REPORT OF THE

Expert Advisory Council *to the* Minister of Environment and Climate Change

A Green Economy Transition for Manitoba

JANUARY 2024

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1. Land Acknowledgement

The Expert Advisory Council acknowledges that Manitoba is located on Treaty Territories 1, 2, 3, 4, and 5, and on the ancestral lands of the Anishinaabeg, Anishininewuk, Dakota Oyate, Denesuline and Nehethowuk nations.

We acknowledge that Manitoba is located on the Homeland of the Red River Métis.

We acknowledge that northern Manitoba includes lands that were and are the ancestral lands of Inuit.

We respect the spirit and intent of Treaties and remain committed to working in partnership with First Nations, Inuit and Métis people as we walk the shared path of truth and reconciliation.

We recognize the shared responsibility towards current and future generations and trust this report contributes to the goal of a green economy.

2. Letter to the Minister

Dear Minister Schmidt,

This report sets out the Expert Advisory Council's (the Council) recommendations on Manitoba's transition to a green economy. These recommendations include Green Economy Transition opportunities in Manitoba's economy and a potential role for government to support and leverage them.

In preparing these recommendations, the Council has considered substantial expert input, stakeholder feedback, and peer reviewed reports. In addition, we reflected upon key learnings from the Opportunities in a Low Carbon Economy Forum that focused on understanding the economic factors that influence a shift to a low-carbon economy.

We are also mindful of your first mandate letter, dated Oct. 19, 2023, that states:

- Climate change is one of the greatest challenges of all times.
- You will also provide a critical lens to your cabinet colleagues that ensures we measure the environmental impact of our decisions as a government.
- Your work will intersect with many other departments as our government strives to mitigate the impacts of climate change in every way possible.
- Make Manitoba a leader in clean energy and help our government take bold action when it comes to fighting the climate crisis.
- Work with Indigenous communities on the goal of protecting 30 per cent of Manitoba's diverse landscapes by 2030.
- Implement our Affordable Home Energy Program to help families make the switch to geothermal home heating.
- Work with the Department of Finance to introduce an EV rebate for new and used EVs and plug-in hybrid vehicles.
- Create a roadmap to meet net-zero targets by 2050.

The Council respectfully presents our advice and recommendations to help government identify current priorities and emerging opportunities upon which to begin building a green economy. To protect Manitobans from the damaging impacts of climate change, the Council stresses the critical importance of ensuring that climate change risks and opportunities are fully integrated into Manitoba's government strategies, policies, programs, and actions.

Successfully transitioning Manitoba to a green economy involves achieving sustainable economic growth that brings prosperity, good jobs and economic opportunities for Manitobans while protecting and enhancing the environment, while also doing our part in Canada's, and in the global, effort to achieve net-zero emissions, now and into the future.

We are confident these recommendations will support Manitoba's transition to a green economy that builds on its clean energy assets and ensures its competitiveness with other jurisdictions.

3. Executive Summary

The Expert Advisory Council (the Council) is an independent group of experts, whose biographies are included in Appendix C. The Council developed recommendations for a Green Economy Transition for Manitoba based on feedback during the November 2019 Opportunities in a Low Carbon Economy Forum. More recently, the Council gathered information from several sources including expert advice, literature reviews, a report from the International Institute for Sustainable Development (IISD), a submission from our subcommittee, the Youth Advisory Council (YAC), and from our own expert knowledge of the subject matter. The Council reflected on important input from a diverse range of stakeholders; meeting with several, reviewing written submissions and hosting several panel discussions. The Council also received input from government departments on what a Green Economy Transition would mean for the province. A full list of stakeholders and experts that were engaged is provided in Appendix A.

The Council recommends the following effective actions regarding a Green Economy Transition for Manitoba:

Government Decision-Making and Information Gathering

1. Implement a formal climate/green lens through which key government decisions are viewed and assessed.
2. Analyze the impacts of a Green Economy Transition on Manitoba's most vulnerable populations and those facing barriers to employment and integrate relevant findings into planning.
3. Apply decision support tools to identify the economic sectors that can serve as catalysts to propel Manitoba's Green Economy Transition.

Communications

4. Implement a comprehensive, intentional, whole-of-government public education plan for a Green Economy Transition that develops Manitobans' awareness and supports informed decision-making. Focus on messaging that mobilizes effective action for advancing Manitoba's Green Economy Transition.

Solutions

5. Support, engage and inspire Manitobans to begin Green Economy Transition efforts locally and to develop their own community-led solutions.
6. Mandate sustainable procurement in the Manitoba government to help support a Green Economy Transition.
7. Collaborate with the federal government to substantially increase the number of approvals for federal funding in Manitoba.
8. Identify gaps in Manitoba's zero emissions vehicle (ZEV) infrastructure and develop a plan to meet Manitobans' sustainable transportation needs.
9. Implement an immediate policy for Manitoba to adopt the latest National Building Code, applying efficiency tiers above the default efficiency level (Tier 1), while ensuring widespread training availability to facilitate successful implementation.
10. Explore fiscal and policy instruments to increase the uptake of emission reduction technologies and actions.

Additionally, previous recommendations [1] provided by the Council in relation to provincial emissions reduction targets include:

- Establish net-zero legislation for the province.
- Align the mandate of Crown corporations (e.g., Manitoba Hydro, Efficiency Manitoba) to include climate actions and greenhouse gas (GHG) reduction goals (e.g., net-zero by 2050), leveraging leadership from Crown corporations that have set emission reduction targets and are actively working towards achieving them, such as Manitoba Liquor and Lotteries Corporation.
- Provide additional programs and incentives for increased uptake of emerging technologies, such as heat pumps (including heat pumps for water heaters).
- Develop and introduce a provincial clean hydrogen standard to ensure that hydrogen production will be from clean sources.
- Provide funding for pilot projects and emerging technologies, front-end engineering and design (FEED) studies and ready projects that support industrial electrification (e.g., Conservation and Climate Fund) and increase funding for projects that reduce GHG emissions.
- Expand on current agriculture emission reduction programs in Manitoba to deliver significantly more agriculture sector emission reductions.
- Work with the federal government to maximize emission reduction opportunities for the reinvestment of carbon revenues particularly for industry, as well as municipalities, universities, schools, and hospitals.
- Support targeted nature-based solutions that require time to establish before becoming fully effective, focusing on actions with demonstrable emission reductions and optimizing co-benefits, such as adaptation and biodiversity.

1 https://www.manitoba.ca/asset_library/en/eac/eac_carbon_savings_report2022.pdf

4. Introduction

Globally and locally, a changing climate is impacting communities and ecosystems, and these effects will be amplified over the coming decades. At the same time, the world is emerging from a global pandemic and is dealing with compounding issues including inflation and supply chain disruptions. For these complex challenges to be addressed, major shifts in society are urgently required.

Jurisdictions around the world are implementing a green economy framework to support economic security and opportunity for citizens, while also respecting natural environmental limits and reducing greenhouse gas (GHG) emissions. At the international level, the United Nations Environmental Programme (UNEP) has promoted a green economic approach. Momentum for the approach has been growing in recent years through policies such as the US Inflation Reduction Act[2] and the EU's Green Industrial Plan.[3]

Nationally, the Government of Canada has committed to upholding the International Labour Organization's 2015 guidelines for a "just transition," which includes:

- the creation of good, high-paying, decent work for all
- ongoing social dialogue with affected workers and employers
- consultation with relevant stakeholders[4]

Canada released an Interim Sustainable Jobs Plan[5] in February 2023. This is to be followed by the federal Sustainable Jobs Act which will outline the principles and governance structures associated with federal just transition work. Canada has also created the Regional Tables on Energy and Natural Resources, which aim to bring together provincial and federal governments to jointly prioritize areas for industrial policy and investment (Natural Resources Canada, 2022). Industries and their supply chains are working to meet commitments to reduce emissions with many setting net-zero targets. Manitoba businesses who participate in these supply chains are adapting.

Building on its previous work, the Council has undertaken a new round of engagement on this topic. They have met with a wide variety of stakeholders (listed in Appendix A), reviewed reports and information from many reputable sources (see Appendix B), and have discussed and considered all of the inputs alongside their own expertise. The Council recognizes the barriers to achieving a green economy are enormous and that there are many forces that impact our chances of success. For these reasons, urgent action and clear communication with the public are required. The report outlines the Council's findings and recommendations.

