

CULTIVATING EFFECTIVE CLIMATE GOVERNANCE

A GUIDE FOR SMALL FARM CORPORATIONS IN CANADA

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ABOUT THE CANADA CLIMATE LAW INITIATIVE:

The Canada Climate Law Initiative (CCLI) provides businesses and regulators with climate governance guidance so that they can make informed decisions in the transition to a net-zero economy. Powered by the nation's top expertise, we engage with boards of directors and trustees to ensure businesses, pension funds, and asset managers understand their legal duties with respect to climate change. Our legal research offers important insights in a rapidly transforming policy landscape.

CCLI acknowledges that it is situated on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) and is committed to working in partnership with Indigenous Peoples on effective climate governance.

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1 EXECUTIVE SUMMARY

Climate change has exacerbated recent fires, droughts and floods. Because of its potential magnitude in the future, climate change has become one of the focal points necessitating the exercise of directors' skill, care and diligence in the performance of their duties. In Canadian law, directors of corporations have a legal obligation to exercise care and due diligence in the performance of their duties as directors of the corporation in overseeing operations and ensuring the long-term viability of farms that are incorporated. Regardless of personal opinions on climate change, a director needs to consider climate considerations in their duties to oversee the corporation they serve as there is clear evidence climate change impact economies and financial systems. In failing to do so, directors may be exposing themselves to personal liability.

Planning for this future and future climate change risks, beyond the farmgate and the immediate crop season, is increasingly important and the underlying purpose of this report. And while larger farms and agri-food businesses may be more advanced in their climate and sustainability journey, and governed by more sophisticated boards of directors, the duties with respect to climate also apply to smaller farms and agri-food corporations, regardless of the board composition, level of knowledge, resources, and capacity. Directors of smaller farm corporations also need to have effective climate governance in place and consider climate-related risks and opportunities in their decision-making to ensure the farm business they oversee is resilient to severe weather events, changing climate, and rapidly evolving regulations and market expectations. This report details climate risk for agricultural corporations, duties of directors in anticipating climate risk, and strategies for managing climate risk.

A WHY SHOULD SMALLER AGRICULTURE CORPORATIONS CARE

This past year, the evidence of the impacts of climate change has been undeniable: fires throughout Canada, and drought in the Prairie Provinces. Climate change is real, it's happening now, and humans are both the cause and the solution.¹ The change in global surface air temperature over land has risen 1.9°C since 1850.² In some places in Canada, this is experienced as being 'less cold'. The average winter minimum temperature has increased to minus 16°C today from minus 22°C 55 years ago (a 6-degree Celsius warming). The average frost-free growing period has similarly increased to 140 days, up from 106 days in the mid-1960s.³ This warming has manifested in such things as the advent of the West Nile virus and the unprecedented extent and severity of the pine beetle infestation.⁴ Climate change is also experienced through more frequent and intense droughts, fires, and floods. These events pose risks for livelihoods, agricultural and industrial production, and the economy in general. Climate change risk is also increasingly the outcome of limited and ineffectual responses.

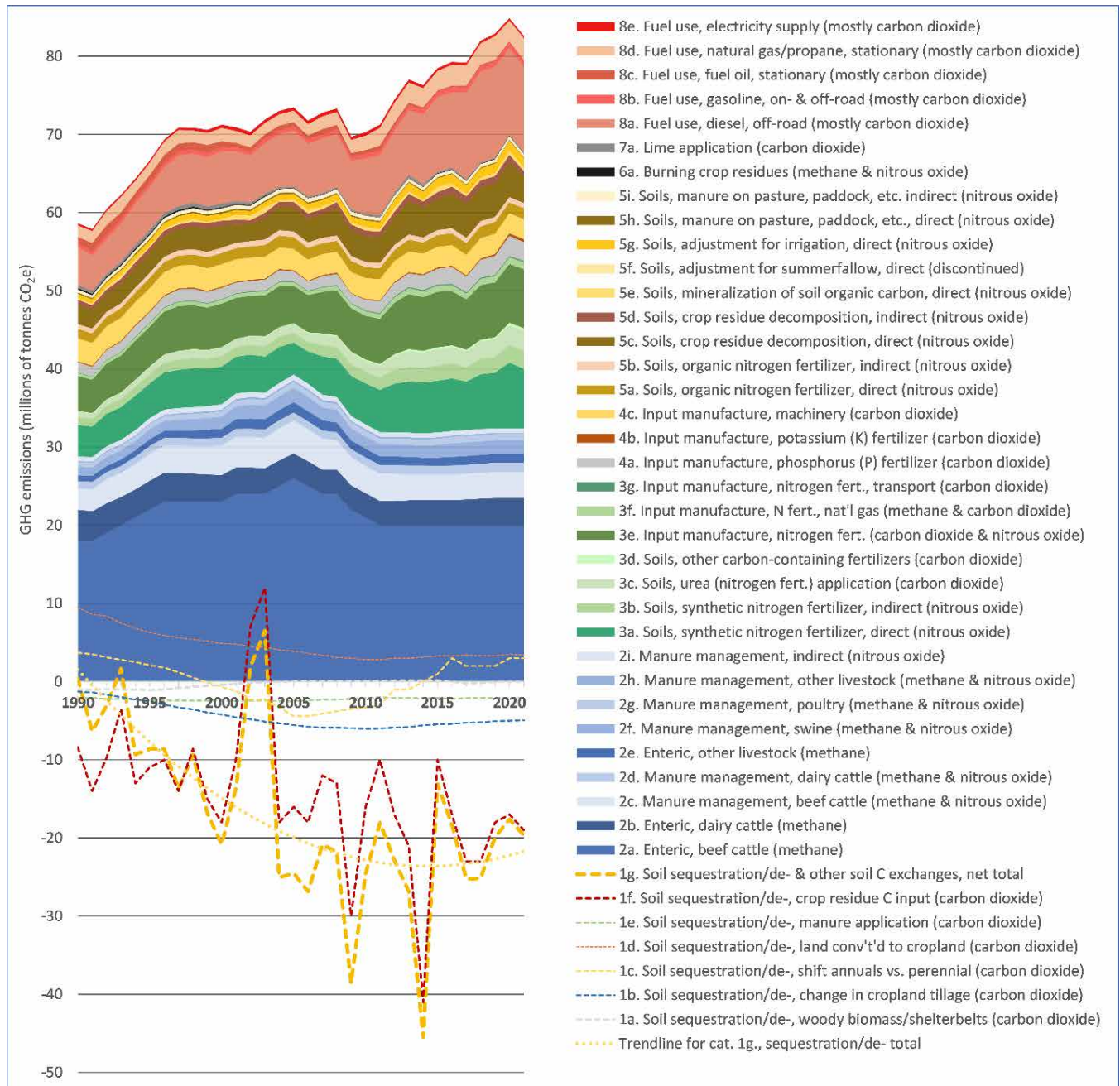
Human activity increases greenhouse gas emissions⁵ (expressed in CO₂ equivalents, and within this document often generically referred to as 'carbon') which in turn changes our climate. This human



activity has been most intense since the industrial revolution. In turn, climate now impacts the human activity that can be conducted. Increasingly countries are responding with mitigative measures that reduce greenhouse gas emissions and adapting human activity to changed climate.

While the oil and gas and transportation sectors are the largest contributors to GHGs, agriculture has accounted for between 7-10% in the last few decades. In addition to on-farm fuel use, application of biosolids and inorganic nitrogen fertilizers, decomposition of crop residues, loss of soil organic carbon, cultivation of organic soils, indirect emissions from leaching and volatilization, field burning of agricultural residues, liming, and urea application account for the GHGs from crop production. Animal housing, manure storage, manure deposited by grazing animals, and application of manure to manage soils account for GHGs from animal production. In 2020 agriculture was the fifth largest source of GHG emissions, 3% higher than in 2019. Between 1990 and 2020 GHG emissions grew by 33% mostly due to emissions related to crop production and increased use of fertilizer. Not included in these calculations are energy sources of emissions from production processes, transportation, and fugitive emissions during the production of nitrogen fertilizers.⁶ Adding these would increase GHG emissions to 12% of Canada's total emissions.⁷

FIGURE 1: CANADIAN AGRICULTURAL EMISSIONS AND FLUXES, 2019-2020⁸



For many years, Canadian decision-makers have tended to discount, or reduce, risks happening in the future. Former Bank of England and Bank of Canada governor Mark Carney refers to the climate crisis as the “tragedy of the horizon”.⁹ Although severe droughts, floods, and fires are occurring now, the fact is that the severe effects of climate change will be felt well beyond most government and business’ traditional horizons, imposing a cost on future generations that we, the current generation, have little immediate incentive to fix.

