written submissions and consultations where appropriate.

Thank You

The Saskatchewan Chamber of Commerce greatly appreciates the time and effort put forward by the businesses who contributed written submissions, specifically:

- Barbara Hanbidge, Provincial Policy Specialist, and Michael P. Champion, Head of Industry and Government Relations, Saskatchewan at Ducks Unlimited Canada
- Carol Howes, Vice President of Energy Safety Canada's Communications and PetroLMI. Contributors: Lisette Cameron, Tamara Gale, Breanne O'Reilly
- Chad Eggerman, Partner, MLT Aikins LLP
- Dean Clark, President & CEO, Greenwave Innovations
- Guy Lonechild, President and CEO, First Nations Power Authority
- Jessica Nixon, Chief Executive Officer, Cowessess Ventures Ltd.
- Dr. Larry S. Rosia, President & CEO, Saskatchewan Polytechnic
- Dr. Margot Hurlbert, Canada Research Chair, Climate Change, Energy and Sustainability Policy, Johnson Shoyama Graduate School of Public Policy, University of Regina
- Mark Cooper, President and CEO, Saskatchewan Construction Association
- R. J. Schutzman, Director, Environmental Affairs – Canada, EVRAZ North America
- Robert Vanderhooft, Chief Investment Officer, TD Asset Management Inc.

Thank you all for your effort.

Disclaimer

The recommendations put forward in this paper were the result of multiple stakeholder consultations conducted by the Saskatchewan Chamber of Commerce. The authors who kindly donated their time in writing submissions were not given the opportunity to approve or disapprove any of the final recommendations. Therefore, they may not reflect the views of the authors. It is the responsibility of the Saskatchewan Chamber of Commerce to represent the best interest of the broad Saskatchewan business community.

WHY WE STARTED: A CHANGING ENVIRONMENT

In an annual letter addressed to clients in January 2020, Larry Fink, CEO of the investment management company BlackRock,^b articulated that the intensifying climate crisis and its associated risks would bring about a fundamental reshaping of finance.⁹ Fink's underlying assumption is that climate change is qualitatively different than previous financial crises and challenges because climate change, if left unchecked, will have long-term, structural implications for societies. In contrast, previous economic crises like the inflation spikes of the 1970s and 1980s, the 1997 Asian Financial Crisis, the 2000s era dot-com bubble, and the 2007-2009 global financial crisis, while significant, were all relatively short-term by comparison.¹⁰

As a large institutional investor with a fiduciary responsibility to its clients, Fink notes in the letter that firms like BlackRock have a responsibility to place environmental sustainability considerations at the forefront of their investment strategy. For Fink, climate risk is synonymous with investment risk; the increased frequency and severity of droughts, floods, and other natural disasters associated with climate change will create uncertainty (and therefore additional risks and costs) for businesses and society. This, combined with changing tastes among more environmentally conscious consumers, changing public sentiments around corporate responsibility, and expanded disclosure requirements, makes a significant reallocation of capital over the coming decades much more likely.¹¹

Fink goes on to articulate in the letter a vision of capitalism for the 21st century that is more accountable, transparent,

sustainable, inclusive, and committed to serving a broader range of stakeholders beyond the traditional corporate ones - in this case, customers, employees, and communities.¹² This idea has been referred to as *Stakeholder Capitalism*. In the letter, Fink expresses skepticism for the "laissez-faire" approach to climate policy, which assumes market mechanisms by themselves will move society toward a low carbon economy, and instead believes that governments must play an active role in this transition in conjunction with private industry and investors.¹³

BlackRock's annual letter to its clients is indicative of a paradigm shift taking place in the global marketplace. BlackRock is not alone in its commitment to environmentally sustainable business practices. Several large institutional investors, including the Canada Pension Plan Investment Board, are increasingly factoring in environmental sustainability into their investment portfolio decision-making.

This trend is not limited to large institutional investors; examples of major consumer-facing companies pledging some form of carbon neutrality include Microsoft, Amazon, Google, Apple, TELUS, Maersk, Unilever, Bank of America, and others.¹⁴ Companies with an operational presence in Saskatchewan, including Canadian Natural Resources Ltd., Maple Leaf Brand Foods, and Calgary-based Cenovus Energy, have also made similar commitments against their own carbon budgets.

In addition to private companies and investors, governments across the world are starting to embrace policies and legislation consistent with the concept of net zero by either 2030 or 2050. Countries that have formally declared a commitment to net zero include the United Kingdom, Sweden, France, Denmark, New Zealand, and Hungary. Canada introduced its net-zero emissions legislation (Bill C-15) on November 19, 2020.¹⁵ Additionally, Spain, Chile, the European Union, and Fiji are currently considering lofty net zero targets.¹⁶

While not formally declared, Finland, Austria, Iceland, Germany, Switzerland, Norway, Ireland, Portugal, Costa Rica, Slovenia, and the Marshall Islands have net zero targets embedded in various policy documents. Other countries actively considering net zero goals include the Netherlands, Uruguay, Italy, South Korea, Mexico, Argentina, Columbia, Belgium, Pakistan, and others.¹⁷

^b Note: BlackRock is an American global investment company based in New York City. It is the world's largest asset manager with managed assets worth in excess of \$7 trillion.

Both Bhutan and Suriname have already achieved net zero emissions.

At the sub-national level, over 100 cities and 10 regions have pledged to be net zero by 2050.¹⁸ At the municipal level here in Saskatchewan, in 2018 the City of Regina pledged to be 100% renewable by 2050 while the City of Saskatoon released its *Low Emissions Community Plan – Saskatoon’s Actions for Climate Change Mitigation* document in August 2019.

WHY IS CLIMATE CHANGE AN ISSUE FOR THE SASKATCHEWAN BUSINESS COMMUNITY?

The evidence for anthropogenic climate change is overwhelming and undeniable. According to the United Nations (UN) International Panel on Climate Change (IPCC), since 1850 the change in the global surface air temperature over land has risen by almost 2 degrees Celsius.²⁰ This general warming trend manifests itself in Saskatchewan in the following ways. Saskatchewan’s average winter minimum temperature has increased to -16 degrees Celsius today from -22 degrees Celsius in 1965, which is a net increase of 6 degrees Celsius.²¹ In 2020, the province’s average frost-free growing season was 140 days – an increase of 36 days from a 106-day average recorded in the mid-1960s.²¹

According to research scientist and climatologist Virginia Wittrock at the Saskatchewan Research Council (SRC), statistical data suggests that the City of Saskatoon has been experiencing greater weather variability over time and that both the frequency and severity of extreme weather events in the province is greater than it was in the past. This has made forecasting extreme summertime rain episodes like droughts and floods, an already difficult task at the best of times, even more difficult.²²

Put simply, climate change is increasing the frequency and intensity of extreme weather events like droughts, floods, storms, and wildfires and this will have ramifications on peoples’ livelihoods, health, the ecosystem, commerce, and economy. This means increased uncertainty for the private sector.²³ Climate change will impact the market viability of flood and fire insurance for commercial enterprises, amongst others. Insurance companies face

the dual challenge of addressing escalating climate change risks and shifting industry regulations. Specifically, the Insurance Regulator State of Climate Risks Survey, conducted by the Deloitte Center for Financial Services, found: “A majority of insurance regulators expect all types of insurance companies’ climate change risks to increase over the medium to long term—including physical risks, liability risks, and transition risks”.²⁴ Further, more than half of the regulators surveyed also indicated that climate change was likely to have a high impact or an extremely high impact on coverage availability and underwriting assumptions.²⁵

Left unchecked, climate change will also impact how businesses get their goods to market. For example, many components of public infrastructure that help facilitate commerce like roads, bridges, sewers, and dams were originally built with tolerances that do not align with today’s climate and are thus less resilient to increasingly volatile weather patterns.

Climate change is fundamentally about risk. Businesses that account for and prudently manage the risks and costs associated with climate change before it threatens their business resilience will become more competitive. Taking it one step further, businesses that mitigate their own emissions through proactive investments early on will be ahead of the curve as doing so will hedge against the rising costs of emissions driven primarily by an annual escalating carbon price and accompanying regulations.

In 2020, Canada announced legislation to achieve net-zero emissions by 2050, along with a plan to set five-year emissions-reduction targets. One of the main components of Canada’s net-zero plan is an escalating carbon tax that will reach \$170/tonne by 2030. For a jurisdiction like Saskatchewan, whose high standard of living and comparative advantage in producing energy-intense, trade-exposed commodities is fueled quite literally by inexpensive fossil fuels, such as coal and natural gas, the province’s transition toward a low carbon economy will be difficult, expensive, and likely lead to stranding assets^c put in place over the past century to facilitate economic growth.²⁶

^c Stranded assets are those assets that at some time prior to the end of their economic life (as assumed at the investment decision point) are no longer able to earn an economic return (i.e., meet the company’s internal rate of return) as a result of changes associated with the transition to a low-carbon economy.



WHAT WE KNEW: AN OVERVIEW OF CLIMATE ACTIONS

Policies in Place

International Level

In 2016, 195 countries, including Canada, became signatories to the Paris Agreement (COP 21), a universal and legally-binding agreement that requires signatories to maintain the increase in the global average temperature to less than 2 degrees Celsius below pre-industrial levels, as well as pursue efforts that limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels.

In November 2019, the United States (US) under President Trump formally notified the UN that the US would withdraw from the Paris Agreement; however, in January 2021, President Biden signed an executive order to rejoin. The US' wavering on the Paris Agreement clearly highlights the complexities and challenges associated with attempting to coordinate global action that is dependent on various governments operating at the national and sub-national level who maintain incredibly diverse economic and political priorities.²⁷

According to the UN IPCC (2014), there is evidence to suggest that the planet's remaining carbon budget (the remaining amount of GHG emissions that can be released into the atmosphere while still being able to meet the Paris Agreement commitments) may be depleted by the

year 2028. If GHGs are emitted above and beyond this amount, which appears likely, the world will be unable to meet its Paris Agreement commitments.

Margot Hurlbert (Canada Research Chair, Climate change, energy and sustainability policy, Johnson Shoyama Graduate School of Public Policy, University of Regina) notes that most climate change scenarios in compliance with the Paris Agreement rely on a mix of negative emissions technologies (NET) (e.g., planting trees, expanding protected areas, biomass to biochar conversion, and other nature-based solutions); carbon dioxide removal (CRD) methods (e.g., direct air capture, carbon capture and storage (CCS) for coal and bioenergy); and clean energy technologies (e.g., wind, and nuclear).²⁸

National Level

Governments operating at the federal (and national level) employ four distinct types of legislative tools when dealing with GHG emissions:

- *Taxes* (e.g., economy-wide carbon levy on combustible fuels and Output-Based Pricing Systems on larger emitters) to induce a change in behaviour;
- *Greenhouse gas emission inventories and reporting* (e.g., federal Greenhouse Gas Reporting Program with expansion to provincial reports where similar data is collected in the provinces, submissions to the United Nations);

- *Mandated fuel switching* (e.g., biofuel supplementation in gasoline and diesel); and
- *Emissions Limits or Performance Standards* (e.g., emission standards for vehicles and industrial facilities, placing an upward limit on emissions for a given sector, mandating energy efficiency standards for equipment).²⁹

Emission reduction-related legislation at both the federal and provincial level is mostly applied to the following economic sectors: Oil and Gas, Electricity Generation, Transportation, Heavy Industry, Buildings, Agriculture, and Waste.³⁰

At the national level, in addition to its commitment to reduce GHG emissions by 30% below 2005 levels by 2030, Canada has committed to net-zero by 2050. To facilitate these goals, the government first introduced The Pan-Canadian Framework on Clean Growth and Climate Change (PCF), and then the Canadian Net-Zero Emissions Accountability Act. The PCF was Canada's first plan to fight climate change in accordance with its Paris Agreement emissions reductions goals. In December 2016, it was adopted by all provinces and territories except for Saskatchewan.³¹ Since then, Alberta, Manitoba, Ontario, and New Brunswick had provincial government changes that withdrew them from the plan. Despite initial non-agreement or later withdrawal from the provinces, the federal government has continued to move the emission reduction agenda forward through unilateral programs. The PCF was based on four pillars:

- Carbon pricing (economy-wide carbon levy on fuels, Output-Based Pricing System);
- Complimentary actions to reduce emissions (e.g., Clean Fuel Standard in 2022);
- Adaptation and climate resilience; and
- Clean technology, innovation, and jobs.

The main pillar outlined in the PCF - carbon pricing - has been the most controversial and is the main reason why then-Saskatchewan Premier Brad Wall refused to sign on to the PCF in 2016. The Government of Saskatchewan is legally challenging the federal government's ability to impose this tax and is awaiting a Supreme Court of Canada ruling as of February 2020. Until then,

where possible the province has implemented its own performance standards to replace the federal system; and the federal carbon pollution pricing system only applies to emission sources not covered by the provincial system. For example, Saskatchewan's Output-Based Performance Standards does not include electricity generation and natural gas transmission pipelines (these are subject to the federal standards) but does cover facilities from sectors that emit 25,000 tonnes or more of carbon dioxide (CO₂) equivalent annually, smaller facilities that emit 10,000 tonnes or more of CO₂ equivalent annually (who may voluntarily opt into the system), and upstream oil and gas over zero emissions.^d

Other key actions associated with the PCF that the federal government has continued to expand upon include the creation of methane emissions regulations (upstream oil and gas sector)^e, the accelerated phase-out of conventional coal-fired electricity generation by 2030, investment in zero emission vehicles (ZEVs) to reduce emissions in the transportation sector, the development of net-zero ready building codes, the adoption of a climate lens when evaluating federally funded infrastructure projects, and the creation of the Canadian Centre for Climate Services.³²

In July 2020, Environment and Climate Change Canada (ECCC) released its Strategic Assessment of Climate Change (SACC). SACC requires proponents of designated projects, and potentially some non-designated projects (such as those regulated by the Canada Energy Regulator or under regional assessments) to provide detailed information on GHG emissions and other climate change factors at each phase of the impact assessment process under the *Impact Assessment Act*, SC 2019, c 28, s 1 (IAA).³³ Under SACC, calculating a project's net GHG emissions estimate involves several calculations. First, net GHG emissions need to be calculated by taking the sum of a project's direct GHG emissions (i.e., generated by project activities) and acquired energy GHG emissions (i.e., energy acquired from third parties for the project) less any GHG mitigation factors (i.e., captured and stored CO₂, avoided domestic GHG emissions and offset credits). Secondly, project proponents must report the project's estimate GHG emission intensity. The SACC wants the intensity

^d Note: CO₂ eq. (also expressed as CO₂e) here refers to *carbon dioxide equivalents*. It is the standard unit in carbon accounting to measure and quantify GHG emissions over a defined time period. Because each GHG has its own global warming potential (GWP), carbon dioxide (CO₂) is used as the reference GHG that all other GHGs are compared to. CO₂e places all GHG emissions in relation to carbon dioxide, which is considered to have a GWP of 1. CO₂e translates emissions into a common unit that can be reported as a single combined quantity.

^e Through equivalency agreements, Saskatchewan utilizes the *Oil and Gas Emissions Management Regulations* to replace the federal regulations.

estimate to compare the project with similar project types in order to better situate the design within the larger project infrastructure context. “Lastly, proponents may also be required to provide an assessment of upstream GHG emissions based on its upstream GHG emissions threshold. Upstream GHG emissions include emissions from all stages of production of a project from the point of resource extraction or utilization, to the project under review.”³⁴ With this information, the SACC will assess the extent to which a designated project hinders or contributes to the Government of Canada's ability to meet its commitments in respect of climate change. In short, any new mines, pipelines, power plants and railways in Canada, as well as other types of assessed projects, will have to include a plan to hit net zero emissions by 2050 to have any hope of approval.

After the conclusion of the Saskatchewan Chamber of Commerce's consultation process on a low carbon economy but prior to the release of this paper, the federal government announced the *A Healthy Environment and a Healthy Economy* plan. The plan continues and expands upon many PCF measures. However, most notably, the federal carbon tax will increase to \$170 a tonne by 2030 (\$15 per tonne after 2022 until 2030). The plan includes 64 measures and \$15 billion in spending over ten years to plant trees, improve energy efficiency, increase the production and use of low-carbon fuels, enhance electrification, and more.³⁵ Shortly after the release of *A Healthy Environment and a Healthy Economy* plan the federal government also released the draft Clean Fuel Standard. The Clean Fuel Standard requires suppliers of liquid fuels, such as gasoline, diesel, and kerosene, to gradually cut the amount of carbon in their product. It is estimated that the CFS will amount to a net cost of \$94 per tonne of CO₂ eq. reduced.

Re-elected Saskatchewan Premier Scott Moe has continued with the Wall-era policy of stridently opposing a federally imposed carbon price in Saskatchewan.³⁶ The current provincial government's main argument is that carbon pricing is negligible in abating global emissions and will do tremendous harm to the province's largely energy-intensive trade-exposed (EITE) resource-dependent economy. The provincial government's preferred policy approach has relied on the adoption of emission mitigating technologies, like CCS at Boundary Dam #3, as well as the uptake of cleaner renewable energy, such as wind and solar.³⁷

Other national level legislation and regulations (aside from the *Greenhouse Gas Pollution Pricing Act*) that deal with GHG emissions include the *Canadian Environmental Protection Act* (1999) and the various regulations contained under the Act, *The Railway Safety Act* (1985), which establishes emissions standards and idling restrictions for locomotives operating under federal jurisdiction, and *The Canada Shipping Act* (2001), which establishes emissions and energy efficiency standards for large vessels operating in Canadian waters.³⁸ The Greenhouse Gas Reporting Program (2004) requires facilities that emit 10 Mt (or 10,000 tonnes) of CO₂ equivalent per year to report their emissions.³⁹

Provincial Level

At the provincial level, Saskatchewan's main emissions reduction document is *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy*. Released in December 2017, *Prairie Resilience* is the province's overarching strategy and outlines provincial government commitments across five areas designed to make the province more resilient to the climatic, economic, and policy impacts of climate change. *Prairie Resilience* establishes a sector-specific Output-Based Performance Standard (OBPS) for regulated facilities to reduce their GHG emissions. Most industrial facilities in Saskatchewan are regulated under the provincial OBPS, whereas electricity generation (SaskPower) and natural gas pipeline transmission (SaskEnergy) activities are regulated under the federal OBPS.

In terms of compliance, for both the provincial and federal OBPS, if a regulated facility outperforms its annual emissions intensity (emissions per unit of production) performance standard, it can earn and bank a credit; if it simply meets the standard, it will avoid having to pay a penalty; and if it cannot meet the standard, it will have to pay a penalty based on the established carbon price per tonne for that year. Regulated emitters will have the ability to acquire or purchase carbon offsets to satisfy their performance obligations. Both the provincial and federal OBPS came into force and effect in January 2019.

The Saskatchewan Technology Fund was established in law through *The Management and Reduction of Greenhouse Gases Act, 2018*. The fund primarily consists of two payment sources: compliance payments from regulated emitters under the Ministry of Environment's OBPS program, and penalty payments from emitters under The Oil and Gas Emissions Management Regulation

(Saskatchewan's methane regulations). The Fund, which expects initial payments from emitters' in 2021, will be used to enable investment in transformative technologies and innovation to reduce greenhouse gas emissions in the province.⁴⁰ Enabling this investment is essential to transitioning to a low carbon economy, and the creation of the Technology Fund was an important step for the province. In the *A Healthy Environment and a Healthy Economy* plan, the federal government also announced that proceeds collected from the Output-Based Pricing System (OBPS) for industry will be used to further support industrial projects to cut emissions and use cleaner technologies and processes.

In addition to establishing a provincial OBPS for large industrial emitters, *Prairie Resilience* also commits the provincial government to demonstrating progress on climate change resilience actions by means of tracking and reporting requirements, retrofitting government-owned buildings to improve energy performance, and more. The third and final component of *Prairie Resilience* is a Methane Action Plan that outlines the government's approach to reducing GHG emissions from venting and flaring activities associated with the province's upstream oil and gas activities.⁴¹

According to the Government of Saskatchewan, the focus of *Prairie Resilience* is on resilience, which means the ability to cope with and adapt to, recover from stress and change. The Government of Saskatchewan describes the relationship between adaptation and mitigation in a more intricate and nuanced fashion than just treating adaptation and mitigation as a zero-sum, either/or binary and as such, it believes that the solution is not as deceptively simple as "if we lower carbon emissions and prepare for change, we should be better off in the long run." Mitigating emissions in a sustainable fashion is important and how that action is carried out makes climate policy a delicate balancing act among competing options.

A criticism among those who take a more critical view of the provincial government's approach to climate change is that it emphasizes a reliance on adaptation measures at the expense of more robust GHG mitigation measures. While *Prairie Resilience* does reference Canada's Paris Agreement commitment to reduce GHG emissions by 30% below 2005 levels by 2030, it does not explicitly state that the province is committed to this target.⁴² *Prairie Resilience* does mention the SaskPower-specific target of up to 50% electricity generated from renewable sources

by 2030. Since the introduction of *Prairie Resilience*, the provincial government has been amending various pieces of legislation to support the strategic policy direction of the framework. Furthermore, the Government of Saskatchewan's government-wide "Climate Resilience Measurement Framework" has a suite of measures that demonstrate how the province is increasing resilience to climate change.⁴³ Specifically, this framework reports on five key areas: natural systems, physical infrastructure, economic sustainability, community preparedness, and human well-being.

While some provinces group together multiple GHG emission regulations under one umbrella piece of legislation (e.g., Ontario), the preferred approach taken by Saskatchewan is a one-for-one pairing of a legislative act with a single piece of regulation under it.⁴⁴ In addition to the actions articulated in *Prairie Resilience*, legislations and regulations that cover GHG emissions include *The Ethanol Fuel Act* (2002) and *The Renewable Diesel Act* (2002), requiring that all gasoline (7.5%) and diesel (2%) sold or consumed in the province contain a minimum amount of biofuel; *The Oil and Gas Conservation Amendment Act* (2019), which regulates the flaring and venting of methane in the upstream oil and gas sector; and *The Management of Greenhouse Gases Act* (2018) that imposes reporting requirements on all facilities that emit 10,000 tonnes of CO₂ eq. or more annually, creates an OBPS for large industrial emitters, and imposes a hard cap on emissions in electricity generation.⁴⁵

CANADA AND SASKATCHEWAN GHG EMISSIONS PROFILES

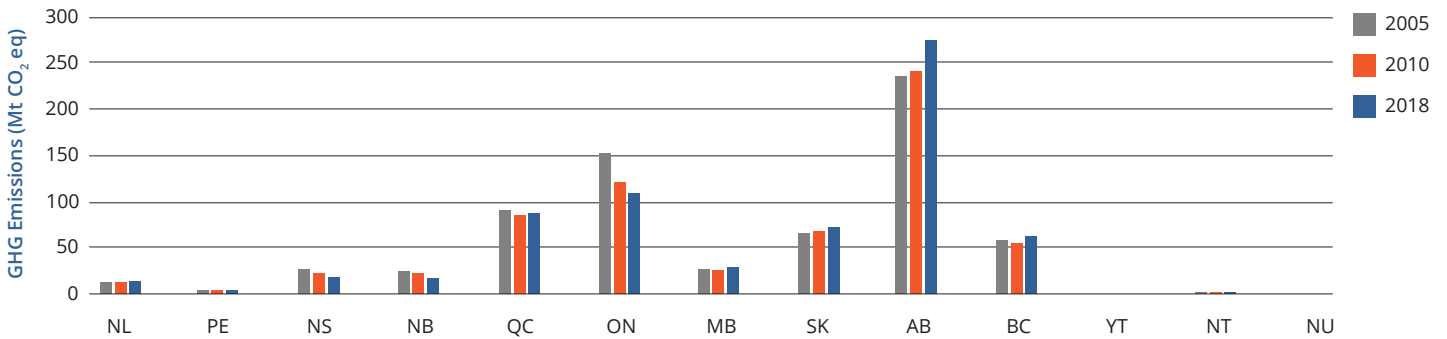
Canada

Before delving into the numbers, it is important to know from the outset that GHG emission levels vary widely across Canada due to factors such as economic structure and pattern of development, population, climate, geographical location, and energy sources used. Overall, Canada’s annual GHG emission profile is similar to other advanced economies.⁴⁶ Holding all other variables constant, economies based on resource extraction or are goods-oriented will generate more emissions than service-oriented economies. Provinces whose electricity

generation relies to a greater degree on hydrocarbons like coal and natural gas will emit, in relative terms, more GHG emissions than provinces that rely more on cleaner sources like nuclear and hydroelectricity.⁴⁷

Looking at the emission levels of the two largest emitting provinces (Alberta and Ontario) across selected years (2005, 2010, 2018), the data suggest that each province’s emission trendline diverged significantly. Alberta’s emissions increased considerably, mainly as a result of an expansion of economic activity in the province’s oil and gas sector, while emissions in Ontario declined significantly over the same period due primarily to the phase out of conventional coal-fired plants in the province (see Figure 1).⁴⁸

FIGURE 1: EMISSIONS BY PROVINCE AND TERRITORY IN 2005, 2010, 2018



Source: Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.



