



Special Committee on Climate Change
First Report of the Second Session, Sixty-sixth General Assembly

Final Report:
Motion 37
Creation of a Special Committee on Climate Change

May 12, 2021

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Mr. Speaker and Members of the Legislative Assembly of Prince Edward Island:

I have the honour to present the final report of the Special Committee on Climate Change under the terms of its Order of Reference, Motion 37, as adopted by the Legislative Assembly of Prince Edward Island on July 11, 2019. Over the past two years the committee received input from many individuals, groups, businesses, associations and governmental organizations, gathered a sizeable quantity of information and distilled it into a set of recommendations with the aim of bringing our provincial greenhouse gas emissions down to the level required by the *Climate Leadership Act*.

As with all legislative activities during the Sixty-sixth General Assembly, the committee's work was disrupted by the global COVID-19 pandemic. The committee had to adapt its work and the plans it had made prior to the pandemic reaching our shores. The committee was able to carry out its mandate in keeping with modifications made by the Legislative Assembly built upon guidance of the Chief Public Health Office. The pandemic and climate change are not dissimilar in that they force us to change many aspects of our lives if we are to persevere and thrive.

Over the course of its mandate, the committee received input from Islanders with many different perspectives, from many communities and many walks of life. Climate Change is a global matter, and the committee drew on the knowledge of experts in diverse jurisdictions, from Quebec, to California, to Delaware, to Denmark and elsewhere. The committee was assisted on multiple occasions by officials in the provincial Government, particularly the PEI Climate Change Secretariat and the Department of Agriculture and Land. The committee gratefully thanks all those who shared their knowledge and experience.

Out of this wide-ranging consultation, the committee was expected to make fully costed recommendations on how the province can best meet its greenhouse gas emissions reduction targets. Accordingly, the committee is pleased to make 24 recommendations, in addition to 16 recommendations submitted in previous reports, based on its reviews and discussions. By the adoption and implementation of these recommendations, your committee sees the Island dramatically reducing emissions over a fairly tight time frame. It will be a challenge, but rising to it will leave the Island better off in many ways.

Adoption of this report effectively concludes the work of the Special Committee on Climate Change.

Respectfully submitted,

Lynne Lund, MLA

Chair of the Special Committee on Climate Change

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Executive Summary

The Special Committee on Climate Change was created by passage of Motion 37 in the Legislative Assembly on July 11, 2019. The purpose of the motion was to establish a committee that would explore options to reduce greenhouse gas emissions, consult with Islanders and government, and make fully costed recommendations on how the province can meet its emissions reduction targets.

Your committee began its meetings in late summer, 2019, and began hearing from witnesses in fall, 2019. During the winter of 2020 the committee held a series of meetings in Island communities to hear directly from Islanders on ways to reduce emissions. Unfortunately, inclement weather caused the cancellation of some of these meetings, and then the outbreak of the COVID-19 pandemic prevented further meetings from happening over the winter-spring, 2020 period. When the committee was able to meet again, it did so with a focus on addressing PEI's two largest emissions sectors, transportation and agriculture, and sought input from experts in these areas. Over the course of winter, 2021, the committee worked toward submission of a final report. Throughout its mandate the committee accepted written submissions from any individual, group or organization that wished to provide input under the committee's mandate, and actively solicited written input from a variety of organizations across multiple sectors of society. Your committee tabled, and the Legislative Assembly adopted, three previous reports, in the fall of 2019, summer of 2020, and fall of 2020. Your committee now puts forward a report that includes its final recommendations and conclusion.

The year 2030 is the deadline for bringing our annual provincial GHG emissions down to a level – at least – that aligns with the global reduction needed to avoid a temperature increase that will make life on this planet extremely difficult. Nine years may seem like ample time, but the actions needed to reduce emissions at a provincial scale, whether they are new or intensifications of existing efforts, are not tasks that can be accomplished overnight. They will require planning, design, implementation, widespread uptake, refinement, and evaluation. Consultation should of course precede those steps, and your committee is satisfied that it has completed significant public consultation, even with the disruption of the pandemic. That consultation yielded a plethora of ideas. Your committee has considered these, and considered PEI's particular sources of GHGs, and believes that any further delays in new or increased GHG reduction efforts should be minimized, as not acting now could jeopardize our chances of meeting the 2030 target. Government is moving forward with actions under new and previous strategies meant to tackle climate change, and your committee wishes to help move the province forward in that sense.

The reductions we need to achieve are in the hundreds of kilotonnes of carbon dioxide equivalent (CO₂e) per year. One kilotonne is 1,000 tonnes or 1,000,000 kilograms. Clearly, major, societal efforts will be necessary to achieve such reductions, and that, combined with the timeframe involved, means bold actions are in order.