Failure to act now threatens the welfare of future generations. Without it, decisions might be made 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. Young people believe the time to act is now; 70% of young people consider the speed of transition to be either stagnant or too slow; our future agriculture consumers are willing to pay for faster change and also willing to accept the lifestyle that changes require.¹⁰

Great change in global and Canadian business, industry, sectors and supply chains is in the future as the risk of climate change is addressed. The energy supply chain will very likely be different and this will have impacts on agriculture. To achieve Paris commitments the International Energy Agency concludes renewables will not be enough on their own. Solar, wind, nuclear energy, low-carbon hydrogen, batteries and carbon capture and storage (CCUS) should be a part of governments’ plans. The transport sector and agriculture will need to be decarbonized.¹¹ Many countries, regions, cities, and businesses have legislated or declared goals of achieving net-zero emissions by 2030 or 2050, and many more are considering them.¹²

Decision-making on how to address climate change is not an exercise only of single individuals, nor is it linear or simple. There will be complex tradeoffs between adaptation policies (to reduce climate change impacts) and mitigation (to reduce the rate of climate change), 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 global, Canadian, provincial, and municipal commitments. Rigid national, provincial, territorial or sectoral targets give rise to burden-sharing decisions. The Government of Canada set out its climate change objectives as part of its 2017 Pan-Canadian Framework on Climate Change. British Columbia and Manitoba have legislated climate accountability frameworks, along with New Zealand and the United Kingdom.¹³ At the federal level, the government of Canada is embarking on achieving net-zero carbon emissions by 2050. The Canadian Net-Zero Emissions Accountability Act was introduced to Parliament in November 2019 and assented to in June 2021 to make the goal legally binding by 2050.

Changing public sentiment about 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 climate change, failing to

incorporate climate change risks into investments and planning, failing to report climate change risks, or weak, misleading or inadequate disclosure surrounding planning for climate risk including, climate scenarios for limiting global warming well below 2°C.¹⁴ Calls for increased obligations surrounding planning for net 2°C and communicating it (akin to net-zero by 2050)¹⁵ has been endorsed by the G20,¹⁶ the American Bar Association,¹⁷ and the European Commission.¹⁸ These international and national developments are building momentum and proactive consideration by the agriculture sector would ensure sector-appropriate decisions, regulations, and strategy.

B THE ROLE OF DIRECTORS

Agricultural producers have always managed and adapted to variable weather and changing climate conditions. Prairie farmers have deep experience adapting to drought conditions, managing water and drainage on their farms, salinity issues, as well as weeds and pests. With a changing climate, new weather conditions, or climate impacts including more intense and frequent droughts and floods, and faster switchover between droughts and floods brings new challenges. Compounding risks, or the experience of two risks such as drought as well as a global pandemic with associated supply chain failures, adds new frontiers to potential agricultural risk. Further, cascading risks might ricochet through supply chains as regional conflicts impact agricultural inputs (their availability and price), or influence the pricing of agricultural products and access to foreign markets.

While international policy has always had implications on the trade of agricultural products, increasingly climate policy will have implications in the future. Global, national and regional changes in insurance may creep into agricultural insurance schemes. Commitments to reduce greenhouse gases that have had implications for power production and large industrial emitters are also changing the transportation sector, with implications for farm machinery and agricultural product transport. In the horizon of addressing climate change and meeting climate mitigation commitments to reduce GHGs, agriculture will not be exempt.

Planning for this future and future climate change risks, beyond the farmgate, and beyond the immediate crop season, will be increasingly important for agricultural producers and directors of farm corporations.

This guide focuses on small farm corporations (below 5,000 ha) that increasingly need to implement effective climate governance and risk management practices. It aims to highlight the climate risks and opportunities to agricultural corporations, the legal duties of directors and officers in Canada's agriculture sector in the transition to a net-zero economy, the current and upcoming regulations, and the best practices in climate governance.

C GUIDE STRUCTURE

This guide is organized in six parts. After the executive summary, section II outlines climate change risks (physical, transition, and systemic), section III provides a legal overview of directors' duties and their standard of care, section IV outlines climate opportunity and highlights some agriculture climate action leadership, and section V provides practical information about responding to climate risk and fulfilling directors' duties and standard of care through effective climate governance. The report ends with a conclusion.





2 CLIMATE CHANGE RISKS

Agriculture is generally regarded as a high-risk sector because of its dependence on local soil and climatic conditions, weather, and externally set market prices for farm products¹⁹. Climate-related impacts are nothing new. But the intensity and frequency, as well as the complex inter-relationship of climate-related impacts in other sectors (especially supply chain-related sectors of transportation, large industrial emitters—power production, including fertilizer companies, etc.), may have significant impacts on agriculture and agricultural producers in the future. Climate impact risks, such as drought, flood, and fire, are not linear and therefore difficult to forecast based on historical data; climate impact risks of drought and flood also suffer from uncertainty in relation to timing, magnitude, and intensity. As floods and droughts become more frequent and severe, the ‘whiplash’ between these events will worsen making it hard to plan for drought in times of flood or excess moisture and vice versa. Adapting for one eventuality such as drought, without consideration of another like flood, might result in ‘maladaptation’ and lack of preparedness, or choosing a drought adaptation instead of a better adaptation appropriate for both drought and flood.²⁰

Climate change risk include climate-related hazards that result from exposure (being in the time and place) of a climate impact occurring, such as drought, fire, or flood. However, climate risks can also result from inadequate or inappropriate human responses to climate change, human climate decisions not achieving the intended objectives, or involving suboptimal 'trade-offs'.

Climate change risks occurring in other sectors, including financial and secondary insurance markets, may have dire implications that limit accessibility for agricultural producers as conventional risk management tools become unavailable or unaffordable.

A PHYSICAL RISKS: DROUGHT, FLOOD, AND FIRE

Physical risks of climate change involve risks from climate change impacts such as droughts, floods, or fires, and their impact on infrastructure or facilities, operations, resource availability (including water and raw materials), and supply chain disruptions.²¹ Climate change impacts are synonymous with agricultural risks.

The World Economic Forum's top four risks over the next ten years include risks that will potentially greatly affect agriculture. Biodiversity loss, ecosystem collapse, and natural disasters from extreme weather have the most direct impact, but critical change to Earth systems and natural resource shortages are just as concerning.²² In Canada, changes to ecosystems and extreme climate events, including droughts, are projected as the dominant negative effects.²³ The Intergovernmental Panel on Climate Change (IPCC) projects that with current warming trajectories, droughts will be two to four times more likely and precipitation events, resulting in floods, 1.5 to 2.7 times more likely.²⁴ Redirecting the world's path to well below 2°C is still achievable²⁵ but with significant change. Droughts have great impact on agriculture and gross domestic product (GDP). The 2001-2002 drought, which affected mainly the southeast part of Alberta and the southwest area of Saskatchewan, produced an estimated reduction in GDP in Canada of \$5.8 billion.²⁶

In the central Canadian Prairies, the annual average number of days over 30°C have risen and are anticipated to increase by 29 days from the 1976-2005 period to the 2051-2080 period.²⁷ The average winter minimum temperature has increased to minus 16°C today from minus 22°C Celsius before 1965 (a 6°C warming) and the average frost-free growing period has similarly increased to 140 days, up from 106 days in the mid-1960s.²⁸ This expanded West Nile virus and the unprecedented extent and severity of the pine beetle infestation are some consequences.²⁹ Heat domes and fires have been unprecedented in summers and climate models suggest increased risk³⁰ as multiple climate impacts occur simultaneously or consecutively. Multiple risks occur at the same time, including reduced water quality, wetland loss, soil erosion and degradation, and habitat destruction.³¹ In the future, these impacts are anticipated to worsen with droughts being more frequent and intense. The seasonal availability of freshwater will change with water supply shortages anticipated in the summer and worsened by increased evaporation due to higher temperatures. Stream flows will also

be stronger in the winter as rainfall replaces snowfall and loss of glacier ice reduces summer stream flows.³² At the same time, extreme precipitation events that result in floods are anticipated to worsen. The number of extreme one-day, three- and five-day precipitation events 20 years into the future is expected to increase from 5 to 20%. In a high emissions scenario, the extreme 10-year, 24-hour precipitation amount will increase by almost 18%, while the 50-year, 24-hour amount will increase by 21.3% over the Canadian Prairie region.³³

An example of changes in future possible extreme precipitation is from Mladjic et al.³⁴ These scientists used ensembles of the Canadian Regional Climate Model for the past and the future 2040-2071 period. Results for eastern agricultural Saskatchewan are in the range of a 5 to 20% increase in the extreme one-day, three- and five-day precipitation amounts for the 20-year return period. In addition, Zhang et al.³⁵ found that for the end of the century (2081-2100) under the high emission scenario, the extreme 10-year, 24-hour precipitation amount will increase by almost 18%, while the 50-year, 24-hour amount will increase by 21.3% over the Canadian Prairie region. Adapting to this future will be key for the 1.5 million Canadian homes that are not insured against flooding due to their location in flood-prone areas and the lack of affordability of flood insurance premiums as a result.³⁶ This also applies to farm residences on lower-lying land or in flood plains that may be exposed to more intense precipitation and snow melt events.

B TRANSITION RISKS

Climate change transition risks are perceived in many organizations as outside normal temporal decision-making processes and essentially involving the future. However, increasingly best practices and legal responsibility are changing the habit of ‘kicking the can down the road’, or not anticipating, and taking action in relation to these transition risks now.

Transition risks involve those related to transitioning to a net-zero carbon economy. Transition risks entail policy, legal, technology, market, liability, and reputational risks. Their consideration is important to avoid the risk of stranded infrastructure, such as built equipment whose useful life doesn’t last the full term of its mortgaged or depreciable life, suffering a downgraded credit rating resulting in higher loan payments and insolvency, or losses in investments because of the loss of an asset through a climate impact like flood, but the retention of a mortgage or loan associated with its purchase.

Many of the potential consequences of a changing climate and a transition to a net-zero carbon economy are and will occur within the lifespan of a farmer operating an agricultural corporation.