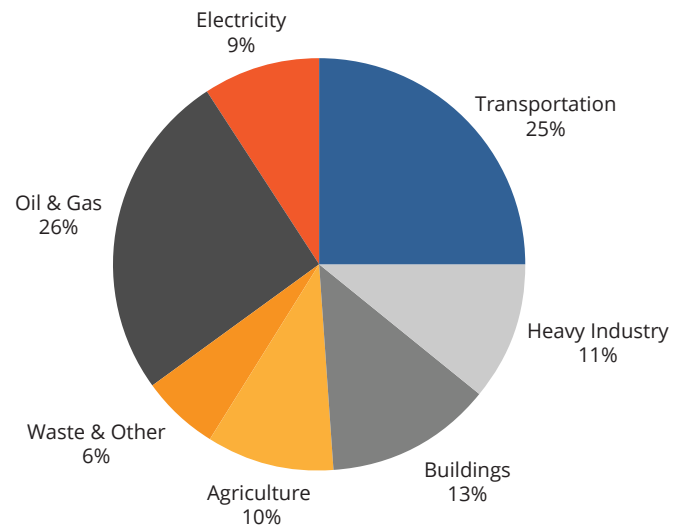
Photo by Tandem X Visuals

According to the 2018 data in Environment and Climate Change Canada's (ECCC) *National Inventory Report*, Canada generated a total amount of 729 megatonnes (Mt) (or 729 million tonnes) of CO₂ eq. in 2018. To put this into perspective, Canada's share of total global emissions is almost 2%. Canada's overall emissions for several years hovered between 700 to 720 Mt CO₂ eq. and increased to 729 Mt CO₂ eq. for 2018. Canada's incremental increase of 15 Mt CO₂ eq. from 2017 was driven by several factors, including a colder winter season, increased fuel consumption by vehicles, increased production in the oil and gas sector, and an increase in the use of hydrocarbons in the industrial sector. These emission increases were offset by decreases in electricity generation as the province continues to transition its electricity generation to alternate sources.⁴⁹

When measured on a per capita basis, Canada consistently ranks as one of the largest emitters in the world. For 2018, Canada's per capita emissions were 19.7 Mt CO₂ eq./capita. While Canada's emissions per capita are among the highest in the world, they have dropped since the mid-2000s (22.6 Mt CO₂ eq./capita) and reached their lowest point thus far in 2017 (19.5 Mt CO₂ eq./capita). Moreover, from an emissions intensity standpoint (GHG emissions per GDP), Canada has declined by over one-third (36%) since 1990 and by one-fifth (20%) since the mid-2000s; this trend suggests that Canada's economy is growing faster than its emissions on an annual basis and is decoupling GHG emissions from economic growth.⁵⁰

Breaking down Canada's GHG emissions by economic sector (see Figure 2), in 2018, Oil and Gas accounted for 26%; Electricity Generation accounted for 9%; Transportation 25%; Heavy Industry 11%; Buildings 13%; Agriculture 10%; and Waste and Others at 6%. When comparing Canada's GHG emissions by economic sector over the selected years (1990, 2005, 2015, 2018), (see Figure 3), growth in Oil & Gas emissions is noticeable, along with growth in emissions from the Transportation sector. Growth in emissions in Oil & Gas and Transportation are offset by declines in emissions attributed to Electricity Generation and Heavy Industry during that same period.

FIGURE 2: 2018 CANADA GHG EMISSIONS PROFILE BY ECONOMIC SECTOR

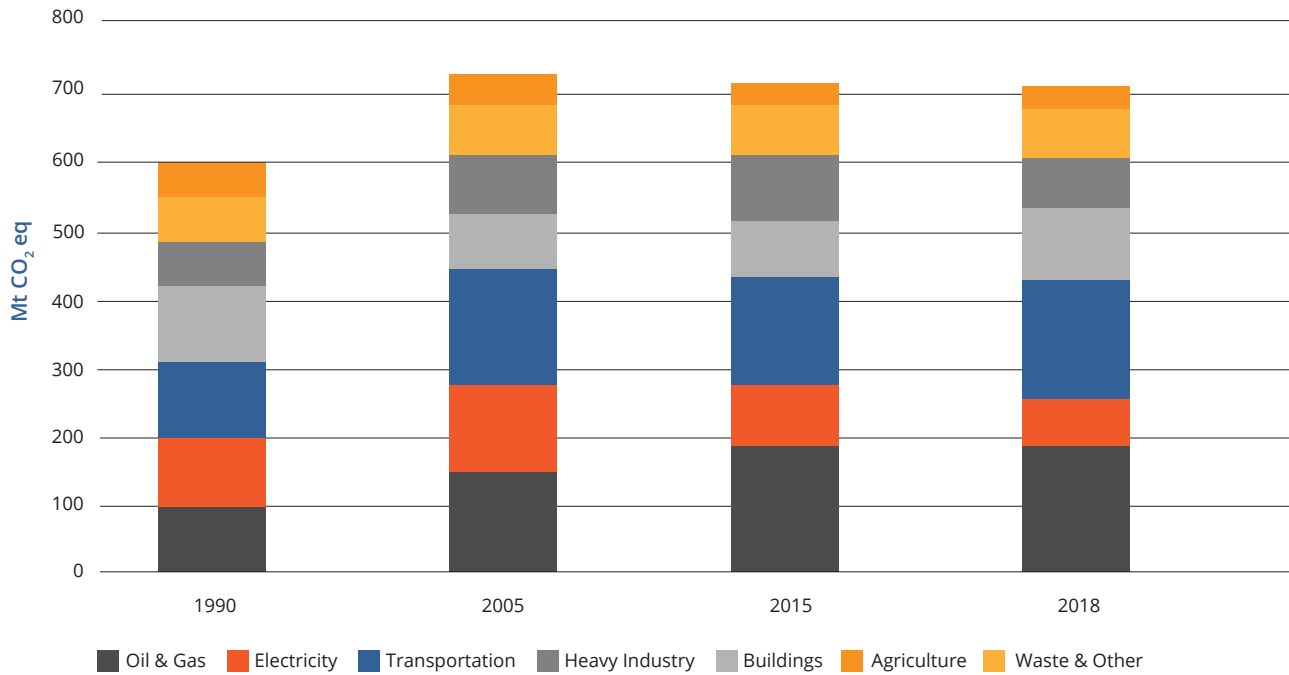


Total = 729 megatonnes (Mt) CO₂ equivalent (eq)

Source: *Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.*

When breaking down Canada's annual total GHG emissions for 2018 by greenhouse gas, carbon dioxide (CO₂) accounts for 80% of all GHG emissions generated in Canada due to the combustion of fossil fuels. Methane (CH₄) emissions accounted for the second largest portion of Canada's overall GHGs with 13%. The main sources of methane emissions include fugitive emissions associated with oil and natural gas systems, enteric fermentation in agriculture, and landfill operations. Nitrous oxide (N₂O) emissions accounted for 5.2% of all emissions, resulting mostly from soil management practices in agriculture and, to a lesser extent, activities in the Transportation sector. Synthetic GHGs, like hydrofluorocarbons (HFCs) primarily used for refrigeration, perfluorocarbons (PFCs) in industrial applications, sulfur hexafluoride (SF₆) commonly used in electrical applications, and nitrogen trifluoride (NF₃) typically used in the manufacturing of semi-conductors and LCDs, accounted for just under 2% of Canada's emissions.⁵¹

FIGURE 3: CANADA GHG EMISSIONS BY SECTOR, SELECTED YEARS



Source: Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.

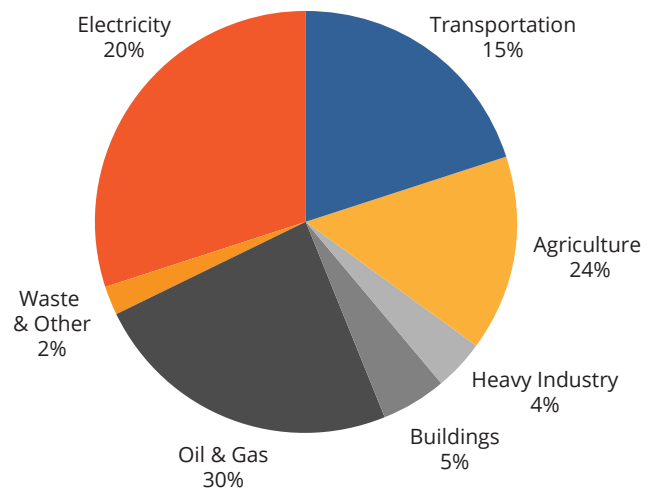
Saskatchewan

Between 2005 to 2018, Saskatchewan’s emissions grew by 12%.⁵² Since 1990, when National Inventory Reporting began, Saskatchewan’s emissions have grown 75%.⁵³ In 2018, Saskatchewan’s reported emissions were 76.4 million tonnes CO₂ eq., accounting for approximately 10.5% of Canada’s total emissions. Comparing total emissions by province in 2018 (Figure 1), Saskatchewan had the fourth highest emissions in Canada, behind more populous provinces like Alberta (273 Mt CO₂ eq.), Ontario (165 Mt CO₂ eq.), and Quebec (83 Mt CO₂ eq.). However, when measured on a per capita basis, Saskatchewan is the largest emitter in Canada; in fact, Saskatchewan’s emissions per capita are among the highest in Canada and in the world.⁵⁴

Breaking down Saskatchewan’s reported emissions by economic sector in 2018 (see Figure 4), Oil and Gas represented 30% of emissions, Electricity Generation 20%, Transportation 15%, Heavy Industry 4%, Buildings 5%, Agriculture 24%, and Waste and Other with 2%.

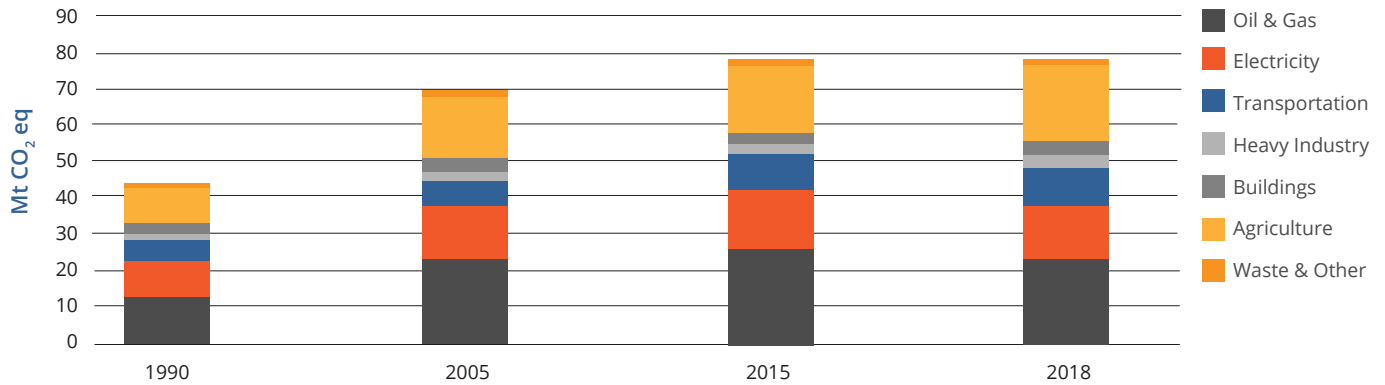
Comparing Saskatchewan’s GHG emissions by economic sector across the selected years of 1990, 2005, 2015, and 2018, take note of the larger trend in the annual growth of emissions in aggregate and across the seven individual economic sectors (see Figure 5).

FIGURE 4: 2018 SASKATCHEWAN GHG EMISSIONS PROFILE BY SECTOR



Source: Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.

FIGURE 5: SASKATCHEWAN GHG EMISSIONS BY SECTOR, SELECTED YEARS



Source: Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.

Despite this trend, there is some good news to report on the emissions front. While Saskatchewan’s annual emissions in absolute terms grew 12% from 2005 – 2018, the province’s GHG *emissions intensity* actually declined by 12% while the provincial economy grew by 25% between 2006 – 2014.⁵⁵ Like Canada, there is evidence to suggest that Saskatchewan is decoupling growth from emissions, albeit at a smaller magnitude.

Saskatchewan’s high emission levels are driven historically by the use of fossil fuels in upstream oil and gas production, electricity generation (coal and natural gas-fired plants), and agriculture.⁵⁶ According to the ECCC’s latest *National Inventory Report* figures, as a percentage of total annual emissions, in 2018 the three largest emitting economic sectors in Saskatchewan were Oil and Gas (30%), Electricity Generation (20%), and Agriculture (24%). Since 2003, transportation emissions have increased 78% while emissions from residential buildings have declined by 7%.⁵⁷

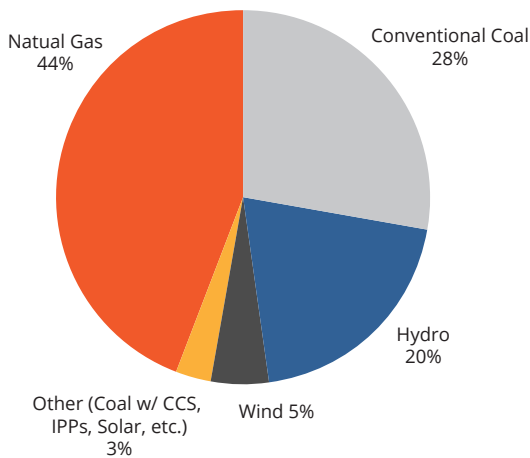
Saskatchewan is the second largest producer of crude oil (mainly conventional heavy oil) in Canada, behind Alberta, and accounts for about 10% of Canada’s total crude oil production. Most of the emissions generated in Saskatchewan’s oil and gas sector can be attributed to production, processing, and transmission, while a much smaller proportion is related to petroleum refining (downstream) and natural gas distribution.⁵⁸

Moreover, Saskatchewan’s electricity generation sector emits the second largest amount of GHGs, behind Alberta. Given the goods producing, resource-based nature of the Saskatchewan economy, the largest consumers of power have been industrial users by a significant

margin, followed by commercial users and residential users. Saskatchewan alone accounts for 21% of Canada’s total emissions resulting from power generation. When measured on a per capita basis, Saskatchewan’s electricity consumption is the second highest in Canada, consuming over one-third (37%) more than the national average.⁵⁹ The Saskatchewan electricity generation sector has the second highest GHG emissions intensity in Canada.⁶⁰ This is unsurprising data as both Saskatchewan and Alberta rely heavily on fossil fuel-based sources, particularly coal-fired generation.⁶¹

According to the most recent available data from SaskPower on its current power mix (see Figure 6), natural gas and conventional coal accounted for 44% and 28% of available generating capacity (4,493 MW total), respectively. Therefore, power generation from fossil fuel sources currently accounts for almost three-quarters (72%) of total available generating capacity.

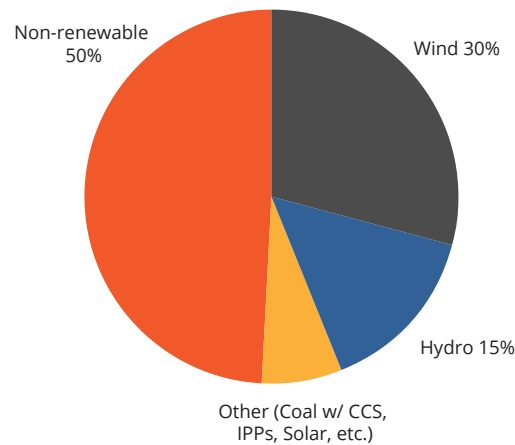
FIGURE 6: SASKATCHEWAN'S CURRENT POWER MIX 2020



Available Generating Capacity 4,993 MW

Source: Adapted from SaskPower, *Balancing Supply Options - Our Energy Mix, 2020*

FIGURE 7: SASKATCHEWAN'S FUTURE POTENTIAL POWER MIX



Generating Capacity 7,000 MW

Source: Adapted from SaskPower, *Plans for a Sustainable Power Future - Saskatchewan Renewable IPP and Supplier Information Session Regina, SK, November 17, 2016*

The Government of Saskatchewan announced a climate goal for electricity generation of a 40 per cent annual reduction in greenhouse gas emissions from 2005 levels by 2030.⁶² As part of their contribution, SaskPower announced it would double the percentage of renewable generating capacity from the then-current (2015) 25% to 50% by 2030 (see Figure 7). To accomplish this, SaskPower announced it would undertake the following actions:

- Add 60 MW of ground solar generation by 2021
- Procure 10 MW of utility-scale solar
- Increase wind power capacity from 221 MW to roughly 2100 MW by 2030
- Add 350 MW of natural gas generation (Chinook) to support intermittent renewables
- Announced site considerations for another 350 – 700 MW natural gas generation project (announced in 2020 as the Moose Jaw Natural Gas Plant)
- Signed a power purchase agreement (PPA) with Deep Earth Energy Production (DEEP) to allow for future research toward the feasibility of a baseload geothermal source located near Estevan
- New flare gas power projects that provide a combined 1.75 MW of electricity to the electrical grid⁶³

As these commitments are developed, and industry continues to reduce its output emissions, Saskatchewan's emissions profile will change significantly over the next decade.

This shift to greener energy, and a low carbon economy overall, will be expensive for Saskatchewan, requiring a substantial investment. In September 2020, the Institute for Sustainable Finance released *The Capital Mobilization Plan for a Canadian Low Carbon Economy*, which concluded that Canada requires an investment of \$128 billion over the next 10 years to achieve its 2030 emission reduction targets (see Table 2).⁶⁴ However, this report also went further and looked at the required investments for Saskatchewan:

"The "weighted average abatement cost" for each province and territory is achieved by adding the proportional costs of each sector that contributes to that jurisdiction's emissions. For example, Saskatchewan's top three emissions drivers are Oil & Gas, Agriculture, and Electricity. The province's weighted abatement cost of \$150/ tCO₂eq factors in the proportional costs of those three main drivers (as well as those of other, smaller, contributing sectors). We calculate a jurisdiction's required investment by multiplying its weighted cost by the amount of emissions it is required to reduce. The latter figure is simply a product of that jurisdiction's "share" of Canada's

789 million tonne reduction requirement, based on its current contribution to overall emissions."⁶⁵

For Saskatchewan, its share of required reductions is equal to 82.7 Mt. CO₂ (or 10.5% of 789 Mt. CO₂). Given Saskatchewan's weighted abatement cost is \$150/ tCO₂eq (a product of the proportional costs of its emissions drivers), its total required investment is roughly \$12.4

billion over the next 10 years.⁶⁶ This means Saskatchewan will require over 9.6% of Canada's investment into a low carbon economy despite being home to only 3.1% of its population.

TABLE 2

Total Weighted Average Abatement Cost for Canada Breakdown

SECTOR	PROPORTION (%)	AVERAGE COST (\$/T CO ₂ EQ)	ABATEMENT REQUIRED (MT. CO ₂ EQ)	REQUIRED INVESTMENT (\$ MILLIONS)
Oil & Gas	27	126	209	26,329
Transportation	24	283	186	52,656
Buildings	11	123	88	10,847
Electricity	10	214	76	16,252
Heavy industry	9	126	75	9,391
Agriculture	9	88	74	6,455
Waste & others	5	139	41	5,660
Land use & Forestry (LULUCF)	5	14	39	545
TOTAL			789	128,125

Source: Simon Martin and Ryan Riordan, "Capital Mobilization Plan for a Canadian Low-Carbon Economy." Institute for Sustainable Finance (September 2020)





WHAT WE HEARD: BACKGROUND ON THE SCC RECOMMENDATIONS

While diverse in perspective and area of focus, the written submissions and consultation input the Saskatchewan Chamber of Commerce received contained several reoccurring and overarching themes. These included business competitiveness, energy efficiency, clean energy, workforce development, and accounting for natural infrastructure. Each of these themes is discussed in greater detail below.

Business Competitiveness

Ensuring that Saskatchewan business survives and thrives in a globally competitive marketplace throughout its transition to a low carbon economy was top of mind among participating businesses in the Chamber's low carbon economy conversations. Saskatchewan was Canada's 6th largest economy in 2018, with an annual real GDP growth rate of 2.1%, slightly above the national average of 2.0%.⁶⁷ The 2018 GDP per capita was \$71,000, over one-third (36%) higher than the Canada-wide GDP per capita figure. Saskatchewan's advantage is mainly due to the worker productivity gains associated with having more capital-intensive sectors.⁶⁸

Saskatchewan is a predominantly energy-intensive, trade-exposed (EITE), goods-producing economy. Goods-

producing sectors like oil and gas, mining, agriculture, and forestry account for half of the provincial GDP.⁶⁹ Exports accounted for about 37% of Saskatchewan's total GDP in 2018. Many of these goods-producing sectors involve businesses who sell a commodity; by definition, commodities are a largely undifferentiated raw material with plenty of substitute options sold on competitive international markets (e.g., steel, grain, potash, crude oil, uranium). Because commodity producers are by nature price-takers (highly competitive global markets determine the price), their ability to pass along the incremental costs associated with carbon taxes and added regulations to customers is virtually non-existent.

Given that Saskatchewan's economy developed on the availability of plentiful and relatively inexpensive energy, combined with the fact that international competitors like the USA, China, India, etc. do not face the same kind of environmental regulatory costs Canadian operations do, there will be pressure on Saskatchewan businesses as costs increase but prices do not.⁷⁰ This could lead to businesses relocating (a.k.a. carbon leakage) or closing altogether.

There are three ways through which a business can end up paying a carbon tax. First, a carbon tax can be directly collected on the emissions made by large emitters – this is where the Output-Based Performance Standard (OBPS) is applied. Secondly, businesses pay the tax directly on

the fossil fuels they purchase (e.g., per load of diesel they utilize on site); and thirdly, businesses pay the carbon tax when it is passed onto them through other business inputs (e.g., SaskPower charges customers more to recoup its increased cost of production due to the collection of a carbon tax on its outputs). These incremental cost increases everywhere, in addition to the compliance costs associated with operating in a highly regulated environment, can often overwhelm businesses. Businesses are particularly sensitive when, as outlined above, the regulated and taxed producers do not control their market and their competitors are not facing the same regulation and taxation.

Magnifying this problem is the fact that the federal government has not appropriately recognized that there are some industry activities that have fixed, unavoidable carbon emissions with no proven, commercially viable low carbon alternatives to production processes in the near term. The broad application of the carbon tax without consideration of market control and viable alternatives disproportionately damages Saskatchewan companies.

1

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal government reevaluate the structure and broad imposition of the carbon tax to address the lack of complete market control needed to make such taxes work without carbon leakage, with current technology limitations, and with the lack of viable low carbon alternatives available to specific industries, processes, and regions.