In this final report, your committee has put forward 24 recommendations. These are in addition to a total of 16 recommendations from previous reports. Several of the recommendations are in the form of incentives, i.e. rewards for individuals, households, communities, businesses or organizations in return for making choices or taking actions that have a beneficial effect in bringing emissions down. Other recommendations call on Government to use its legislative power to effect changes that can directly affect emissions or facilitate their reduction through other means. Other recommendations do not suggest a new effort, but rather a boost to an existing program or series of programs to increase uptake through greater eligibility, resources, or other intensification. Disincentives are also included in the recommendations. This is not done lightly, but the benefits of positive actions and choices can be undermined if actions and choices that needlessly and excessively increase emissions are permitted to continue without penalty.

With several types of greenhouse gases, and many different sources of them, it follows that there are many ways in which emissions can be reduced. As noted above, your committee received many suggestions. The recommendations presented here are not an exhaustive list of options. Instead, your committee has attempted to refine the many ideas put forward into recommendations that are effective, relevant to our provincial context and attainable. To be effective, the recommended action needs to directly reduce emissions through a particular activity, or support a related action that has that direct effect. To be relevant to our provincial context, the recommended action has to apply to at least one of our major sources of emissions; the recommendations thus primarily focus on transportation and agriculture, and not an area such as industrial emissions sources, given that they make up a far smaller portion of our mix than in other provinces. To be attainable, the recommended action needs to have a reasonable possibility of implementation at the necessary scale and within the necessary time frame.

Your committee has included cost estimates for these recommendations where possible and appropriate. These estimates are intended to be flexible, rather than precisely prescriptive, so that in implementation they may be scaled up or otherwise adjusted as deemed appropriate through the process of program design. The estimates are generally conservative; they typically reflect a minimum level of investment, and more may well be warranted. In some cases, your committee supports boosting existing programs, but a dollar estimate is not provided as the boost may come through changes to the program rules and administration, widened eligibility or other facets not necessarily directly linked to a greater budget.

Costing of recommendations has been a challenge. The committee did contemplate seeking permission to hire a consultant. However, as a temporary committee of the legislature, your committee is not as well positioned as Government to establish an ongoing working relationship with a consultant that can proceed from data gathering, modelling and program design to program delivery and evaluation. Also, the need for a diversity of expertise was apparent, as the committee's areas of examinations span fields such as energy, natural resources and agriculture, which could necessitate multiple contracts. Your committee was also aware that consultant work for Government has already been completed or is underway, that has and will inform strategies and programs; the report on agricultural best management practices produced by the PEI Federation of Agriculture and Dr. David Burton, and the engagement of Navius Research Inc. for energy modelling, are two examples of this. Your committee was also able to draw on sufficient evidence and experience from experts in other jurisdictions and here on the Island to inform its recommendations.

The following list represents the committee's final recommendations in their basic statement form; greater discussion, rationale and cost estimates for them are provided in the Final Recommendations section. Your committee also notes that several of its previously issued recommendations remain relevant and should still be implemented.

Regarding transportation:

- 1. Your committee recommends that government introduce legislation to enact a zero emissions vehicle mandate.**
- 2. Your committee supports the Universal Electric Vehicle Incentive, and recommends that significantly greater, multi-year funding be devoted to it in order to spur greater uptake, and that Government explore the possibility of providing financing to make electric vehicles an option for more people.**

- 3. Your committee recommends that Government develop and implement an incentive program for the installation of electric vehicle chargers at multi-unit residential buildings, workplaces and municipal facilities.**
- 4. Your committee recommends government undertake a public education campaign on ZEVs.**
- 5. Your committee recommends government develop significant disincentives for high fuel consumption internal combustion engine vehicles through purchase and registration levies.**
- 6. Your committee recommends that a whole-Island, public transit system be developed, with low- or no-cost fares for riders.**
- 7. Your committee supports efforts to promote an Island-wide active transportation corridor, and alternative commuting; however, your committee notes that lack of access to high-speed internet remains a barrier to telecommuting for many.**

Regarding agriculture:

- 8. Your committee recommends that an incentive for the purchase and use of chisel plows be provided to producers in order to promote conservation tillage.**
- 9. Your committee recommends that an amendment be made to the *Agricultural Crop Rotation Act* to lengthen the minimum regulated crop rotation from three to four years; that the amendment be made to take effect as of January 1, 2025; and that a temporary incentive be provided to producers to shift to a four-year rotation until the amendment comes into effect.**
- 10. Your committee recommends that the Department of Agriculture and Land work with producers to identify shorter season, more nutrient-efficient potato varieties that will grow well in PEI, and identify marketing opportunities for them.**
- 11. Your committee recommends that the Department of Agriculture and Land work with agricultural organizations to evaluate ways to increase the production, distribution and land application of compost within the industry.**
- 12. Your committee recommends that an incentive for the purchase and use of commercial compost turners be provided to producers in order to promote composting of solid manure windrows.**
- 13. Your committee recommends that incentives for the installation of Liquid Manure Storage Covers (Climate Solutions Program BMP #5) be increased, and that the necessary legislative or regulatory changes be made to require construction of any new storage containers to include a cover.**
- 14. Your committee recommends that the Climate Solutions Program be expanded to include not only demonstration projects for the inclusion of feed additives in ruminant livestock diets, but support to expand use of locally produced, seaweed-based additives.**
- 15. Your committee recommends that a greater, multi-year funding commitment be made to the PEI Agriculture Climate Solutions Program in order to maximize the GHG reduction potential of its best management practices.**