2 https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy
3 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_en
4 https://www.ilo.org/wcmsp5/groups/public/@ed_emp/@emp_ent/documents/publication/wcms_432859.pdf
5 https://www.canada.ca/en/services/jobs/training/initiatives/sustainable-jobs/plan.html

5. The Expert Advisory Council

The Climate and Green Plan (the Plan) and the Climate and Green Plan Act (the Act) provide the overarching framework for addressing Manitoba's changing climate. The Plan and Act articulate a vision of a sustainable economy for the province based around the four pillars of climate, jobs, water, and nature.

The Expert Advisory Council (the Council) was established under Section 7 of the Act, passed by the Legislature of Manitoba in 2018. The Council is an independent group of experts with a mandate to provide advice and recommendations to the Minister of Environment and Climate Change on the Plan. Specifically, under the Act, the Council is to:

- Provide advice and recommendations to the minister on programs, policies and measures to be included in the climate and green plan.
- Review progress on the implementation of the climate and green plan, and provide advice on any required changes to the plan.
- Provide advice and recommendations to the minister respecting greenhouse gas (GHG) emissions reduction goals to be established under section 3.

The Council plays an important role in helping the Minister set GHG reduction goals and the Act sets out a framework for this: the Carbon Savings Account (CSA).

The CSA is built around five-year emissions reductions goals. The most recent goal was set at 5.6 Mt of CO_2e cumulative emissions reductions by Manitoba for the 2023-2027 period, based on advice from the Council.[6] The Council's advice was developed with expert input from stakeholder feedback, industry, the not-for-profit-sector, technical advice from external consultants, and knowledge from the Council.

The Council established a subcommittee called the Youth Advisory Council (YAC) to ensure that youth have a seat at the provincial table and that they can participate in critical discussions around climate change and other environmental issues that will affect their future.

The biographies of current Expert Advisory Council members can be found in Appendix C and those of the Youth Advisory Council in Appendix D.

6 https://www.manitoba.ca/asset_library/en/eac/sd_response.pdf

Expert Advisory Council (as of August 2023)

Back L to R: Bob Adamson, Roger Rempel, Daryl Domitruk, Laren Bill, Karla Guyn;
Front L to R: Laurie Streich, Edward Onyebuchi (Chair), Dimple Roy; Missing: Andrew MacSkimming (Vice Chair)

Although their current mandate item was provided in October 2021, the Council has been looking at the topic of a Green Economy Transition since 2019, when they hosted the Opportunities in a Low Carbon Economy (OLCE) Forum.

The OLCE Forum was organized to help the Council in understanding the economic factors that influence a shift to a low-carbon economy with primary areas of focus being decarbonization, agriculture, and transportation. The event facilitated meaningful dialogue and engagement and the Council gained important insight from the dynamic group of participants.

The key learnings from the OLCE Forum, summarized in Table 1, influenced the work of the Council on their following mandate items to:

- Provide recommendations and advice on a Provincial Transportation Strategy (June 2021).[7]
- Provide recommendations and advice on a Provincial Water Management Strategy for Manitoba (January 2021).[8]

7 https://www.manitoba.ca/asset_library/en/eac/green_transportation.pdf
8 https://www.manitoba.ca/asset_library/en/eac/eac_recommendations.pdf

Table 1: Analysis from the Opportunities in a Low Carbon Economy Forum – 2019

KEY LEARNINGS		DESCRIPTION
Strengths		- Clean energy grid - Increasing green energy use in buildings - Significant activity around data collection centres - Well-educated and reasonably priced workforce - Phenomenal standard of living - Abundantly available quantities of water available in almost all regions - Support for research & development
Weaknesses		- Failure to promote as a place to "do the business of the future" - Need to grow high-tech workforce to an even greater extent - Lack of engagement with post-secondary institutions regarding needs for future workforce - Speed of government service delivery has not always been consistent across all parts of the economy relevant to cleantech - Lack of planning and preparedness for climate change amongst businesses
Opportunities	Energy	- Companies can produce very little scope 2 emissions compared to elsewhere (scope 2 emissions are indirect emissions from the generation of purchased energy) - Fuel-switching to electricity can be done relatively cheaply - Clean energy can support fluctuating renewables - Manitoba Hydro: world leader, expertise in HVDC lines
	Buildings	- Look at updates to building code - Revitalize buildings in the province – stimulate the local economy, create jobs, investment
	Transportation	- Leader in ethanol and diesel blending rates - Electrification of transportation as a longer-term opportunity - As a non-landlocked province with an Arctic port, there is enormous untapped potential supporting role as a central transportation and logistics hub for North America
	Agriculture & Nature-Based Solutions	- Leader in re-thinking agricultural practices, and potential to serve as a model - Reduced fertilizer use, regenerative agriculture, monetizing carbon - Agricultural waste use for biomass/biofuels - Intensify agriculture, "re-wild" the marginal farms and unused lands - Nature-based solutions and offset markets - Agriculture sector has much potential for carbon offset projects that would support Manitoba enterprises and organizations wishing to assert credible claims of carbon neutrality where cost-effective reductions are not immediately available
	Waste	- Potential to gasify waste - A whole new system could be based off of existing infrastructure
	Research & Development	- Grow as a hub for trucking and transportation-related research and development - Consider innovation zones where new technologies can be rapidly deployed - Consider increased use of technical review committees

KEY LEARNINGS		DESCRIPTION
Threats	Planning and Regulatory Structure	- (Un)Readiness of the planning and regulatory structure for net zero emissions governance - Land-use planning issues, urban sprawl
	Economic Competitiveness	- Diversified economy requires Manitoba to unite around some key areas and come together to intentionally drive growth - Regulatory initiatives that add cost or reduce efficiency may impact competitiveness unless those same measures are also imposed on competitors - Government programming and regulation must be extremely mindful about how their actions will impact business

6. What is a Green Economy?

There are many ways to define a green economy but, at its foundation, a green economy is a pursuit of economic development in a way that respects environmental limits. A green economy is low in carbon emissions, resource-efficient, and socially-inclusive.

The United Nations Environment Programme (UNEP) states that: in a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services.[9]

In other words, a green economy not only serves to create jobs and generate income, but also supports the health and well-being of the people and the ecosystems around them. It advocates for integrated policymaking and highlights the relationship between investing in the environment and positive social and development outcomes.

In addition to the above, the Council reviewed a variety of definitions for the purposes of this work. UNEP defines the Green Economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (2010). Another more elaborate definition of green economy is:

> "The Green Economy is one in which the vital linkages among the economy, society, and environment are taken into account and in which the transformation of production processes, and consumption patterns, while contributing to a reduced waste, pollution, and the efficient use of resources, materials, and energy, will revitalize and diversify economies, create decent employment opportunities, promote sustainable trade, reduce poverty, and improve equity and income distribution."[10]

The Council agreed to utilize the above definition and identified a set of Manitoba-specific principles to accompany it:

- **Focus on a strong fiscal future for Manitoba.**
  - Maximize Manitoba's economic opportunities and limit challenges.
- **Secure Manitoba as a youth-friendly province.**
  - Manitoba should be a place that youth want to come to and want to stay. Both retention and attraction are important. Youth are highly invested in the success of Manitoba's Green Economic Transition.
- **Do not apply a "one-size-fits-all" lens.**
  - Different communities require different approaches as each has local needs and unique opportunities. Decision-makers need to meet communities where they are at, move forward and celebrate successes, regardless how small.

9 https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy#:~:text=In%20a%20green%20economy%2C%20growth%20in%20employment%20and,of%20the%20loss%20of%20biodiversity%20and%20ecosystem%20services.

10 Green Economy in Action: Articles and Excerpts that Illustrate Green Economy and Sustainable Development Efforts. United Nations Development Programme, Environment and Energy, August 2012

- **Do not underestimate the urgency to act.**
  - Requires the clarity of a clear goal, clear messaging, and vision for the path forward so that everyone understands. Ensure that the urgency is effectively communicated. All levels of government also need to be working together.
- **Focus on actions that will "move the needle."**
  - Manitoba needs to act now, with purpose and look for opportunities that will have a major impact and will help Manitoba to catch up and show leadership.
- **Ensure that no one is left behind.**
  - Actions to propel a Green Economy Transition must consider how marginalized, impoverished, most impacted groups are supported such that they can prosper going forward.
- **Contribute to reconciliation with Indigenous People.**
  - Indigenous communities must be supported to advance in a Green Economy Transition.
- **Stop labeling Manitoba as a "have not" province.**
  - Manitoba is sometimes referred to as a "have not' province by others. In reality, Manitoba boasts many advantages and needs to draw on them.
- **Draw on the strengths of Manitoba's community social fabric.**
  - Manitobans are often very proud of their communities. This is a strength in terms of bringing people together around a common cause.