POLICY

A key transition risk relates to upcoming changes in climate and climate-related policy. As pointed out in the introduction, Canada has been involved for some time in international climate change discussions and commitments. It is only in recent years that significant changes have occurred in relation to climate law and policy. Generally, climate law and policy relate to ‘mitigation’, which is the reduction of GHGs, or ‘adaptation’, the proactive preparation for climate impacts in the future by minimizing harm and taking advantage of opportunities.

Directors of farm corporations have a responsibility to be informed, understand, plan for, and oversee the implementation of farm practices and strategies responding to climate law and policy changes. There is a suite of overarching policies that have indirect implications at the present time for agriculture, and there is also a suite of policies that directly apply to agricultural production. Climate change policy is important; without policy Canada’s emissions would be 7% higher and in 2030 they would be 41% higher.³⁷

One of the most significant policy measures has been carbon pricing and the federal government’s legislation requiring minimum standards.³⁸ Carbon pricing is about recognizing the cost of pollution and putting a price on it. It is based on the theoretical premise that as products, such as gasoline or natural gas, that include GHGs become more expensive, consumers will purchase less of them, adopt alternatives, or embrace efficiencies to reduce their usage, ultimately resulting in fewer GHGs in the atmosphere.³⁹ An increasing number of companies need to disclose the use of internal carbon pricing and directors of farm companies should plan for the potential impact of carbon pricing on their corporations, suppliers and distributors as it will be a key risk to be managed in the future.⁴⁰

Key goals of Canada’s 2030 agricultural strategy include beneficial management practices and natural climate solutions, such as rotational grazing, cover cropping, regenerative agriculture, nutrient management, manure management, and agroforestry. A resilient agricultural landscapes program and the Agricultural Climate Solutions On-Farm Climate Action Fund provide financial support to these measures. Canada has committed to setting a national fertilizer emission reduction target of 30% below 2020 levels by 2030.⁴¹ Sheldrick recommends that industrial and agricultural chemicals, the largest source of emissions through ammonia, and the upstream source material for consumer

products (e.g. ethylene) be first.⁴² It is recommended Canada builds on its membership in the First Movers Coalition to explore opportunities with like-minded countries. The industry is dominated by a relatively small number of companies; Nutrien was created in 2008 through the merger of Agrium and PotashCorp and is responsible for 2.7 Mt of emissions from five of its largest facilities.⁴³ Although consultations are underway in achieving this, the fertilizer and chemical industry has started to plan for climate risk.

One of the largest sources of GHGs in the agriculture sector is generated by nitrogen fertilizer. A 4R Nutrient Stewardship policy has been in existence and is incented by some provinces such as Saskatchewan's Resilience Strategy which tracks its implementation. Studies have demonstrated that adapting the 4R protocol of applying fertilizer with the right source, at the right rate, at the right time, and in the right place can provide benefits from \$9 per acre to \$87.⁴⁴ Saskatchewan's Climate Resilience Measurement Framework adopts as one of its 25 measures the uptake of 4R Nutrient Stewardship policy. However, in a 2020 scorecard, approximately 0.3% of the agricultural land area had a 4R plan.⁴⁵

International policies and measures include national offset systems, voluntary carbon markets that are expanding, and industry-led cost-share programs. There is recognition that offsets will not be enough,⁴⁶ and although there are challenges with carbon markets in the land sector, the potential either at the farm gate or food processor level exists. Complex issues arise, including carbon leakage, passing costs to consumers, social equity, regional inequality, and loss of market share due to competition. Transparency and ensuring monitoring, verification and reporting of GHGs are accurate will be important, with potential international implications. Ultimately, World Trade Organization issues and political arguments for border adjustments might arise.⁴⁷ Currently, the European Green Deal directed the European Commission to propose a carbon border adjustment mechanism (CBAM) for selected sectors to reduce the potential for carbon leakage - or adverse incentives that penalize European producers with carbon intensive industries thereby providing a preference in the European market to non-European industries that don't pay such carbon prices in their own countries. A CBAM would adjust the price of these imports to Europe, by increasing prices, to reflect the European carbon price.

New Zealand is considering methane and nitrous oxide to be included in its emission trading system. International climate change action has recently focused on the reduction of methane as it is a short-lived, but very potent GHG. Finding the right policy suite to transition agriculture to net-zero will need to be adapted and coordinated globally considering local context, consumption policies, and food spoilage and waste.⁴⁸

Directors of agricultural corporations should be aware of the potential legal risk that arises from using, or overly relying, on carbon offsets to decarbonize their businesses and any associated policy changes that impact claiming offsets into the future. While protocols are being developed for

enhanced soil organic carbon offsets the National Farmers Union has expressed reservations that these practices can 'offset' emissions from fossil fuels, partly because of the permanent fossil-fuel emissions and temporary nature of carbon sequestered inches below the soil surface.⁴⁹

FINANCIAL

Climate risk is already having major impacts on the financial sector. Desjardins Group, a major financial institution has stopped offering mortgages in high-risk flood areas, those that are in 20-year flood plains, impacting home values.⁵⁰ Banks, insurance companies and futures contracts have been affected and are discussed below.

Often the government responds to the impact of climate change (i.e. extreme weather events) through disaster payments and subsidies such as crop insurance. These approaches are not sustainable fiscally, economically, or environmentally.⁵¹ In the United States, the Institute for Agriculture & Trade Policy (IATP) has recommended agricultural insurance policies, loans, and bonds be changed to help agricultural producers reduce GHG emissions and adapt. Trading of agricultural contracts in the future and options will require climate-related regulations to make future prices more reliable price benchmarks for the forward contracting of crops. Considering substantial potential market disruptions and contract defaults of market participants in the future will be necessary to ensure the continued viability of futures contracts. This IATP also recommends "agribusinesses should disclose climate related financial risks and opportunities to investors and lenders to make operations and supply chains sustainable," as well that private equity-owned farm companies and publicly listed firms disclose climate-related financial risks for themselves and along their entire supply chains. Banks in the business of farm lending will become unstable if their risk assessments, credit policies and issuance terms avoid internalizing climate change risks and costs.

Financial incentives to farmers to encourage risk management, economic stabilization, and beneficial management practices as well as research and development centers across the country have been the policy mechanisms of the past. Although literature supports economic instruments such as financial incentives,⁵³ there is increasing support globally for carbon pricing mechanisms which are argued to be efficient and effective.⁵⁴

Although it often appears questionable that federal and provincial agreement exists on carbon pricing, there has been agreement since 2016. The Federal-Provincial-Territorial First Ministers formed a Pan-Canadian Framework on Clean Growth and Climate Change in 2016 that envisioned either a priced carbon system or a cap-and-trade system with an emission reduction equivalent to the one achieved by the carbon price, set to increase to \$170 per tonne by 2030. It varies by province if farmers are subject to carbon pricing and in respect of which inputs and activities. Some provinces exempt diesel and gasoline from carbon pricing in agricultural production while others, such as Alberta, do not.

Farmers are exempt from the carbon tax levied under the Greenhouse Gas Pollution Pricing Act in respect of light fuel oil (i.e. diesel) used in farm trucks and tractors, other farm vehicles not licensed to operate on a public road (e.g. combines), industrial machines and stationary and portable engines.⁵⁵ A partial (80%) exemption is granted on natural gas and propane used for heating or the production of carbon dioxide in the operation of a commercial greenhouse. However, heating or cooling a building or similar structure (e.g. barns) and grain and oilseed drying (estimated \$33 million in carbon tax in 2019) are not exempt.⁵⁶ One of the key political contestations surrounds the possible exemption of these latter items. Key issues are whether farmers experience negative competitiveness with international competitors and carbon leakage.⁵⁷ The inconsistency of carbon pricing applications by province makes arguments difficult. Ontario and Québec employ a cap-and-trade system. The effective carbon price might be between \$15 and \$20.⁵⁸ The lack of data and common metrics makes calculation and associated climate models difficult.

Implementing emission trading systems is difficult. There are a large number of heterogeneous buyers and sellers, high levels of complexity, difficulties in monitoring, reporting and verifying emissions from biological systems, and potential carbon leakage that stymies first adopters. However, in order to address carbon leakage, countries are adopting border adjustment mechanisms (as outlined above). The European Union has introduced a carbon border adjustment mechanism (CBAM) designed to reduce emissions leakage. The EU will be applying a tariff at the border on goods being imported that have either no carbon pricing or a more lenient pricing level and system in their home jurisdiction. By raising the price of imported products, the EU will ensure the competitive pricing of EU goods.

OPERATIONAL

Directors of farm corporations will need to consider not only the day-to-day, week-to-week, and month-to-month planning for climate-related weather events and their risks as they have, but also they will need to consider long-term trends. Planning for the next two to ten or 20 years will increasingly be required as a strategy is required to make the planning activity correspond more symbiotically with amortization dates on financing and credit obtained from banks and lending institutions. Not only will planning in relation to agricultural outputs be required, but also agricultural infrastructure and local, regional, national, and even perhaps international critical infrastructure.

Launched in 2018 the Canadian Agricultural Partnership committed \$3 billion over five years in a cost-shared investment between the federal, provincial and territorial governments to support agricultural programs and services tailored to meet regional needs.⁵⁹ Cost-shared environmental stewardship programs support Environmental Farm Plans and beneficial management practices with multiple environmental co-benefits.