Regarding buildings:

16. Your committee recommends that Government continue the current suite of programs offered by EfficiencyPEI, but take advantage of any opportunity to increase resources, broaden programming and ease restrictions to enable greater access.

17. In terms of energy efficiency in public buildings and infrastructure, your committee recommends any effort to include energy efficiency measures in capital spending on construction and renovation of municipal facilities and provincial buildings, including in schools and institutions, so that they may achieve or at least move closer to net zero energy consumption.

Regarding natural resources:

18. Your committee recommends that Government continue to aim for a higher percentage of protected natural areas in the province, and dedicate the necessary resources to do so.

19. Your committee recommends that Government continue to recognize the valuable contributions watershed groups make to carbon sequestration via their work in protecting and restoring natural ecosystems, and support them whenever possible.

20. Your committee recommends that reforestation programs be optimized by planting Acadian forest species and increasing diversity of planted tree/shrub species to increase resilience against pests and changing weather caused by climate change; and that other forestry practices be reviewed and revised to ensure they do not counteract forests' ability to act as carbon sinks.

21. Your committee recommends that greater emphasis be placed on wetland protection in general, and that it be carefully considered whether it is truly appropriate to allow any expansion of peat moss extraction if our wetlands are to return to a state of net carbon sequestration.

Regarding energy generation and storage:

22. Your committee looks forward to the incorporation of Smart Metering and Time-of-Use Pricing for electrical load management.

23. Your committee recommends that Government look for opportunities to promote vehicle-to-grid demonstration programs aimed at the 20-100 vehicle-fleet level.

Regarding carbon pricing:

24. Recognizing that carbon pricing costs less than alternative mitigation policies, in both the short- and long-term, your committee recommends that the new provincial carbon pricing system, expected to be announced in September, 2021, be enhanced to make it broader and therefore more effective in reducing emissions.

Your committee hopes these recommendations are well-received and, if adopted, implemented so that they can contribute to a substantial and beneficial shift in our provincial greenhouse gas emissions.

Introduction

The Special Committee on Climate Change was created by the Legislative Assembly of Prince Edward Island to explore options available to reduce greenhouse gas (GHG) emissions and to make fully costed recommendations on how the province can best meet its emission reduction targets.

The committee was established via Motion 37, “Creation of a special committee on climate change”, moved on July 11, 2019, by Lynne Lund (District 21: Summerside-Wilmot), and seconded by Hon. Brad Trivers (District 18: Rustico-Emerald; Minister of Social Development and Housing) and former member Robert Mitchell (District 10: Charlottetown-Winsloe). The motion was debated, amended and passed on July 11, 2019, with the final text as follows:

WHEREAS the Legislative Assembly has established targets for the reduction of greenhouse gas (GHG) emissions in Prince Edward Island;

AND WHEREAS there are many options available to reduce GHG emissions;

AND WHEREAS the province should adopt emission reduction measures that are cost effective in order to reduce, as much as possible, the potential burden on Islanders and Island businesses of reducing emissions;

THEREFORE BE IT RESOLVED that a Special Committee of the Legislative Assembly, consisting of two representatives to be named by the Premier; two to be named by the Leader of the Opposition; and two to be named by the Leader of the Third Party, be created to explore the options available to reduce GHG emissions and to make fully costed recommendations on how the province can best meet its emission reduction targets.

THEREFORE BE IT FURTHER RESOLVED the Committee shall engage with the public and government in its deliberations.

The following members were appointed to the committee by the leaders of their parties, as indicated in the motion:

- Lynne Lund (District 21: Summerside-Wilmot)
- Stephen Howard (District 22: Summerside-South Drive)
- Heath MacDonald (District 16: Cornwall-Meadowbank)
- Robert Mitchell (former member for District 10: Charlottetown-Winsloe)
- Sidney MacEwen (District 7: Morell-Donagh)
- Hon. Brad Trivers (District 18: Rustico-Emerald; Minister of Social Development and Housing)

Changes in the committee’s permanent membership were subsequently made, as follows:

- Hal Perry (District 27: Tignish-Palmer Road) was appointed in place of Heath MacDonald as of October 27, 2019
- Sonny Gallant (District 24: Evangeline-Miscouche; Leader of the Third Party) was appointed in place of former member Robert Mitchell as of January 13, 2020
- Hon. Natalie Jameson (District 9: Charlottetown-Hillsborough Park; Minister of Education and Lifelong Learning) was appointed in place of Hon. Brad Trivers as of June 2, 2020