The Council recognizes that Manitoba's infrastructure reflects the needs and expectations of a northern continental jurisdiction in the first world. Manitoba's population is comparatively small and is growing in diversity. Much of the population lives in urban environments. As government provides leadership to green the economy, Manitobans are looking to:

- achieve and maintain a high standard of living
- do so with improved environmental impacts
- do so while fixing the inequities the previous economy generated

7. Why a Green Economy Transition?

Although the concept of a green economy is not new, it did not always have significant uptake. According to UNEP, "one of the reasons for lack of significant progress has been inability to clearly make the business case for investing in the environment. To encourage policy and decision makers to invest in the environment, they need to be convinced that such a transition would result in economic benefits as well."[11]

Jurisdictions around the world are seeing the economic benefits of a Green Economy Transition and the case for a green economic approach is growing stronger. For example, from an energy perspective, the latest Intergovernmental Panel on Climate Change (IPCC) AR6 report finds that, in some cases, maintaining fossil fuel-based energy systems is going to be more expensive than transitioning to low-carbon energy sources (IPCC, 2023). Hence, the "green" choice is also becoming the "economically beneficial" choice in many cases.

International trends have also shown that decreasing costs for renewable energy will continue to shift the economic landscape of clean energy into the future (IEA, 2022), and the same can be seen in Canada. A recent report from Clean Energy Canada (2023) found that "[w]hile there will be a 1.5-million job decline in fossil fuels in a net-zero 2050, this is far exceeded by the 2.2-million job increase in clean energy as employment in the sector grows 7 per cent a year out to 2050." The success of clean energy follows an overall growth in green investment in recent years (Baker, 2023).

In Manitoba, there are many forces driving the shift to a green economy. The province has opportunities and advantages that could propel it into a leading position, but this requires focused and deliberate action. Other jurisdictions are prioritizing a Green Economy Transition as a competitive advantage and, if Manitoba does not act swiftly, the province will miss long-term economic opportunities seized by jurisdictions successful in their own green transition. It has become clear that a Green Economy Transition will happen and can bring great advantages to Manitobans.

Federal climate policies are another driving force of the green economy. The carbon price, projected to increase annually to CAD$170/tonne in 2030, is shaping industry and investor decisions, and driving decarbonization efforts. The federal government has also committed to end public financing and subsidies for fossil fuels and redirect those funds into clean technologies, mirroring a broader shift in public funding to emissions reduction measures around the world. With the introduction of the Integrated Climate Lens, which is currently being piloted, all federal government spending will be assessed for its GHG emissions impacts. Federal policies can have significant impacts in Manitoba and need to be leveraged.

New climate policies from other countries, such as the US Inflation Reduction Act and the REPower EU, have an impact on the green economy in Manitoba by shifting markets and supply chains with strong interlinkages to Manitoba's economy.

From an economic perspective, the transition to a green economy drives innovation, development of sustainable technologies and practices, which, in turn, contribute to new employment opportunities, economic growth, and long-term prosperity. By promoting resource efficiency, minimizing wastes, and embracing circular economy principles in the transition to a green economy, businesses can achieve significant cost savings while also enhancing their competitiveness.

11 file:///M:/LIBRARY/Green%20Economy%20Green%20Jobs/Green%20Economy%20in%20Action_%20Articles%20and%20Excerpts%20that%20Illustrate%20Green%20Economy%20and%20Sustainable%20Development%20Efforts.pdf

8. What We Heard

The Council met with a multitude of stakeholders in 2023 and reviewed literature to help inform its advice to government. See Appendix A for Stakeholder and Expert Engagement List and Appendix B for Literature Sources.

The Council heard many different perspectives and identified the following key themes:

- **There is a strong need for clarity on the path forward from government.**
  Council heard that one of the most important things that government can do is to provide clear messaging and a clear path forward. Currently, businesses and others are asking, "What exactly is the goal and what do we need to do?" They are confused and, in the absence of clear direction, are having to guess. Stakeholders also reported that they are hearing mixed messages from different sources and levels of government. When government takes small, uncoordinated steps to "dampen each fire," it does not help everyone to "push in the same direction." Rather, it is through clear direction that Manitoba organizations and individuals can take necessary coordinated steps. Policy coherency provides greater certainty and needs to create an environment where innovation is encouraged and supported.
- **Manitoba is behind, particularly with respect to resilient infrastructure.**
  Council heard that stakeholders feel that Manitoba is behind in "moving the needle" by taking the necessary steps towards a green economy. For example, it was noted that infrastructure projects are currently not consistently undergoing a full sustainability review using frameworks such as Envision, which is a "consistent, consensus-based framework for assessing sustainability, resiliency, and equity in civil infrastructure"[12] that is used in other jurisdictions. Another example is sustainable procurement. Where other jurisdictions have moved forward on comprehensive sustainable procurement policies (including environmental, social, equity, diversity, and accessibility considerations and a focus on Indigenous procurement, among other aspects), Manitoba has yet to take this step.
- **Government can be risk averse and there is a lack of investment in new technology.**
  Council heard that it is often too difficult to introduce new technologies and processes into the Manitoba market due to a bias for the status quo. Innovation is stifled by an unwillingness to try new things outside of entrenched ways. There is sometimes a desire to try to "pick only winners," but if Manitoba waits until technology is proven, the advantages will go elsewhere. For the Green Economy Transition, there is no guarantee what will work best, so Manitoba must be willing to experiment. The benefit of Manitoba's comparatively smaller market is that the province can be nimble. This allows suppliers to course-correct as needed. International trends make it clear that the Manitoba economy will be greened. The question is if it will be greened by Manitoba based on provincial priorities, or by other external forces. Manitoba should seize the opportunity to define its priorities, versus having those priorities dictated by external forces.
- **Urgency for Green Economic Transition is not currently understood.**
  Council has found that the sheer urgency of addressing climate change and transitioning to a green economy is generally not well-understood or driving sufficient action. There must be a realization that the cost of inaction is greater than the cost of action. Jurisdictions around the world are responding to this urgency and prioritizing the Green Economy Transition. Manitoba also needs to act ambitiously and immediately.

12 https://sustainableinfrastructure.org/envision/overview-of-envision/

- **Current language around "green economy" is not helping Manitobans understand the challenges, solutions, and opportunities.**
  Council heard that terminology is inconsistent, confusing, and that the term "green economy" is not well-understood. Education on climate change and its impacts and a Green Economy Transition need to extend beyond the kindergarten to grade 12 years. Greater efforts are required to ensure that the information government puts out is understandable by, and accessible to, the public. Council heard that, in a vacuum of clear and consistent public information, disinformation is constantly arising to take its place. Council also heard that the public needs to be aware of local success stories to show that we can be successful in a Green Economy Transition and increase our resilience to climate impacts.
- **Government procurement is powerful and can help to support local action.**
  Council heard of the value of sustainable procurement as a powerful tool to "move the needle" as opposed to narrow transactional or operational contracts. When the focus of procurement shifts to looking at a full circle of costs and benefits, you get a lot more value overall than simply looking for the lowest price. Additionally, there was strong support for a systematic focus on local options and supporting local expertise. For example, Manitoba is a society that thrives in weather extremes for which we have a wealth of tools and techniques. Manitoba could be a leader in adaptation and resilience with the idea that "if you can make it work in Manitoba, you can make it work anywhere."
- **A social justice lens must be applied to a Green Economy Transition.**
  There was very clear messaging that the Green Economy Transition must not leave anyone behind. The groups that are the most vulnerable are also those who will have the hardest time adapting to a changing climate. They will experience issues including access to cooling in buildings, food security, emerging health risks and affordability.
- **Manitobans often identify more with their community, town, or city rather than the province as a whole. This can be powerful for achieving local action.**
  Stakeholders and the Council identified the importance of community-focused interventions. It was suggested that Manitobans may identify more strongly with their specific community, as opposed to the province as a whole, and there may be strength in leveraging this affinity.