The carbon tax has not been the federal government's only approach to GHG emission control. The federal government has unleashed numerous initiatives to accelerate the transition to a low carbon economy. In addition to the Pan-Canadian Framework on Clean Growth and Climate Change (which introduced carbon pricing) and the *Canadian Environmental Protection Act* (1999) and its associated regulations to control GHG emissions, new regulations/ initiatives include: the commitment to net-zero, presented through the *A Healthy Environment and a Healthy Economy* plan, which contained 64 measures

including increasing the carbon tax by \$15 per tonne after 2022 until it reaches \$170 per tonne in 2030; the Hydrogen Strategy for Canada; the creation of a Canada Water Agency; Canada's Small Modular Reactor Action Plan; the potential Federal Greenhouse Gas Offset System; and the Clean Fuel Standard (CFS). Additionally, the Strategic Assessment of Climate Change (SACC) involves extensive emission information requirements for project proponents navigating the federal impact assessment process. Other national level legislation and regulations aside from those outlined above that deal with GHG emissions include The Greenhouse Gas Reporting Program (2004), which requires facilities that emit 10 Mt (or 10,000 tonnes) of CO₂ equivalent per year to report their emissions, *The Railway Safety Act* (1985), which establishes emissions standards and idling restrictions for locomotives operating under federal jurisdiction, and *The Canada Shipping Act* (2001), which establishes emissions and energy efficiency standards for large vessels operating in Canadian waters.⁷¹ In several areas, these federal regulations/ initiatives overlap with provincial ones. The combination of these regulations and policies create difficult and burdensome requirements for businesses to make sense of. It is also important to note that in many instances Saskatchewan is impacted to a greater degree than other Canadian jurisdictions simply due to its geography (i.e., distance to ports increase costs via CFS and the Output-Based Pricing System (OBPS)).

All the regulations, policies, and initiatives outlined above have an impact on businesses and none of them operate independently. Instead, they compound together to increase the cost of doing business in Saskatchewan and in Canada. This concern is not limited solely to the costs generated by GHG emission regulations, but the overall cumulative impact of the growing burden imposed by fees, taxes, and regulations that the private sector is facing.⁷² The ability for companies within Canada, and particularly Saskatchewan, to grow and compete in the global marketplace is being threatened, as is the country's ability to attract global investment. To date, the federal government has given very little consideration to the combined impact of its environmental policies. The federal government needs to consider how these policies work together and overlap with each other in order to prevent the unintended consequences of too much regulation on competitiveness.

2

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal government conduct a thorough evaluation of the impacts of the current environmental legislation and regulation to identify opportunities for harmonization and streamlining, as well as the ultimate amounts of, and opportunities to reduce, the government-imposed cost to business.

3

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

That under no circumstances should the federal government make targets more challenging or change the standards businesses are measuring success against prior to the conclusion of the already overly ambitious agenda announced.

Regardless of the flaws inherent in the carbon tax and the overlapping regulatory system, the federal government has given every indication that it will continue to move forward with this approach. Bracing for this future, challenges articulated by member businesses related to business competitiveness in a low carbon economy included: feasibility of targets, carbon leakage issues, and sustainable finance and risk management practices. Members also expressed concern over the practicality of the timeframes outlined by government. It is important to note that many Saskatchewan companies/industries are already world leaders in environmental performance relative to global competitors so improving upon the environmental protection measures already in place is not a simple task. The deadline for achieving the Government of Saskatchewan's climate change objectives as outlined in *Prairie Resilience* and the Government of Canada's net zero mandate are ten and thirty years' away, respectively. These goals are going to stretch capacity, innovation, and technology beyond known levels. Providing industry with adequate adaptation time and consistent goals must be the primary consideration of all climate change policy and planning going forward.

Carbon Leakage Issues

Carbon leakage is an unintended consequence of carbon pricing whereby actions undertaken to reduce emissions (like implementing a tax or regulation) results in more emissions in another, typically competing, jurisdiction. The Conference Board of Canada aptly describes carbon leakage as "a simple concept that is challenging to measure."⁷³ Carbon leakage can manifest itself in two ways. The first is by relocating production; as jurisdictions price carbon differently (or not at all), production over time will shift from the more expensive jurisdiction to the less expensive jurisdiction. This is because the price of goods from jurisdictions that price carbon lower or not at all become more attractive on international markets. The second form of carbon leakage is by shifting trade between countries. To reduce its own direct emissions, a jurisdiction can import a larger share of a product it would normally produce; however, these imported products will contain embedded carbon that is either unpriced or priced lower.

Challenges and Opportunities

The federal Output-Based Pricing System and the provincial Output-Based Performance Standard (OBPS) were designed with carbon leakage concerns in mind, which is why regulated emitters subject to the OBPS only have to pay the carbon price on a certain portion of their emissions since having to pay the carbon price on every unit of emission generated would render these energy-intensive, trade-exposed sectors uncompetitive. While both the federal and provincial OBPS do take carbon leakage issues into account, they are limited and do not address the full impact of carbon pricing. Businesses operating in jurisdictions with carbon pricing

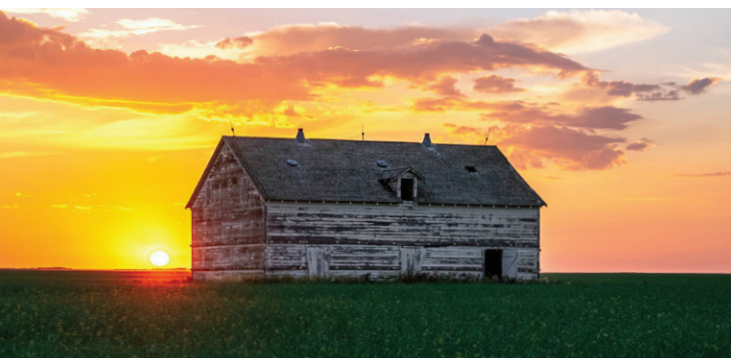


Photo by Tandem X Visuals

experienced a higher price on all their inputs (e.g., for Saskatchewan, the price of power purchased is higher because SaskPower passes the carbon cost through to customers). Multiple incremental cost increases and the cumulative costs of carbon pricing, in addition to the compliance costs associated with operating in a highly regulated environment, can often overwhelm businesses. Both the federal and provincial government need to do a better job of recognizing and addressing this competitive disadvantage.

Both forms of carbon leakage can lead to a reduction in the net benefit to the global environment. In some cases, it can even lead to a net *increase* in global emissions through both more emissions in production and more emissions generated by the transportation of excess imports.⁷⁴ To account for some of this differential, a disadvantaged jurisdiction can levy a tariff on imported goods. In Canada's 2020 Fall Economic Update, Ottawa announced it will be exploring the possibility of border carbon adjustments, where a fee is imposed on imports from countries without carbon pricing so foreign products do not undercut those produced in Canada by companies subject to Canadian carbon pricing systems. While currently in its earliest stages, this concept has the potential for both positive and negative impacts; thus, proper design is of the utmost importance.

GHG emissions do not respect or adhere to political boundaries – this is a global issue. Historically, most jurisdictions' policies have been designed to focus narrowly on emissions generated directly within their own jurisdiction, leaving carbon leakage issues significantly unaccounted for, although this appears to be changing. Like Canada, a discussion is also currently occurring in Europe on the development of a border carbon adjustment mechanism. Furthermore, the election of President Biden in the United States has also opened the potential for similar policies in the USA. Both Canada and Saskatchewan would benefit from closely examining these developments and match positions, as needed, so as not to be eclipsed or pinned in international trade. Similar to the broader issue of climate change, Canada acting alone has limited value.

4

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal government must consult with diverse industries and regional representatives prior to the implementation of border carbon adjustments. Canada must also closely examine the development of a carbon border adjustment mechanism currently underway in other jurisdictions and incorporate developments, as needed, to protect Canada's international trade position.

Sustainable Finance & Risk Management

The global discussion on climate change and the control of GHG emissions is a universal issue, however, worldwide agreement among political leaders continues to be elusive, although the Paris Agreement was notable progress. Even in the absence of a political agreement regarding the adoption of rules and guidelines for more ambitious climate-related actions, large companies and investors with large portfolios are generally in alignment. Large institutional investors are beginning to take note of the risks associated with climate change and are incorporating Environmental, Social, and Governance (ESG) considerations into their investment mandates. As such, funding for fossil-fuel based projects is expected to decrease.⁷⁵ Furthermore, several climate-related financial disclosure protocols either exist or are in the process of being developed. Several international entities comprised of industry experts are developing climate-related risk disclosures for use by companies to provide information to stakeholders, such as investors, lenders, insurers, and others.⁷⁶ The International Organization for Standards (ISO) is developing a green financing standard, ISO 14030, to help identify green investments.⁷⁷ Here at home, the Canadian Standards Association (CSA) is currently developing a framework tailored for Canada's low-carbon transition.⁷⁸ This trend is set and growing, demonstrating that environmental performance will impact investment attraction in the private sector. This presents challenges for businesses looking to improve their environmental performance as the availability of capital to fund uneconomical emission reduction projects is sparse, businesses continue to prioritize a high return-on-investment, but high performance is desired.

Challenges and Opportunities

The emergence of climate-related financial disclosure tools creates both challenges and opportunities for Saskatchewan and its economy. The hodgepodge of different climate-related financial disclosure protocols and their differing reporting methodologies makes for a fragmented and inconsistent evaluation process for relevant stakeholders.⁷⁹ Also, certain kinds of climate-related financial disclosures, such as the frameworks developed in the EU, are not well-suited to dealing with some activities related to the Canadian (and Saskatchewan) industries and resource extraction.⁸⁰

The other challenge has to do with access to accurate, timely, and useful data. For example, the data released through ECCC's *National Inventory Report* (NIR), the *National Pollutant Release Inventory* (NPRI) and the *Greenhouse Gas Reporting Program* (GHGRP) lags two to three years despite industry collecting this information annually and reporting it on June 1 of the next year. Since the federal government has repeatedly stressed the importance of emission control to industry and the general public, they should focus appropriate resources towards ensuring accurate, timely, and useful data is available for decision-making by the end of the year following the reported year. Access to reliable, timely data could also help facilitate the establishment of a broad carbon accounting system which includes monetization of emissions with systems that support emissions trading. Moreover, the Intergovernmental Panel on Climate Change (IPCC) for the United Nations and the Government of Canada differ in their approach to classifying economic sectors, creating inconsistency for stakeholders. A harmonized approach would be considerably more beneficial.

In terms of opportunities, Saskatchewan is well poised for sustainable investment in renewable energy sources like wind, solar, and geothermal given the province's largely unrealized potential in these areas.⁸¹ Getting the policy signals right will be crucial to realizing the investment potential here. The emergence of climate-related financial disclosure also presents a unique opportunity for Saskatchewan businesses, particularly ones involved in resource extraction, to tell their story and manage the narrative to their benefit. Saskatchewan has a comparative advantage in areas like agriculture, oil and gas, potash, uranium mining, etc. and should capitalize on its reputation as an ethical, quality-oriented producer of goods in these areas.

5

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal government focus appropriate resources towards ensuring accurate, timely, and useful data is available for decision-making.

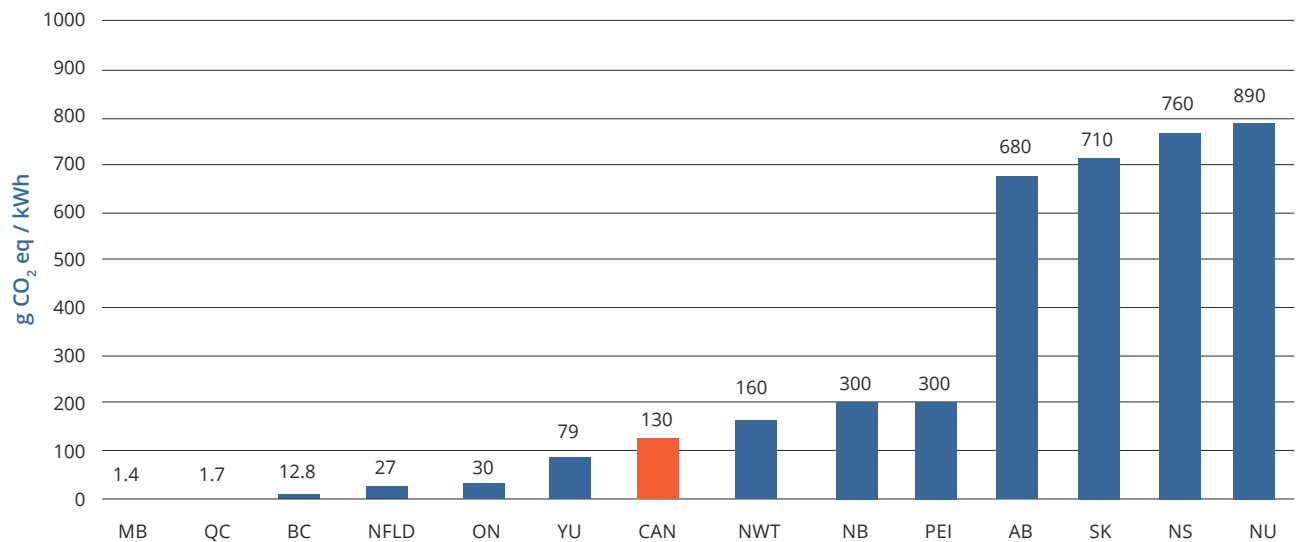


Energy Efficiency

Several submissions highlighted that in the short-term, increasing energy (and material) efficiency is the best way to simultaneously reduce GHG emissions and improve competitiveness.⁸² The merits of encouraging energy efficiency are numerous. Promoting energy efficiency is the logical first step to reducing emissions, as well as the lowest cost option for a low carbon transition. To better illustrate the “value for money” an energy efficiency project has in Saskatchewan relative to other provinces, in 2018 Saskatchewan recorded the third highest electrical consumption intensity numbers among provinces and

territories at 710 g CO₂ eq. per kWh (see Figure 8). Only Nunavut (890 g CO₂ eq. per kWh) and Nova Scotia (760 g CO₂ eq. per kWh) had higher electrical consumption intensity numbers than Saskatchewan. Saskatchewan’s electrical consumption intensity numbers are 5.5 times greater compared to the Canada-wide average of 130 g CO₂ eq. per kWh. Considering this, when compared to Manitoba (1.4 g CO₂ eq. per kWh), an energy efficiency project in Saskatchewan’s electrical sector has about 507 times more environmental benefit than one in Manitoba, all else being equal.

FIGURE 8: ELECTRICITY CONSUMPTION INTENSITY BY PROVINCE AND TERRITORY, 2018



Source: Environment and Climate Change Canada, 2018 Data from National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, April 2020.

In terms of timeliness, energy efficiency is also the quickest and easiest way to move the needle on emission reduction since energy efficiency results occur within months and lead to permanent baseload power reductions that cannot be achieved with either wind or solar without energy storage and management. Moreover, energy efficiency is the foundation for right-sizing new, cleaner generation sources like wind and solar to prevent excess generation. Energy efficiency programming also has broad support among Saskatchewan people. As Dean Clark, President and CEO of Greenwave Innovations Inc., likes to say, “The best part of energy efficiency discussions is that a climate change activist, a climate change denier, a politician, and a business owner can all agree that using less energy makes good sense.” Broad segments of society including residential, commercial, and industrial energy users also get an opportunity to participate in conserving energy. Finally, investment in energy efficiency programming is an investment in permanently reducing fuel and capital costs (i.e., building new supply) and contributes to grid peak shaving.⁸³

The federal government’s *A Healthy Environment and a Healthy Economy* plan, released in December 2020, promises significant support for community spaces and homeowners to enhance energy efficiency.⁸⁴ Additionally, the government had previously announced the three-year Canadian Infrastructure Bank’s Growth Plan committing \$2 billion to large-scale building retrofits to increase energy efficiency, with this support being repaid by businesses over time. One of the biggest barriers preventing businesses from participating in energy efficiency programs and renewable energy projects are the large up-front costs. To remedy this, the then Minister of Environment and Climate Change Catherine McKenna announced in May 2019 the Climate Action Incentive Fund available to small and medium sized enterprises (SMEs) in the federal backstop provinces. The program offered a 25% rebate on the up-front costs of eligible energy efficiency retrofits and projects. The program was put on hold due to COVID-19 in the spring of 2020. Saskatchewan demand for the program was strong, with the province’s share of funding being oversubscribed to. While helpful to some businesses, this program was still limited and large up-front costs continue to pose a barrier to increased uptake, especially for significantly costly projects or smaller businesses with limited capital investment cash flow.

Furthermore, in the past, Saskatchewan businesses have expressed hesitancy when accessing government funding/ programs because of the burdensome conditions or

unnecessary information requests associated with it. Also, federal programs with excessively limited/narrow scope for fund accessibility pull exploratory administration resources from a company without success, driving down future enthusiasm for engagement with government programs. The federal government has imposed upon Saskatchewan businesses an almost impossible goal of achieving net zero; now is not the time for it to take advantage of this opportunity to extract private information or create barriers. Previously, onerous requirements have been evident throughout entire federal programs, from application to receipt; and micro details within any given program can make seemingly applicable businesses ineligible. The federal government needs to be a true partner by making the process simple. Coming out of the challenges posed to businesses by COVID-19, the federal government needs to develop programming with accessibility at the forefront and it needs to recognize that this phase of projects will likely be more complex and expensive than earlier investments.

Incentives for energy efficiency building retrofits can help act as a stimulus to rebuild the post-COVID-19 economy by creating work for tradespeople. As such, the Saskatchewan Chamber of Commerce supports, alongside improved accessibility, expediting funding for energy efficiency projects.

6

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal government promptly distribute the announced funding for energy efficiency enhancements.

7

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The process to access funding for energy efficiency enhancements should be simple and accessible, without onerous requirements or unnecessary information requests.

Challenges and Opportunities

A challenge identified in the SCC's 2017 *Saskatchewan Energy Efficiency Strategy* was housing the administration of demand side management (DSM) programs within Saskatchewan utilities, SaskPower (electricity) and SaskEnergy (heating). There is an obvious financial conflict when the same utility (in this case SaskPower and SaskEnergy) is both selling customers energy and then incentivizing them to reduce their consumption. Since then, the SCC has recommended that DSM programs be housed within an independent, third-party entity, employing a delegated authority model which, governed by a Board of Directors and supported by a stakeholder advisory committee with technical expertise, could be responsible for developing, administering, and implementing DSM programs aimed at businesses and residents. The potential for DSM programs is growing and as government policies continue to develop, getting the foundational execution right is critical.

Housing DSM programming in an independent, third-party entity gets around the obvious financial conflict and avoids having to place DSM programming directly under line-item ministries or agencies, which subjects them to short-term political considerations and encourages a focus on shallower targets.⁸⁵ The fact that Saskatchewan chooses to house its DSM programs within its two crown utilities could partly explain why DSM program spending in Saskatchewan is among the lowest across Canada when measured on a per capita basis and as a percentage of domestic sales.⁸⁶

A further challenge identified around promoting energy efficiency measures that has been identified by SCC members, as well as by Martin Boucher and Christopher Gunter at Johnson Shoyama Graduate School of Public Policy, is that the current DSM programming and energy efficiency incentives being offered between SaskPower, SaskEnergy, and the provincial government proper are done in a fragmented and piecemeal fashion. Such programming would benefit from being coordinated and administered in a third-party centralized entity, as recommended earlier.⁸⁷ Contributing to this problem is the fact that historically housing DSM programs in separate utilities serves to reinforce the fragmentation and siloing of fuels, and thus discourages a more integrated approach to delivering energy efficiency programming.⁸⁸ There have been no statements on the part of the provincial government or either crown utility to suggest that the current policy will be revisited.

8

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

Demand side management programs be housed within an independent, third-party entity, employing a delegated authority model to reduce financial conflict while offering clarity and specialized supports.

Another persistent barrier to realizing progress on the energy efficiency file that the SCC has heard loud and clear from members, and that is well documented in the literature, has to do with conflicting priorities among different stakeholders and split incentives. As one member business in buildings and construction stated, the construction industry is extremely fragmented with diffuse decision-making; primary decisions are driven by project owners who have a strong bias toward controlling up-front construction costs.⁸⁹ This often results in inadequate investment in the early project design and planning stage. This is a lost opportunity to improve the full lifecycle energy performance of a building from the outset.⁹⁰ The Institute for Sustainable Finance identified the Building sector as Canada's easiest opportunity when it comes to low-cost GHG reductions, "in fact, it is the only sector where, in certain scenarios, reducing carbon emissions is less expensive than maintaining them."⁹¹ Focused actions need to be taken to capitalize on this emission reduction opportunity.

A relevant example of conflicting priorities between stakeholders has to do with the building energy codes under the National Building Code (NBC). Building energy codes designed to promote improved energy performance for buildings on the path to net-zero are developed at the federal level. Provinces can adopt this federal tiered energy model as written or can adapt or amend it for local circumstances before codifying it through legislation. Once the model is codified provincially, the enforcement of code standards is typically done at the municipal level.⁹² The low level of perceived priority often demonstrated at the municipal level can be explained due to limited and uneven enforcement capacity, as well as the prioritization of enforcing fire and safety building code regulations over environmental and energy performance ones.⁹³ The fact that the implementation of tiered energy codes will put upward pressure on up-front building construction costs is a challenge in and of itself.⁹⁴

9

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

That thorough and extensive industry and stakeholder consultations be held and enhanced building codes, standards, and practices be developed to support and expand energy efficiency.

A unique opportunity going forward has to do with the ability to unlock additional capital for energy efficiency building retrofits through a mechanism known as Property Assessed Clean Energy (PACE) programming. PACE programming addresses the split incentive dilemma by transferring the benefits of investments, along with repayment responsibilities, with the sale of the property. For example, under PACE programming, if a property owner wants to install an energy efficiency upgrade, money can be borrowed through the municipality. Repayment of the loan and interest is collected through charges attached to the property (property tax). Therefore, should the property sell, the remaining payments become the obligation of the new owner.

In the case of a commercial PACE program, the split incentive is removed when the associated costs of upgrading or retrofitting a commercial building are recovered from business tenants as the landlord's property taxes are passed along through triple-net leases.⁹⁵ PACE financing can be stacked with available federal, provincial, and municipal incentives as well.

The provincial government made efforts in early 2020 to amend *The Municipalities Act* to grant municipalities the authority to allow property owners to fund environmental sustainability retrofits through their property taxes.⁹⁶ In early 2021, the City of Saskatoon took a leadership role in the province by proposing a PACE program. The proposed Saskatoon program would provide loans of up to \$60,000 for homeowners, repayable through property taxes, for a range of energy efficient upgrades and retrofits.⁹⁷ Municipalities will ultimately have to decide whether to support PACE programming in their own jurisdictions but increasing awareness of this opportunity is essential.

10

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

That the provincial government and other stakeholders actively engage with Saskatchewan's municipalities to build awareness of and support the establishment of Property Assessed Clean Energy (PACE) programming in the province.

Another challenge that the SCC came across through both informal discussions with member businesses and during the written submission process for this study was funding-related barriers (both private and public sources). The SCC found that real-time energy measurement and management services tied to energy efficiency projects are ineligible for funding under the Government of Canada's *Low Carbon Economy Fund (LCEF)*. It is important that these programs, which allow permanent energy management systems, be eligible. These physically installed metering and management solutions allow for utility savings and GHG emission reduction opportunities to be accurately identified and prioritized over the life-cycle management of a building. These systems also allow for the "low hanging fruit" building re-commissioning activities to be implemented, which are often over-looked when moving straight into larger capital expenditures. These non-capital efficiency measures have produced permanent reductions by using data to re-schedule and find problems within existing building automation and control systems. Having accurate and granular consumption data can also be key, particularly in Saskatchewan, to strategically sizing renewable energy and storage systems that optimize utility bills and GHG emission reductions. This is a relatively easy energy efficiency improvement for a variety of businesses and should be supported.

11

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

Real time energy measurement and management services tied to energy efficiency projects be eligible for funding under the Government of Canada's *Low Carbon Economy Fund (LCEF)*.