The following members served as substitutes at various committee meetings:

- Zack Bell (District 10: Charlottetown-Winsloe)
- Hon. Peter Bevan-Baker (District 17: New Haven-Rocky Point; Leader of the Official Opposition)
- Cory Deagle (District 3: Montague-Kilmuir)
- Sonny Gallant
- Ole Hammarlund (District 13: Charlottetown-Brighton)
- Robert Henderson (District 25: O'Leary-Inverness)
- Hon. Natalie Jameson
- Gordon McNeilly (District 14: Charlottetown-West Royalty)
- Hon. Brad Trivers

Background

In 2018, the Legislative Assembly of PEI passed the *Climate Leadership Act*, to adopt an approach to pricing carbon pollution, as all provinces and territories were mandated to do by the Government of Canada. While carbon pricing was the focus of the Act, its preamble indicates that “carbon pricing alone will not be sufficient to meet emission targets and additional complementary initiatives to support and promote the transition to a low-carbon economy will be needed”. Section 2 of the Act defined its purpose as providing a price on carbon for purchasers and consumers of fuel in order to reduce greenhouse gas emissions in the province to less than 1.4 megatonnes¹ (Mt) of carbon dioxide equivalent (CO₂e) per year by 2030.

During the spring, 2019 sitting, the Assembly adopted Bill 102, *An Act to Amend the Climate Leadership Act*. The bill changed the greenhouse gas emissions reduction target provided in section 2 of the *Climate Leadership Act* from 1.4 Mt of CO₂e per year by 2030, to **1.2**. This change was made to bring PEI in line with the Intergovernmental Panel on Climate Change’s findings that, to avoid extreme impacts on human and natural systems, global temperatures must not increase more than 1.5 degrees Celsius above pre-industrial times.

To understand how much of a reduction this involves, one must look at PEI’s current annual GHG emissions levels, as provided in Environment and Climate Change Canada’s National Inventory Report. The most recent report (spring, 2021) indicates PEI had 1.8 Mt of CO₂e emissions in 2019. This is up slightly from the five prior years, which were each 1.7 Mt of CO₂e. Emissions measurement methods are subject to ongoing refinement, which sometimes results in revised totals for previous years. The actions contained in the provincial Climate Change Action Plan for the 2018-2023 period, if fully implemented, are expected to reduce annual emissions by 180 kilotonnes (kt). Using the most recent annual emissions estimate of 1.8 Mt, and if no other significant reductions were made beyond those brought about by the Climate Change Action Plan, PEI’s annual emissions total for 2030 would be 1.62 Mt. More would have had to be done to get to the former goal of 1.4 Mt. With the new 1.2 Mt target, the estimated annual reduction that needs to be achieved by 2030 is 420 kt.

The revised target and the reduction needed to reach it are what the committee has in mind as it carries out the work expressed in the operative clauses of Motion 37. In October, 2020, subsequent to the committee’s creation, Government announced new targets of reaching net zero emissions in its energy supply by 2030, and net zero across all sectors by 2040.

PEI’s GHG emissions sources are: transportation - 44%; agriculture – 26%; buildings – 20%; industry – 7%; and waste – 4% (these are 2018 figures; 2019 emissions by sector are not yet available for the provinces).

Reducing GHG emissions is the means to mitigate, or lessen the intensity, of climate change in coming years. The other side of the climate change response is adaptation, or adjusting in order to withstand the effects that have already occurred and are likely to occur in the future. Climate change mitigation, rather than adaptation, is the focus of this committee’s work, but the two are intertwined, and mitigation efforts can have adaptive benefits, and vice versa.

¹ 1 Megatonne = 1,000 kilotonnes = 1,000,000 tonnes = 1,000,000,000 kilograms

Committee Activities

After being established by motion of the House, and members appointed by the leaders of their parties, your committee began meeting in late summer, 2019. It continued meeting during fall, 2019 to develop its work plan, consider its approach to public engagement and outreach, and hear from provincial and federal officials. These activities are summarized in greater detail in the committee's report on its activities to the Legislative Assembly, submitted on November 27, 2019.

In early winter, 2020, the committee continued hearing from witnesses with expertise in areas such as energy storage and public engagement. After promotional efforts through news media and social media, your committee began its series of community meetings in February, 2020, and also at that time reached out to many Island businesses, organizations and groups to seek written input. The work of this period is provided in the committee's second report on its activities, submitted on July 2, 2020.

In its meetings over the summer and fall of 2020, your committee focused its attention on transportation and agriculture in particular, gathering input from witnesses from both PEI and other jurisdictions on ways to reduce emissions in these sectors. The third report on committee activities was submitted on December 2, 2020. Your committee was nearing completion of its mandate at that time, but had not quite finalized its recommendations.