The YAC observed the following with respect to a Green Economy Transition for Manitoba:
(Please note that these perspectives are not listed in any particular order.)

- Youth generally feel that there is inadequate action and a lack of urgency with current climate efforts in the province.
- Manitoba's transportation system is fragmented, offering limited access to alternative transportation opportunities and is heavily reliant on internal combustion engine vehicles. Significant portions of the province are without access to basic transportation options, such as bus service, bike and pedestrian infrastructure.
- Active transportation provides additional and multifaceted social benefits beyond reduced emissions, such as improved access to employment opportunities, better health outcomes and increased access to services.
- In the spirit of reconciliation, it is important to acknowledge that Manitoba's development of clean energy has caused historic and ongoing harms to northern and Indigenous communities.
- Youth see climate change and related matters as having significant and predominantly negative implications for their future opportunities. Youth are interested in participating in decisions that affect their future.
- Youth continue to struggle with finding gainful and meaningful employment within Manitoba's economy, with too few opportunities outside of Winnipeg. Youth perceive there to be a greater abundance of career advancing opportunities in other provinces.

- Inaction on climate change, and actions needed to transition to a green economy, are policy choices with consequences that impact youth.
- Youth see the shift to a green economy as an opportunity to achieve an inclusive transition that mitigates climate risks and addresses reconciliation, affordability, and social justice.
- The intersection between climate action and reconciliation is paramount. Indigenous communities tend to be the first to experience the direct consequences of climate change due to their location on marginalized land that is prone to flooding and wildfires. These communities will need increased support for climate and adaptation planning.

The observations above provide the basis for the following recommendations to the EAC:

- Take a whole-of-government approach and work urgently to address climate change to achieve an equitable and livable future for all Manitobans.
- Incorporate holistic green transportation solutions, such as public and active transportation, that are widely accessible, regardless of socioeconomic status, or age. For example, greening transportation by predominantly focusing on electric vehicles ignores the affordability and accessibility challenges with this solution for youth, northern and other populations at this time.
- Create opportunities for youth to be active policy collaborators supporting climate-action and other related decisions, while compensating them fairly for their time and contributions.
- Conduct government operational activities in a sustainable manner that considers climate change and increases access to employment for rural and northern residents.
- Encourage the sharing of Traditional Knowledge with youth to support the transfer of intergenerational insight and observations that provides critical knowledge for navigating and adapting to climate change.
- Plan for a green transition, with consideration given to the full range of impacts from various choices. Apply a lens that considers a diverse range of factors such as youth employment, carbon emission reduction, social justice, equity, affordability, accessibility, and biodiversity protection.
- Facilitate the availability of various transportation options for all socioeconomic classes, such as electric bikes for youth and those unable to drive/afford a vehicle.
- Use holistic green solutions that provide equal benefits to all members of society while reducing emissions. Municipalities and Indigenous communities cannot be left behind in these solutions.
- Prioritize central coordination throughout government to ensure the broad application of a climate-lens in all government decision making.
- Incorporate climate-related topics in all courses and disciplines of the education system to reflect the cross-cutting nature of climate change, to reinforce the implications and benefits of action on climate change for all Manitobans.
- Rethink the approach to community planning by considering public and active transportation improvements to address a broad range of health and equity issues, while also reducing emissions.
- Create tangible, actionable climate policy that involves youth as active collaborators and decision-makers, while motivating Manitobans to take action.
- Encourage opportunities for Traditional Knowledge to be incorporated into Manitoba's education curriculum.
- Target investment and training of young people and those employed in fossil fuel intensive sectors to facilitate employment in the green economy to support an inclusive transition that stimulates a strong economy.
- Promote the opportunities available within the green economy so Manitobans can benefit from the shift.

- Leverage Canada's immigration policy to match newcomers with related skills to fill labour shortages in the green economy.
- Develop a Green Jobs Hub for youth to promote the various careers within the green economy while providing opportunities throughout the province for youth to gain reliable, well-paying employment that establishes future career opportunities.
- Facilitate a culture that empowers youth, Indigenous people, those with disabilities and other minority groups, and develops future leaders.
- Emphasize circular economy solutions in the green transition to address a wide range of externalities associated with the current economic system and leverage new resources for growth.
- To ensure accountability, provide access to transparent dashboards to track status and progress on climate action across the province to empower the public with data-driven decision making.
- Communicate climate progress in a way that inspires Manitobans, while providing reassurance about an uncertain future.

9. EAC Recommendations

The world is moving in the direction of a Green Economy Transition and Manitoba can benefit from these new opportunities, including:

- Growing and advancing the emerging employment sectors associated with renewable energy and green technologies.
- Working collaboratively with Indigenous Nations to support co-development of green renewable energy and green technology opportunities.
- Supporting opportunities to maintain and grow the competitive trade advantage for Manitoba's economic sectors.
- Reducing the emissions that drive climate change and its existing and emerging impacts to infrastructure, communities, and economic sectors.
- Providing more cost predictability for costly public assets through the application of a climate lens to prioritize resilience to climate hazards and to protect service life.
- Maximizing co-benefits of each investment by considering all interactions (social, environmental, financial).
- Enabling upcoming generations of Manitobans to better understand the link between their economic well-being and the health of the environment.

The Expert Advisory Council (the Council) has developed 10 recommendations for the Minister's consideration. They are divided into three categories as follows:

- Government Decision-Making and Information Gathering
- Communications
- Solutions

Government Decision-Making and Information Gathering

Government plays a unique role in supporting Manitoba's Green Economy Transition. It can create the necessary conditions to drive and accelerate the transition by strategically applying policy, regulation and planning principles that are coherent and consistent in areas related to procurement, design, operation and maintenance of public assets and services. It is also crucial for government to produce accurate and timely data, and to monitor progress using key milestones to support decision-making that is leading, not impeding, progress.

Every decision can be reviewed, based on how well it supports the Green Economy Transition and the principles of climate resilience and sustainable development. Using this lens, government can strive to foster and encourage the transition and avoid policies and actions that could impede success.

The Council recommends the following:

1. Implement a formal climate lens through which key government decisions are viewed and assessed.

Climate change triggers new and emerging challenges while compounding existing ones. By understanding how these challenges impact government, and implementing sound risk management, the costs of dealing with increased climate extremes can be dramatically reduced, leading to a

more stable, affordable, and prosperous future.[13] For example, using climate-resilient materials when maintaining and replacing roads can reduce climate change-related damage costs by up to 98 per cent.[14]

Each new government policy, action, and process represents an opportunity to make decisions that position Manitoba for a resilient future. It is vital that there is consistency and coherency across government policies so that one policy does not undermine the goals of the other.

To support smart and forward-thinking decision-making, several Canadian jurisdictions (at federal, provincial, municipal and Indigenous Nations levels) have implemented the use of a climate lens in relation to major public infrastructure and capital investment. For example, projects receiving specific federal funds[15] are required to apply a climate lens, which is mandatory prior to releasing funds to the proponent.

Other entities, such as Infrastructure Ontario, have recently (2022) implemented a policy requiring a climate lens assessment on every major asset under Infrastructure Ontario's jurisdiction. In Manitoba, the provincial government sponsors Eco-West Canada to help municipalities develop local climate change plans to inventory and reduce their GHG emissions.

A climate lens contains two key components:

1. The assessment of the extent of greenhouse gas (GHG) emissions generated by a project.
2. The assessment of the resiliency of each project's design, operation and maintenance for coping with anticipated climate hazards.

The systematic application of a climate lens would, therefore, provide government with:

1. The ability to minimize GHG emissions generated by new projects.
2. The decision-support information needed to manage the risks stemming from anticipated climate impacts.

Examples of established and applied climate lens frameworks include Infrastructure Canada's Climate Lens Requirements,[16] the Institute for Sustainable Infrastructure's ENVISION framework,[17] and the City of Calgary's prescribed High-Level Screening PIEVC Process (City of Calgary/ICLR2021).

Applying this approach yields multiple strategic benefits:

- Climate resilience considered in asset designs leading to reduced climate impacts, less damage and disruption, and lower insurance costs.
- Increased reliability of critical infrastructure and critical services, avoiding disruption in the infrastructure and services that Manitoba's economic sectors depend on for business continuity to compete in a global market.
- Improved positioning of Manitoba's economic sectors for participation and benefit from emerging federal funding programs intended to advance green economic development.
- Compliance with international standards to participate in critical markets.