REPUTATIONAL

Agricultural producers have long been regarded as stewards of the land in Canada.⁶⁰ Negotiating the unique challenges of addressing future climate change risks, aligning with climate change solutions, and continuing to outpace their weight in addressing global food security while remaining profitable and sustainable into the future, will not be any easier. While reputational risk is a more immediate and proximate concern for producers selling into local and regional markets, it can still have a significant impact on agricultural producers selling internationally. Previous bans of Canadian beef, canola, peas, and soya beans had significant impacts on Canadian agricultural producers.⁶¹

Historically the agricultural sector in Canada has been strongly supported by general public interest because of its contribution to food security both in Canada and abroad. However, in the future, this grace that has been enjoyed may change. Farm corporations may increasingly be assessed by external parameters from other sectors. Biodiversity and its loss is increasingly important to many. The Kunming-Montréal Global Biodiversity Framework of 2022, agreed to by many countries, including Canada, set four major goals and 23 targets. The Framework obligates countries to take legal, administrative or policy measures to encourage and enable businesses to monitor, assess, and disclose risks, and impacts on biodiversity, provide information that promotes sustainable consumption patterns, and report on compliance.⁶² Not only have legal obligations been created for directors to be aware of, but failure to consider changing legal and public expectations surrounding climate change risks could result in negative market implications for a particular producer, its region, and even its country. Ensuring farm processes take account of these obligations, ensure compliance, and communicate this to customers and the public are good reputational damage preventative measures.

TECHNOLOGICAL

Technological risk generally includes situations where a particular technology is damaged or impacted by climate change or change necessary to achieve net-zero emissions. Transitioning to natural gas from a more carbon-intensive form of power production may satisfy GHG obligation reductions in some industries during one time period, but technology may be rendered superfluous when regulations require less GHG-intense technologies to achieve net-zero emissions.⁶³ Further, customers, especially comprised of younger generations, may provide even more harsh requirements for change and transitions away from carbon intensive technology than government action.

Farm corporations will operate in a future socio-technological world that embraces more renewable and clean energy supply, cleaner transportation (including electric vehicles), and cleaner transportation of products globally (including net-zero aviation, shipping and rail). Planning for this long-term change will ensure that short-term decisions don't lock in technology or practices that will be more expensive and harder to change in the long term. For example, although natural gas is

cleaner than diesel, in a net-zero carbon emissions economy future, any equipment running on natural gas will be phased out. If agricultural producers are reliant on power production that is available all of the time, considerations of baseload power supporting renewable energy will be germane. If agricultural corporations require access to foreign markets only accessible through shipping, the decarbonization of this sector and associated costs and implications will be important risk management considerations.

Technology for addressing climate change will include adopting farm equipment and machinery with net-zero emissions and advancing farm practices and technologies that achieve net-zero emissions on land and in wetlands and dugouts. Optimizing animal feed and additives, feed grain processing, genetic selections and breeding nitrification inhibitors, anaerobic manure digestions, and controlled-release and stabilized fertilizers might all be part of the equation.⁶⁴ Canada is advancing tools for precision agriculture, anaerobic digestors, smart irrigation infrastructure and more energy-efficient farm equipment such as grain dryers.

The federal Agricultural Clean Technology Program aims to accelerate the adoption and availability of more energy-efficient technologies. One stream supports research and innovation, development, demonstration, and commercialization of technologies. A second stream incentivizes the adoption of lower emission-intensity technology. \$50 million is specifically focused on the purchase of more efficient grain dryers and \$10 million is allocated to move off diesel.⁶⁵

HUMAN CAPITAL

The future of Canada's workforce is anticipated to be quite different. The Royal Bank of Canada (RBC) anticipates that 15% of Canada's workforce, or about 3.1 million jobs, will be impacted as Canada transitions over the next ten years to a net-zero economy.⁶⁶ Agriculture as a sector has been in transition to an older workforce, and larger agricultural units for some time. Between 1976 and 2021 the number of Canadian farms fell 44% from 338,552 to 189,874.⁶⁷ This decline was particularly populated by mid-sized farms; small and large farms increased in number.⁶⁸ While larger farms are partly attributable to technological advances, they are also a response to a highly competitive market with low margins having to increase in size and workforce; some smaller farms have adjusted by selling food products that garner a higher price. While farmers are aging, the high costs of farming are prohibitive to young people entering farming.⁶⁹ A 2022 RBC report found 40% of Canadian farm operators planned to retire over the next decade and 66% didn't have a succession plan.⁷⁰ Planning for the future, including future farm ownership, management, and labour issues is an ever-present oversight obligation of directors.

LIABILITY

Agriculture corporations face various legal and liability risks. Directors are obliged to be well informed about climate change, its climate impacts and risks, and the changing landscape of the expansive

agriculture sector. Simply put, climate change has an impact on the corporation, and directors are required to consider the best interest of the corporation.

As climate science has been improving, the science of climate attribution, or establishing causation between emissions and resulting damages has become stronger. This increases the risks that countries and sectors that have been carbon intensive over the past decades are potentially liable for current and future climate change impacts, disasters, and associated costs. This may result in bankruptcies and supply chain effects.⁷¹

The primary areas that apply to agricultural corporations are:

DAMAGES

Climate-related litigation is rising and agriculture is not exempt. The United Nation's 2023 global climate litigation report notes that in 2022 the number of cases more than doubled since 2017 and such tactic is integral in securing climate action and justice found the IPCC.⁷² Of 2,341 global climate cases as of June 2023, more than 50% have had outcomes favourable to climate action.⁷³

In New Zealand, the Supreme Court unanimously ruled that the Mauri had a right to sue several companies whose combined GHG emissions made up one-third of the country's total reported GHG between 2020 and 2021. These companies included Fonterra, which owns and operates eight dairy factories in New Zealand, and Dairy Holdings Ltd., which operates 59 dairy farms with 50,000 milking cows releasing methane and nitrogen dioxide from Nitrogen-based fertilizer used on farms. The plaintiff alleges the companies failed to credibly commit to voluntary reduction measures and actively lobbied against regulatory measures pointing to the fact agricultural GHG emissions are not part of the current emission trading system. The Supreme Court stated that common law should be able to evolve and consider such a claim.⁷⁴ While the results of the case will not be known for a few years, and although another jurisdiction, it shows that agricultural corporations are not immune from climate-related lawsuits.

Canadian courts have not yet recognized public interest claims, the basis of the New Zealand claim. However, several cases have advanced such claim; further arguments supporting such a claim in relation to preserving the climate and the environment have recently been strengthened by amendments to the Canadian Environmental Protection Act. The preamble states that the Government of Canada recognizes the right to a healthy environment and subsection 2(a.2) obligates the government of Canada to protect the right of every individual in Canada to a healthy environment.

BREACH OF FIDUCIARY DUTIES

Directors could potentially face personal liability lawsuits for the farm corporation's climate strategy, or lack thereof. This trend has started in oil and gas companies against directors for not aligning

Shell's climate strategy with the Paris Climate Agreement.⁷⁵ The duty arises in relation to the duty of loyalty that requires directors and officers to act honestly and in good faith with a view to the best interests of the corporation and the duty of care that requires them to exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances. Further Canadian directors may be liable pursuant to an oppression remedy that requires fair conduct. As more people and shareholders become passionate about climate change, the possibility of such actions becomes increasingly possible as failure to act appropriately may increasingly be judged as 'unfair'.⁷⁶

GREENWASHING

Insufficient or improper disclosure and management of climate change, especially through advertising, are likely to increase the risk of contract breaches or false advertising. Young people are increasingly skeptical of climate change claims, requiring evidence of these corporate claims and seeking verification.⁷⁷ An increasing number of plaintiffs are bringing complaints in front of the Competition Bureau, such as the recent cases against Keurig Canada, Royal Bank of Canada, Shell Canada, and Lululemon to only name a few. Greenwashing complaints affect all industries, ranging from the manufacturing to the retail sectors. The corporate farm sector is not immune to the greenwashing risk. Directors of agricultural corporations should be careful when claiming to use sustainable farming practices, such as 'regenerative farming' or 'nature-based solutions', or selling green products.⁷⁸

C SYSTEMIC RISKS

Agriculture is not only part of the food system, but it is part of a bigger system whose GHG emissions will increasingly be relevant. Considering risk in a 'whole system' manner provides for better risk management.