Since its last report in December, 2020, your committee met three times.

On January 7, 2021, your committee met *in camera* to consider options for the costing of its potential report recommendations. At this meeting your committee agreed to seek preliminary input from Navius Research Inc., which had been contracted by the PEI Climate Change Secretariat, on the committee's potential recommendations, and to seek a meeting with Navius in this regard.

Your committee met, *in camera*, again on February 24, 2021 to meet with Noel Melton of Navius Research Inc. and discuss the committee's areas of potential recommendation. Your committee appreciated the input from Mr. Melton, but decided to use existing information and data sources to develop cost estimates for its recommendations, rather than entering into a contract with Navius. Your committee also agreed to seek further information from the Department on Agriculture and Land on the agricultural best management practices for GHG reduction to be included in a new pilot program.

Your committee met *in camera* on May 4, 2021, to consider its draft final report to the Legislative Assembly.

Since its last report, your committee received written submissions from Tony Reddin; the Sustainable Transportation Action Plan Working Group; Dr. David Burton of the Dalhousie University Faculty of Agriculture; Lynda Ramsay, Director of Resources in the Department of Agriculture and Land; Matthew McCarville; the Canadian Vehicle Manufacturer's Association; and the Minister of Agriculture and Land. Your committee appreciates the information provided in these submissions.

Previous Recommendations to the Legislative Assembly

In its previous reports, your committee issued the following recommendations:

From the Second Report of the First Session, Sixty-sixth General Assembly (July 2, 2020):

- 1. Your committee recommends that the Climate Change Secretariat undertake work immediately to determine the carbon dioxide abatement costs associated with potential greenhouse gas emissions reductions efforts that could be carried out on PEI.**
- 2. Your committee recommends that Government negotiate for a more effective carbon pricing framework.**
- 3. Your committee recommends that Government recognize the federal Social Cost of Carbon as an acceptable figure to factor into the overall costing of mitigation measures taken or proposed to be taken.**
- 4. Your committee recommends that Government adopt policies toward encouraging energy rate structures that reward efficiency, on-Island energy storage, and renewable energy generation.**
- 5. Your committee encourages Government to further promote remote work in the civil service, and to consider incentives for private industry toward the same end.**
- 6. Your committee recommends that Government bolster environmental protections by setting an increased target for protected land, and dedicating resources to protect natural areas that serve as carbon sinks.**
- 7. Your committee recommends that Government recognize the importance of making the electrification of transportation a priority.**
- 8. Your committee recommends that an Island-wide public transit corridor be expedited.**
- 9. Your committee recommends that creative incentives for the use of electric vehicles be put in place.**
- 10. Your committee recommends that Government use any electric school buses it purchases in a pilot project for vehicle-to-grid technology.**
- 11. Your committee recommends that installation of oil heating systems in new construction be prohibited, and that rule changes be made to Efficiency PEI programs to support the installation of low- or no-emissions alternatives in new construction in order to make them cost comparable to oil systems.**
- 12. Your committee recommends that no further public investments in biomass energy that is not carbon neutral within a ten-year cycle be pursued.**
- 13. Your committee recommends that Government consider ways of supporting further development of energy modelling initiatives.**

14. Your committee recommends that a new focus on public engagement toward greenhouse gas emissions reduction be undertaken.

From the Third Report of the First Session, Sixty-sixth General Assembly (December 2, 2020):

1. Your committee recommends that the PEI Climate Change Secretariat develop in-house capacity to determine carbon abatement costs to government for programs related to greenhouse gas emissions reduction.

2. Your committee recommends that Government begin planning now for a direct incentive for zero-emissions vehicles in order to include it in budgeting for the 2021-22 fiscal year.

Government tabled a written response to the committee's July 2, 2020 report on December 4, 2020.

Final Recommendations to the Legislative Assembly

Since its inception, your committee has heard from experts, industry stakeholders, other jurisdictions taking on the task of fighting climate change, and Islanders on how PEI can best reach the new target of 1.2 Mt CO₂e by 2030. Reaching that goal will be a significant challenge, but one your committee believes is entirely possible. Islanders were enthusiastic to share their ideas with the committee on how best to meet that challenge.

Given the high GHG emissions in both the transportation sector and the agriculture sector, your committee believes these are the areas where the additional emissions reduction needs to come from most and so those areas form the primary focus of this report. That is not meant to disregard the work being done in other areas, and certainly the committee does encourage further efforts to reduce building-, industry- and waste-related emissions, as well as protection and restoration of natural areas to boost their ability to sequester carbon dioxide from the atmosphere.