Despite the many challenges and obstacles experienced by member businesses around unlocking the full potential of energy efficiency programming in this province, there are some unique opportunities on the horizon. One of the main advantages of energy efficiency initiatives is that they can be brought online relatively quickly and can deliver results in months. Given the impact of COVID-19 on the provincial economy and the subsequent unprecedented economic stimulus funding over the next two years, energy efficiency retrofits could be effective short-term economic stimulus.⁹⁸

Stimulus funding for energy efficiency projects will go a long way in generating much-needed economic activity for businesses and workers operating in design/engineering, construction, and professional services. This is especially true for workers since energy efficiency and renewable projects tend to be more labour-intensive.⁹⁹ Further to this, *Prairie Resilience* outlines several government actions around climate change, including the retrofitting of government-owned buildings to improve energy performance. Here lies a unique opportunity for the provincial government to lead by example on climate action and stimulate economic activity in this space.

12

THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The Government of Saskatchewan prioritize investing in an effective transition to enhanced energy efficiency within its internal spaces.

Clean Energy

Promoting the increased uptake of clean energy sources has been an area of focus for the SCC and its members over the past few years. The clean energy sector in Saskatchewan accounted for 1% of provincial GDP (\$1.1 billion) and just over 5,600 jobs in 2017.¹⁰⁰ To provide some context for readers, the SCC surveyed its members on the issue of carbon pricing and to gauge their support (or lack thereof) for it on two separate occasions: once in December 2016 and then two years later in December 2018. In both surveys, an overwhelming majority of respondents supported the idea that Saskatchewan should work to meaningfully reduce GHG emissions. However, when asked about their preference for a carbon tax, about three-quarters of respondents stated that a carbon tax was not the right policy option for Saskatchewan. Respondents instead preferred a greater focus on energy efficiency programming and the increased uptake of renewable sources to reduce emissions in the province's energy system.¹⁰¹

The Government of Saskatchewan announced a climate goal for electricity generation of a 40 per cent annual reduction in greenhouse gas emissions from 2005 levels by 2030.¹⁰² SaskPower specifically announced plans in 2015 to increase its available renewable generating capacity from the then-current percentage 25% to 50% by 2030. The utility is already seeing the impacts of its past planning activities as emissions levels in 2020 were approaching 10% below 2005 levels despite growth of approximately 25% in electricity sales since then.

SaskPower plays a complicated dual role in the province; it is both a public entity (Crown corporation) and expected to generate profits. As such, merging its already challenging dual priorities with emission reductions will require careful strategizing with awareness of divergent interests and concerns. For example, the Government of Saskatchewan announced in fall 2020 that all SaskPower customers would receive a 10 per cent rebate on their power bills. This rebate, known as the Saskatchewan Economic Recovery Rebate, will run from December 1, 2020 to the end of November 2021.¹⁰³ Without the conflicted nature of SaskPower, this rebate money could have been targeted to support the transition to the low carbon economy, such as through an incentive to lower consumption or utilized by SaskPower as a tangible capital investment into greener energy alternatives. The provincial government needs to ensure a clear mandate is supplied to SaskPower, enabling it to make the strategic investments required to plan for a low carbon economy.

For Saskatchewan to meet the projected growing energy demand of businesses and households and meet its emission reduction targets, the province will require an increasingly diverse and greener mix of generation sources like wind, solar, hydroelectricity, geothermal, battery storage, nuclear SMRs, biomass, etc.¹⁰⁴ Saskatchewan’s current power generation source is overwhelmingly coal and natural gas fired, so gradually decarbonizing Saskatchewan’s carbon-intensive electrical grid will be no small feat, especially since Saskatchewan (or Canada) does not have any comparative advantage in renewable energy technology at the moment.¹⁰⁵

Wind and Solar

Each type of energy source has pros and cons (see Table 3). Factors that impact the viability of different sources include weather, geography, intermittency, up-front costs, ROI conditions, policy environment, administrative costs, and technological feasibility, amongst others. The use of wind power is growing in Saskatchewan, particularly in the southwest part of the province with utility-scale windfarms. As an intermittent source, wind power is dependent on weather conditions but southwest Saskatchewan is known for being able to generate large amounts of wind power on a consistent basis. Utility-scale wind power will likely be doing the heavy lifting on the renewable energy front for the province due to its abundance and low cost.¹⁰⁶ Solar is used in regions that receive a large amount of sunlight, like the southern portion of Saskatchewan. The use and scale of solar power varies considerably across the province - everything from individual households and businesses self-generating with rooftop solar to offset their own load to large, utility-scale sites supplying electricity to SaskPower.¹⁰⁷ SaskPower has committed to growing Saskatchewan’s solar capacity over the next decade.

Hydroelectricity

Hydroelectric generation currently accounts for about 20% of SaskPower’s generating capacity. There are two main types of hydroelectric plants: reservoir/storage and run-of-the-river. Both can provide emissions-free baseload energy. Large-scale hydroelectric dams involve substantial up-front costs, create a large ecological footprint on the landscape, and require significant resources committed to environmental analysis and community engagement at the beginning of the project. In contrast, run-of-the-river projects tend to have smaller up-front costs and ecological footprint, but the amount of energy produced is contingent on river flow at a given time. Saskatchewan currently has eight hydroelectric facilities in operation.

Geothermal

The potential for baseload geothermal power in Saskatchewan currently exists in the Williston Basin area and its potential generation capacity has been estimated at 3500 MW. In 2017, SaskPower signed a power purchase agreement with Deep Earth Energy Production (DEEP) to research the feasibility of baseload geothermal power generation near Estevan. In September 2020, DEEP reported successful production and injection well tests. They are setting the first 20 MW geothermal powerplant in Saskatchewan/Canada into the design phase. Geothermal’s main advantage is that it provides clean baseload power 24/7 and relies on the existing expertise around drilling found in the province’s oil and gas sector. Its main disadvantage is the large start-up costs required to access and process energy found underground.¹⁰⁸

TABLE 3

RENEWABLE SOURCE	DISPATCHABILITY ^F	COST RATING (\$)	ENVIRONMENTAL IMPACT
Wind	Low	Low	Low
Solar	Low	High	Low
Hydroelectricity	High	Medium	Low
Geothermal	High	High	Low
Biomass	Medium	High	Low

Source: Adapted from SaskPower, Wind and Solar RFQ/RFP Process: Saskatchewan Renewables IPP And Supplier Information Session Saskatoon, SK (November 17, 2016).

^fNote: 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. Also, while hydroelectricity does not require the use of fossil fuels and therefore emits no GHGs, large-scale hydroelectric dams do have a large ecological footprint within the landscape and require large up-front investment.



Nuclear

Saskatchewan currently does not produce nuclear power in any capacity, despite its sizable uranium mining industry. Recently, the provincial government signaled a willingness to take another look at nuclear power generation. The Canadian Small Modular Roadmap Steering Committee, comprised of provincial and territorial stakeholders, released its roadmap document for small modular reactors (SMRs) in November 2018.¹⁰⁹ In 2019, Saskatchewan signed a Moratorium of Understanding with New Brunswick and Ontario committing to SMRs. Additionally, Saskatchewan established the Nuclear Secretariat in June 2020 to further explore the feasibility of such projects.¹¹⁰ Cameco (Saskatchewan) and Bruce Power (Ontario) announced a research partnership on a series of initiatives related to next-generation nuclear technologies and the life sciences.¹¹¹ Further to this, SaskPower has announced it is looking into the potential to add it to the supply mix by the early 2030s.¹¹²

While nuclear does create nuclear waste as a by-product of the power generation process, it also provides emission-free baseload power. The main disadvantages associated with conventional large-scale nuclear plants are the massive up-front costs and the stigma associated with past incidents like Chernobyl, Three-Mile Island, and Fukushima. SMRs get around these issues due to their enhanced safety design, discreetness, and the economic efficiencies that can be achieved by mass producing modular units. However, while SMRs have a history of operating in marine vessels, they have never been operational as a baseload power source anywhere in the world. Because of this, there is significant uncertainty related to the modularity aspect and scaling up, as well as ambiguous risks associated with the technology, making a risk analysis exercise difficult.¹¹³

Carbon Capture and Storage (CCS)

While not a clean energy source *per se*, CCS will be included in this section for the purposes of this discussion. CCS is a newer, proven technology designed to reduce the environmental impacts of fossil fuel-based generation through the storage of carbon. In Saskatchewan, there is a CCS unit installed at SaskPower's Boundary Dam #3 coal-fired plant near Estevan. Saskatchewan has developed a reputation for expertise in CCS technology. In 2014, Boundary Dam #3 became the first power station in the world to successfully use this technology. The use of CCS at Boundary Dam #3 has led to the use of captured CO₂ in the enhanced oil recovery (EOR) process, notably at the Weyburn Midale oilfields.¹¹⁴ The CO₂ capture rate at Boundary Dam #3 in recent times has been about 90% or about 1 megatonne per year. The International CCS Knowledge Centre, located in Regina, recently performed a feasibility study on the Shand Power Station near Estevan.¹¹⁵

The main advantage of retrofitting a conventional coal-fired plant with CCS technology is that it prevents the stranding of an asset in light of Ottawa's decision to phase-out conventional coal-fired plants by 2030.¹¹⁶ Additionally, CCS technology can add value to other applications like EOR while reducing emissions from coal-plants. The disadvantages of CCS technology are the large up-front costs and the significant operations and maintenance related costs.¹¹⁷ However, second generation CCS technology has a significantly lower capital cost per tonne of CO₂.¹¹⁸

Challenges and Opportunities

SaskPower's current mandate to provide affordable and reliable power to the people of Saskatchewan has historically defined the utility's approach to power generation.¹¹⁹ Part of the affordability component of their mandate has included "a lowest unit cost" bias that created path dependencies around certain kinds of relatively inexpensive but emissions-intensive generation sources, like coal and natural gas. In recent times, the lowest unit cost approach falls short considering the full costs of carbon-intensive sources. The lowest unit cost bias also discounts the value of small-scale generation in terms of avoided fuel costs and incremental capital costs related to the building of supply, transmission, and distribution infrastructure by SaskPower. This is especially true at the "grid-fringe" in rural and remote areas of the province where building incremental infrastructure becomes cost prohibitive due to low population density.

Many of the barriers and challenges around promoting clean energy in Saskatchewan are policy related, particularly when it comes to non-utility scale or small-scale (i.e., micro grid) generation by IPPs. Historically, small-scale power producers have not played a significant role in Saskatchewan, especially compared to the Great Plains states in the US, where community-owned utilities, like rural electrical cooperatives, are well-established.¹¹⁹ Nevertheless this is changing, it is expected that by 2030 approximately 40% of SaskPower's generation will be provided by IPPs – predominately with renewable technology, but also with natural gas-fired generation.

SaskPower's current mandate and quazi-monopoly status comes in between large industrial users of power looking for cleaner sources and prospective IPPs. Virtually all renewable development needs to occur through SaskPower's existing process.¹²¹ Because SaskPower has legislated monopoly on transmission and distribution under *The Saskatchewan Power Corporation Act*, their exclusive authority over transmission right-of-way makes it virtually impossible for a prospective IPP to sell power directly to a large industrial user, this is a hinderance to the expansion and innovation opportunities for renewable energy production in Saskatchewan.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The Government of Saskatchewan enable private companies to find clean energy sources without needing Crown corporation involvement under a structure that does not cause a significant upward impact on rates for other SaskPower customers.

Despite the aforementioned challenges and policy-related barriers to the growth of clean energy in Saskatchewan, there are some promising signs on the horizon. Southern Saskatchewan is well-situated for growth in solar energy. According to data from the Canada Energy Regulator, Regina and Saskatoon have the highest and second highest average solar photovoltaic (PV) generation potential in Canada among major cities valued at 7.15 kWh per square metre and 7.10 kWh per square metre, respectively.¹²² The southern portion of the province is one of the sunniest places in Canada.

Wind power in Saskatchewan is so vast and abundant that the majority of the province's large-scale wind turbines rank in the top 10% globally when it comes to efficiency.¹²³ Utility-scale wind power is also extremely cost-competitive with established sources from a levelized cost of electricity perspective.¹²⁴ Wind power in this province is not only abundant and consistently generated, but it also has broad support across the province.

According to a 2018 survey conducted by Inshightrix Research on behalf of the now-defunct Canadian Wind Energy Association, 84% of randomly selected respondents (806) said they "strongly support or somewhat support government policies that encourage the development of wind energy in Saskatchewan."¹²⁵ There is also fairly strong support for decarbonization more broadly among Saskatchewan. In a 2018 public opinion poll on peoples' attitudes toward energy, slightly over 50% of respondents supported a transition away from fossil fuels either immediately (17.3%) or over a 10-year period (33.3%).¹²⁶

⁸ The Alberta Carbon Trunk Line is the world's largest carbon capture and storage project. It consists of a 240 km pipeline which will gather, compress and store up to 14.6 million tonnes of CO₂ per year, and inject this CO₂ into depleted oil reservoirs.

There are emerging opportunities in GHG mitigation technologies like CCS. Saskatchewan could potentially link its carbon capture and utilization trunk line to the newly finished Alberta Trunk Line.⁸ CCS in Saskatchewan could also potentially serve as the essential ingredient of non-emitting hydrogen fuel for use in heavy duty transportation.¹²⁷ On SMRs, Saskatchewan could take advantage of being home to some of the highest-grade deposits of uranium in the world and its world-class research in nuclear science, creating an entirely new value chain in nuclear power.¹²⁸

Fortunately, Saskatchewan is not alone in its efforts towards clean energy. Other provinces and northern United States have large clean energy resources already developed (i.e., hydroelectricity). Therefore, while Saskatchewan works to build and expand its own sources, it can partner with others. Strengthening transmission interties across Canada and into the United States, along with stable trade and interjurisdictional export regulations that enable trade of renewable energy east-west and north-south, will create a more robust renewable energy industry in Saskatchewan and lower emissions. In fact, interconnections, and the unlocking of Saskatchewan's wind and solar energy for potential export, are key to Saskatchewan's potential achievement of net zero. The greater the transmission capacity with other jurisdictions, the greater operational flexibility for Saskatchewan's grid and the more low-cost wind and solar power Saskatchewan can have while still maintaining a reliable electricity supply. The Saskatchewan Chamber of Commerce was pleased to see the federal government include this consideration in its *A Healthy Environment and A Healthy Economy* plan and will continue to advocate for this recognition to turn into action.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

Establish transmission interties across Canada and into the United States, along with stable trade and interjurisdictional export regulations, that enable trade of renewable energy.

Not only does clean energy have the ability to reduce emissions in the energy sector and create investment opportunities and jobs, but it can also serve as the vehicle for the advancement of reconciliation with Indigenous peoples. First and foremost, the low carbon economy concept closely aligns with the Indigenous belief system of protecting and preserving mother earth by taking only what is needed and nothing more.¹²⁹ Additionally, a collaborative, Indigenous focused approach to renewable energy generation provides greater potential for own-source revenue generation opportunities for First Nation communities and businesses, thereby increasing local employment and skills training opportunities.¹³⁰ Indigenous groups within Saskatchewan are taking advantage of the opportunities to partner with developers and become independent power producers in their own right. To offer an illustrative example, Indigenous Power Authority (FNPA), an organization established to facilitate the development of First Nations-led power development projects, has committed to developing new clean energy infrastructure that contributes to the net zero by 2050 vision. In 2011, SaskPower signed a Master Agreement with the FNPA to work together, share information, and identify opportunities for Indigenous inclusion into energy supply.¹³¹ SaskPower also has an Indigenous procurement policy. The goal of this policy is to increase Indigenous participation in the supply chain of SaskPower. Since 2012, a number of contracts have been awarded through this policy benefitting both SaskPower and the Indigenous communities in the province.¹³² The continuation and potential expansion of these policies and agreement is vital to continue to promote economic development in the province in collaboration with Indigenous communities.

Growth in locally generated and distributed clean energy can provide investment and jobs to Indigenous people and Indigenous communities. From an equity and fairness standpoint, energy efficiency and renewable energy projects are especially beneficial to Indigenous communities. This is because much of the existing on-reserve building stock is in poor condition and suffers from inefficient building envelopes that were not designed or built for the climate.¹³³ Many rural and remote communities up north also rely on carbon-intensive generating sources like diesel to power their communities. This reality is reflected in significantly higher than average power bills for many households in the northern part of the province.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

SaskPower, the Government of Canada and the Government of Saskatchewan continue to work with Indigenous organizations, energy producers and user groups to maintain and expand policies and practices which increase Indigenous participation in the energy supply chain.

Clean energy is not a cure-all but rather a key component of a multifaceted approach that includes energy efficiency measures and other GHG mitigation tools to support the transition to a low carbon economy.¹³⁴

LABOUR MARKETS AND WORKFORCE DEVELOPMENT

Prior to COVID-19, Saskatchewan was seeing some troubling long-term trends like an aging workforce across the board, chronic skills mismatches in certain areas, and slowing population growth due to recent migration trends. The ensuing economic slowdown due to the COVID-19 pandemic has accelerated and exacerbated many of these trends, in fact COVID-19 has caused massive, unprecedented labour market disruption in terms of unemployment, telecommuting, absenteeism, and reduced hours.¹³⁵ The province is experiencing uneven job recovery as the pandemic progresses; the larger private sector, along with sectors like tourism and hospitality, were hit harder than others and continue to struggle. Saskatchewan's unemployment rate averaged 8.4 per cent in 2020, well above the 2019 rate of just 5.6 per cent.¹³⁶ Notably, the unemployment rate for women, youth workers, and recent immigrants increased in the pandemic, and these segments are at risk for protracted unemployment.

Recent labour force data also reveals there is a paradox of sorts occurring in the labour market wherein the economy was experiencing weak demand for labour while employers were reporting difficulties in filling jobs and attracting workers. It is highly probable that COVID-19 will accelerate automation (due to cost-cutting), displace workers, and exacerbate skill mismatches.¹³⁷ It is likely the

disruption and uncertainty created by the pandemic will continue to impact the Saskatchewan labour market into the foreseeable future.

The SCC's discussions on labour market issues and the transition to the low carbon economy identified considerable areas of common concern among diverse sectors.

Challenges and Opportunities

Saskatchewan's labour market will be experiencing a new normal in labour supply and demand. COVID-19 in the short-term and climate change over the long-term will necessitate large investments in human capital. This is because Saskatchewan's gradual decarbonization over time will mean the displacement of workers in carbon-intensive sectors, like oil and gas and coal in certain regions, along with larger structural changes for these industries. Therefore, the reskilling and upskilling of workers (particularly in the established energy sector) will be necessary for Saskatchewan and its workforce to survive and thrive in the 21st century low carbon economy. It is also important to note that the displacement of workers in carbon-intensive sectors will have broader community ramifications that will need to be addressed as well.

In light of the short-term disruption caused by COVID-19 and the long-term challenges associated with climate change over the next decade, member businesses told us that labour market policy must become more employer-focused than ever before. Employer-led initiatives should be designed to promote worker flexibility to remedy ongoing skills mismatches, and to enable Saskatchewan to better utilize, train, and upgrade its trades workers to prepare them for the workforce demands of a low carbon economy. This approach can be fostered through public-private partnerships, or through an ad-hoc industry taskforce model comprised of experts tasked with modernizing skills training.¹³⁸

Looking beyond the existing workforce, Saskatchewan has not always had strong transitions from high school graduation into post-secondary, and this is an opportunity that needs to be capitalized on. Businesses are supportive of increased efforts around experiential learning opportunities through co-ops, apprenticeships, and internships, as well as through on-the-job training to prepare youth for the dynamic and ever-changing workforce of the 21st century. These experience-based programs will also be valuable as there will be

an increased expectation of readiness on the part of employers for new entrants into the workforce.¹³⁹ Building on this, Saskatchewan needs to do more to enhance the access youth have to quality career guidance services; awareness of future opportunities is crucial.

Throughout the SCC consultations, there was general agreement on the increasingly important role that technology and automation will play in the Saskatchewan labour force, especially given the challenges associated with an aging workforce and the need for businesses to cut costs to shore up cashflow. In the case of the oil and gas sector, the pace at which the sector will be adopting new technologies to replace routine, mundane, or dangerous tasks will only accelerate. This will free up workers to focus on higher value-added activities instead. Many of these new technology-driven oil and gas jobs will appeal to youth. This will also require a different set of skills on the part of workers (digital fluency, creativity, problem-solving, etc.) than has typically been the case. New technologies like augmented reality have enormous potential for worker training.¹⁴⁰

Additionally, the federal government's focus on carbon pricing and other complementary regulatory measures intended to reduce emissions in carbon-intensive sectors like oil and gas will drive demand for new skills and occupations related to the reduction, measurement, and monitoring of emissions. This would include roles in areas like regulatory management, data analytics, and information technology.¹⁴¹

accessibility of education and training opportunities for those segments of society will be crucial in ensuring a full recovery going forward. In light of the more pronounced unemployment effects on vulnerable segments of society, such as Indigenous peoples and recent immigrants, simply retraining the existing workforce will not be enough to ensure a full economic recovery. Workforce diversity and inclusion initiatives will be crucial going forward.

Finally, a common challenge discussed in members' written submissions has to do with the need for more timely, relevant, and accurate labour market data amidst an environment of uncertainty. Everyone on the supply-side of the labour market benefits from better labour market data. Employers and workers benefit from having information on present and future skills requirements when designing and implementing workforce development strategies. Education and training providers benefit from knowing which skills are required and when curricula updates are needed. Government officials benefit when designing and updating qualifications and developing skills strategies and skills requirements. Employment service professionals benefit by using this information to connect job seekers with the types of skills needed for the low carbon economy and policymakers benefit from this data to inform policy decisions around budget allocations for training programs.¹⁴² There was also a desire for more granular labour market data at the region/community level to better understand the subtle nuances of regional labour markets across the province.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

Expanded public-private partnerships and curriculum co-development be used to facilitate employer-led initiatives designed to promote youth training and worker flexibility, while remedying ongoing skill mismatches.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The Government of Saskatchewan identify specific areas of provincial data that are not currently being properly collected and create a process to gather useable data in those areas once an independent cost-benefit analysis has been undertaken to confirm that the data collection will be worth the expense.

Regarding fairness and equity considerations for those underrepresented in the workforce, we heard from member businesses' written submissions that the

NATURAL INFRASTRUCTURE

Natural infrastructure has the potential to “provide multiple positive environmental outcomes, including enhanced biodiversity, protection of habitat for animals, climate change resiliency, carbon sequestration, runoff reduction, water purification, drought reduction, and other benefits that support the health and well-being of communities and the larger ecosystem.”¹⁴³ The economic benefits of investing in natural infrastructure are numerous and include improved corporate reputation, cost reductions, and operational improvements.¹⁴⁴ Unfortunately, there are barriers to understanding and unlocking the full value of Canada’s, and Saskatchewan’s, natural infrastructure with regards to emission reduction. In order to successfully utilize this opportunity, a distinction needs to be made between designed natural infrastructure and existing natural assets.¹⁴⁵ These different opportunities are often lumped together.

Naturalized areas and intentionally engineered, enhanced, or managed systems are usually considered to be designed natural infrastructure. Naturalized areas can take the form of an urban park where high input (fertilization, mowing, irrigation) areas are replaced with grass / forb / shrub areas that, once established, have a much smaller ecological footprint and provide benefits of wildlife habitat, carbon sequestration, and so forth. Further, a naturalized area could also be the reseeding of native plants in areas of native prairie that had been previously broken, or a tree planting effort (assuming the trees are not logging replacements). Naturalized systems occur where the functions of natural systems have been intentionally engineered or enhanced, such as bio-swales, green roofs, managed wetlands and urban greenspaces / forests, however, many of these may also be referred to as naturalized areas.

As part of the *A Healthy Environment and a Healthy Economy* plan announced by the federal government in December 2020, more than two billion trees will be planted over 10 years at the cost of approximately \$3.16 billion. This natural infrastructure endeavor is projected to reduce greenhouse gas emissions by up to 12 megatonnes by 2050. Based on this commitment, it is clear the federal government recognizes the important role the natural environment can play in helping control carbon emissions. However, Canada and Saskatchewan have not fully utilized or quantified this opportunity, with the missing piece being existing natural assets.