A Task Force empowered by the Farmers for Climate Solutions concluded that federal Business Risk Management Programs incentivized farmers to adopt riskier practices and reduced the likelihood farmers would adopt climate risk reduction practices including diversifying crop rotations, improving soil health and adopting climate-friendly beneficial management programs. In fact, these programs provided an incentive to convert marginal lands, wetlands, grasslands and treed areas to crop production, which could cause significant GHG emissions. Agri-stability, one of the Canadian farm programs which protects against loss of income due to market fluctuations, was found to have the potential to encourage specialization and thereby in turn increase risk.⁷⁹

Significant change is on the horizon. A net-zero target has been adopted by 92% of the world's economy (by gross domestic product).⁸⁰ Investment platforms are forming to advance innovation and investments to achieve these goals in 'first-of-a-kind' operational pilots bringing together philanthropic, private and public funding. In a similar vein, sustainable finance frameworks,

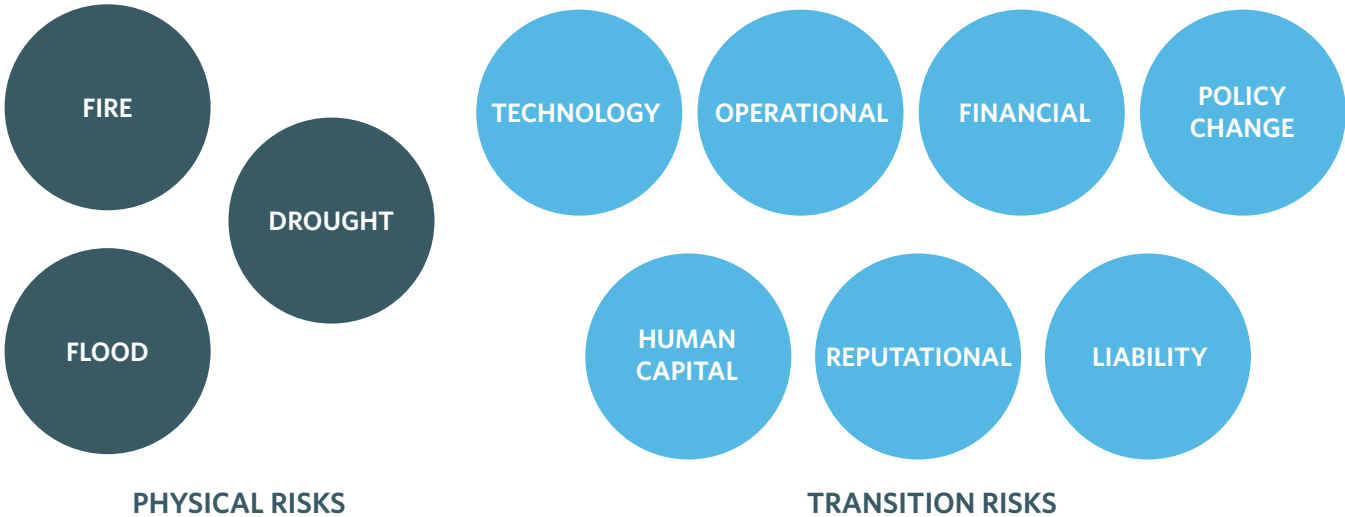
taxonomies, disclosure regulations and alliances of net-zero institutional investors have formed to mobilize private capital to finance the transition to net-zero futures.⁸¹

Companies listed on stock exchanges are increasingly required to disclose climate risk in their annual reporting. In 2021 Canadian Securities Administrators proposed a draft National Instrument 51-107 Disclosure of Climate-related Matters to set expectations for companies on obligations to disclose climate risks and opportunities. The International Financial Reporting Standard (IFRS) published the S2 Climate-related Disclosure standard for which 63 jurisdictions have declared support.⁸² The Canadian Sustainability Standards Board, an organization that works with the International Sustainability Standards Board, has proposed and released a Canadian Sustainability Disclosure Standard that endorses and is aligned with the IFRS S2. These standards will not be binding in Canada unless the Canadian Securities Administrators adopt them, or the standards are otherwise mandated by legislation. The proposed standards were open for comment until June 10, 2024.

Not adopting international standards can create problems. Lack of clear standards leaves companies increasingly vulnerable to litigation, as they either fail to consider and plan for climate risk disclosure, or fail to meet the mark for expectations, which is ultimately decided by a judge in litigation.

New standards are requiring corporations to provide information about the information and data sources used in identifying, assessing, prioritizing and monitoring climate-related risks and opportunities, whether climate-related scenario analysis informs this process, including how the processes and outcomes have changed from previous years because of these new procedures.⁸³ The draft National Instrument 51-107 allows for an approach commensurate with the skills, resources and capabilities of a corporation; further leeway should be provided on indirect scope 3 emissions in the agricultural value chain as information is not yet fully accurate.⁸⁴

FIGURE 2 SYSTEMIC CLIMATE RISKS TO AGRICULTURE CORPORATIONS





3 LEGAL OVERVIEW

A DIRECTOR'S DUTIES

In Canadian law, directors of corporations have a legal obligation to exercise care and due diligence in the performance of their duties as directors of the corporation in overseeing operations and ensuring long-term viability.⁸⁵ Climate change, because of its potential magnitude impacting agricultural corporations, has become one of the focal points necessitating the exercise of directors' skill, care and diligence in the performance of their duties. Although what exactly is appropriate for each farm corporation differs, following best practices in climate governance, actively monitoring and managing climate risks, and overseeing appropriate mitigation and adaptation efforts have become standard expectations of corporate directors.⁸⁶ A director is expected to look after both short-term and long-term interests of a corporation ensuring proper oversight and disclosure.

Generally, directors and officers are expected to make reasonable business decisions given "prevailing socio-economic conditions of which they knew or ought to have known."⁸⁷ Breaching this duty of

care could occur if a director or officer were wilfully blind or put a corporation at undue risk. Thus, if directors overlook climate change and its associated risks and opportunities, it is arguably a breach of their duty of care. Personal opinions and beliefs are regarded in law as ‘subjective’ and not necessarily compatible with the objective standards determined as ‘expected’ by a judge in a court of law. So regardless of personal opinions on climate change, a director who rejects climate change science expressed by a body such as the IPCC and does not consider climate-related risks may expose themselves to personal liability.⁸⁸ In a trial to determine liability, the lawyers will call expert witnesses which may include scientists either from the IPCC or who have contributed to its scientific assessments detailing climate change and the information readily available to the public, such as the IPCC’s Summary for Policymakers and Technical Summary.

B DIRECTOR’S STANDARD OF CARE

Climate change poses an existential challenge to our future⁸⁹, and in Canada, we are warming at twice the global warming rate.⁹⁰ Because of the significance of this, directors and officers of corporations have an obligation to oversee the management of climate change risks and opportunities.

In a 2022 legal opinion, Carol Hansell stated that “directors must put aside any preconceptions they may have about the reality or imminence of climate change risk and be open to the information relevant to the business of the corporation [...]. They must be satisfied that the corporation is addressing climate change risk appropriately.”⁹¹ Dr. Janis Sarra observed that “directors and officers must directly engage with developments in knowledge regarding physical and transition risks related to climate change and how these risks may impact their corporation [...] directors and officers have an obligation to make the inquiries, to devise strategies to address risks, and to have ongoing monitoring to ensure the strategies continue to be responsive to the risk.”⁹² Directors have a duty to ensure that environmental concerns are being brought to their attention and that officers of the corporation are promptly addressing environmental concerns; directors should immediately and personally react when they notice the system has failed.⁹³

The Supreme Court of Canada has determined that the standard of care for directors is an objective standard of what a ‘reasonably prudent person’ would do in similar circumstances.⁹⁴ This standard of care does not envision being overly risk-averse or cautious, nor does it entail engagement of too much risk. Further, the circumstances are important as an inherently risky start-up venture involving new processes or patents versus a traditional farm corporation that has been within a family for many years would have very different expectations of what are reasonable standards of risk.⁹⁵ This duty is also captured in many provincial laws. Table 1 provides a few examples.

TABLE 1 PROVINCIAL REGULATIONS GOVERNING FARM DIRECTORS' DUTIES

PROVINCE	SECTION AND ACT	PROVISION
British Columbia	<i>Business Corporations Act</i> , SBC 2002, c. 57	142(1) - A director or officer of a company, when exercising the powers and performing the functions of a director or officer of the company, as the case may be, must (a) act honestly and in good faith with a view to the best interests of the company, (b) exercise the care, diligence and skill that a reasonably prudent individual would exercise in comparable circumstances
Manitoba	<i>The Corporations Act</i> , CCSM c.C225	117(1) Every director and officer of a corporation in exercising his powers and discharging his duties shall (a) act honestly and in good faith with a view to the best interests of the corporation; and (b) exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances.
New Brunswick	<i>Business Corporations Act</i> , SNB 1981, C. B-9.1	79(1) Every director and officer of a corporation in exercising his powers and discharging his duties shall (a) act honestly and in good faith, and exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances in the best interests of the corporation.
Ontario	<i>Business Corporations Act</i> , RSO 1990, c. B.16 s. 134 (1); 2006, c. 34, Sched. B, s. 24.	Every director and officer of a corporation in exercising his or her powers and discharging his or her duties to the corporation shall, (a) act honestly and in good faith with a view to the best interests of the corporation; and exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances
Québec	<i>Business Corporations Act</i> , LR c. S-31.1	119 Subject to this division, the directors are bound by the same obligations as are imposed by the Civil Code on any director of a legal person. Consequently, in the exercise of their functions, the directors are duty-bound toward the corporation to act with prudence and diligence, honesty and loyalty and in the interest of the corporation.
Saskatchewan	<i>Business Corporations Act</i> , 2021, SS 2021, 9-23 (1)	Every director and officer of a corporation in exercising the director's or officer's powers and discharging the director's or officer's duties shall: (a) act honestly and in good faith with a view to the best interests of the corporation; and exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances.