Electrifying transport

Transportation remains our most GHG-emissive sector, accounting for 44% of our provincial total emissions as of 2018. We need to tackle this number head on, and replacing internal combustion engine (ICE) vehicles with zero emissions vehicles (ZEV) is a direct way to do so. This largely involves the electrification of transport. To do this, the committee puts forward recommendations to address the supply and cost of ZEVs, expansion of charging infrastructure, disincentives to discourage the purchase of fuel inefficient ICE vehicles, and public education. Additionally, your committee makes recommendations regarding public transportation, active transportation and alternative commuting.

Your committee acknowledges that Government has developed a Sustainable Transportation Action Plan, with 27 actions aimed to improve transportation in PEI. Your committee supports this plan, and does not disagree with any of its actions. Your committee simply emphasizes certain areas more with the intention of achieving greater GHG reductions.

1. Your committee recommends that government introduce legislation to enact a zero emissions vehicle mandate.

To effectively reduce GHG emissions through a new form of consumer technology, both demand and supply of the technology must be addressed. At present there are not many electric vehicles available for purchase on PEI. Legislation is the most effective way to ensure supply, especially given the short window remaining to reach the 2030 emissions reduction target. Leaving supply up to the dictates of the market alone risks elongating the period over which ZEVs will replace ICE vehicles in the transportation sector.

PEI is not the only jurisdiction looking to reduce emissions through ZEVs. There are more models of battery electric vehicles and plug-in hybrids, from more manufacturers, than ever before, but the demand still surpasses the supply. Jurisdictions such as British Columbia, Quebec and several US states² have implemented legislation to require that vehicle manufacturers provide a baseline supply of ZEVs

² California, Colorado, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont and Washington

for sale in their jurisdiction. The purpose of this legislation is to ensure there are ZEVs available to meet consumer demand, and your committee sees the need for such legislation on PEI.

PEI's own mandate could use Quebec's ZEV standard as a model. In Quebec, vehicle manufacturers must obtain a certain amount of credits via the sale of ZEV vehicles or the purchase of credits from other manufacturers. Credits are issued according to a formula that incorporates the vehicle's electric range, with the sale of a battery electric or hydrogen fuel cell vehicle earning a maximum of 4 credits, and plug-in hybrids a maximum of 1.3. The amount of credits a manufacturer must obtain is set as a percentage of total sales, and so will vary from one manufacturer to the next. Manufacturers are categorized as small, medium or large based on total annual sales. Only medium and large manufacturers must meet credit requirements, but small manufacturers can also obtain them through the sale of ZEVs and then sell those credits to other manufacturers. The credit requirements and formula are consistent with those of California, upon which many jurisdictions have based their ZEV mandates. However, Quebec is the first jurisdiction that also provides credits for the sale of used ZEVs, according to criteria on warranty, parts and mileage, and that the vehicle was originally sold in another jurisdiction and now resold in Quebec. Credit requirements rise year over year, and there is a rising requirement for the amount of credits that must be acquired strictly through full ZEV sales (as opposed to plug-in hybrid sales). Credits are only earned when a vehicle is "placed in service", i.e. upon retail sale within Quebec. The Quebec government establishes this by requiring manufacturers to submit the Vehicle Identification Number of all vehicles delivered to Quebec dealers, and then cross-referencing those VINs with those of vehicles registered. In this way, the standard ensures that ZEV vehicles are actually being used for transportation in Quebec, rather than simply being placed on lots.

Manufacturers that are unable to meet the credit requirements for a reporting period are penalized \$5,000 per credit owing. The Quebec government publishes a report each year showing the amount of credits each automaker has, and it will show any penalties an automaker has had to pay. However, to date, Quebec has not had to issue any penalties. In addition to avoiding financial penalty, it's in manufacturers' interests to maintain a good corporate image by meeting what is essentially an environmental responsibility.

There are advantages to the Quebec system that would be transferable to PEI. By providing more credits for vehicles with greater range, manufacturers are incentivized to make more efficient vehicles. Evidence from US states with ZEV mandates shows that manufacturers direct their EVs to states with these mandates over states without them. A new ZEV law that is very similar to Quebec's will be very similar to that of California and other states, with which vehicle manufacturers are already familiar. The ZEV standard has played a part in increasing the diversity of ZEV models available in Quebec: in 2016, prior to the standard, Quebec had roughly 60% of the electric models offered in California; now, over 96% of all electric vehicle models available in California are also available in Quebec. Even with the standard, there are still waiting lists for electric vehicles in Quebec.

Quebec initially budgeted \$3 million over a five-year period to establish the administrative and IT capacity to carry out the legislated mandate. Actual expenses have come in well under budget, around \$730,000 in total for the 2016-2017 to 2020-21 fiscal years.