Existing natural assets, also referred to as natural infrastructure, are different from naturalized areas. They are naturally occurring, existing assets which are not managed, engineered, or enhanced in any way. Examples of existing natural assets would include wetlands, grasslands, boreal forests, rivers, soil, and protected areas.¹⁴⁶

Challenges and Opportunities

As noted above, distinguishing natural infrastructure and existing natural assets is necessary to successfully utilize this emission reduction tool. However, in addition to definitional issues, there are information gaps that make recognizing the value of each assets' carbon sequestration capabilities very difficult in practice. The inability to properly value these assets prevents the creation of wide-spread financial incentives that would help preserve and expand them. Existing natural assets are rarely recognized or quantified using consistent methodologies and when data is available, it is often employed in an inconsistent fashion.¹⁴⁷

For example, both agricultural soil and wetlands (existing natural asset) sequester large amounts of carbon. However, if the latter is drained for agricultural use, the wetland releases the sequestered carbon back into the atmosphere. The released carbon from the now-drained wetland is not included under Saskatchewan’s GHG emissions by economic sector in ECCC’s annual *National Inventory Report*. This is regrettable since conserving and expanding existing natural assets like wetlands is a simple and cost-effective emission management tool.¹⁴⁸ In fact, draining as little as six hectares of wetland can release the same greenhouse gas equivalent as the carbon sequestered in one year from no-till farming 2,000 hectares.¹⁴⁹

This also highlights another, larger problem: the current lack of accurate, recent, and useable information on the value of existing natural assets, like wetlands, grasslands and boreal forest. For example, while the Saskatchewan Water Security Agency does have data on wetland carbon storage, it does not monitor or report on wetland loss.¹⁵⁰ This inconsistent and disjointed approach to data collection, monitoring, and reporting ultimately serves to undermine the province’s ability to recognize, evaluate, and quantify the full value of existing natural assets throughout the province.

This issue is even more pressing as The Paris Agreement outlines the need to establish an accounting system

to credit past and future land use and management decisions that sequester carbon. Further to this, the federal government started discussion on the development of a Federal Greenhouse Gas Offset System. Canada and Saskatchewan have been leaders at land use and management including agricultural efforts like zero tillage, crop selection, and the general advancement of low emission practices, in addition to the managements of commercial forests to maintain forest resilience. Coupling this information with the quantification of Canada's existing natural infrastructure will enable accurate carbon accounting and support emissions trading/ offsets that can assist with Canada's net-zero ambition.

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THE SASKATCHEWAN CHAMBER OF COMMERCE RECOMMENDS:

The federal and provincial governments properly evaluate and value the emission control potential of existing natural infrastructure and then create financial incentives to help preserve and expand them.



Photo by Tandem X Visuals

WHAT THE EXPERTS SAID: WRITTEN SUBMISSIONS

Innovation & Technology by Dean Clark, President & CEO of Greenwave Innovations

WHY IS THIS AN ISSUE?

The debate around climate change severity and mitigation strategies continues with a wide contrast of opinions amongst politicians, business leaders, academics and within the general public. This is especially true in our natural resource rich province where carbon intense commodities such as oil and coal have long provided the basis for a strong economy in Saskatchewan.

Regardless of our individual views on climate change, it needs to be acknowledged that supporting a low carbon economy in Saskatchewan must become a priority that is taken seriously. The global investment community has spoken which will truly be the catalyst for change.

We need to offer our political and business leaders innovative GHG emission reduction solutions that can produce financial benefits, job creation and an opportunity for technology export. It becomes a Win / Win approach when economic based solutions are able to deliver environmental results. Low carbon innovation and technology should be well supported in this province as part of a Saskatchewan plan.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL AND INTERNATIONAL LANDSCAPES

In 2019, I was recommended by the Government of Saskatchewan and accepted by the Government of Canada as a Canadian Delegate at COP25 – UN Climate Change Convention in Madrid, Spain. It was an honour to be able to represent my company, our province and our country at this event.

While government officials failed to come to an agreement on Article 6 of the Paris Agreement (the adoption of strong rules and guidelines that would foster more ambitious climate action), the large corporations and investment portfolio managers were in alignment. The international investment community is not waiting around for government negotiators to reach political agreements. Corporations have been directed to develop and implement climate conscious initiatives or face the risk of being excluded from investment portfolios in the future.

This global message needs to be heard and repeated locally in order to support a low carbon economy in Saskatchewan. We need to adhere to the will of the international investment community and not delay the development of our local low carbon economy.

IDENTIFY POTENTIAL ISSUES

The political views, at all levels of government, are very diverse and we know that the development of a low carbon economy will not be accomplished within 4 year election cycles. As a business chamber, we need to ensure that all strategies are not politically motivated where progress can survive electoral cycles ... probably easier said than done.

I believe that provincial and federal funding should be used for low carbon technology R&D and pilot demonstration projects to support those businesses that are working towards delivering stand-alone positive ROI structures in the future. We need to create a structure to accelerate progress but ensure new business plans are not built on temporary incentive programs.

Provincially, we certainly have to be sensitive to the short-term impacts of supporting a low carbon transition. I think this is where the terms “low carbon” vs “zero carbon” become important to distinguish. Let’s be sure to highlight and support the technology solutions and businesses that support efficiency and transitional strategies vs an “all or nothing” approach.

IDENTIFY KEY QUESTIONS

- How do we help Saskatchewan businesses identify and adopt technology that will help support their sustainability initiatives and our low carbon economy?
- What does Saskatchewan need to create for products and processes vs what can we introduce as best practices from elsewhere?
- How can we offer support to the start-ups and continued development of Saskatchewan based businesses trying to succeed in an early-stage low carbon marketplace?

I believe with these questions, the strategy lies in technology education and continuing to uncover the solutions that provide the best path to an economic based approach. The formation of a carbon offset trading system may be one of the mechanisms that can work well in our province.

The Governments of Saskatchewan and Canada are both working on the development of independent carbon offset trading systems. These may become key economic mechanisms that will provide incentives to the development of new technologies and processes required to take carbon offsets to market.

IDENTIFY BEST PRACTICES

Saskatchewan has to clearly define where we can make both short-term and long-term impacts in our carbon emission reductions. Let's focus on supporting the low carbon businesses producing short-term results and nurture the development of businesses working on new long-term strategies.

In the short-term, we have an opportunity to use Saskatchewan's carbon intense electrical grid to our advantage and to encourage energy efficiency within buildings. It has been demonstrated that most buildings could reduce electrical consumption, and GHG emissions, by 10 - 40% through the implementation of data driven energy management systems. This would provide immediate economic and environmental wins and allow the province to focus on sizing future generation technologies (i.e. SMRs) based on what we actually require ... not what we are using today.

Energy efficiency can play an important role in developing low carbon ambition as it's something that everyone in the province can contribute to within their homes, places of work, community buildings, hospitals, schools, etc, etc. Regardless of your political and environmental views, using less more effectively makes sense.

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES

It has been accepted globally that the science around climate change is real and a low carbon transition is a must. What appears to still be at the forefront of global debate is the severity of the situation, which defines the timeline for action, as well as the definition of the strategies and policies that offer the best approach to combat the challenge.

As a business owner or executive in this province, my recommendation is to embrace the low carbon economy and commit to an action plan that will provide short and long term value. In addition to the economic-based ROI analysis, realize the importance of making decisions that enable you to "tell your story" and attract employees, clients, partners, tenants and investors that are now

looking for low carbon corporations who commit to sustainability initiatives.

Saskatchewan has always done well with collaboration and in supporting our local business community. I'd encourage education and the formation of strategic partnership as we develop and nurture our low carbon economy moving forward.

ABOUT THE AUTHOR



Dean Clark,
President & CEO
Greenwave Innovations

Dean Clark is the Founder, President and CEO of Regina based Greenwave Innovations. Greenwave specializes in the delivery of energy management solutions and conservation results within buildings.

Dean is a University of Regina Electronic Engineering graduate and considered an expert in developing energy efficiency strategies and solutions. Dean has delivered presentations on these topics throughout Saskatchewan, Canada and International events. Dean was recommended by the Government of Saskatchewan and selected by the Government of Canada as a Canadian Delegate at COP25 - UN Climate Change Convention in Madrid, Spain (Dec '19).

BUILDINGS AND CONSTRUCTION BY MARK COOPER, PRESIDENT & CEO OF THE SASKATCHEWAN CONSTRUCTION ASSOCIATION

WHY IS THIS AN ISSUE?

Approximately 40 per cent of global carbon emissions come from the construction of (11 per cent) or the operation (28 per cent) of buildings. When this fact is coupled with the reality that we are undergoing the greatest continuous growth of the world's urban population, it becomes perilously clear that any path to genuine reduction in carbon emission goes through a better built environment. According to Architecture 2030, achieving the Paris Climate Agreement targets will require the elimination of all GHG emissions from the built environment by 2040, an unattainable goal without immediate intervention. Currently, the total built environment is growing at a faster pace annually than the sector is improving in reducing its carbon emission. So, while we are getting better, we are not getting better fast enough.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL AND INTERNATIONAL LANDSCAPES

Globally there has been a coalescing of industry interests to make the case for more environmentally conscious building design, construction, operation and maintenance. Broad industry coalitions are emerging that engage national, sub-national, and local governments with academia, private sector investors, and global design and construction firms. The focus of these groups is on identifying opportunities for GHG emission reduction, raising awareness, developing appropriate standards, and recommending action.

Locally, scant attention has been paid to dramatically shifting standards to help meet global emission guidelines. When public attention does turn to policy options compelling greater efficiency, industry is quick to point out the resulting upwards pressure on construction cost. With low intensity urban areas in Saskatchewan, there is little internal push for change.

IDENTIFY POTENTIAL ISSUES

Coordination of strategy within the construction industry is a challenge. The industry is extremely fragmented with diffuse decision-making. Decisions within the continuum

are driven by those paying the bill – what we call project owners. Absent government regulation, the owner decides what standards should be achieved in terms of building performance, and while the owner should be considering the whole life cycle cost of the asset – which would thus include consideration of energy efficiency – the truth is that most owners are focused on controlling up front construction costs. Building cheaper is rarely building more efficiently. This focus on cost control also typically means that not enough money is invested in project design and planning. Insufficient design strengthens the likelihood of environmental inefficiency.

Regulation is one means to compel better performance across the industry. The challenge is in getting the rules right. Due to the lack of hands-on construction or design expertise within most regulators, industry regulations tend to be heavy-handed and often overreach with excessively prescriptive guidance. Governments are likely to hit the right notes when they: use outcome-based regulatory models; lead by example with their own construction; and support the arguments in favour of new construction methodologies with research and marketing investments.

IDENTIFY KEY QUESTIONS

The questions that spring to mind when considering Saskatchewan's built environment include:

- Saskatchewan's public sector is, in its totality, the largest owner/leasee of commercial/institutional property in the province. How can governments leverage this market position, plus their position as regulator, to drive better environmental outcomes across the sector?
- Private-sector project owners may require either incentive or regulation to choose to invest the necessary money up front to achieve better environmental performance of a project over its life cycle. Which lever – incentive or regulation – is best in Saskatchewan, and how should the public sector apply the lever?
- Very little, if any, research exists as to the contributions of the built environment in Saskatchewan to our provincial GHG emissions. Global research is interesting, but given the rural nature of Saskatchewan, it is hardly indicative of realities on the ground here. What are the realities of Saskatchewan's built environment when it comes to GHG emissions and where are the major opportunities for us to improve?

IDENTIFY BEST PRACTICES

In general, the best approaches globally seem to emphasize and pursue a layering approach with respect to policy decision-making and implementation at multiple levels of government, along with collaborative engagement with the design and construction industries to set and pursue targets. This approach generates the will to push change, the momentum to sustain it, and the solutions to overcome obstacles that will inevitably arise.

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES

Construction is a service-industry. We build things for other people. The owners of the projects we build are primarily responsible for determinations regarding project scope, cost, and quality. Construction companies frequently tell me that they will build whatever the client wants. The challenge then becomes – how do we incent or regulate the project owners to make different decisions when it comes to their plans to design, build, operate and maintain their assets?

It likely starts with a greater collective effort to generate awareness, desire, and knowledge.

With respect to awareness, government and industry should collaborate to build a convincing case for greater consideration of the environmental impact of buildings and for whole life cycle costing by the project owners. Evidence suggests that this approach can not only reduce carbon emissions but also reduce the life cycle cost of the asset while delivering efficient and effective service to the owner. More effort should be put into building and selling that evidence.

On the desire front, governments at all levels should either incent improved behaviour with rewards like tax breaks or refunds or penalize inaction through regulations and penalties. Either approach can work, and the selection of the right one should be taken together by government and industry.

Finally, with respect to knowledge, industry should be coordinating efforts internally and with organizations like the Applied Research Group at Saskatchewan Polytechnic and the National Research Council, to capture industry best practices with respect to the reduction of life cycle GHGs and to share that knowledge broadly throughout the industry.

ABOUT THE AUTHOR



Mark Cooper
President & CEO
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Mark Cooper has been the President and CEO of the Saskatchewan Construction Association since April 2013. Prior to coming to the SKCA, Mark was the Director of Policy and Communications at the Saskatchewan Urban Municipalities Association. Mark has an MBA from Royal Roads University. He is a certified mediator, a Project Management Professional, and has his yellow belt in Lean. As President of the SKCA, Mark is focused on ensuring that every member of the association receives extraordinary value for their investment.

INDIGENOUS RESOURCE DEVELOPMENT BY JESSICA NIXON, CEO OF COWESSESS VENTURES LTD. (CVL)

WHY IS THIS AN ISSUE?

Saskatchewan's gradual transition to a low carbon economy is an important issue because it aligns with our community's traditional belief system which is to protect and preserve mother earth by taking only what is needed and no more. As an arm's length economic development corporation owned by Cowessess First Nation, our own home community's carbon footprint is generally low, with the exception of emissions generated resulting from the energy needed to heat and power buildings and fuel vehicles. Cowessess Ventures Ltd. (CVL) due to its substantial rural and agricultural land holdings is well poised to leverage the vegetation on those lands as a carbon sink or potential carbon offset.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL, AND INTERNATIONAL LANDSCAPES

As alluded to earlier, CVL is a First Nation-owned economic development corporation that leverages its land and asset holdings to drive economic development and prosperity for the community. The Nation has purchased key land holdings surrounding Regina, Saskatoon, and Yorkton and on these lands the community wishes to pursue business development. Most notable on the land holding 3KM SE of Regina is the 1 MW Cowessess Wind, Solar and Battery Storage Facility. One of the only facilities in Canada to boast all these three mediums of renewable power. Through past development, Cowessess has established its spot in Saskatchewan as a leading Nation when it comes to renewable power development. The community currently has a 10 MW solar project under development through the First Nations Power Authority (FNPA) set aside and is also pursuing a 300kW Community Net Metering project on 5 community building on the home reserve.

Provincially the environment for renewable development is lukewarm. Virtually all renewable development needs to occur through SaskPower's existing procurements. This limits the amount and creativity in terms of solutions for end users (residential, commercial, and industrial) to invest further in renewable development in Saskatchewan.

IDENTIFY POTENTIAL ISSUES

One of the challenges that CVL has faced working in the renewable energy space is dealing with SaskPower (SPC), Per the *Saskatchewan Power Corporation Act*. Any power generated from utility-scale renewable energy projects must go through SPC. For example, an Independent Power Producer (IPP) like CVL cannot sell the power they generate directly to another party – it must be purchased by SaskPower. SPC's monopoly and existing mandate gets in between large industrial users of power looking for cleaner sources and prospective IPPs. Second, SPC's mandate also involves providing power to residents and businesses at the lowest unit cost. However, a lowest unit cost may not be the most environmentally sustainable way to procure power.

Another SPC-related barrier were the changes made to the net metering program last summer that ended the 1:1 credit. Cowessess was disproportionately impacted by the changes. As a renewable energy producer with solar assets specially on our school building which uses approximately 300KW annually, we cannot utilize full credits when Cowessess First Nation children are at school during fall and winter months. Peak generation for solar is during the summer months when children are out of school, at which time only ½ credits are earned, then in the winter when there is full student capacity, the sun is not as powerful and demand increases and only ½ credit can be utilized. The new SPC net metering program is not structured in a way to benefit schools, which happen to be the buildings/user that need the financial benefit the most so that any savings can be redirected to help fund core education needs.

Furthermore, changes made to the 1:1 credit deteriorated the return of investment (ROI) conditions for current and proposed CVL projects. Cutting the 1:1 credit in half made projects less lucrative and effectively doubled the payback period for our projects from four to eight years, despite taking into consider significant federal grant contributions through Low Carbon Economy Fund. Under the new net metering program, the average payback period for some self-generation projects are now 15-17 years. For the 300KW Cowessess Community Net Metering Project, CVL had the system design and federal funding all in place right before changes to the program were made. SPC also made the changes over a very compressed period of time all without adequate stakeholder consultation. In the future, the net metering should be reformed to encourage Indigenous participation by accounting for the issues around lack of home ownership and lack of access to

capital on-reserves to access financing to take advantage of purchasing solar to offset home consumption. We would encourage an Indigenous-specific Net Metering Program to be developed which brings back the 20% grant, 1:1 credits, and a financing instrument that can be utilized by those living on reserve who do not own their own homes but are responsible for their utility bills. FNPA could play a significant role in developing and administering such a program on behalf of SaskPower.

Aside from the SPC-related challenges, another challenge or barrier is at the political elected level where there is insufficient buy-in around renewables. Finally, there is also a disconnect between the federal and provincial government around the transition to a low carbon economy. Regarding a recent project, CVL had to work through SaskBuilds process to be eligible and considered for Infrastructure Canada funding from the federal government. CVL is used to working directly with the federal government to access funding and resources. Working at a Provincial level was new and unique and came with some differing Provincial priorities vs. perhaps Indigenous and Federal priorities.

IDENTIFY OUTSTANDING QUESTIONS

CVL considers itself to be an IPP that develops utility-scale renewable energy projects with an established generation portfolio. Because reducing energy consumption through energy efficiency measures is the cheapest and logical first step toward reducing carbon emissions, there exists some outstanding questions around how we can best reduce energy consumption on-reserve. There are companies like Greenwave Innovations that provide real-time, day-to-day energy consumption monitoring services that can shape behavioural changes around energy use and make recommendations for capital upgrades to improve building efficiency. However real-time energy monitoring services are not eligible under the federal government's Low Carbon Economy Fund (LCEF) criteria. This is particularly relevant for CVL because First Nation communities face some of the highest energy costs, especially in northern Saskatchewan where it is cold during the winter and buildings on reserve often have insufficient heating envelopes.

One outstanding question would be why is real-time energy monitoring not considered an eligible service under the LCEF and how should we fund or incentivize real-time energy monitoring services with the goal of reducing energy use to reduce emissions?

Another outstanding question related to changes to the net metering program discussed above is given the fact that your typical net metering participant is likely to be more well-off financially due (in a position to fund or remortgage home to pay for solar); what is the average net income of the typical net metering participant? We would be interested to know how, if at all, the Net Metering program served those rate payers most in need at lower income levels.

IDENTIFY BEST PRACTICES

For Indigenous Communities it is important to pursue renewable initiatives but the challenge for many communities is how to start. Often communities can solicit consulting services which are a great way to conceive the first project or two. But really the goal for an Indigenous Community should be to internalize some expertise. The Catalyst 20/20 Program is a great mentorship program specifically design for Indigenous communities to develop internal capacity. Cowessess' very own Daphne Kay was a successful candidate as part of the 2020 cohort in the Catalyst 20/20 Program. Daphne is our Community Energy Specialist and is learning more every day in her new role so that in time she can lead the community's developments. We would encourage other communities to explore if Catalyst 20/20 would be a fit for them (<https://indigenoucleanenergy.com/2020-catalysts-program/>).

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES.

Because very few Indigenous communities have adequate funding or expertise around developing renewable energy projects, it is important to identify funding pools first and then develop and undertake projects based on the program funding criteria. Also, start small at first – develop the necessary experience and expertise on small-scale projects to gradually build up capacity over time. For example, CVL is now developing a 10MW, utility-scale project under the First Nations Power Authority (FNPA) banner through a set aside, but it would not have been able to do this without getting its feet wet with smaller projects first. Finally, do not be afraid to have someone advocate from within your community and write letters or briefing notes to elected local officials like MLAs or MPs.

ABOUT THE AUTHOR



Jessica Nixon
CEO
Cowessess Ventures Ltd.

After graduating from the University of Regina with a degree in finance, Jessica worked for six years with a private consulting firm in the areas of feasibility analysis, business planning, sourcing funding, and project management. During this time, Cowessess First Nation was one of Jessica's primary clients and Jessica was able to lead the 1 MW Cowessess Wind Battery Demonstration project which was commissioned in May 2013. With a drive to work in project implementation and construction, Jessica spent the next three years with a large general contracting company working as a project manager, while obtaining her Master's Degree in Business Administration. Following which, Jessica joined Cowessess First Nation in May 2017 to lead the community's economic development interests. Now as the Chief Executive Officer for Cowessess Ventures Ltd, the business development corporation that oversees six operating businesses on behalf of Cowessess First Nation, Jessica is the primary resource for project development on behalf of the community.

Cowessess commissioned a 400kW of solar generation in 2018 and an additional 100kW in 2019. Cowessess is actively developing a 10 MW utility scale solar project in Saskatchewan under the FNPA set aside with SaskPower, in addition to a 300kW community led net metering solar project – construction of these projects is planned for 2020. Jessica is based in Regina, Saskatchewan.



Photo by Cowessess Ventures Ltd.

CONCEPTS OF A LOW CARBON ECONOMY BY DR. LARRY S. ROSIA, PRESIDENT & CEO OF SASKATCHEWAN POLYTECHNIC

WHY IS THIS AN ISSUE?

Climate change and the transition to a low-carbon economy are among the defining challenges of the 21st century. As a leading North American energy producer, Saskatchewan will necessarily play a key role in this transition. However, we cannot assume that labour market demand and supply will remain what it has been for the energy sector for several decades.

First, such a fundamental transition does not occur instantly – demand for fossil energy will continue, and will generate much of the capital required for the transition. Capacity and innovation in fossil fuel production is still needed, though adapted to new and evolving regulations and standards.

Second, as much as technology needs to change to support the transition, so too does the labour force. Saskatchewan companies must identify changing skills development needs, as well as invest in re-training opportunities for existing and older workers as low-carbon forms of energy production increase market share. For the low-carbon industry, advanced skills in trades, engineering, operations and management, are in growing demand. Each of these professionals will require training/ re-training, and transferable knowledge. Vitality important will be the skills to design and adopt technologies, products and processes to minimize carbon emissions.

According to OECD's Greener Skills and Jobs for a Low-Carbon Future 2013 report, "The successful transition to a low-carbon economy will only be possible by ensuring the labour force is able to transfer from areas of decreasing employment to other industries, and if adequate human capital exists to develop new industries that will grow as a result of climate change mitigation and adaptation activities. Skills development activities will play a major role in each of these transitions."ⁱ

The collapse of oil prices over the last year, combined with the COVID-19 crisis, shows the volatility that pervades the energy sector globally and in Canada. However, Saskatchewan enterprises now face an unprecedented opportunity to take advantage of stimulus programs aimed at rebooting economic activity, adopting new technologies on the digital and automation fronts, or developing scalable solutions for the renewable energy sector.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL AND INTERNATIONAL LANDSCAPES

Public policy incentives and technological innovations are driving demand for low-carbon economy workers across the globe. Among the range of responses, many are tied to workforce development and skills, job creation and job alteration. A policy brief supporting the United Nations' Sustainable Development Goals suggests that employment in the renewable energy sector will rise from 8.3 million in 2016 to 25 million by 2030.ⁱⁱ Internationally, there is a trend toward placing employers at the heart of workforce development strategies.