Directors are not expected to have perfect judgement, only that of a reasonably prudent person would have in similar circumstances. When directors act in good faith and diligently, courts will respect their decision, even if it subsequently proves to be erroneous. This is encapsulated in the business judgement rule that protects directors from liability when they make well-informed and honest decisions based on what they knew at the time.⁹⁶

While larger farm businesses may be more advanced in their climate and sustainability journey and governed by more sophisticated boards of directors, the duties with respect to climate outlined above also apply to smaller farm corporations regardless of the board composition, level of knowledge, resources, and capacity. Directors of smaller corporations also need to consider climate-related risks and opportunities in their decision-making to ensure the business they oversee is resilient to severe weather events, changing climate, and rapidly evolving regulations and market expectations. Directors of smaller agriculture corporations also need to have effective climate governance in place.



4 CLIMATE-RELATED OPPORTUNITIES

For generations Canadian farmers have been stewards of the land, preserving their farms for the next generation. In addition to negotiating the risks detailed above, there will be opportunities. Farmers have adopted sustainable practices and technologies that have adapted to the variable Canadian climate and reduce emissions through better and more efficient practices. Canada's agricultural Beneficial Management Practices (BMPs) have encouraged environmental practices historically have, but are only adopted if beneficial to a farm's bottom line.⁹⁷ Evolving climate-related risks are changing the metrics of these calculations and lengthening the planning horizon.

Improvements are being made in identifying the correct beneficial management practice for the correct farm or business. Calibrating the practice to climate resiliency and environmental sustainability at the farm level is being advanced. Relevant, applicable and endorsable BMPs and increased communication building processes between the policymakers and the corporate farm community is progressing.⁹⁸

Of all economic sectors, agriculture is recognized as having the greatest near-term mitigation potential mostly by soil organic carbon sequestration.⁹⁹ Three major avenues advance this:

1. Land-use change: reducing farmland area, increasing agricultural yields, and restoring natural habitats (reclaiming wetlands, woodlands, planting windbreaks);
2. Land-management change: less summer fallow and increased adoption of no-till and/or minimum-till; and
3. Crop mix and yield changes: shifting to crops with greater root depth or perennial crops increases the soil’s capacity to sequester organic carbon.

Many other opportunities to address climate risks exist for agricultural corporations. Table 2 outlines possibilities.

TABLE 2 OPPORTUNITIES TO ADDRESS CLIMATE RISKS FOR CANADIAN FARMS

CATEGORY	OPPORTUNITIES
Resource efficiency	<ul style="list-style-type: none"> ▪ Use more efficient modes of transportation (including electric vehicles) ▪ Reduce water usage and consumption
Energy	<ul style="list-style-type: none"> ▪ Use lower-emission sources of energy including solar, wind, and heat pumps ▪ Use new technologies ▪ Participate in the carbon market
Products and services	<ul style="list-style-type: none"> ▪ Document and develop low emission products ▪ Development of climate adaptation and insurance risk solutions
Markets	<ul style="list-style-type: none"> ▪ Access new markets and product certifications ▪ Use public sector government incentives
Resilience	<ul style="list-style-type: none"> ▪ Participate in renewable energy programs ▪ Diversification

Farmers for Climate Solutions published a roadmap for reducing emissions in the next Agricultural Policy Framework in 2022 listing 19 Beneficial Management Practices with potential to reduce GHG emissions. BMPs included avoided conversion of shelterbelts, wetland restoration, planting riparian trees, silvopasture, alley cropping, avoided conversion of wetlands, soil management (through cover cropping and intercropping), livestock management (increasing legumes in pasture, rotational grazing, extended grazing period), manure storage and handling (synthetic impermeable floating covers, acidification of liquid manure), and nitrogen management (4R, improved crediting of organic sources, elimination of fall nitrogen application, enhanced efficiency nitrogen fertilizer, precision nitrogen management, and quantitative determination of right rate).

Regenerative farming is being used by some agricultural producers to increase the farm's resilience to extreme weather events and sequester carbon in soil through unconventional means. Cover crops and rotational grazing of livestock to encourage plant regrowth are some of the practices. Cargill, Walmart, and General Mills have all started to promote the adoption of regenerative practices.¹⁰⁰

A PRODUCT CERTIFICATION AND DIFFERENTIATION

Over the last two decades, certifications for agricultural products have emerged as a voluntary measure.¹⁰¹ Generally, certification involves third-party accreditation that a certain product or process conforms to standards, of sustainability or GHG intensity set by a body such as the International Organization for Standardization, although there are many initiatives with many non-governmental and non-profit bodies involved. Some stress differing metrics.¹⁰² For instance, due to concerns for trade-related land-use change tracing 'imported deforestation' is of importance in Europe and policies and certifications have been developed in countries such as France.¹⁰³

Measuring agricultural GHGs has evolved. Researchers measure soil organic carbon change and GHG fluxes from agricultural soils while comparing land uses and arrangements. Similarly, measurement systems and both empirical and process models have been developed in relation to livestock production. These measurements can be combined with regional-level modeling to estimate emissions and then scaled up into local, regional and national assessments.¹⁰⁴

International standards and certification schemes that focus on land and climate are developing. Many are specific to particular crops to root out and end unsustainable agricultural products by tracing supply chain impacts from producer to consumer.¹⁰⁵ For instance, the Rainforest Alliance has developed Sustainable Agriculture Standard Farm Requirements that require a sustainable agriculture standard to be followed on the farm and within the supply chain of the farm product. There is a certification and auditing system established through information technology support tools. Key measures target soil fertility, water resources, and ecosystem services, and emphasis is on crop productivity, input use efficiency, and profitability. Social indicators, including the respect of farmers' human rights, as well as the protection of forests and natural ecosystems, are inherently oriented towards climate-smart agriculture focusing on adaptation and resilience.¹⁰⁶

B NEW PRODUCTS AND PROGRAMS

Part of Canada's 2030 Emissions Reduction Plan includes supporting farmers. The plan includes \$470 million in investment in Agricultural Climate Solutions: On-Farm Climate Action Fund to encourage the sustainable practices of cover crops, rotational grazing and fertilizer management. There is also \$330 million earmarked for the Agricultural Clean Technology Program to support energy-efficient equipment. This program is aimed at technologies that reduce emissions and enhance competitiveness. Energy efficiency, precision agriculture and bioeconomic technologies are priorities. \$100 million is allocated to transformative science for a sustainable sector in climate change research, knowledge transfer and developing metrics.¹⁰⁷

The widespread adoption of beneficial management practices in the Canadian prairies, such as reduced tillage, decreased summer fallow, more cover crops, and increased in perennial instead of annual cropping systems, reduced emissions between 1981 and 2011.¹⁰⁸

C INTER-GENERATIONAL FARMING

Although climate change impacts are being experienced today, the risks of future climate change impacts are greater for future generations. An integral characteristic of a family farm is the intergenerational transfer to ensure it is passed down from one generation of a family to the next.¹⁰⁹ Several drivers are impacting the inter-generational transfer of Canadian farms. First, the number of farms in Canada and the farm population in Canada is declining. In 1971, one in 14 Canadians was a member of the farm population, but by 2021 this decreased to one in 61.¹¹⁰ Between 1966 and 2016 there was a 43% reduction in farmers.¹¹¹

Second, Canadian farms on average are getting larger. In the Prairie provinces, in 1986, 10,000 acres and larger farms represented 5% of total farms, and in 2016, this number rose by 19%. Conversely, farms 1 to 999 acres in 1986 represented 32% of total farms but by 2016, this figure dropped by 13%.¹¹² Lastly, it is widely believed that fewer farmers wish to enter farming and fewer farms have a child successor.¹¹³

As Qualam et al. conclude, "Farmland concentration makes it much harder for young and new farmers to enter agriculture."¹¹⁴ While these dynamics reduce the number of inter-generational farm transfers, long enduring barriers to inter-generational transfer have existed in Canada, the United States, and globally. These barriers include a failure of farmers to plan for a transfer because of the 'soft issues' often not discussed that embody the emotional and social dimensions. Many farmers don't plan for retirement and/or fail to plan for an inter-generational transfer because of the loss of identity, the feeling that will ensue in such a transfer, and the loss of status and power.¹¹⁵ Younger successors also become frustrated because of a lack of delegation as older retiring agricultural producers seek to maintain their knowledge and power preventing full sharing and dissemination of knowledge.¹¹⁶ These

dynamics create the risk of a knowledge gap that could inhibit the operations and sustainability of a family farm.

Research shows that succession planning for farms does increase the chances of an intergenerational farm transfer. A private sale or a lease to a tenant farmer are also options.¹¹⁷ Recommendations to address issues preventing such planning and transfer include being sensitive to the soft emotion issues that act as a barrier so that a transfer can occur and the retiring farmer can be involved in a plan that preserves as much as possible their social identity as a farmer and connections to other farmers and their corporate farm and agribusiness. This can also ensure the retiring farmer shares knowledge and provides the greatest chance of success for the incoming successor to succeed. Soliciting the services of a farm successionship facilitator, or creating a voluntary organization of retired farmers can provide assistance and reduce any risk involved in the transition.¹¹⁸ Tax changes are also facilitating intergenerational transfers and even allowing a transfer to a child through a staged process of three or possibly five to ten years, without the successor child farmer having to set foot on the farm.¹¹⁹

D AGRICULTURE CLIMATE ACTION ON THE GROUND

Many Canadian farms are leading in proactively taking action in relation to climate change. For example, Farmers for Climate Solutions is a farmer and rancher-led coalition that identifies and advances pragmatic solutions to address climate change, transition to low emissions and build high resilience approaches to agriculture.¹²⁰ Farmers for Climate Solutions has also created a farmer-to-farmer learning hub for reducing input costs, boosting productivity and improving soil health titled FaRM Resilience Mentorship accessible on their website.