13 Under Water: The Costs of Climate Change for Canada's Infrastructure, Canadian Climate Institute, 2022.
14 Ibid.
15 The funding triggers have also evolved since the initial launch of Infrastructure Canada's Climate Lens Requirements (2019), with revised, lower funding thresholds triggering the application of a climate lens for a proposed development.
16 https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html?wbdisable=true#1.1
17 https://sustainableinfrastructure.org/envision/overview-of-envision/

The Council recommends that Manitoba move forward by joining the growing roster of other proactive jurisdictions[18] that are implementing a mandatory climate lens for new infrastructure investment decisions, regardless of whether federal funds are involved. The lens should be applied in a comprehensive, judicious, and efficient manner.

Furthermore, while infrastructure projects are a natural fit for the use of a climate lens, the Council also recommends that a screening-level climate lens assessment also be applied to non-infrastructure government decisions. This recommendation acknowledges the reality that many diverse areas of government control have significant exposure to climate impacts and contribute significant GHG emissions to Manitoba's overall emissions. This lens would also support the identification of projects that would benefit from investments generated through a sustainability bond.

To effectively implement the use of a climate lens across government, all public servants should have a foundational understanding of emerging climate hazards in Manitoba, how to prepare for their impacts, and the need to reduce the GHG emissions related to Manitoba's operations and services.

2. Analyze the impact of a Green Economy Transition on Manitoba's most vulnerable populations and those facing barriers to employment and integrate relevant findings into planning.

Affluent populations typically have a much higher capacity for resilience to climate impacts than economically- or socially-disadvantaged groups. In other words, people with the economic means can implement their own adaptive measures to help cope with climate impacts (e.g., purchasing air conditioners during extreme heat) and can more readily pivot to succeed in an emerging global green economy (e.g., re-train for new employment and new sectors).

Vulnerable populations are more at risk of relegation to jobs in sectors that are declining, working with unsustainable technology/equipment, and a have a lack of accessible resources to retrain or upgrade accordingly. These populations in Manitoba need additional supports and consideration.

Indigenous Nations are impacted early by climate changes given they are often located on geographically disadvantaged lands, managing existing infrastructure with low resilience, and in more remote locations. There is an opportunity to work collaboratively to address climate change adaptation and resilience, and training opportunities.

The Council recommends the undertaking of a focused study to examine the sensitivities of vulnerable populations in Manitoba to inform an equitable Green Economy Transition where no one is left behind. These populations include:

- Manitobans living in poverty
- Manitoba's aging population
- Manitobans with disabilities
- newcomers to Manitoba
- workers in carbon-intensive sectors
- geographically isolated communities
- women
- youth
- children

18 Cities requiring a Climate Lens in 2023 include Vancouver, Toronto, Calgary, Montreal, Halifax, Edmonton; Provinces requiring a Climate Lens in 2023 include: ON, QUE, BC, AB, YK

The Council also recommends that specific focus be given to understanding how to support Indigenous economic reconciliation including identifying finance mechanisms for Indigenous participation and ownership in natural resource projects and incentivizing actions that build resiliency in Indigenous communities.

3. Apply decision support tools to identify the economic sectors that can serve as catalysts to propel Manitoba's Green Economy Transition.

For Manitoba to be strategic in its use of resources, the province must analyze which sectors can best accelerate Manitoba's progress in the Green Economic Transition.

The Council recommends working with organizations such as the Transition Accelerator[19] to develop decision support tools, such as value chain analysis, that help to identify potential sectoral focus areas. With this enhanced insight, government can recognize Manitoba's key advantages and work to ensure that these are effectively and responsibly leveraged (e.g., Manitoba's significant critical minerals advantage and their growth in demand to support a global transition from internal combustion engines to electric vehicles). This will require direct partnerships with Indigenous Nations on the opportunities related to developing resources needed to advance the green technology sector.

Communications

Government has a very important role to play in preparing the Manitoba population for a Green Economy Transition, starting with education and awareness. At this time, most Canadians are aware of increasing climate hazards (e.g., extreme heat, wildfire, overland flooding) and the impacts they present to ecosystems, communities, and public health. However, there are large segments of the population that require foundational awareness of the causes, impacts and risks of climate change, as well as the benefits of a Green Economy Transition.

Manitoba can build on its experience engaging and educating Manitobans on other complex issues, such as public health and emergency management. As climate impacts grow in frequency and intensity, Manitobans will look to government for strategies and leadership to respond to the emerging impacts and challenges that they will experience in our province.

The Council recommends the following:

4. Implement a comprehensive, intentional, whole-of-government public education plan for a Green Economy Transition that develops Manitobans' awareness and supports informed decision-making. Focus on messaging that mobilizes effective action for advancing Manitoba's Green Economy Transition.

The Council has identified the need for a communications strategy and action plan to establish and maintain awareness within a diverse Manitoba population to state:

- Why government is preparing Manitoba for a Green Economy Transition.
- What needs to happen to create a green economy for Manitoba.
- What risks Manitoba faces if Manitoba's economy is left behind and does not evolve to integrate with a global green economy.
- What goals Manitoba needs to commit to in order to achieve a Green Economy Transition.
- The extent of benefits that a Green Economy Transition can provide for the province, and all Manitobans, in terms of economic opportunities and security, business continuity for economic sectors, environmental sustainability, public safety, and risk management.

19 https://transitionaccelerator.ca/

Developing a comprehensive Green Economy Transition communications plan that provides clear, concise, understandable messaging will help to engage Manitobans of all ages, backgrounds, and economic status. Doing so will help each individual Manitoban, business, and organization better understand the benefits of a Green Economy Transition for Manitoba.

It should be acknowledged that there are entrenched interests that counter prevailing climate change science and seek to influence public opinion. A comprehensive communications plan allows the province to champion effective, proactive measures for Manitobans to establish our new green economy and empower proactive steps to compete globally and sustainably.

The Youth Advisory Council provides an important perspective on how to engage and appeal to all Manitobans. One recurring theme in the Youth Advisory Council's advice to the Expert Advisory Council has been to communicate with messages of hope. This can be done, in part, by sharing positive and empowering stories about the effective initiatives, programs and actions that government and civil society are engaging in to move economic sectors toward a green economy.

Messaging should demonstrate and describe the benefits to Manitoba's economy of effective Green Economy Transition initiatives, including success stories on solutions tested positively in Manitoba and elsewhere. Manitoba Hydro has a powerful role to play regarding effective communications. Highlighting effective solutions can further inspire individual and collective action towards a Green Economy Transition.

Solutions

Manitoba boasts several advantages that position it well to achieve a Green Economy Transition in a manner that secures significant benefits for the economy, the environment, and Manitobans. To seize on the opportunities these advantages provide, Manitoba is urged to continue exploration of emerging solutions, particularly those that address local needs and drive the innovation required to help Manitoba meet its transitional goals.

Successful progress in Manitoba's transition to a green economy requires a comprehensive approach that encompasses all of Manitoba's economic and industrial sectors. It is noteworthy that the Minister of Agriculture's mandate includes supporting innovation and research, which can improve the potential to decarbonize the sector. The green economy is the next iteration of a knowledge-driven economy. In Manitoba, key areas of investment are:

- **Skilled Labour:** Training and upskilling workers in traditional industries is necessary to equip Manitobans with the skills required for green jobs (e.g., renewable energy, energy efficiency, green buildings, and sustainable agriculture).
- **Research and Development:** Essential to driving innovation in green technologies and practices, research should focus on renewable energy, sustainable agriculture, water management, and climate adaptation and resilience. Apply a climate lens to research and development programs. Supporting collaborative initiatives between the public and private sector can help accelerate the development and deployment of new technologies and processes.
- **Technology and Innovation:** Investing in the development and adoption of clean technologies is crucial for the transition to a green economy.

The Council recommends the following:

5. Support, engage, and inspire Manitobans to begin Green Economy Transition efforts locally and to develop their own community-led solutions.