Skills Australia has a network of advisors who work with employers in redesigning jobs, knowledge transfer and mentoring, job rotation and multi-skilling.ⁱⁱⁱ This collaboration ensures that training resources can be effectively tailored to develop high demand skills and minimize disruption in the transition to a low-carbon economy.

Norway has been successful in producing a versatile, highly skilled and highly educated workforce by prioritizing access to postsecondary education. The country has continued to enhance partnerships between private industry and postsecondary institutions to mitigate skill gaps and support labour market flexibility and worker mobility.^{iv}

In the UK, a comprehensive sector-level approach in its 2016 Transport Infrastructure Skills Strategy has led to modernizing skills training and improving diversity and inclusion in green jobs. The success of this strategy is due to the creation of a taskforce made up of employers.^v

Canada's cleantech sector can tap into a growing global market set to double in the next five years. And boosting innovation and efficiency in the resource and energy sectors – in which Canada has great strengths – represents a \$3.6 trillion opportunity by 2030.^{vi}

In the provincial landscape, there are several examples of sector coordination to support workforce development for emerging low-carbon economy jobs. British Columbia has supported skill development in "metal tech alley," a cluster of 80 high-tech companies ranging from "metallurgy and advanced materials, digital technologies, big data, and circular economy-based businesses".^{viii} The cluster has received widespread acclaim for their workforce development strategies, combining on-the-job training with cutting-edge technology to enhance the skills of workers in Southeastern British Columbia.

Ontario has created similar initiatives through the Centre for Workforce Innovation, a coordinated access point to support key stakeholders in aligning their demands and needs with evidence-based research.^x Successive Ontario provincial governments foster sector-focused partnerships between unions, employers and others, to support training programs in green building skills.^x A recent report, “Closing the Zero Carbon Skills Gap in Ontario’s Construction Industry” (2019), recommends new types of training, incentives and construction processes that will help the trades workforce support the construction and mass retrofit of buildings that lower greenhouse gas emissions.^{xi}

In Saskatchewan, the low-carbon energy sector already employs more than 5600 workers.^{xii} While emerging industries will have diverse and evolving labour needs, Saskatchewan’s labour market will continue to be shaped by the 140,000+ jobs needed to drive our oil & gas sector and other major industries.^{xiii}

Saskatchewan is likely to face both skills shortages and skills mismatches for the labour force needs of the energy sector.

IDENTIFY POTENTIAL ISSUES

To remain competitive, regulatory and public policy frameworks in Saskatchewan must support the attraction and development of a skilled labour force with an emphasis on education, training and skills development. Modernizing school curricula and establishing partnerships between secondary and postsecondary education institutions and employers will be a key driver in equipping graduates with appropriate workforce skills. This includes apprenticeships and other experiential learning programs that are common among many trades most likely to be impacted by the green transition.

For those already participating in the labour market, green skills gaps might develop in some sectors and re-training will be an important piece of the puzzle. The green transition is likely to transform many existing jobs rather than eliminate them entirely (e.g., new building skills and retrofit knowledge skills in the construction sector). In these cases, the most appropriate strategy may be to build the skillsets of existing workers in these sectors through re-training initiatives that reflect an evolving workforce, rather than resorting to layoffs.

Employers and unions have many of the necessary insights to lead such efforts. However, solely focusing on re-training the existing workforce may perpetuate issues of inequity and lack of diversity in some sectors. Therefore, efforts to improve diversity and inclusion in growth sectors would be valuable, including incorporating diversity goals and explicit targets in workforce development initiatives.

Without good data and evidence of the demand for the skills needed by companies in the energy sector, the supply side solutions of training and upskilling will be ineffective. Lack of timely, relevant, granular, sector/sub-sector based labour market information, particularly on changing demand for skills mix, preparedness, experience, and shortage is a major potential challenge for the transition to a low-carbon economy. As noted in a 2020 report on the impact of Covid-19 on the oil and gas sector in Canada, labour market information is critical in this time of economic uncertainty, particularly for a sector undergoing such structural change, confronted with an aging workforce and widespread adoption of new technologies.^{xiv} Timely and relevant labour market information is necessary to help employers make decisions regarding investing in skills training needed for a low-carbon economy.^{xv}

Other labour market implications of the transition to a low-carbon economy are:

- Increased expectations for employers to offer on-the-job training in a time of economic crisis and uncertain recovery,
- Increased expectations from employers for job-readiness from education and training institutions for new entrants into the workforce, including training in new technologies,
- Impacts on northern and Indigenous communities – location of training and re-training; transition from resource extraction work to work for renewable and clean energy work for northern-based workers,
- In the skilled trades, apprenticeship-to-journeyperson ratios must be calibrated to meet emerging labour market demands and allow for timely upskilling,
- Given Saskatchewan’s geography, the transportation and logistics industry will be challenged to meet environmental regulations. According to PricewaterhouseCoopers and the Supply Chain Management Institute, significant low-carbon technology adoption and training will be required in this sector.^{xvi}

According to the Canadian Labour Congress, “The key to Canada’s future prosperity lies in investment in the creation of green jobs, while offering as many options as possible so workers and their families have a better future.”^{xvii}

“Retraining efforts should align with the job requirements of potential new employers, ideally in the same region, including in emerging energy sectors such as renewables. Maintaining job quality was identified as another important consideration for just transition planning. Scholars argue that mere job creation in clean energy and other industries is not sufficient to ensure a just transition, even when those jobs are made available for fossil fuel workers, if new jobs are not comparable on key dimensions such as safety, job security and pay.”^{xviii}

IDENTIFY KEY QUESTIONS

1. How can we work more effectively with the energy industry and governments to ensure training capacity is aligned with the labour market demands?
2. How can we best support existing energy sector workers to learn new skills while still in the workforce?
3. How can the advanced education sector leverage its training expertise to support the province’s sustainability goals?
4. How will we ensure accessibility of training opportunities for northern, Indigenous, under-represented and international learners, particularly in applied STEM fields?
5. How will we provide high-quality apprenticeships and upskill existing tradespeople for the energy sector in the wake of health restrictions stemming from COVID-19?
6. How do we build a culture of innovators and risk-takers for the low carbon economy, since the onus of training and reskilling will rest on the energy sector’s ability to innovate to meet market opportunities?

IDENTIFY BEST PRACTICES

Saskatchewan has an opportunity to lead Canada in aligning skills training with labour market demands within the energy industry. Energy sector workers have advocated for retraining to expand their skills in renewable energy technology, and have called for support from governments to help fund training programs.^{xix}

Some best practices to consider are:

- Enhancing training methods (using virtual and augmented reality tools) and increasing pathways that encourage participation for diverse workers in the fields of STEM.^{xx}
- Bridging the rural-urban divide through enhanced learning technology utilization and improved access to education.^{xxi}
- Increasing collaboration with industry to create greater access points for evidence based research on training approaches.^{xxii}
- Ensuring training resources and qualifications reflect employers’ and learners’ needs.^{xxiii} Increasing availability of training resources to inform workers of upskilling opportunities.^{xxiv}
- Creating clusters that combine new technology with the accrued know-how of industry to produce innovations and enhance skills of our existing workforce.^{xxv}
- Working closely with producers and their supply chains to ensure that all workers have access to relevant training in the foundational and job-specific skill areas required in a low-carbon economy.^{xxvi}
- Capitalizing on prior learning and skill mastery for displaced workers to design efficient pathways to new credentials and emerging occupations.

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES

Employers must plan actively for the emerging labour demands of the low-carbon economy. Many jobs at risk of displacement in the transition to a low-carbon economy share similar skills and could be adapted to meet emerging needs. For example, welders who repair drilling and service rigs could be retrained to repair wind turbines. This strategy has been adopted in Germany, where the range of apprenticeships in the engineering sector has recently been reduced from 47 occupations down to five. The reduction is intended to support transferable skills and mitigate unemployment.^{xxvii}

Accessibility to ongoing advanced skills training across the entire spectrum of learning and training, and robust systems of support and pathways are needed for low-carbon jobs across the entire spectrum of learning and training: from primary and secondary schools through to postsecondary and adult continuing education.

Traditional recruitment and career planning will need to be supplemented with intensive periods of retraining. Here are some possible actions for businesses in the energy sector:

- Consider workforce development strategies that allow at-risk workers to upgrade their skills.
- Support for advanced and agile training solutions mitigates several business continuity risks and yields a positive return on investment.
- Maintain a detailed skills inventory, outside of traditional occupational classifications, to obtain a more accurate picture of where a skills mismatch is likely to occur.
- Consider the range of training formats that would most efficiently meet training needs, from customized on-the-job learning to enrolment in a post-secondary institution.
- Invest in and utilize virtual and augmented reality training technologies for trades training and other technical careers (something other industries have capitalized on during the COVID-19 crisis).
- Partner with institutions of advanced applied education.

Partnering with post-secondary institutions on ways to use new technologies and training delivery methods and offerings (i.e., offering micro-credentials and credit for prior learning and utilizing mobile training labs, to name a few) are effective ways to leverage the expertise in Saskatchewan to solve specific business challenges and to drive innovation. In particular, the polytechnic model of industry-led applied training is an efficient way to develop job-ready skills for emerging labour market needs.

For the energy sector to make the transition to a low-carbon future, our systems of training and skills development must be able to meet future demands. To make this happen, collaboration between employers, workers, educators, researchers, experts and governments at all levels is essential.

ABOUT THE AUTHOR



**Dr. Larry S. Rosia,
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Saskatchewan Polytechnic**

As President and CEO of Saskatchewan Polytechnic, Dr. Larry Rosia leads the province's primary provider of technical education and skills training. Sask Polytech serves more than 28,000 distinct students, and offers programs that touch every sector of the economy.

Dr. Rosia is responsible for leading the development of Sask Polytech's vision and for providing strategic direction to the organization, enabling it to sustain its momentum and capitalize on new opportunities. His priorities include ensuring that students have access to a high-quality, innovative post-secondary education, that employers have access to a highly skilled and qualified workforce that contributes to Saskatchewan's prosperity, and that Sask Polytech nurtures a positive and vibrant workplace environment.

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ENERGY SUPPLY BY CHAD EGGERMAN, PARTNER AT MLT AIKINS LLP

SaskPower and the Government of Saskatchewan have committed to a 40% reduction in emissions by 2030.¹ SaskPower has additional plans to increase the supply of energy generated by renewable sources from its current level to 50% of the demand.² To meet the growing energy demand within the province and the aforementioned emissions reduction targets Saskatchewan has set for itself, the energy supply will have to be produced from an increasingly diverse mix of generation types. Currently Saskatchewan's power mix is predominantly conventional coal and new natural gas but as the province moves towards the future, low carbon sources of energy will continue to take precedence.

There are many sources of energy that can be brought into Saskatchewan's power mix. Wind power generation is currently growing in Saskatchewan. With the increase in wind farms throughout the Southern regions of the province, SaskPower is continuing to purchase power from independent power producers. Wind power is dependent on weather conditions in the area but Southern Saskatchewan has areas that can generate significant levels of energy consistently. Additional projects will be developed in the future as Saskatchewan's wind capacity is utilized. SaskPower has a pipeline of 100mW-200mW requests for proposals (RFPs) which have been going for the past 5 or so years and are expected to continue for the next decade. Wind will likely be the most important generation type for Saskatchewan in the coming decades due to the abundant wind resource in the province, its low cost and ability to generate large amounts of power.

Solar power generation is used in areas that receive a large amount of sunlight. Saskatchewan receives a high level of sunlight exposure throughout the year – the highest in Canada in fact. Solar use is varied in the province from some individual power consumers offsetting their load with rooftop panels to the creation of large utility-scale solar generating facilities supplying SaskPower. There is one solar large utility-scale project set to start construction this year with additional large scale 10mW+ projects on the horizon. A number of First Nations are building projects of approximately 1mW pursuant to the Power Generation Partner Program. SaskPower intends to grow the solar capacity in the province with its commitment to the greenhouse gas reductions. Small scale solar projects can be developed with the goal of offsetting electricity costs for corporations or individuals.

Hydroelectricity produces 60% of Canada's power production. According to SaskPower, hydroelectricity produces roughly 20% of the total electricity generated in Saskatchewan. Hydroelectric dams are a large investment and have a large footprint within the landscape but produce energy for a long period of time with little further emissions. A run-of-river facility is a type of generator that uses river flow to generate electricity. The amount of energy produced is dependent on river flow but they have a smaller ecological footprint. Hydroelectricity requires significant ecological research and community engagement.

Geothermal power generation is used across the globe in areas with easily accessible geothermal resources. In Saskatchewan the potential for geothermal power production exists, although the cost is high, relative to other generation costs, to access and process that energy source. Saskatchewan's geothermal production capacity exists at 3500m. There is significant investment to reach that depth and produce electricity. There is currently a project in development in the Estevan region which will produce 5mW. If successful there would be potential for more geothermal power plants in the province leading to investment and a larger portion of the energy demands being met by renewable sources. Geothermal projects have the added benefit of being able to rely on existing expertise and resources in Saskatchewan in the oil and gas sector to drill, capture and process the hot liquid.

Nuclear energy is currently not produced in Saskatchewan. In 2019 Saskatchewan signed a memorandum of understanding with New Brunswick and Ontario in an effort to explore small modular nuclear reactors. In June 2020, the province announced the creation of a new Nuclear Secretariat to further explore whether such projects are feasible. With this shift in attitude, the Saskatchewan government appears to be signalling an opening of the possibility of developing nuclear power in the province. Nuclear power has the challenge of overcoming the stigma of its history. Nuclear power within the province will require community engagement and collaboration to ensure cheap and safe power production. Nuclear power does have a waste product after use. Research is being conducted into recycling the waste product for re-use and storage. With a change in policy within the province the potential for nuclear power is growing and with it the possibility for investment.

Oil and Gas in Saskatchewan is a large portion of the economy and the power mix. Natural Gas and oil are

present in the south east and western portions of the province. Some oil sands deposits are present in the north west. Saskatchewan's oil and gas resources are well known and well developed and gas-fired generation facilities will likely remain a portion of the power mix for the foreseeable future.

Carbon capturing and sequestering (CCS) is a newer technology used to decrease the environmental impacts created through the fossil fuel energy generation process. By using scrubbers and additional processes in coal plants, the carbon produced can be removed from the exhaust stream and stored in containment areas where it will not be released into the environment. Coal is the most common power generating fuel worldwide. Saskatchewan acknowledged this when they developed the CCS facility at Boundary Dam. As coal will continue to be part of the energy mix, the potential for increased usage of CCS technology exists.

Indigenous groups within Saskatchewan are taking advantage of the opportunities to partner with developers and become independent power producers in their own right. In 2011 SaskPower signed a Master Agreement with the First Nations Power Authority (FNPA) to work together, share information, and identify opportunities for Indigenous inclusion into energy supply.³ SaskPower has an indigenous procurement policy. The goal of this policy is to increase indigenous participation in the supply chain of SaskPower. Since 2012, a number of contracts have been awarded through this policy benefitting both SaskPower and the Indigenous communities in the province.⁴ These policies and agreement will continue to promote economic development in the province in collaboration with Indigenous communities.

Every source of energy has challenges associated with it, from a large environmental footprint, to weather dependency, to administrative or economic investment burdens. The landscape for business venturing into the energy supply field is made easier by involving experienced support groups, such as legal counsel with experience developing energy projects. Bringing together experienced teams which include specialists who live and work in Saskatchewan will benefit our provincial economy greatly and increase the likelihood of success of these projects in the future.

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³About Us, online: First Nations Power Authority <<https://fnpa.ca/about-us/>> (25 June 2020).

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NATURAL INFRASTRUCTURE BY BARBARA HANBIDGE, PROVINCIAL POLICY SPECIALIST AND MICHAEL P. CHAMPION, HEAD OF INDUSTRY AND GOVERNMENT RELATIONS SASKATCHEWAN, AT DUCKS UNLIMITED CANADA

WHY IS THIS AN ISSUE

Natural Infrastructure (NI) is a term that means different things to different people. This presents a problem and a challenge for Saskatchewan as we move towards a low carbon economy. If we want to see an increased use of NI there needs to be clarification and better understanding of terms used. From an international and a business perspective, NI is most often considered to be naturally occurring or naturalized areas or systems which are intentionally engineered, enhanced or managed to provide multiple benefits for the environment, for human well-being and for companies, businesses, urban centres and others.

Unlike Grey or built infrastructure, such as dams or water treatment plants, NI has the ability to provide multiple positive outcomes at the same time, including biodiversity improvements, habitat protection, climate change resiliency, carbon sequestration, runoff reduction, water purification, drought mitigation and other ecosystem services that support the health of communities and functioning ecosystems. NI can also complement and extend the life cycle of Grey Infrastructure. Bio-swales, green roofs, managed wetlands and urban greenspaces / forests are a few examples of where the functions of natural systems have been engineered or enhanced.

2A) Current use of Natural Infrastructure

There are numerous business cases that support the use of Natural Infrastructure solutions for their ability to provide greater benefits when compared to Grey Infrastructure, while fulfilling the same function, being equally efficient and providing the same level of performance. Companies invest in NI to reduce their costs, improve operations and generate financial gains while also benefitting from an improved reputation and social license.

One Saskatchewan example is the Logan Green Project in the City of Yorkton. In 2010 a severe summer storm resulted in large scale downtown flooding of businesses

and the destruction of 14 homes. With support from the Aviva Insurance Company and City of Yorkton, downtown Yorkton was transformed from a storm ravaged area to a place of beauty and function that will help prevent similar flooding from happening again. A storm water retention pond was constructed as part of the Water Management System to showcase how "backwash waste water" from the city's new water treatment plant can be treated, managed, and utilized in an aesthetically pleasing and environmentally beneficial manner. This is accomplished through natural filtration via a series of constructed settling ponds, a stream channel and a fish pond. The innovative Natural Infrastructure design greatly reduced the initial estimated costs and also reduced the demands put on the existing sewage system. The Assiniboine Watershed Stewardship Association acted as project facilitator and brought five additional agencies together who also each contributed towards part of the project.¹

2B) Natural Infrastructure vs Existing Natural Assets: Exploring the Full Equation

A significant complication and concern often raised is that NI data does not include information from systems and areas that already exist naturally and are not managed. Existing Natural Assets (ENAs) are not engineered or enhanced and as such differ from Natural Infrastructure (NI). This is an important distinction.

Wetlands, grasslands, forests, lakes, rivers, soil, protected and natural areas are examples of Saskatchewan's ENA's. They provide significant ecological goods and services such as carbon sequestration, purification of air and water, maintenance of biodiversity, decomposition of wastes, soil and vegetation generation and renewal, pollination of crops and natural vegetation, groundwater recharge through wetlands and flood protection. Combining NI's and ENA's is a sound business strategy.

POTENTIAL ISSUES

Benefits provided by Existing Natural Assets are seldom recognized or quantified using consistent methodologies. When the data has been available, it is not always considered or used, for instance, in the provincial calculations of greenhouse gas emissions.

This has resulted in incomplete information being used for reporting or future planning purposes. Without consideration and inclusion of ENAs in calculations, we end up with an incomplete picture at best and an inaccurate one at worst.

For example: Saskatchewan's agricultural soils have relatively recently been shown to sequester carbon as a result of zero till practices. This should be considered when compiling to our provincial carbon budget. Saskatchewan's overall carbon calculation must also include the concurrent release of carbon when wetlands are drained for agricultural purposes or when other carbon rich ENA's such as intact grasslands are lost.

Wetlands store carbon which is released when they are drained. Draining a little as six hectares of wetland can release the same greenhouse gas equivalent as the carbon sequestered in one year from no-till farming 2,000 hectares. We lose more than 4,000 ha of wetlands annually in Saskatchewan. This results in 89 tonnes of carbon per hectare or a total of 356,000 tonnes released into the atmosphere each year.² This amount has not been included in the total of Saskatchewan's GHG Emissions by Economic Sectors.³

Wetlands are optimum natural environments for sequestering and storing carbon from the atmosphere. Saskatchewan's remaining wetlands store 360 million tonnes of carbon (1.3B tonnes of CO₂) which is more than 7 times the total annual C emissions from the transportation sector in Canada.

Wetland conservation and restoration provides significant opportunities for emission management. When this benefit is added to the list of other environmental goods and services provided by wetlands such as water quality improvement, reduction of flooding, mitigation of drought effects, and the extremely high levels of biodiversity, the case for decreasing the rates of wetland loss is strong.

The amounts of carbon sequestered in Saskatchewan's other ENA's, grasslands and boreal forest are also not considered as part of provincial carbon budget and need to be part of the Saskatchewan carbon equation.

KEY QUESTIONS

On a provincial scale, Saskatchewan lacks accurate, current and useable information on the value of our ENA's. For example, we have data on carbon storage in wetlands but Saskatchewan does not have an inventory of our wetlands. There is also no tracking or reporting of wetland loss by the Water Security Agency. We also lack the remote sensing data to allow the accurate inventory and monitoring of these ENA's. In addition there is a lack of useable data on our grasslands and forests. The task of

finding, compiling and summarizing the information in a usable and meaningful form has not been completed.

Reporting greenhouse gas (GHG) emissions and removals is a requirement under the United Nations Framework Convention on Climate Change (UNFCCC). Canada submits a National Inventory Report of estimated GHG emissions annually and when doing so must follow Good Practice Guidance from Intergovernmental Panel on Climate Change (IPCC). Through this there is useful information⁴ available however the data pertaining to ENAs is incomplete. This is a data gap that has been recognized and that the federal government wants to address.

IDENTIFY BEST PRACTISES

NI and ENA provide significant benefits. We need to recognize, evaluate and quantify the many benefits we receive from them throughout the province. This information should be included in all planning processes, climate change discussions, business case scenarios, and in Environmental Assessments. Although we do not have all the answers, we need to adopt a broader perspective. One source of current local research on ENA in the prairies are the research projects being done by Prairie Water based at the Global Institute for Water Security at the University of Saskatchewan and funded under the Global Water Futures program.⁵

Ongoing recent international research highlights wetland conservation and restoration as a way to achieve climate mitigation targets at the same time as providing many other benefits.⁶

In addition to the monetary value of ENAs the value on human well being is recognized by many in the fields of medicine and the social sciences. Research shows that virtually any form of immersion in the natural world, can improve your overall sense of health. This is an important consideration and although it may not easily or obviously fit within business discussions and recommendations on Saskatchewan's Low Carbon Economy, it is important to the people of Saskatchewan that it does. As the Saskatchewan Growth Plan states, "The purpose of growth is to build a better quality of life for Saskatchewan people".

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES

Solutions to climate change are complex, but one of the simplest and most cost-effective actions we could take as we move ahead is to work with nature. Ignoring the presence and value of our ENAs is a costly missed opportunity.

Many businesses, individuals and producers in Saskatchewan are protecting and restoring areas on their lands and in their communities but we need to do more. There is a benefit to these restoration and preservation projects in the form of climate change resilience and protection. These good practices and the benefits need to be recognized and quantified by the government and the public. The business case for including the use of Natural Infrastructure and in evaluating and protecting our remaining Existing Natural Assets in Saskatchewan as a key component of Saskatchewan's Climate Change Strategy is strong. The return on this investment will pay dividends for generations.

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Since 1991, Barb has held a number of positions within Ducks Unlimited Canada including Area Biologist, Saskatoon Area Manager, Saskatchewan Education Specialist and most recently, Saskatchewan Policy Specialist. As part of the provincial Industry and Government Relations team Barb works on issues associated with wetland and habitat loss. She is also part of the team running her family's Century Farm in south-west Saskatchewan. Barb has a Master of Science Degree from the University of Saskatchewan and her field experience includes work on seabirds, various North American mammals, waterfowl and other water-birds, reptiles and amphibians. Additional skills include vegetation studies in the boreal forest, prairie grasslands and parklands and she has had the good fortune to

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INVESTING TOWARDS A LOW CARBON ECONOMY BY ROBERT VANDERHOOF, CHIEF INVESTMENT OFFICER AT TD ASSET MANAGEMENT INC.