Nature Canada provides a toolkit on nature-based climate solutions for agriculture with information on replanting and restoring abandoned crop fields, rotational grazing, tree/shrub/native vegetation buffer areas, restoring wetlands, and converting developed ranching fields to native grasses and vegetation.¹²¹ The Climate Atlas also provides information on past and future changes in precipitation and hot days¹²² while the Canadian Drought Monitor provides real-time information on drought conditions across much of Canada.¹²³





5 EFFECTIVE CLIMATE GOVERNANCE

Directors play a critical role in ensuring effective governance practices to address risk and plan for climate-related risks. Planning for the future risk landscape will involve new strategies and transformative governance approaches. Various frameworks have been developed to guide businesses in preparing for this future. Despite being written and targeted for public-traded companies with shareholders, the principles established by the Task Force on Climate-related Financial Disclosures (TCFD) framework¹²⁴ provide a valuable foundation for preparing for climate risks as they recognize there is not a one-size-fits-all approach. Farm corporations are diverse in products and product mixture as well as geography and supply chain features. Many Canadian companies already report their climate-related financial risks with the TCFD framework and many countries require issuers to report their climate risks and opportunities in alignment with the TCFD framework. The new global standard IFRS S2 for climate-related reporting will improve transparency and comparability of sustainability information, and contribute to long-term financial stability by revealing decision-useful information to investors and other relevant stakeholders.

Emerging guidelines and principles generally reflect common sense. Climate-related financial reporting has three broad outcomes:

1. Understand and mitigate the potential impact of climate-related risks for farm corporations and future strategy.
2. Implement appropriate governance and risk management practices to manage identified climate-related risks.
3. Remain financially and operationally resilient through severe climate-related risk scenarios and disruption from climate-related disasters.

Climate reporting standards, including the proposed Canadian Sustainability Disclosure Standard (CSDS) 2, Climate-related Disclosures, require corporations to be able to describe the current and anticipated effects of climate change risks and opportunities on its business model and value chain, such as which geographical areas, facilities, and types of assets, and then how this is responded to in strategy and decision making.¹²⁶ Farm corporations should prepare to disclose climate-related information in alignment with these standards. While not all farm corporations may be required to disclose their climate risks and opportunities, banks or investors may ask for this information as their expectations on investee companies to manage climate risks are increasing. Directors of agricultural corporations need to appropriately oversee climate-related financial disclosures and should stay abreast of the standards and disclosure requirements to ensure effective climate governance of the company they oversee.

Similarly, emerging principles also include ensuring appropriate governance and accountability structure in place to manage climate-related risks, incorporating the implications of climate impact risks and associated transition to low GHG economy into business model and strategy, using climate scenario analysis to assess the impact of climate-related risks on its risk profile, business strategy and business model, and mandating sufficient capital and liquidity buffers for climate-related risks.¹²⁷

A GOVERNANCE

Strong governance of a farm corporation will be important for ensuring informed decisions about climate risks, strategies, targets and metrics.¹²⁸ Governance includes the decision-making processes, controls and procedures that a farm corporation uses to manage, oversee, and monitor climate-related risks and opportunities.¹²⁹ For corporations whose directors are individuals different than the officers and day-to-day managers of the corporation, ensuring an appropriate governance and accountability structure inclusive of management reports on climate-related risks will be a best practice.¹³⁰ There are several simple questions to ask:

- Can a director provide an overview of how climate-related risks and opportunities are managed by the corporation?

- Can a director describe climate change impacts, risks and what the corporation is doing to address the challenges?
- Is a director able to affirm that the officers and directors of a farm corporation have the capacity to make effective decisions concerning climate change risks and their disclosure to shareholders and other corporate stakeholders?¹³¹

Increasingly these are expected governance practices for corporate board members with specific obligations to have a good command of the subject of climate risk exposure and management including issues of scenario analysis, strategic integration, and reporting and disclosure.¹³² Some boards may create subcommittees to ensure a particular corporate risk is addressed and, if required and needed, external consultants can be engaged to provide expertise.

Although farm corporations constitute a special sector providing food and sustenance, they share the same legal status of other corporations. Best corporate practices are evolving to include, in addition to collecting data for physical and transition climate risks: 1) utilizing climate scenario analysis tools and models to evaluate climate-related risks with a clear understanding of the data and methodology; 2) monitoring and reporting on corporate indicators and metrics to gauge the effectiveness of climate risk management; and 3) develop the capability to consolidate points 1 and 2 in a timely, iterative, assessment of the corporation's exposure for both adaptive decision-making and objective reporting.¹³³ As directors of farm corporations, it is important to ask the right questions.

QUESTIONS FARM DIRECTORS CAN ASK

1. How does the farm corporation's future strategy align with stated emission reduction plans of 45% by 2030 and 100% by 2050?
2. Does the farm corporation have a climate risk strategy? How many years in the future does the strategy cover? Does it consider future climate change scenarios?
3. How is the climate risk strategy operationalized?
4. What metrics and targets are there to implement a climate risk strategy?
5. What statements are made by the farm corporation to its customers or the supply chain surrounding climate risk management? How are they monitored, verified, and reported?
6. Do the farm corporation's board of directors and senior management have climate expertise and knowledge? If not, how is this knowledge accessed and accumulated?
7. How is the internal price of carbon accounted for in the farm corporation's operations? How does this inform decision-making and investment allocation?

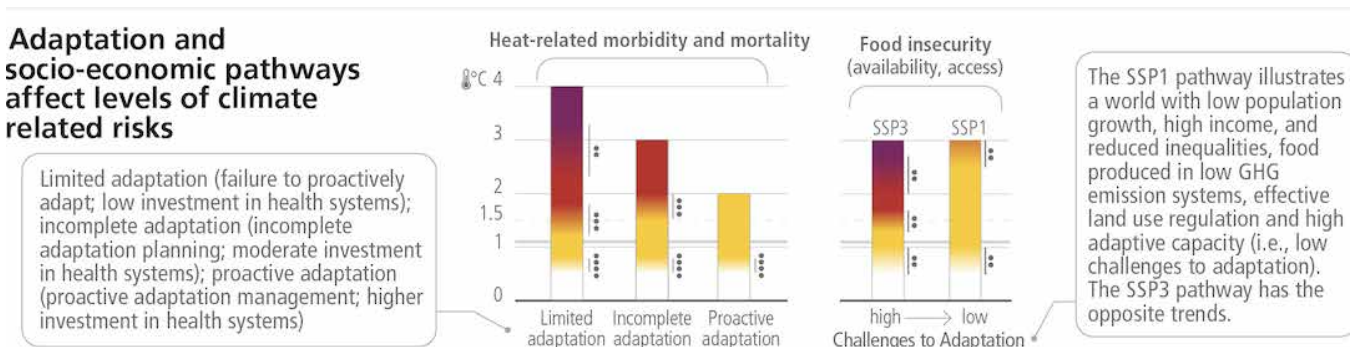
B SCENARIO ANALYSIS

When assessing climate change risk, scenarios are an important part of the analysis. Scenarios are basically what we anticipate will happen in the future. Climate scenarios are plausible representations of future climate conditions that are calculated on a global or regional scale. One of the most important components of climate scenarios concerns GHG emissions into the future. But other important determinants include population growth, energy use and efficiency, technologies, and climate policies. The science of studying emissions and climate change has developed and evolved since 1896 adding layers of human and natural system interactions as well as verification processes.

Climate models are used to estimate global and regional climate futures including levels of warming, extreme weather events both in terms of magnitude and frequency, and large-scale singular events, such as biodiversity loss, tree mortality, permafrost degradation, or wildfire loss. Climate models are also used to determine possible pathways for the future and what combination of reduction in GHGs, land and forest change, technologies, and policies are required to limit global warming. Many climate models to limit global warming to well below 2°C rely on removing GHG through new and existing technologies, afforestation, increased carbon storage in the ground, biomass and soil, etc.¹³⁴ Figure 3 below illustrates the level of climate-related risks based on limited adaptation, incomplete adaptation, and proactive adaptation. There is a higher possibility of risk if 4°C is achieved versus a lower risk with proactive adaptation and lower levels of warming. Similarly, there is a higher food insecurity risk with climate models with higher emissions (socio-economic pathway 3 (SSP3)) versus lower emissions (SSP1).¹³⁵

Climate scenario analysis is an important tool for companies to assess how their business model, strategy, and financial performance will do in different climates and different time horizons. They are an essential exercise to assess companies' climate resilience.