The Council recognizes the importance of community-led action in transitioning to a green economy and preparing for the impacts of a changing climate. An early example of community leadership that advances Manitoba's Green Economy Transition goals is the Fisher River Cree Nation (FRCN). FRCN initiated community-led action supporting a transition to a green economy through its investments in a 1-megawatt solar farm – the largest solar project in Manitoba and the first Indigenous-owned solar farm in the province. This project was developed with the support of local community members, who were involved in the planning and construction phases of the project. The solar farm reduced the community's carbon footprint and serves as a source of economic development and job creation. This project provided economic benefits while respecting traditional knowledge and practices.[20]

Encouraging and incentivizing private and locally-led community initiatives provides opportunities to achieve progress more rapidly than if these communities had opted to defer their actions while awaiting a potential future externally-led initiative or program (e.g., local resilience networks, neighborhood resiliency planning, and models like the watershed districts).

The Council recommends leveraging locally-led initiatives. These are often advanced by community leaders with established profile and credibility in their respective communities. For many Manitobans, there is a stronger connection and credibility to local, immediate community leaders, as opposed to external government officials. Community-based solutions succeed, in part, by finding the trusted entities in communities who have the social capital necessary to effectively engage and lead communities towards implementing needed new solutions.

6. Mandate sustainable procurement in the Manitoba government to help support a Green Economy Transition.

A whole-of-government, comprehensive and formalized sustainable procurement policy is required. Public procurement is more than operational; it can be transformational. It is a powerful instrument for jurisdictions to apply to determine their own futures, establish new best practices, build internal capacities, and support local economies by stimulating local consumption and innovation. Public procurement offers significant opportunities for government to establish new conditions for doing business in Manitoba.

Procurement policies can be used in several ways to advance sustainability and the Green Economy Transition, including:

- Setting clear sustainability criteria in procurement (e.g., percentage of recyclable content in materials, valuing Ecological Goods and Services).
- Prioritizing local and sustainable suppliers.
- Implementing Green Public Procurement (GPP) operating with the goal to procure goods, services and works with reduced environmental impacts throughout the life cycle.
- Mandating energy efficient products (e.g., vehicles, appliances, electronic equipment).
- Supporting innovation by purchasing new and innovative products and services that might not yet be widely available on the market.
- Setting green procurement targets (e.g., targets for percentage of goods and services procured from sustainable sources).

20 Fisher River Cree Nation unveils Manitoba's biggest solar farm, a source of Bullfrog Power's green energy - Fisher River Cree Nation - https://environmentjournal.ca/fisher-river-cree-nation-unveils-manitobas-largest-solar-farm/#:~:text=Fisher%20River%20Cree%20Nation%20has,to%20pursue%20renewable%20energy%20solutions.

- Promoting circular economy principles (e.g., prioritizing products designed for durability, repair, recyclability, and suppliers that adhere to the principles of a circular economy).
- Educating and training procurement officials via programs to convey the importance of sustainability considerations in procurement decisions.

There are government reporting entities in Manitoba that have already instituted requirements for sustainable procurement, such as Manitoba Liquor and Lotteries Corporation. The Council recommends that these proactive steps be expanded and that there be a commitment to applying sustainable procurement as a pivotal instrument to advance Manitoba's Green Economy Transition objectives. A sustainable procurement policy applied universally across Manitoba government departments, Crown corporations and agencies would demonstrate necessary leadership and stimulate transformation across the entire Manitoba economy.

7. Collaborate with the federal government to substantially increase the number of approvals for federal funding in Manitoba.

Anecdotally, the Council heard from engaged stakeholders that Manitoba has historically experienced a lower approval rate than other provinces in securing federal funding for objectives that support a Green Economy Transition. The Council notes that it is very important to identify existing barriers to securing federal funding. Government must work to innovate and develop strategies that will allow Manitoba to secure more of its rightful share of federal funding partnerships. Federal funding partnerships are a critical component in making Manitoba as competitive and successful as possible in the emerging green economy.

The Council understands that opportunities currently exist to have these discussions, as seen with the recently established Regional Tables. Discussion opportunities should be seized upon whenever possible, with timely adjustments made to Manitoba's approach to seeking federal funding contributions based on the findings.

8. Identify gaps in Manitoba's zero emission vehicle (ZEV) infrastructure and develop a plan to meet Manitobans' sustainable transportation needs.

Manitoba's current reliance on producers of petroleum energy outside the province for its transportation sector structurally excludes the province from the economic benefits gained from petroleum energy production. This creates positive pressures for Manitoba to seize opportunities to transition off petroleum products and move instead to clean fuels produced and distributed by energy producers based in Manitoba. A transition from hydrocarbon fuels to clean, renewable energy in the transportation sector would stimulate Manitoba's clean energy sector development. It would also repatriate the economic benefits from energy production that are currently enjoyed by Manitoba's out-of-province sources of production for hydrocarbon fuels. A goal of the transition to renewable energy is to maintain reliability.

The transition to clean transport energy also provides Manitoba with opportunities to improve the environment (air quality and public health). In the United States, a study by the American Lung Association found that transitioning to electric vehicles and renewable energy could lead to USD$72 billion in public health benefits by 2050 in the US. This cost included the consideration of reduced premature deaths, reduced hospital admissions, and reduced lost workdays due to respiratory illness.[21]

In the early adoption phase of electric vehicles (EVs), affordability has been recognized as a significant challenge by consumers. This stage of EV technology is giving way to more affordable EV options across a wider range of vehicle options in personal and commercial transportation. Major recent

21 The Road to Clean Air: Fact Sheet: Mid-Atlantic States (lung.org)

advances in the technology, particularly with EV batteries, are making them a more affordable and accessible option as time moves forward. Over the life cycle of a typical vehicle, savings derived from avoiding the purchase of petroleum fuels, and the price volatility in petroleum are expected to be prime motivators for transitioning Manitobans away from internal combustion engine (ICE) vehicles. These improvements in affordability and accessibility are expected to stimulate and propel demand for rapid expansion of EV networks.

It is also expected that as more ICE vehicle drivers experience the higher performance and lower maintenance costs of EVs, the demand for these vehicles will grow rapidly. Meeting this growing EV demand will require new strategies for supporting EV infrastructure in Manitoba.

The province has already completed a preliminary study to understand where key infrastructure needs to exist to support Manitoba's transition from ICE vehicles to EVs. To prepare for the transition from the internal combustion engine to zero-emission vehicles (ZEVs), Manitoba is urged to develop a foundational charging network across the province, while also continuing to expand its partnerships with municipalities, businesses, and organizations to fill the gaps identified early as Manitoba establishes its EV infrastructure. The Council recommends that government review and implement aggressive and meaningful ZEV mandates and incentives (e.g., sales targets, procurement targets for government fleets, a feebate system) to accelerate the necessary transition away from ICE vehicles. It is also vital that the network provide rapid charging to reduce range anxiety and reduce delays at public charging stations.

Public and active transportation also provide significant opportunities to achieve a variety of benefits including reduced GHGs, ground source pollution emissions, road congestion, and increased affordability and livability in many communities. New Flyer Industries and Motor Coach Industries are examples of Manitoba businesses that provide quality jobs and significant economic opportunities within this sector. The Youth Advisory Council emphasized the need to improve active and public transportation options throughout the province to make sustainable transportation options accessible for all, while providing additional reductions in transportation-related emissions in Manitoba.

Additionally, the Council recommends that government implement all recommendations made with Council's guidance in the 2021 Green Transportation Strategy for Manitoba.[22] Key recommendations include:

- low-carbon and zero emission transportation
- land-use and transportation planning
- enabling technologies and infrastructure
- innovation and economic development

9. Implement an immediate policy for Manitoba to adopt the latest National Building Code applying efficiency tiers above the default efficiency level (Tier 1), while ensuring widespread training availability to facilitate successful implementation.

Currently, Manitoba stands out as one of the few jurisdictions in Canada that fails to adopt the most current National Building Code (NBC). Today, this policy is being challenged by multiple major stakeholders in the Manitoba buildings sector. By adopting the most current NBC in a timely manner, Manitoba can drastically increase the likelihood that building design will be well equipped to deal with emerging impacts of climate change.

22 https://www.manitoba.ca/asset_library/en/eac/green_transportation.pdf

Building stocks that do not integrate newer code requirements will be less equipped to handle their exposure to the impacts, damages and costs related to climate change. Reluctance to adopt the newest codes will lock Manitoba's building assets into higher costs induced by higher maintenance burdens, lower energy efficiencies and lower asset resilience to the more frequent and extreme events triggered by climate change.