The Saskatchewan Chamber of Commerce's position of support for the oil and gas industry is understandably reflective of the current environment where the industry is a vital component of Gross Domestic Product in this province, both through direct activity and spinoffs. It is also reflective of the reality that Saskatchewan and Canada are largely uninhabitable at the present time without the consumption of hydrocarbons, as we simply don't have adequate available and feasible alternative energy sources. While we have focused on lowering carbon emissions by oil and gas producers, we have placed less emphasis on personal consumption. We collectively as a society have tended to stigmatize producers but have not been as quick to take responsibility for our own consumption. Canada is the third highest per capita consumer of oil in the Organisation for Economic Co-operation and Development (OECD) group of developed nations; something we shouldn't be terribly proud of. Canada's climate, geography and population density will necessitate a reliance on hydrocarbon for some time as we ultimately migrate to more renewable sources of energy generation. Given current demand dynamics, the hard truth is that while we could in theory shut down all oil production in Canada that wouldn't impact those factors or the demand for oil, except to the extent we would be much poorer as a country.

With that said we all have a role to play in understanding the current reality and evolving the economy to a more sustainable future. Finance and investment have a role to play, although a finely balanced one, as we invest not on behalf of ourselves but on behalf of our clients in a fiduciary role that seeks to provide the best risk-return outcomes for a given mandate. We as investors do manage both products where we positively screen for Environmental, Social and Governance (ESG) factors and ones where we engage with companies to influence positive change. In those roles, we are guided by the investment mandates and do what is in the best interest of investors. However, the return and ESG goals are not mutually exclusive. We as investors have a role in evaluating and influencing companies and their environmental impact primarily with a risk lens. We look for long-term sustainability in companies in terms of their



ability to grow, pay dividends, pay interest, etc., which tends to correlate directly with sustainable environmental practices and an ongoing continued improvement in those practices.

Government and public policy play a very significant role in influencing investment towards a low carbon economy through regulation, taxation and incentives. A *laissez faire* approach, expecting market mechanisms alone to move us in that direction, are short sighted. In the U.S., regulated mandates for utilities requiring renewable production, plus tax incentives in solar PV generation, have helped to bridge the cost gap between solar and conventional hydrocarbon intensive production (coal, oil, natural gas) such that technology advances in solar have now effectively closed that cost gap.

Saskatchewan is ideally positioned for investment in renewables both wind and solar, but the overarching question is at what cost to the consumer and tax payer as the economics will continue to require for some period a balance of regulation, taxation, and incentives. As public sentiment moves considerably in that direction, governments will need to balance what that collective good is worth to its constituents.

Governments most definitely have a role in changing investment patterns through impacting the cost of consumption of hydrocarbons. As we know there is a direct correlation between the price of gasoline and demand for consumption. With oil oscillating around \$100 USD over the 2011-2013 time period we saw a direct and immediate impact on miles driven and a shift in demand

to lower consumption vehicles, so we know price can have an impact on behaviour. This too though would be a careful balance between public sentiment and political will that governments must take responsibility for.

We all have a role in moving toward a sustainable climate policy and a low carbon economy, but it will take all of us including industry, individuals and government to set the necessary preconditions to allow the markets to work in our favour. While the consequences of transitioning to alternative and renewable energy sources will certainly come with economic and investment costs, the longer-term implications of inaction could be more severe. Inaction could come at the expense of placing the very health of our own futures in peril. The hard choices and sacrifices we make today, through implementation of sound policy decisions that focus on the reduction of hydrocarbon emissions, will put us on path towards sustainability for generations to come.

“While the consequences of transitioning to alternative and renewable energy sources will certainly come with economic and investment costs, the longer-term implications of inaction could be more severe.”

**Robert Vanderhooft, CFA
Chief Investment Officer,
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ABOUT THE AUTHOR



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Robert is a member of the TD Asset Management Operating Committee as well as the TD Wealth Asset Allocation Committee. He currently serves on the Board of the Regina Airport Authority and the Saskatchewan Roughriders Football Club. He is Past Division Chair and Campaign Cabinet member of Regina's United Way campaign. Robert previously sat as a Board Member with the Canadian Coalition for Good Governance and was named one of Canada's "Top 40 under 40" by the Globe & Mail in 2002.

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THE OIL AND GAS LABOUR MARKET IN THE LOW-CARBON ECONOMY: A WORKFORCE IN TRANSITION BY CAROL HOWE, VICE PRESIDENT OF ENERGY SAFETY CANADA'S COMMUNICATIONS AND PETROIMI

Contributors: Lisette Cameron. Tamara Gale, Breanne O'Reilly

INTRODUCTION

The Pan-Canadian Framework on Clean Growth and Climate Change¹ is Canada's plan – developed with the provinces and territories and in consultation with Indigenous peoples – to meet Canada's emissions reduction targets. The plan includes a pan-Canadian approach to pricing carbon pollution, and measures to achieve greenhouse gas emissions reduction across all industry sectors.

In Canada, climate policy is governed by provincial and federal governments. Several provinces have put a price on carbon and the federal government implemented a backstop policy for provinces without a carbon price in 2018.² In December 2017, the Government of Saskatchewan released *Prairie Resilience – A Made-in Saskatchewan Climate Change Strategy*, which outlines commitments designed to make Saskatchewan more resilient to the climatic, economic and policy impacts of climate change.³

The transition to a low-carbon economy presents opportunities and challenges for Canadians working in the oil and gas industry and for those who are looking to become part of it. The oil and gas industry will need to not only adapt the way it conducts its business, but also who it employs.

THE OIL AND GAS INDUSTRY IN SASKATCHEWAN

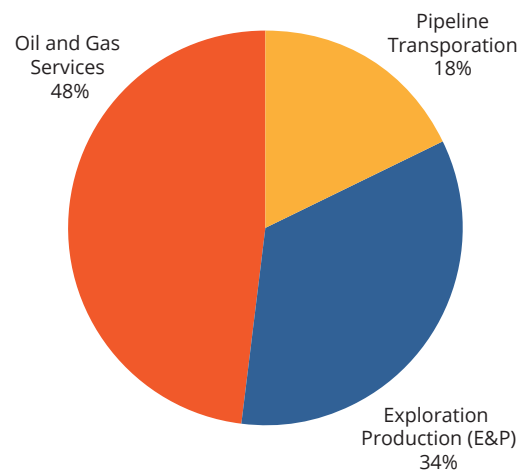
Saskatchewan is Canada's second-largest oil producer and third-largest natural gas producer. The province is the sixth-largest oil producing jurisdiction in North America behind only Texas, Alberta, North Dakota, New Mexico and Oklahoma – and accounts for 10% of total Canadian oil production.⁴

Approximately 11,100 workers were directly employed in Saskatchewan's upstream oil and gas industry in 2019. The province's upstream oil and gas industry is comprised

of three sub-sectors as shown in Figure 1. Also, Table 1 outlines the top occupations directly employed in Saskatchewan's oil and gas industry.

- **Oil and gas services** (48% of the oil and gas industry workforce): Contracted services to the exploration and production (E&P) sub-sector, including drilling and completion services, geophysical services and petroleum services.
- **Exploration and production (E&P)** (34% of the workforce): Involved in the exploration and production of oil and gas for conventional and unconventional reserves (excluding oil sands).
- **Pipeline transportation** (18% of the workforce): Responsible for the storage and mainline transmission for daily crude oil and natural gas production.

FIGURE 1: SASKATCHEWAN'S OIL AND GAS WORKFORCE BY SUB-SECTOR, 2019



Source: Statistics Canada and PetroIMI

TABLE 1: TOP OCCUPATIONS DIRECTLY EMPLOYED IN SASKATCHEWAN'S OIL AND GAS INDUSTRY, 2019

OCCUPATION NATIONAL OCCUPATIONAL CLASSIFICATION (NOC)	ESTIMATED EMPLOYMENT 2019
Total Saskatchewan	11,100
Oil and gas well drillers, servicers, testers and related workers (8232)	1,375
Contractors and supervisors, oil and gas drilling and services (8222)	1,050
Petroleum, gas, chemical process operator (no steam ticket required) (9232)	745
Oil and gas drilling, servicing and related labourers (8615)	700
Oil and gas well drilling workers and service operators (8412)	650
Heavy equipment operators (except crane) (7521)	475
Transport truck drivers (7511)	450
Construction millwrights and industrial mechanics (7311)	390
Managers in natural resources production, drilling and well servicing (0811)	285
Welders and related machine operators (7237)	250
Power engineers and power systems operators (steam-ticket required) (9241)	250

Source: Statistics Canada and PetroLMI

OPPORTUNITIES AND CHALLENGES

Canada’s focus on a carbon tax regime and emissions reduction goals for the oil and gas industry is expected to create demand for broader skills and new occupations that specifically address and measure emissions, apply technologies to help reduce emissions, monitor emissions and help to prove compliance to regulators.

Exploration and production: Most large E&P companies already have the structures in place to measure and monitor carbon emissions. But, efforts to eliminate emissions, where it is financially advantageous to do so, will increase and along with them opportunities for engineers and technologists to implement emissions reduction technologies. Likewise, methane emissions rules will create new roles and expanded skill requirements for measurement, mitigation and reporting.

Oil and gas services: For oil and gas service companies, methane emissions reduction regulations will create new opportunities in measuring, mitigating and monitoring these emissions. Roles in methane leak detection will see an increase in demand. With more electrification of the oil and gas industry expected and service companies diversifying into the power market, this will require additional skills in battery technology, or jobs designing and building more renewable energy sources such as wind or solar installations.

Pipeline transportation: Similarly, new occupations in leak detection, methane monitoring and mitigation, and regulatory compliance are all expected to be added in the pipeline sub-sector. Pipeline operators may also look to replace natural gas power at facilities such as compressor stations with sources of renewable energy such as wind or solar. This will create new opportunities in this sub-sector to install and maintain these new sources of energy.

TRANSITION TO A LOW-CARBON ECONOMY: POTENTIAL IMPACTS ON OCCUPATIONS AND SKILLS

- Expertise in compliance and regulations
- New and expanded measurement, mitigation and reporting occupations
- Skills required for renewable energy installation and operations
- Knowledge of electrical regulations and power grid expertise
- Skills related to carbon and methane emissions mitigation



Opportunities are also on the horizon for decarbonizing oil and gas production and processing, and exploring other emerging renewable energy sources such as geothermal. There are a number of emerging and start-up companies across Canada developing technologies to capture carbon dioxide and turn it into products such as fuels, chemicals and cement additives. Canada's energy industry is already investing significant funds to move these projects and other emissions reduction technologies forward. Examples include projects currently underway, such as the use of carbon sequestration techniques by Whitecap Resources⁵ and Cardinal Energy⁶ to achieve enhanced oil production and in the Weyburn, Saskatchewan area; DEEP's development of Canada's first geothermal power facility in Southern Saskatchewan;⁷ the use of MEG Energy's Modified Steam and Gas Push (eMSAGP) and Modified VAPour Extraction (eMVAPEX) emissions reduction technologies at their Christina Lake oil sands facility;⁸ and the Quest carbon capture and storage project deployed at Shell Canada's Athabasca Oil Sands Project.⁹ As many of these new technologies become commercial and more widely implemented across Canada, it will create work for the traditional engineering and construction sectors and new opportunities to sell, market and install these technologies in Canada and abroad. Similarly, expertise in areas such as international business, currency trading, transportation and foreign languages will be required.

As emissions reduction technologies continue to be developed and automation is integrated into operations, some occupations are at risk of change or elimination. Over the coming decades, the pace at which Canada's oil

and gas industry will adopt new technologies will only accelerate – replacing routine, repetitive or dangerous tasks while freeing up workers to focus on higher value work. With the adoption of more technology, new and interesting careers are evolving and changing; some occupations will decline and may be eliminated entirely. Many of the new and emerging job opportunities will be particularly appealing to youth and those seeking challenging, technology driven occupations. Workers will need to be digitally literate, innovative, creative and flexible, along with having more technical and problem-solving aptitudes than traditionally required.

KEY QUESTIONS

The impact of the transition to a low-carbon economy is likely to be a challenge for employers, workers and governments. Any adjustment of this magnitude requires planning, flexibility and motivation to adapt. As the oil and gas industry prepares and adjusts operations and technologies to meet regulatory obligations and achieve low-carbon emissions targets, it is important for industry to identify emerging occupations and the skills required for the transition to a low-carbon economy.

Planning for the transition is no small feat and companies will need to address these key considerations:

Develop a strategy, goals and objectives

- What goals has your company set to build a skilled and trained workforce?
- What best practices have been established to attract the talent needed?
- What are the new skills and occupations required to build a low-carbon economy workforce?

Identify gaps

- What gaps have been identified to build a skilled and trained workforce?
- What new occupations or skills will be needed to build a skilled and trained workforce?

Adjust behaviours to manage change

- What best practices have been adopted to cultivate and train for the required skills from current workers?
- What technologies are being implemented in response to the transition to a low-carbon economy?
- What best practices are being implemented to enable the transition to a low-carbon economy?

BEST PRACTICES AND ADVICE FOR SASKATCHEWAN BUSINESSES

Key to building a thriving workforce for a transition to a low-carbon economy is establishing best practices that embrace the changes, recognize areas for growth and upskilling and actively work to close gaps in training. Companies can prepare by asking themselves the key questions identified above and employing a strategy to proactively manage and grow their workforce to meet these new objectives.

The transition to a low-carbon economy workforce will see a rise in demand for roles in regulatory management, data analytics and information technology. Companies will benefit from the ability to anticipate the need for these roles and identify areas to incorporate new skill sets into the existing workforce, while recognizing the ability for current workers to upskill and train to fill other emerging roles.

As companies shift operations and processes to adopt new technologies and innovative approaches to reach emissions reduction targets, workers who are adaptable, nimble and manage change well will have an advantage. Third-party contractors will play an important role in filling skill gaps during the transition until companies are able to attract and hire or train people with the required skill sets.

It is imperative to identify and anticipate the support and information companies will need to access prior to making any hiring or training decisions so that skills acquired are relevant for the labour market.¹⁰

- **Employers and workers** in the energy sector benefit from information on present and future skill requirements when designing and implementing human resource development strategies aiming to make work processes energy- and emissions-efficient.
- **Education and training providers** need to know which training curricula to update, what new skills are required, if new courses and course materials should be developed, and if training should be scaled up or down.
- **Government officials and training experts** in charge of designing and updating qualifications, monitoring training systems, or developing skills strategies need to be aware of new trends in skills requirements for jobs in a low-carbon economy.
- **Employment service professionals** use the information to guide job seekers to acquire skills relevant for the low-carbon economy.
- **Policy makers and labour market information professionals** require information about future skill needs for a low-carbon economy to inform policy decisions on budget allocation to various training measures and on regulation of migration. Expected skill shortages in certain occupations can shape migration policy decisions.

ABOUT THE AUTHOR

**Carol Howes,
Vice President
Energy Safety Canada's Communications and PetroLMI**

Carol is responsible for stakeholder relations, brand and communications management. She is also responsible for providing leadership and strategic oversight in all aspects of management and operation for the PetroLMI division.

Prior to joining Energy Safety Canada, Carol worked as a business journalist; as vice-president of a communications consulting firm; as manager of media relations for one of Canada's largest energy companies; and as vice-president of strategic communications for a large, fully integrated national public affairs firm.

More than 30 years of experience in all aspects of business gives Carol a unique perspective on the workforce issues of the oil and gas industry. Carol currently serves on the board of directors of Hospice Calgary. She is also a member of the National Stakeholder Advisory Panel for the Labour Market Information Council, a federal initiative to identify pan-Canadian priorities for the collection, analysis and distribution of labour market information.

¹Government of Canada. <https://www.canada.ca/en/services/environment/weather/climatechange/pancanadian-framework.html>

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³Government of Saskatchewan. <https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/a-made-in-saskatchewan-climate-change-strategy>

⁴Canada Energy Regulator. <https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/sk-eng.html>

⁵Whitecap Resources. <https://www.wcap.ca/sustainability/co2-sequestration>

⁶Cardinal Energy Ltd. <https://cardinalenergy.ca/sustainability/sustainability-overview/>

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⁸MEG Energy. <https://www.megenergy.com/sustainability/environment/air>

⁹Shell Canada. https://www.shell.ca/en_ca/about-us/projects-and-sites/quest-carbon-capture-and-storage-project.html

¹⁰International Labour Office, Anticipating skill needs for the low carbon economy? Difficult, but not impossible, https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_168352.pdf



REGULATIONS BY R.J. SCHUTZMAN, DIRECTOR, ENVIRONMENTAL AFFAIRS – CANADA FOR EVRAZ NORTH AMERICA

WHY IS THIS AN ISSUE?

Saskatchewan's economy has been developed for a century or more on the availability of relatively inexpensive energy, based primarily upon the use of fossil fuels. The Canadian Government has mandated a change to a low carbon economy to address climate change issues. To change to a low (fossil) carbon economy will be difficult, expensive and will likely strand some assets that have been put in place during the last century. The replacement energy technologies available are sometimes not yet established, or are less reliable and/or more expensive. Replacing fossil fuel energy will likely strand some recent investments therein.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL AND INTERNATIONAL LANDSCAPES

The major agency responsible for addressing climate change is the United Nations Framework Convention on Climate Change (UNFCCC). Canada is a signatory to the UNFCCC. In 2016, 195 countries signed the Paris Agreement, which called for measures to hold the increase in the global average temperature to well below 2 C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 C above pre-industrial levels. The United States withdrew from the Agreement and is in the process of rejoining it.

Canada has committed to a target to reduce greenhouse gases (GHG) emissions by 30% below 2005 levels by 2030. Plans for how to achieve this were approved in the Pan-Canadian Framework on Clean Growth and Climate Change. It was signed in 2016 by the Federal Government and all Provinces and Territories, except Saskatchewan. While both governments require reporting of GHG emissions by emitters of more than 10,000 tonnes per annum (t/a), Saskatchewan has developed its own Prairie Resilience Climate Change Strategy to address climate change more widely. It has also put in place an Output Based Performance system (OBPS) to require larger industrial emitters to reduce their carbon emissions per unit of production to that for the best available technology, on a graduated scale by 2030. Saskatchewan has also introduced bio-fuel content requirements of 7.5% for gasoline and 2% for diesel fuel.

The Federal Government has introduced a carbon tax per tonne of carbon emission, which will rise at \$10/t each year until reaching \$50/t in 2022, after which it may yet be further increased. They also have an output-based pricing system (OBPS) to require larger industrial emitters to reduce their carbon emissions per unit of production, if they are not covered by an approved Provincial system. Environment and Climate Change Canada is developing a Clean Fuel Standard to require increased non-fossil content in liquid, solid and gaseous fuels, with the liquid fuels regulation expected in 2021. Most recently, the Federal government made a commitment to have 'net zero' GHG emissions by 2050, but details of exactly what that means or how it is to be done are not yet available.

Our international competitors in countries such as the United States, China, India and Korea do not face such requirements and costs. Internationally, there is a Task Force on Climate-related Financial Disclosures (TCFD), comprised mainly of bankers and investment houses, which is developing climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders. At the same time, a standard for 'green financing', ISO 14030, is being developed to identify 'green' investments, including with respect to GHG emissions and climate change.

POTENTIAL ISSUES

The adversities to be overcome in meeting this challenge include:

1. Replacement energy technologies and infrastructure are sometimes not yet established, or are less reliable and/or more expensive.
2. Lower carbon or carbon-free manufacturing technology is still in development and has little commercial availability.
3. The costs of a carbon tax will be passed through to domestic fuel and energy users, increasing business costs.
4. For business that sell commodities (e.g. steel, grain, potash, etc.) on international markets, (the energy-intensive trade-exposed (EITE) industries) there will be difficulty maintaining competitiveness as costs increase while prices do not, and our inter-national competitors do not face the same costs. (Exports are 30 – 40% of GDP.)

5. The availability of capital to fund uneconomic proposals will be sparse, while at the same time funding available for fossil fuel projects is also expected to decrease.
6. The changes to the energy supply and infrastructure may lead to stranded investments in the fossil fuel area.

KEY QUESTIONS

Several key questions remain as we all attempt to tackle this conundrum:

- What will be the requirements for each sector of the economy?
- How and with what tools will we parse the issue by sectors, e.g. agriculture, transportation, commercial and industrial business?
- When will various actions be required?
- What incentives and initiatives will be put in place to encourage the adoption of measures to reduce GHG emissions, and the construction of new enterprise to provide the alternatives to fossil fuels, and related infrastructure?

IDENTIFY BEST PRACTICES

For the short term, increasing our energy and material efficiency is the best way to reduce GHG emissions, while also increasing our competitiveness. Recycling is also a way to reduce the carbon footprint of materials that we use. Establishing a preference for green energy will theoretically hasten the greening our electrical grid, but this is likely also to need political backing with monopoly utilities. Implementing green manufacturing technology where it exists and is economic will also improve our GHG-related performance.

ADVICE FOR SASKATCHEWAN BUSINESSES

Saskatchewan businesses should look to the practices above at their earliest opportunity, to reduce their GHG emissions. We should also plan for a transition of higher cost and investment to achieve it.

ABOUT THE AUTHOR



**R. J. Schutzman, Director,
Environmental Affairs – Canada
EVRAZ North America**

Mr. Schutzman has recently retired from EVRAZ Inc. NA Canada, as their Director of Environmental Affairs. He led the Company's environmental activities for compliance across its Canadian operations located in 4 provinces, including its 4 pipe mill sites, 13 scrap operations with 5 shredders, and its Regina steel works. He also has been responsible for the decommissioning and clean-up of 2 former steel mills, a galvanizing pipe mill and 3 other inactive sites. Mr. Schutzman is a Professional Engineer with a degree from the University of Saskatchewan. He has held environment-related positions in consulting, as a regulator in the water resources field in Alberta and in the wastewater and drinking water areas in Saskatchewan, and in the mining and steel industries.

Mr. Schutzman chaired the Environment Committee of the Saskatchewan Chamber of Commerce, and was a member and past Chair of the Environment and Energy Committee of the Canadian Steel Producers Association. He was a Director and Vice-Chair of the Great Plains Air Zone, and chaired its Science Committee. Bob was a member of the Saskatchewan Environmental Code Advisory Committee, and was also on the Development Committee for the creation of the Code. Bob is a past Director and past Chair of the Technical Safety Authority of Saskatchewan, and a past Director and past Chair of the Saskatchewan Environmental Industry and Managers Association. Bob is a past Director of the Canadian Prairie and Northern Section of the Air and Waste Management Association, and of the Saskatchewan Waste Reduction Council. He was also a member and past Chair of the former Saskatchewan Regulatory Modernization Council.



Photo by Tandem X Visuals

EMERGING INDIGENOUS GREEN ENERGY AND CANADA'S ZERO EMISSIONS ENERGY VISION BY GUY LONECHILD, PRESIDENT & CEO, FIRST NATIONS POWER AUTHORITY

If the COVID-19 pandemic taught us anything it is that Saskatchewan and Canada have the capacity to pull together. While we must maintain our vigilance about the pandemic, it is time to talk openly about how we can convert that commitment to other collective aspirations. Our urgent need to balance safe, reliable energy supplies with high level environmental stewardship is a prime focus for our common effort. Indigenous peoples are determined to stand with other citizens of the province and country as we embark on this critical journey.

EMERGING INDIGENOUS GREEN ENERGY AND CANADA'S ZERO EMISSIONS ENERGY VISION

First Nations Power Authority (FNPA) is leading the development of Indigenous-led power projects, in large part through our ground-breaking partnership with SaskPower. We need plans for climate action and a clean energy future. Done properly, FNPA's participation in this enterprise can ensure that this vital effort also contributes to economic reconciliation with Indigenous peoples.