FIGURE 3 RISKS ARE INCREASING WITH EVERY INCREMENT OF WARMING¹³⁶



C CARBON MEASUREMENT

Ensuring monitoring, verification, and reporting of carbon is necessary to support financial transactions and markets reflecting carbon offsets, pricing, BMPs, and climate models. For instance, in 2018, 82% of agricultural soil in Ontario displayed net carbon releases.¹³⁷ Emissions are continuing to rise even with carbon offset markets and a suite of instruments to protect soil from degradation and desertification and advance the food supply chain.¹³⁸

Carbon intensities can be calculated for crop and animal production, but the actual numbers depend on practices, regions, and weather and humidity levels at the time of measurement. Crops with low GHG emission intensities include legumes like alfalfa and soya beans. These crops also offer synergies when they fix nitrogen in the soil and sequester carbon in the soil.¹³⁹

Customized, whole-farm, free software¹⁴⁰ is available to help estimate GHGs from animal agricultural operations, including eggs, beef, dairy, swine, sheep, and poultry. The software is a whole-system approach that can be customized to better reflect an agricultural operation. For example, a beef producer switching from planting annual grass forage to perennial legume forage can calculate the impact that cascades through the entire operation. It can help decrease the need for nitrogen fertilizer, eliminate the energy going into fertilizer production, decrease nitrogen losses to the environment in air and water sources, reduce the need for fuel and machine usage as perennials do not require yearly re-seeding, increase the herd's gains due to the higher nutritional quality of legumes, decreasing the time cattle need to spend grazing thereby reducing enteric methane and manure, and incorporating carbon into soil.¹⁴¹

D RESILIENCE STRATEGY

For governments and governmental organizations, climate-resilient agriculture has become a best practice. Resilience is about a farm corporation having the capacity to adjust to the uncertainties arising from sustainability-related risks. Climate resilient agriculture melds adapting to climate change by responding to climate impacts and combating poverty at the same time enhancing food security. 'Greening' agri-food systems are part of the focus, as measured by the United Nations Sustainable Development Goals.¹⁴² Some of the terminology includes 'climate-smart agriculture', endorsed by the Food and Agriculture Organization and World Bank, which consists of three pillars: increasing the productivity of agriculture; adapting and building resilience to climate change by responding to climate impacts; and reducing or removing GHGs through practices such as carbon farming (sequestering carbon in soil and plant material).¹⁴³ Similarly, the United States follows climate-smart farming by linking adaptation with resilience planning focusing on climate-smart conservation practices by measuring GHG benefits with farm practices.¹⁴⁴

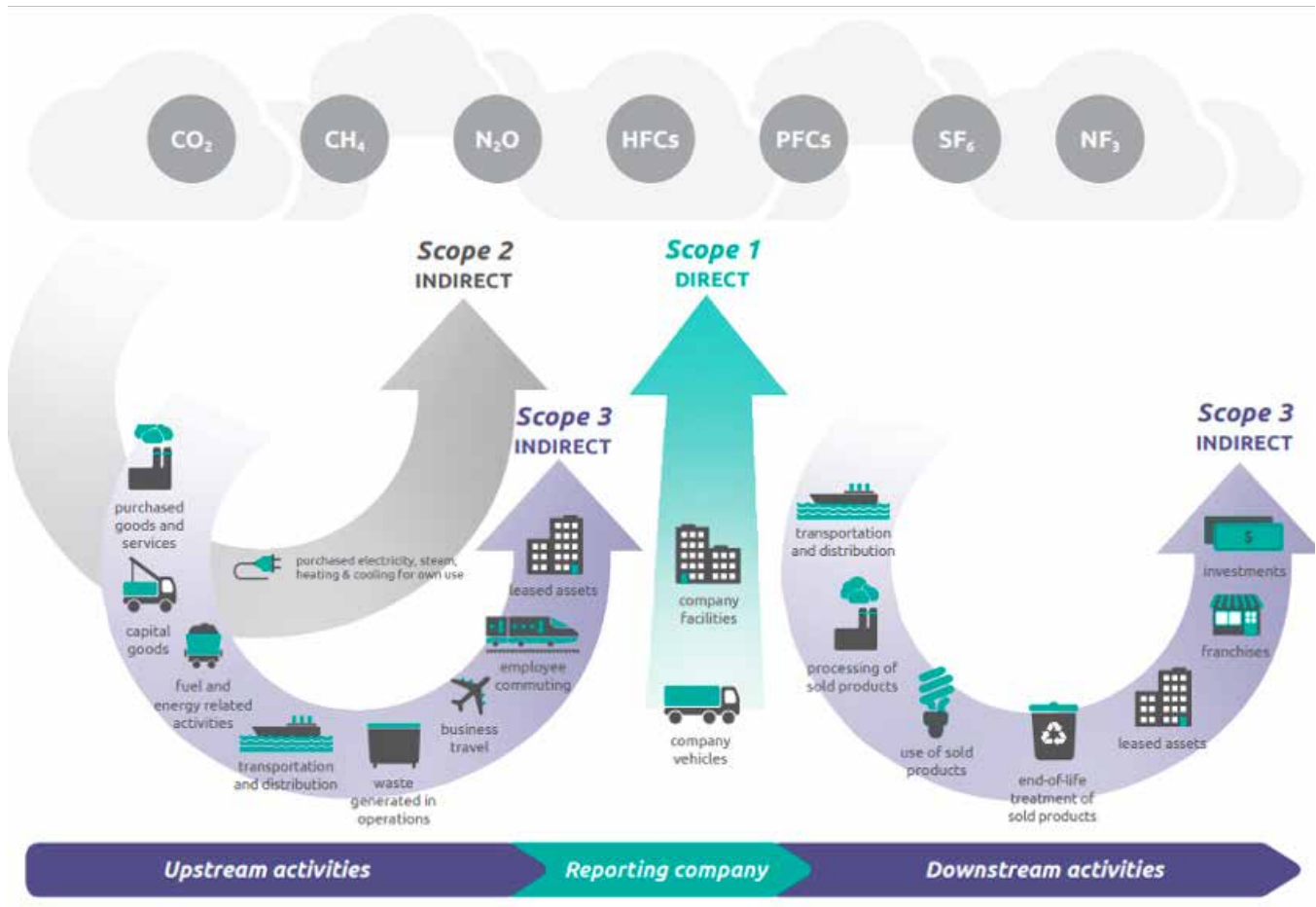
There are four steps in building a resilient strategy with the advent of climate change:

1. Assess the risks specific to the agricultural corporation.
2. Assess the relevant climate scenarios, which may be hydrological or water-related locally, regionally, and changing weather and climate conditions historically and into the future to provide future context.
3. Evaluate how the climate information assessed in Step 2 impacts the farm corporation. This step can be approached in several ways. Discussions with agricultural advisors, suppliers, insurers, scientists, and agricultural non-profits or cooperatives can provide helpful inputs.
4. Identify potential strategies and actions for the future which may change the agricultural corporation's practices, strategies, and investments in technologies and service providers. A resilience assessment can be carried out qualitatively or quantitatively through numeric assessments of possible future profitability, sales, or value. Ranges can be provided, or single calculations with stated assumptions.¹⁴⁵

E SCOPE 1, 2 AND 3 GREENHOUSE GAS EMISSIONS

Increasingly corporations are being tasked with accounting for direct GHG emissions from sources owned and controlled by the company, including vehicles, boilers, furnaces, industrial processes, refrigerants, etc. These GHG emissions are termed scope 1 emissions. In addition, corporations are being held accountable for scope 2 emissions, which include those generated from purchased or acquired electricity, steam, heat and cooling and GHG-generating activities within the control of the corporation. Lastly, scope 3 emissions are increasingly considered in a corporation's responsibility. While not directly within a company's control, these are generated as a consequence of a corporation's activities and decisions. Examples might include indirect upstream sources such as purchased goods and services, employee commuting, business travel, or upstream transportation and distribution as well as indirect downstream sources such as processing or use of sold products, downstream transportation and distribution, and end-of-life treatment of sold products. In this way, scope 1 and 2 GHG emissions of suppliers and customers are considered scope 3 emissions of a corporation.¹⁴⁶

FIGURE 4 GREENHOUSE GAS PROTOCOL 2013¹⁴⁷



F CLIMATE-RELATED EMISSION TARGETS

In 2022 the federal, provincial, and territorial Agriculture Ministers announced a five-year agriculture policy framework with an agreement in principle to reduce GHG emissions in agriculture by 3-5 Mt CO₂ Eq. Specific policy measures include the commitment to reduce methane and specifically fertilizer emissions by 30% below 2020 levels by 2030.¹⁴⁸

Farmers for Climate Solutions recommends an agriculture sector-wide target for GHG emission reductions be set by the end of the next funding period for the agricultural policy framework in 2028.¹⁴⁹ Much work will be required in establishing the right mixture of incentives, the right system of monitoring, verification and reporting, and documenting the actual reductions of GHG Emissions for each beneficial management practice.



6 CONCLUSION

This report has synthesized climate change science and climate impact risks, as well as transition risks, all encapsulated as systemic risks for agriculture corporations now and in the future. While significant risks exist in the future, in the areas of policy change, financial burdens, operational risk, new technology, stranded infrastructure, human capital, and liability, the future, however, is not all dour. Opportunities exist to tackle climate change directly and proactively planning for the future with new products and programs, product certification and differentiation, and inter-generational farming is necessary. Agriculture climate action leaders have developed real networks on the ground. Proactive planning at the board and management levels surrounding governance, scenario analysis, carbon measurement and planning for resilience helps address climate risk. This guide provides suggestions and practical tools and instruments.

Regardless of directors' level of knowledge, sophistication, and personal beliefs, planning for future climate change risks is increasingly necessary. Regardless of farm size, farm type, and local or region, directors of farm corporations have duties to oversee the plan for climate impacts and transition risks

management, to put in place the necessary governance processes and considerations, and to enable appropriate decision-making. Anticipating agriculture's future will be necessary to weather future climate change and ensure a resilient future.

The Canada Climate Law initiative offers free presentations to boards and their senior executives that would like more information on regulatory changes and best practices. Contact: ccli-info@allard.ubc.ca



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