For the province to meet its decarbonization objectives, it needs to adopt higher tiers representing more stringent energy code levels. Building code advancements contained in code updates mandate the implementation of measures offering multiple benefits to a building's maintenance and ongoing operations. These benefits are substantial and include:

- lower operating costs
- reduced energy demand
- increased climate resilience and reliability
- lower insurance costs
- predictable service life for engineered assets

Climate-resilient and energy-efficient buildings are a key aspect of a Green Economy Transition. The Council urges that this is not a time to "wait and see" or "catch up" later on adopting current building codes. Reluctance to adopt the latest building codes will set Manitoba back compared to jurisdictions that routinely implement new versions of the National Building Code. Continued reliance on older, stale versions of the NBC risk "locking in" lower resilience and the costs associated with maintaining assets that do not include contemporary design improvements mandated in newer building codes.

As a province of climatic extremes, Manitoba has much to gain by requiring designers of building assets to build to emerging higher standards as soon as they are released through NBC version updates. When the choice exists, Manitoba should adopt the highest standard wherever possible.

Additionally, the Council recommends that government review the existing home energy audit program to determine how to leverage energy audit results in a manner that can support and accelerate Manitoba's Green Economy Transition. Council understands that Manitoba has a significant pool of trained energy auditors available to the province, and, with effective co-ordination, these auditors can be leveraged to advance Manitoba's Green Economy Transition.

10. Explore fiscal and policy instruments to increase the uptake of emission reduction technologies and actions.

The Council recommends that Manitoba explore the many innovative fiscal and policy instruments that deliver emission reduction results. The Council urges Manitoba to move forward on the development of a Green/Sustainability Bond. Such a bond seeks to "attract private and institutional capital for major projects with defined environmental benefits, such as green strategic infrastructure, to help create new jobs."[23] It is also recommended that Manitoba investigate other fiscal instruments that help release capital into the marketplace to support the Green Economy Transition. Additionally, recommendations from the Council's Second Carbon Savings Account Report (December 2022)[24] are relevant to Green Economy Transition planning as well. These are as follows:

- Establish net-zero legislation for the province.
- Align the mandate of Crown corporations (e.g., Manitoba Hydro, Efficiency Manitoba) to include climate actions and GHG reduction goals (e.g., net-zero by 2050), leveraging leadership from those

23 https://www.manitoba.ca/asset_library/en/climatechange/climategreenplandiscussionpaper.pdf
24 https://www.manitoba.ca/asset_library/en/eac/eac_carbon_savings_report2022.pdf

Crown corporations that have set emission reductions targets and are actively working towards achieving them, such as Manitoba Liquor and Lotteries Corporation.

- Provide additional programs and incentives for increased uptake of emerging technologies, including the required training, such as heat pumps (including heat pumps for water heaters).
- Develop and introduce a provincial clean hydrogen standard to ensure that hydrogen production will be from clean sources.
- Provide funding for pilot projects and emerging technologies, front-end engineering and design (FEED) studies and shovel-ready-projects that support industrial electrification (e.g., Conservation and Climate Fund) and increase funding for projects that reduce GHG emissions.
- Create the policies and framework for significant future agriculture sector emission reductions.
- Work with the federal government to maximize emission reduction opportunities for the reinvestment of carbon revenues particularly for industry, as well as municipalities, universities, schools, and hospitals.
- Support targeted nature-based solutions that require time to establish before becoming fully effective, focusing on actions with demonstrable emission reductions and optimizing co-benefits, such as adaptation and biodiversity.

10. Conclusions

Manitoba's economy, people and natural environment are all exposed to considerable risk if efforts are not made to decarbonize the economy and invest in climate change adaptation and resilience. Climate change impacts are intensifying nationally and globally. There is urgency for real, immediate action that will continue to grow in the future. Setting ambitious GHG emissions reduction targets, and actively pursuing pathways to achieving them, will ultimately benefit the province by encouraging innovation, communicating clear direction, and launching next-generation skills and technologies. This will support efficiencies, reduce the amount of capital leaving the province to pay carbon taxes and imported fossil fuels, and increase available capital for reinvestment in the local economy. Collectively, this will help to ensure Manitoba remains attractive to both business and residents.

The Council recognizes that investments by government, the private sector and citizens will be necessary to achieve a sustainable and prosperous future in light of the changing climate. The Council encourages forthright and meaningful action on the part of the Manitoba government. There are real and increasing costs to delaying or taking too little action to address climate change. For Manitoba, transformational action can create significant opportunities. The strategic advantages created through a Green Economy Transition will position the province for economic prosperity, social equity and environmental well-being that will benefit all Manitobans.

11. Appendices

Appendix A – Acknowledgements and Stakeholders Engaged

The Council met with the following organizations/individuals and thank them for their time and effort:

1. Alex Stuart - Standard Carbon Inc.
2. Corinne Evason - City of Winnipeg
3. Dan Wicklum - The Transition Accelerator
4. Darrell Brown - Kisik Clean Energy
5. Darren Swanson - Novel Futures
6. Derek Earl - KPMG
7. Donna Dagg - Manitoba Liquor and Lotteries Corporation
8. Greg Reader - Manitoba Consumer Protection and Government Services
9. Jack Winram - Manitoba Environmental Industries Association
10. James Kornelsen - Manitoba Council for International Cooperation
11. Manitoba Association of Mining - Jeff Fountain (Vale) and Landice Yestrau (Hudbay Minerals)- Mining Association of Manitoba Inc.
12. Jeffrey Brown - Terra Focus
13. Jennifer Chiarotto - Manitoba Economic Development, Investment and Trade
14. Josh Brandon - Social Planning Council of Winnipeg
15. Molly McCracken - Canadian Centre for Policy Alternatives - Manitoba
16. Omkarnath Beruar - Manitoba Economic Development, Investment and Trade
17. Richard Tuck - Entrepreneur, Startup Advisor, Consultant
18. Ross Homeniuk - KPMG
19. Steve Apfelbaum - Applied Ecological Institute
20. Steven Nitah - Nature for Justice (N4J)
21. Tori Williamson - Buy Social Canada
22. Tricia Schmalenberg - Maple Leaf
23. William Findlater - YES! Winnipeg

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Additional input was provided by:

- Canadian Community Economic Development Network – Manitoba
- The Youth Advisory Council on the Climate & Green Plan

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Appendix C – Biographies of Council Members

Edward Onyebuchi, Chair

Edward Onyebuchi (Winnipeg) worked as a senior economic consultant at Manitoba Hydro for 26 years, where he provided business case and economic impact analysis for major capital projects and on corporate activities related to sustainable development, climate change and other environmental matters. He also worked internationally in electric power utilities in China, Liberia, and Saudi Arabia, through Manitoba Hydro International. He previously worked for the Manitoba government as a senior policy analyst, where he coordinated the Sustainable Development Strategy. He served as Adjunct Professor, Natural Resources Institute, University of Manitoba (1996-2010), and as an Instructor, Red River College, Manitoba (1991-1996). Edward Onyebuchi holds a Master's degree in Natural Resources Management from the University of Manitoba and a PhD in community and regional planning from the University of British Columbia.

Bob Adamson

Bob Adamson (Winnipeg) is the chair of Nutrients for Life Canada, a national educational foundation that focuses on sustainable nutrition, and currently sits on the International Science Schools Network Executive. Bob was the STEM program leader for Pembina Trails School Division until his retirement in June 2021, as well as the founder and director of a provincial ag biotech program that has already reached over 26,000 students. He attended and completed the Climate Reality Canada Leaders' Training, presented by Al Gore. Bob Adamson has been the recipient of the Bioscience Educator of the Year Award, the Lieutenant Governor's Greenwing Conservation Award, the Prime Minister's Award for Teacher Excellence, and the Manitoba Association of School Boards President's Award.

Laren Bill

Laren Bill (Winnipeg) is a member of the Pelican Lake First Nation in central Saskatchewan. He worked with the Treaty Land Entitlement Committee as an Implementation Advisor to First Nations in Manitoba for seven years. He has been the chairperson of the Implementation Monitoring Committee for Treaty Land Entitlement in Manitoba for the past seven years. He holds a Master's degree in Natural Resources Management with a focus on Traditional Land Use and Occupancy Studies from the University of Manitoba through the Natural Resources Institute.