ENHANCING A PATHWAY TO POWERFUL OPPORTUNITIES

Other Canadian jurisdictions have forged energy partnerships with First Nations in hydro-electric, wind, solar, nuclear and geo-thermal projects that provide important lessons for Saskatchewan. These initiatives work best when they are connected to First Nations job, business and wealth creation efforts. These collaborations advance shared environmental, social and corporate governance (ESG) priorities, unite the contributions of large industrial emitters, Saskatchewan consumers, and Indigenous communities. FNPA, with superb connections with First Nations, strong engagement with SaskPower and an eye firmly on the future of energy production and conservation, can also collaborate with the province's largest emitters that include some of the largest Crown Corporations, and mining, oil and gas key players in Canada.

WHY CROSS-SECTOR COLLABORATION IS ESSENTIAL TO SASKATCHEWAN'S ENERGY FUTURE.

First Nations Power Authority, SaskPower and large industrial emitters must ensure that the ESG goals become the norm for corporations in the private sector. This is hard and essential work. New sources of capital could support corporate sustainability plans and help us

meet corporate environmental performance objectives. This effort would complement SaskPower's 'Clean Energy Future Roadmap'.

First Nations Power Authority believes First Nations can support SaskPower and other large industrial emitters through meaningful stakeholder engagement, responsible supply chain management and reducing the province's environmental footprint, exposure to the Federal carbon tax, operational expenditures, and overall greenhouse gas emissions. FNPA is determined to play a crucial role in improving collaboration between the Ministry of Environment, SaskPower, SaskEnergy and other large industrial emitters with First Nations communities in order to achieve this clean energy future.

Our collective aspirations have to be transformative while demonstrating to Saskatchewan the many benefits of active Indigenous engagement in provincial development. We can reduce emissions to 40% below 2005 by 2030, but it will take the kind of province-wide determination that has worked for Saskatchewan in the past. First Nations and FNPA are committed to developing new clean energy infrastructure that contributes to a Zero Emissions Energy Vision by 2050. This involves developing clean energy projects, renewable and Small Modular Reactor technologies, that maximize Indigenous participation.

First Nations and FNPA can contribute by attracting federal investment in locally developed renewable energy power generation facilities. This would involve energy efficiency strategies to maximize the shared benefits of interconnection and importing power from Manitoba Hydro generating stations, thus ensuring significant long-term benefits to a variety of stakeholders.

BROADER ECONOMIC BENEFITS

While environmental benefits dominate energy discussion, much more is at stake. These high-profile initiatives would position First Nations at the leading edge of economic reconciliation and as key players in the preservation and improvement of provincial prosperity. The emphasis on clean, affordable and locally generated and distributed energy will stabilize provincial supplies and improve the market competitiveness of all provincial business and operators, Indigenous and non-Indigenous alike. In energy, as in so many other sectors, there is no longer a sharp division between Indigenous needs and those of the province of the whole.

Concerted and values-based approaches to energy management, including focusing on ESG goals, will attract increased private sector investment in renewable energy and carbon neutral projects. By focusing on Saskatchewan production by Saskatchewan providers, this approach will likewise improve procurement and supply chain opportunities for Indigenous businesses, which continue to move into the space at a rapid pace.

Saskatchewan must pay close attention to the broader benefits of effective and efficient energy production. This new and collaborative approach provides greater potential for own-source revenue generation opportunities for First Nation communities and businesses, thereby increasing local employment and skills training opportunities. The result will be the improved deployment, construction and operation of renewable energy and carbon neutral projects.

GOVERNANCE GOALS

As Saskatchewan improves provincial production of renewable and advanced energy systems, so too will our technical capacity and contribute to the application of sustainability measures to attract new interest in infrastructure investments. The steady and thoughtful expansion of the industry will produce increased opportunity for government organizations, working the FNPA, energy producers and user groups to refine policy and program objectives related to renewable energy, climate change and power generation and sustainability. Collaborative efforts at the industry level will help bring provincial citizens to a vision of a common energy future. These strategies will also produce increased collaboration between the Governments of Canada and Saskatchewan in the improvement of Indigenous participation in the economy, a development of assured benefit to all the people of Saskatchewan.

A PATH TO ECONOMIC RECONCILIATION THROUGH SASKPOWER AND ALL LARGE EMITTERS

Improving opportunities for First Nations is a top priority for Saskatchewan and one that can and should be tied directly to the transformation of the provincial energy system. As First Nations forge new economic, social, political and cultural ties with other Saskatchewan residents, there is a growing realization that such improvements have to be built into the core commitments and structures of the province. Saskatchewan could set world-leading aspirations, all based on appropriate

business cases. Indigenous access to investment capital, that could reset relationships within the province.

For example, 50% of all new generation in Saskatchewan should have a minimum of 25% Indigenous equity ownership. Furthermore, 25% of all new power generation projects in Saskatchewan would have at least 51% indigenous ownership. Steps should be taken by the Government of Canada, First Nations and Metis governments, the Crown Corporations and other partners to ensure Indigenous equity ownership of no less than 25%, for major transmission projects, renewable energy projects, and carbon neutral projects, as well as baseload power projects such as natural gas plants and installations of Small Modular Reactor technologies.

First Nations have made it clear that they want to be major players in Saskatchewan's energy future. FNPA has set a goal of having at least 25% of renewable energy or carbon neutral projects geared towards majority Indigenous ownership (at least 250MW). There is a collective desire to have up to 75% of baseload capacity contracts geared towards projects with significant Indigenous ownership. We aspire to a situation where Indigenous peoples have not less than 25% of the equity in each new baseload capacity project (up to 750MW).

We have a strong commitment to exploring new energy sources. We urge the development of a \$300-\$500 million fund to support Indigenous investment in renewable energy power generation, power transmission projects and Indigenous ownership in SMR technologies. We want to be engaged in the present energy system, but we are even more determined to be a critical part of the future.

On behalf of our board of directors at First Nations Power Authority and our over 135 General and Industry Members, I would like to acknowledge the incredible work the Saskatchewan Chamber of Commerce, notably Steve McLellan and his staff, are doing to advance the conversation around Low Carbon Economy in Canada and the Chamber's support for a commitment to mutually beneficial economic reconciliation.

The Saskatchewan Growth Plan, The Next Decade of Growth 2020 - 2030, states the "purpose is to build a better quality of life for Saskatchewan people - to build strong communities and strong families - and grow a stronger Saskatchewan now, and for the next decade." FNPA supports this commitment and will do whatever is needed to ensure that Indigenous people's engagement are full participants in the decade of growth and the transformation of the energy sector.

ABOUT THE AUTHOR



**Guy Lonechild,
President & CEO,
First Nations Power Authority**

Guy Lonechild is a well-known advocate for enabling growth and opportunities for First Nation communities and serves as Chief Executive Officer of First Nations Power Authority, an organization he helped initiate in 2011. Mr. Lonechild has served Saskatchewan First Nations in elected positions, administrative capacities, and as a private management consultant. He holds an Associate Degree in Business Management from San Diego, California and is completing work on an MBA in Community Economic Development at Cape Breton University. His research in, 'Mobilizing Aboriginal Wealth: Development Corporations and the Prosperity Opportunity in Canada', serves to inform the First Nations, academic, and business community in emerging trends in AEDC development. Mr. Lonechild has led a number of taskforces, development programs, and initiatives to enable good governance, change management, and growth and renewal of First Nations and enterprises in Canada.

GLOBAL ISSUES BY DR. MARGOT HURLBERT, CANADA RESEARCH CHAIR, CLIMATE CHANGE, ENERGY AND SUSTAINABILITY POLICY, JOHNSON SHOYAMA GRADUATE SCHOOL OF PUBLIC POLICY, UNIVERSITY OF REGINA

WHY IS THIS AN ISSUE?

Climate change is about risk. And risk poorly managed can engender a crisis; in 2019 climate change became the 'climate crisis.'

This past year, the evidence of the impacts of climate change (CC) has been undeniable: bushfires in Australia, floods in Indonesia, locust swarms in East Africa. Climate change is real, it's happening now, and humans are both the cause, and the solution (IPCC 2018; 2019A; 2019B). The change in global surface air temperature over land has risen 1.9 degrees Celsius since 1850 (IPCC 2019A). In Saskatchewan we experience this as being less cold. Our average winter minimum temperature has increased to minus 16 degrees Celsius today from minus 22 degrees Celsius 55 years ago (a 6 degree Celsius warming). Our average frost-free growing period has similarly increased to 140 days, up from 106 days in the mid-1960s (SRC 2020; Cross 2020). This warming has manifest in such things as the advent of West Nile virus and the unprecedented extent and severity of the pine beetle infestation (Kurz et al. 2008). CC is also about the increasing frequency and intensity of floods, fires, and droughts, and their impact on livelihoods, health, ecosystems and species, business,

and the economy. CC risk is increasingly the outcome of limited and ineffectual responses.

CC risk has become reputational. In the words of Greta Thunberg addressing the United Nations,

"People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction, and all you can talk about is money and fairy tales of eternal economic growth. How dare you!" (Thunberg 2019).

Climate strikes took place in at least 150 countries worldwide taking up Greta's challenge; by the end of 2019 1,480 jurisdictions that spanned 28 countries and covered 820 million citizens issued 'climate emergency' declarations (Ren21, 2020).

Globally interconnected CC risks are only beginning to be understood and experienced. Multi food supply failures exacerbate urbanization, migration, and conflict as El Nino and La Nina events potentially create cascading risk through northern and southern hemispheres. In a synthesis of the latest peer-reviewed, state-of-the planet research more than one third of scientists identified the underlined threat posed by the synergistic interplay and feedback loops between the top five global risks that "might cascade to create global systemic crisis." These include extreme heatwaves accelerating global warming by releasing large amounts of stored carbon, at the same time intensifying water crisis and/or food scarcity; loss of biodiversity weakens the capacity of natural and agriculture systems to cope with climate extremes increasing vulnerability to food crisis (Future Earth 2020).

Pandemics were long talked about without action prior to COVID-19. The same has been true in terms of climate change, but very little concrete action has been taken. The fact is time is fast running out and CC impacts will be longer lasting and more massive than that of COVID-19. As the International Panel on Climate Change warned in 2019 “the window of opportunity, the period when significant change can be made, for limiting CC within tolerable boundaries is rapidly narrowing”. We have no option but to rebuild our economy post COVID-19, and it can be done mindful of reducing CC risk, and with thoughtful decarbonization of the economy.

“In a synthesis of the latest peer-reviewed, state-of-the planet research more than one third of scientists identified the underlined threat posed by the synergistic interplay and feedback loops between the top five global risks that ‘might cascade to create global systemic crisis.’ ”

Prof. Margot Hurlbert
Canada Research Chair, Tier 1
Climate Change, Energy, and
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Today there is a gap between current policy and the behavioral and policy changes needed to address climate change. People, their livelihoods, their employers, their businesses, and Canada’s economy are all critical factors in addressing this gap. But decision makers tend to discount the future, particularly when it involves longer-term horizons as is the case with CC. As a result, extinction of species and ecosystems, melting of polar ice caps, are given a diminishing value. Today is a time for the kind of moral leadership that recognizes failure to act now threatens the welfare of future generations. Without it, we face making decisions that create stranded assets in

the future, such as coal or natural gas power plants that are not equipped with carbon capture technology, and become impediments to reaching our goal of a net-zero carbon emission future by 2050.

ENVIRONMENTAL SCAN OF CURRENT PROVINCIAL, NATIONAL AND INTERNATIONAL LANDSCAPES

Former Bank of England and Bank of Canada governor Mark Carney, refers to the climate crisis as the “tragedy of the horizon” (Carney 2019: 12). In other words, our socio-ecological systems are not developing fast enough for the world to reach net zero. The fact is that the severe effects of CC will be felt well beyond most government and business’ traditional horizons, imposing a cost on future generation that we, the current generation, have little immediate incentive to fix.

The world’s remaining carbon budget (the amount of GHG emissions that can be released into the atmosphere over time) may be depleted as soon as 2028.* At this point, if we emit further carbon into our atmosphere, we will likely be unable to meet our Paris Agreement commitments. It is clear urgent action is required - a combination of new technology (clean and renewable), energy efficiency and societal change (IPCC 2014).

CC risk also presents opportunity.

The majority of climate change scenarios consistent with the Paris Agreement rely on a combination of negative emission technologies (NET), carbon dioxide removal (CDR), and clean energy technologies such as solar, wind, and nuclear. Negative emission technologies also comprise nature-based solutions such as planting trees and expanding protected areas, converting biomass to biochar (charcoal-like substance made by burning organic material in a controlled process) and using it as a soil amendment, direct air capture with carbon capture and storage (CCS), bioenergy CCS (burning of biomass (switchgrass or loblolly pine) to produce energy and capture CO₂ using CCS). CDR occurs with agricultural best management practices that increase soil organic carbon content, reduce soil erosion, salinization and compaction, and include soil carbon sequestration, and processes to speed carbon mineralization.

* The remaining carbon budget for a one in two chance of limiting global warming to 1.5 degrees C is about 580 GtCo₂ and about 420 GtCo₂ for a two in three chance. These budgets are reduced by approximately 100 GtCo₂ when permafrost and other less represented Earth system feedback are taken into account. At constant 2017 emissions these budgets would be depleted by the years 2032 and 2028 respectively (IPCC 2018; IPCC 2019A, B).

Projections by the International Energy Agency indicate global demand for oil and gas will reach its peak by about 2025 and then remain relatively constant through to 2050. Having said that, the energy supply chain will very likely be different. To achieve Paris commitments the IEA states, “renewables will not be enough on their own” (Chestney 2020) and solar, wind, low-carbon hydrogen, batteries and carbon capture and storage (CCUS) should be a part of governments’ plans for both stimulating clean energy transitions and stimulating economies (Birof 2020; Chestney 2020). Further, we will not achieve Paris commitments without decarbonizing the transport sector (Chestney 2020).

One consequence of the COVID pandemic is people are more savvy about global supply chains. It will have significant impacts. For example, our medical system depends on products such as plastics, syringes and other equipment that is derived from oil. Moreover electric vehicles still require oil and gas products in their construction, and many of our household products and clothes contain oil and gas derivatives. As global consumers demand low to zero emission mining, industry, and transportation, the challenge becomes how we will supply essential products.

Saskatchewan is well situated to take advantage of this opportunity. The application of carbon capture utilization and storage (CCUS) on a coal-fired power plant at SaskPower’s Boundary Dam 3 CCS Facility has led to the use of its CO₂ for Enhanced Oil Recovery at the Weyburn Midale oilfields. A portion of that CO₂ has also been injected into a sandstone and brine formation at the Aquistore test site managed by the Petroleum Technology Research Centre (PTRC) to help finalize measurement and monitoring technologies for safe CO₂ storage, whether in oil fields or in saline aquifers. Saskatchewan now has a reputation as a world leader in carbon capture and storage. The province needs to leverage that reputation by expanding its role in CCUS and Saskatchewan has the knowledge of the Regina International CCS Knowledge Centre to help it do so.

For example, an option is to create a Saskatchewan carbon capture and utilization trunk line that could be either linked to Alberta’s Carbon Trunk line which was completed in May, or exist on its own as a Saskatchewan Hub. The Alberta line transports carbon captured from the Nutrien Redwater fertilizer and NWR Sturgeon Refinery to a facility that creates dry CO₂ and Syngas. Captured carbon also is an essential ingredient in the creation

of non-emitting hydrogen fuel, which many see as the transportation fuel of the future. Manufacturing pipelines in the future could be about CO₂ transport rather than just shipping oil and natural gas. With the right breakthrough technology and infrastructure, CO₂ can be transformed from a pollutant to part of the CC solution. In Squamish, Carbon Engineering has a plant that captures CO₂ directly out of the atmosphere which then can be stored deep in the ground or used for making clean transportation fuels.

Moreover, coal fired power stations could be transformed by using bioenergy feedstock to replace coal CCS (required for NET and CDR), or repurposed for small modular nuclear reactors in the future. Saskatchewan is also home to some of the world’s largest uranium deposits, and has knowledge of, and capacity supporting nuclear science at its universities and the Sylvia Fedoruk Canadian Centre for Nuclear Innovation. Mining uranium in the future could be a part of supporting a Saskatchewan and Canadian small modular nuclear reactor industry.

IDENTIFY POTENTIAL ISSUES

Because of short planning horizons businesses potentially fail to consider the significant CC risks. Planning CCS pipelines and hubs, conversion of coal fired power plants, and building SMRs require planning, proper economic studies and engineering designs.

Saskatchewan businesses also have additional CC risks. What will our businesses do in the event of a multi-year drought, the likes of which has not been experienced this century? How will decisions be made between competing water uses, including water for cooling power production and necessary for other industrial processes? How will municipalities and local communities raise necessary funds for replacement and upgrading of water infrastructure to anticipate both increasing frequency and intensity of droughts and floods?

IDENTIFY KEY QUESTIONS

Understanding CC decision-making is a complex process. It requires weighing the tradeoffs between adaptation policies (to reduce CC impacts) and mitigation (to reduce the rate of CC), and competing interests such as forestry (storing carbon) and agriculture (advancing food security). A key question is how to optimize these decisions in the face of increasingly legally binding commitments. Rigid national, provincial, territorial or sectoral targets gives rise to burden-sharing decisions. The Government of Canada has set out its CC objectives as part of its Pan-

Canadian Framework on Climate Change. British Columbia and Manitoba have legislated climate accountability frameworks, along with New Zealand and the United Kingdom (Beugin et al. 2020). Does Saskatchewan's Prairie Resilience Strategy go far enough? Can Saskatchewan rise to the challenge by meeting the federal-mandated standards, or risk being subject to a federal, Canadian climate accountability framework? (See Beugin et al. 2020)

IDENTIFY BEST PRACTICES

The way forward for Saskatchewan is to identify best practices and include them in a policy framework. There are three key elements:

- **First, to recognized that managing climate change risk is about systems planning.** Different decision-making and strategic planning is needed, which means medium and longer-term forward thinking, which requires overcoming our natural tendency to discount high future risk impacts, especially traditional CC risks (drought, flood, fire), and our reticence to pro-actively expend money for risk reduction. Holistic, cross/multi-sector, multi-government level decision-making is required to correct these behavioural biases and address CC risk.

There is no one policy solution, instead we need a system or suite of policy portfolio. Economists prefer a carbon tax for its economic efficiency and because it is technology neutral allowing producers and consumers to make ultimate choice. But markets are not always efficient and often times new technology and innovation requires a different impetus. CO₂ pipelines, infrastructure for electric or hydrogen vehicles, geothermal heating, also require government leadership. Green financing, targeted tax credits (such as the American 45Q), a CO₂-enhanced oil recovery (EOR) royalty incentive, accelerating greater efficiencies in infrastructure, buildings, and homes, and advancing nature-based solutions (NBS) (constructed wetlands, rainwater harvesting, conservation easements, green walls to reduce urban heat islands, protecting grass and grazing lands).

The World Economic Forum (2020) has recognized a system approach is the best practice for enabling a transition and has an Energy Transition Index (ETI) intended to enable policy-makers and businesses to plot the course for a successful energy transition. Important transition dimensions include energy system structure, human capital and consumer participation, infrastructure and innovative business environment, institutions and

governance, regulation and political commitment, and capital and investment. Canada's ETI score has gone backwards, decreasing from 2015 to 2020 (WEC 2020).

- **Second, governments are increasingly recognizing the need to embrace laws and policies with targets of net zero emissions by 2030 or 2050.** We live in a world where policy and priorities are shaped by commitments to address CC. Many countries have declared (Sweden, United Kingdom, France Denmark, New Zealand, Hungary -while Suriname and Bhutan have achieved) or are currently considering (European Union, Spain, Chile, Fiji) ambitious net-zero emissions goals (Energy & Climate 2020). Finland, Austria, Iceland, Germany, Switzerland, Norway, Ireland, Portugal, Costa Rica, Slovenia, Marshall Islands have these targets in policy documents; Uruguay, Italy, Canada, South Korea, Mexico, the Netherlands, Colombia, Argentina, Belgium, Pakistan, and many more are considering these measures(*ibid.*). 77 countries, 10 regions and more than 100 cities announced their commitment to net zero carbon emissions by 2050; the momentum is building (Beugin et al. 2020). A large number of global organizations have declared carbon neutral targets, especially those with end-consumer-facing business models (including Amazon, Google, Apple, Cenovus Energy, TELUS, and Maple Leaf Foods). Calgary's Canadian Natural Resources Limited has set an aspirational goal of net zero.

There is much diversity surrounding 'net zero' (carbon neutral, decarbonization, climate neutral) from choice of greenhouse gasses, treatment of offsets and negative emission alternatives, and boundaries for accounting emissions. There is much opportunity for tailoring a strategy through deliberative dialogue in order to build target points, timelines and sector specifics into an achievable roadmap. Gradual implementation of carbon pricing mechanisms allows for adjustment. Additionally, a sector specific approach allows for response to distributional considerations. Targeted fiscal support may be required for sectors vulnerable through challenges to international trade competitiveness from carbon leakage.



• **Third, planning for the long term** is increasingly crucial for resilience. Planning for the financial quarter or year-end is obsolete. Apple has been a leader is not paying large stock dividends or buy backs and instead investing in a reserve to finance innovation in difficult times and keep people employed. The automobile industry wasn't as well prepared and resilient prior to the 2008 financial crisis, and suffered reputational damage as a result. Reputational damage also exists to varying degrees with different stakeholders. One has only to harken back to the opening words of Greta. 70% of young people consider the speed of energy transition to be either stagnant or too slow – but the opportunity in this is they are willing to pay for it and accept the lifestyle changes required for energy transition (WEF 2020).

Changing public sentiment of corporate responsibility is also paralleled by changing legal responsibility. Youth public trust claims are increasing against governments for inadequate climate efforts, but so are lawsuits against private entities for failure to adapt to CC, failing to incorporate CC risks into investments and planning, failing to report CC risks, or weak, misleading or inadequate disclosure surrounding planning for CC risk including CC scenarios for limiting global warming well below 2 degrees Celsius (Setzer and Byrnes 2019; Peel et al. 2017). Increased obligations surrounding planning for net 2 degrees Celsius and communicating it (akin to net zero by 2050)(IPCC 2018) has been endorsed by the G20 (Carney), the American Bar Association (Brammer et al. 2019), and the European Commission (Zadek).

OFFER ADVICE FOR SASKATCHEWAN BUSINESSES.

CC is a complex problem and transformative approaches will be needed to address it. Creating a CC solutions space will allow discussion of opportunities and synergies for Saskatchewan and allow Saskatchewan's businesses and people to excel at working together on these issues. Renewables are an important part of solving CC, but more is needed for baseload energy and continued reliability. Synergies between power production, oil and gas, and industry require joint problem solving. For example, hydrogen fueled transportation and electric vehicles give risk to potential opportunities if synergistically considered in relation to Saskatchewan's economy. The reality of their use also gives rise to necessary adaptations and modifications of Saskatchewan's transportation hub, road, and service station infrastructure. Bioenergy CCS creates opportunities for individual agricultural producers as well as oil, gas and power production communities.

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Margot's experience includes 11 years of private practice, 7 years at SaskPower as the Assistant General Counsel, Coordinating Lead Author with the IPCC Land and Climate Report (2019) (as well as current author in the sixth Assessment Report (2022)), and member Future Earth Working Group on Transformations. Margot is a Senior Research Fellow of the Task Force on Earth System Law and the Earth Systems Governance Project (Future Earth), Delft, the Netherlands.

Margot has a B. Admin. (Great Distinction) from the University of Regina (1985), an LL.B. (Osgoode) (1987), an LL.M. (Osgoode) (2005) in Constitutional Law with a focus on energy, natural resource, Indigenous and environmental issues, and a Ph.D. (University of Amsterdam) in Social and Behaviour Sciences with a thesis "Adaptive Governance of Disaster: Drought and Flood in Rural Areas" published by Springer.

With over 100 publications, her research interests focus on energy, climate change, agriculture, and water. Margot has led and participated in many SSHRC, NSERC and IDRC research projects, serves on the editorial boards of international journals, and is the Lead of the Science, Technology and Innovation Research Cluster at Johnson Shoyama Graduate School of Public Policy in Regina.

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