Though the vehicle industry was not in favour of a ZEV standard as additional regulation, vehicle manufacturers have been cooperative since Quebec introduced the standard. While it is the manufacturer that must obtain credits, the Quebec government has worked with dealerships to provide education and make sure they have what they need to facilitate the sale of vehicles that pertain to the

standard. Dealerships' fears that customers will go to other jurisdictions to buy their cars, and that they'll be left with unwanted ZEVs, have not materialized. In fact, the opposite has resulted: as mentioned above, even with the mandate there are not enough ZEVs at many dealerships to meet the demand, and waiting lists persist.

Without a ZEV mandate, a small jurisdiction like PEI could be easily overlooked by manufacturers that need to direct their ZEVs elsewhere. At the same time, implementation by comparatively small US states, such as Maine, Vermont and Rhode Island, has shown that ZEV mandates are not for major jurisdictions only. Legislative models already exist for these mandates, manufacturers are familiar with them, and your committee recommends that PEI model its own mandate off that of Quebec.

2. Your committee supports the Universal Electric Vehicle Incentive, and recommends that significantly greater, multi-year funding be devoted to it in order to spur greater uptake, and that Government explore the possibility of providing financing to make electric vehicles an option for more people.

Government's recent announcement that electric vehicles purchased on PEI will be eligible for a \$5,000 rebate and a free level 2 charger, or \$2,500 for a plug-in hybrid, is welcome news. Extending the rebate to used vehicles will not only increase the number of vehicles eligible for the rebate, but also increase the number of Islanders likely to participate, given that not everyone prefers or can afford a brand new vehicle. Rebates for electric and plug-in hybrid vehicles boost the demand side of the equation in concert with a legislated mandate that addresses the supply side, as discussed above. Your committee recommended in its previous report that Government include this type of incentive in its 2021-22 budget, and appreciates that Government listened.

To estimate emissions that could be avoided by the replacement of ICE vehicles with ZEV vehicles, the following assumptions are used:

PEI	2015	2016	2017	2018	2019	2020	Average
Total registrations, vehicles weighing less than 4,500 kg ³	77,723	74,795	71,683	100,276	101,594	N/A	85,214
Total, new motor vehicles sales ⁴	7,976	8,768	8,587	7,734	8,110	7,010	8,031
Passenger Cars	3,432	3,101	2,849	2,386	2,214	1,430	2,568
Trucks	4,544	5,667	5,738	5,351	5,906	5,596	5,467
Average Distance Travelled Per Year ⁵							
Cars	15,323	15,542	16,155	14,533	N/A	N/A	15,388
Passenger Light Trucks	15,417	15,965	16,807	15,368	N/A	N/A	15,889
On-Road Average Fuel Consumption (L/100km, gasoline) ^{4,6}							
Cars	8.0	7.9	7.8	7.8	N/A	N/A	7.9
Passenger Light Trucks	12.1	11.9	11.7	11.6	N/A	N/A	11.8

<i>Additional assumptions, provided by the PEI Climate Change Secretariat</i>	
Electricity Consumption, Electric Car	19 kWh/100km
GHG emissions factors	
Gasoline	2,326 g CO2e/L
Electricity from grid	200 g CO2e /KWh

Average annual emissions of a gasoline-powered passenger car on PEI:

7.9 L gasoline / 100 km driven = 0.079 L / km

15,388 km driven / year x 0.079 = 1,215.7 L gasoline consumed / year

1,215.7 L gasoline x 2,326 g CO2e / L = 2,827,718.2 g = **2.83 t CO2e emitted / year**

Average annual emissions if the above car were electric:

19 kWh / 100 km driven = 0.19 kWh / km

15,388 km driven / year x 0.19 = 2,923.7 kWh consumed / year

2,923.7 x 200 g CO2e / kWh = 584,744 g = **0.58 t CO2e emitted /year**

Average passenger cars purchased / year: 2,568

2,568 gasoline cars x 2.83 t CO2e emitted / year = 7,267.44 t = 7.27 kt CO2e emitted /year

2,568 electric cars x 0.58 t CO2e emitted / year = 1,489.44 t = 1.49 kt CO2e emitted /year

³ Statistics Canada. [Table 23-10-0067-01 Vehicle registrations, by type of vehicle](#)

⁴ Statistics Canada. [Table 20-10-0001-01 New motor vehicle sales](#)

⁵ Natural Resources Canada. Comprehensive Energy Use Database. Transportation Sector – Prince Edward Island – Tables 23 (Car Explanatory Variables) and 37 (Truck Explanatory Variables).

https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive/trends_tran_pei.cfm

⁶ As of 2018, PEI's cars were 98.9% fueled by gasoline, and 1.1% by diesel. Passenger trucks were 99.1% gasoline and 0.9% diesel fueled. These figures are derived from Tables 20 and 25 of the NRCan Comprehensive Energy Use Database.

7.27 – 1.49 = Roughly 5.78 kt CO₂e could be reduced / year if all new passenger cars purchased were electric.