Daryl Domitruk

Daryl Domitruk (Darlingford) is the executive director of Manitoba Pulse & Soybean Growers. He is a registered agrologist and serves on the provincial council of Agrologists Manitoba. Daryl's career spans over 30 years in the crop protection industry, farmer-led research organizations and Manitoba's public service. As a public servant, Daryl delivered farmer-focused programmes in resource conservation and crop production, and directed research, renewable energy, and science policy programmes. He led the Pulse & Soybean Growers' research program prior to assuming overall leadership of the organization. Daryl Domitruk earned a Bachelor of Science in Agriculture and a Master of Science from the University of Manitoba, and a PhD in Crop Science from the University of Saskatchewan.

Dimple Roy

Dimple Roy (Winnipeg) is a director with the International Institute for Sustainable Development, where she has worked in various capacities since 2008. Dimple Roy provides research leadership, policy analyses and management functions on issues related to sustainable development in the context of people, land, water, and agriculture in Canada and globally. She was also a policy analyst for the former department of Manitoba Conservation (2005 to 2006). She holds a Master of Environmental Design from the University of Calgary.

Laurie Streich

Laurie Streich (Winnipeg) served in many environment-related positions during her career in government, including her role as director of the pollution prevention branch of the former department of Manitoba Conservation. She retired from government in 2015 and has been a member of the Clean Environment Commission since 2016.

Andrew MacSkimming, Vice-chair (previous member)

Andrew MacSkimming (Winnipeg) is a lawyer and owner of A.H MacSkimming Law Office. He has been a practicing lawyer since 2005 and has also worked as a senior policy advisor for the federal Office of the Minister of the Environment (2006 to 2007). He previously worked as a lawyer and articling student with Environment Canada Legal Services, and as a research analyst with a leading energy consulting and brokerage firm. Andrew MacSkimming has also served in a variety of public roles, including as chair of the Manitoba Bar Association's Environmental, Energy and Resources Law Section. He holds a Master of Laws degree in Environmental Law (2004).

Karla Guyn (previous member)

Karla Guyn (Lockport) is the former CEO of Ducks Unlimited Canada, having retired in the fall of 2021. Prior to assuming the role of CEO, she held several senior leadership positions with Ducks Unlimited Canada over her 24-year career with the organization. This included serving as the national director of conservation (2013-2016) and director of conservation planning (2006-2013). She is recognized as a North American conservation leader, serving on international committees including the North American Waterfowl Management Plan and the Sustainable Forestry Initiative. Karla Guyn holds a Master of Science and a PhD from the University of Saskatchewan.

Roger Rempel (previous member)

Roger Rempel (Winnipeg) is a climate change technical service lead at Dillon Consulting. From 2017 to 2020, he served as the director of the Climate Group for Risk Sciences International. Roger is an environmental engineer with over 30 years of experience in environmental assessment, climate change vulnerability assessment, industrial risk assessment, environmental systems modeling and stakeholder engagement. Roger Rempel oversees the delivery of climate risk analytical and advisory services, including the development of climate analytics for engineering applications, forensic investigations of severe weather and climate-related infrastructure failures, climate change and human health, and climate change and essential services. He is a past-president of the Association of Consulting Engineering Companies Manitoba and is a certified Infrastructure Resiliency Professional (IRP).

Appendix D – Youth Advisory Council Members

Annie Martel, (Chair)

Annie Martel (she/her) is a Red River Michif woman from St-Pierre, located on Treaty 1 territory. She is currently a Master's student at the University of Winnipeg, completing a Master of Arts in Environmental and Social Change, with a focus on Indigenous Knowledges and climate change adaptation. She holds a Bachelor of Arts degree from Mount Allison, where she majored in Environmental Studies and minored in Geography and Indigenous Environmental Science. Annie has been involved in numerous student organizations and societies that are committed to tackling issues of climate change and sustainable development.

Caitlin Stewart, (Vice-chair)

Caitlin Stewart (Swan River) is a third-year university student at Lakehead University working towards her Bachelor of Science (Honours) in Forest Health and Protection. Caitlin has been a member of the Youth Advisory Council since 2020 making this her third Youth Advisory Council cohort. She has taken part in the 2020 Project Learning Tree, Green Mentorship program and is the Vice-President of the Lakehead Natural Resources Student Society. She has also worked as a Research Assistant for The Office of Institutional Planning and Analysis at Lakehead University. Caitlin is also a Team Co-Captain of the Lakehead University Timberwolves Loggersports team.

Bijan Salimi

Bijan Salimi (Morden) is a grade 12 student who is the Student Body President of his school. He has served the last two years as the Co-Chair of the Provincial Student Advisory Council, working with various stakeholders in the department of education. Bjian has also served as the Youth Council Member for the City of Morden.

Emily Robb

Emily is a Métis citizen who grew up in rural Southwestern Manitoba. She is currently a second-year agro-ecology student at the University of Manitoba who holds holistic ideologies in agricultural education delivery, improving food system resiliency, and promoting ecological stewardship. Passionate about community engagement, Emily is a volunteer note taker, teaching assistant, University of Manitoba Future Leaders 4-H Club President, and Faculty of Agricultural Students' Organization Vice-Stick External on campus. Outside of her studies, Emily is a Youth Director on the Manitoba 4-H Council Board of Directors, the Manitoban representative and Vice-Chair of 4-H Canada's Youth Advisory Committee, and a seasonal crop pathology research student for Agriculture and Agri-food Canada.

Justin Langan

Justin Langan is a 24-year-old Metis, LGBTQ2+ national activist from Swan River, MB. He is studying political studies at the University of Manitoba, before pursuing the study of human rights law. He has been recognized as an Indspire Laureate, Terry Fox Humanitarian, Top 25 Environmentalists under 25, and more.

Marissa Magsino

Marissa is a high school student at St. Mary's Academy in Winnipeg, where she has been a part of various groups including the SMA Green Team, the SMA Leadership Team and the SMA Senior Debate Team. She has travelled to various national and international competitions in North America to take part in events such as the International BioGENEius Challenge, the Weston Innovation Award Science Competition and many Youth Science Canada STEM Fairs.

Mohamed Crossman-Serb

Mohamed Crossman-Serb (he/him) is a Libyan-Metis born and raised in Winnipeg. He is in the Master's in Development Practice program at the University of Winnipeg. Mohamed co-founded Waterways, a non-profit that runs canoe programming for Indigenous youth across the province. He is currently working at the First Nations Waste Minimization team at the Green Action Centre as the community engagement coordinator.

Olivia Kehler

Olivia Kehler (Winnipeg) is a Master's student at the University of Winnipeg, pursuing a Master of Arts in Environmental and Social Change, with a thesis project focusing on Indigenous research methods. Holding a Bachelor of Arts in International Development Studies with a minor in Economics, she has particular interest in sustainable development and in degrowth. She has experience with land-based living, including small-scale agriculture and canoe tripping.

Ryan Kum

Ryan Kum is working towards a Bachelor of Science degree in Biosystems Engineering at the University of Manitoba. He has worked as an arctic and freshwater science researcher, and an environmental engineering consultant. He has also held various positions in the public service, each with a climate lens in prairie agricultural research and development, building energy efficiency, alternative energy systems, and natural and municipal infrastructure.

Soomin Han

Driven by her passion for climate, solutions-design, and bringing young people together, Soomin is an advocate for climate justice and equitable decision-making processes. Currently as the Programs Lead at Youth Climate Lab, she supports youth across the world to build capacity and lead climate solutions through climate policy, finance, and skills-development. A recent graduate of the University of Manitoba with a Bachelor of Environmental Studies, she has worked with various environmental and justice-centered non-profits, UN Climate Change, Parliament Hill as a GreenPAC Parliamentary Intern, and currently serves on the board of directors at The Starfish Canada. With all aspects of her work rooted in intersectionality, youth engagement, community care, and equity, she was also named one of the Top 25 Environmentalists under 25.

Sydney Van Aert

Sydney Van Aert is a Sustainability Analyst at CanSustain, where she supports clients with sustainability projects. Prior to this, she gained diverse work experience in the environmental field through various summer positions related to agriculture, forestry, and water remediation. She graduated from the University of Manitoba in 2020 with a Bachelor of Environmental Science.