This is a conservative estimate, for several reasons:

- The above relates only to the displacement of gasoline cars (i.e. sedans and hatchbacks). Truck and SUV purchases have more than doubled those of cars for several years running. With a purchase incentive, and the substantial fuel and maintenance savings of electric cars, at least some consumers will opt for a new electric car instead of a truck or SUV, which will displace some emissions from that vehicle category. Also, electric and plug-in hybrid SUVs are now produced by several manufacturers, and electric pickup trucks are expected in the 2022 or 2023 model years. Every SUV or truck replaced by an electric or plug-in version will cause a more dramatic drop in individual vehicle emissions, given that these larger vehicles typically consume more gasoline per kilometre than cars do.
- Electric vehicles are moving closer and closer to being cost equivalent to internal combustion engine vehicles; falling sticker prices compound the effect of the rebate, making them yet more attractive to buyers.
- As electric vehicles replace gasoline vehicles year over year, they will occupy a larger and larger portion of the total vehicle stock. This means that the emissions from the total vehicle stock will decrease in step with the growing electric portion.
- Emissions from electric vehicles are derived from their use of grid electricity; as more and more renewable energy is added to our electric grid, the CO₂e / kWh figure should go down.

It is acknowledged that this is an exercise in estimating, and that while several factors point to GHG reduction likely being greater than the figure calculated above, those factors are not mathematically estimated here. The energy modelling produced by Navius Research Inc. for the Climate Change Secretariat may produce a more comprehensive estimate. Nevertheless, incentives for the displacement of internal combustion vehicles by zero or low-emissions vehicles are the best option for bringing transportation emissions down.

The Universal Electric Vehicle Incentive is funded at \$500,000 for the 2021-2022 fiscal year. At most, that can account for 100 fully electric vehicles at \$5,000 rebated per vehicle (not factoring in the cost of free chargers or \$2,500 rebates for plug-in hybrids that are also featured in the incentive). A significantly greater investment is needed if the aim is to see all annual new car purchases be of the electric variety, with a rebate of \$5,000 issued for each one: 2,500 (rounded) new purchases x \$5,000 = \$12,500,000 per year. To cut transportation emissions sufficiently to reach the 2030 goal, this needs to be an ongoing incentive for at least the next nine years. It may also make sense to scale the incentive to encourage early uptake, as the sooner an electric vehicle displaces a gasoline vehicle, the sooner emissions drop and the longer the benefit extends year over year. To promote this, the incentive amount could be increased in the early years, then gradually reduced in subsequently years, with the schedule of rates well published so that consumers know that they will pay less if they adopt early. Of course supply needs to be secured before incentives drop, which is the intention of the previous recommendation.

Even after a rebate is applied, electric vehicle buyers may need financing to pay the remainder of the cost over a number of years. Some may not have access to financing from traditional lenders due to low credit scores or income levels. To make electric vehicles an accessible option for more Islanders, Government should explore whether a loan program could also be available alongside the Universal Electric Vehicle Incentive. EfficiencyPEI's Energy Efficiency Loan Program could provide a good model; it

provides financing for homeowners approved for the Energy Efficient Equipment or Home Insulation Rebates, in addition to the rebates themselves.

3. Your committee recommends that Government develop and implement an incentive program for the installation of electric vehicle chargers at multi-unit residential buildings, workplaces and municipal facilities.

Your committee supports the inclusion of free level 2 chargers in the new Universal Electric Vehicle Incentive. The province has also demonstrated strong commitment to install charging infrastructure across PEI so far. Continuing this work in rural parts of the province is especially important.

Supporting workplaces, multi-unit residential buildings (MURBs) and municipalities in the installation of EV chargers is also an important next step. Quebec also provides a good model in this area. Through the provincial *Roulez vert* program, 50% of purchase and installation costs, up to \$5,000 per connector, are covered for electric vehicle chargers at workplaces and MURBs.

As of the 2016 Census, there were 18,195 private dwellings in multi-unit residential structures in PEI.⁷ Housing construction starts have been on an upward trajectory since 2017, and of these, multi-unit buildings, particularly apartments and row housing, account for the largest share.⁸ Electric vehicles need to be an accessible option for residents in multi-unit buildings, and this is best done with access to at-home chargers. Assistance with the cost of purchase and installation of such chargers is the most obvious way to encourage their proliferation. Supplementary means of encouragement could include adjustments to property taxes. The requirement for at least a minimum level of electric vehicle charging capacity could be phased in to the building permit process in upcoming years.

A shared electric vehicle program or incentive might pair well with assistance for charger installations in multi-unit residential buildings. Government recently introduced an Electric Swing Vehicle for the civil service, in which employees can book the vehicle in order to travel from the Public Administration Complex to work-related meetings in other locations. Through incentives, a similar program could be offered to owners and residents of multi-unit residential buildings. One or more electric vehicles, and an appropriate number of onsite chargers, could be owned by the landlord, the housing cooperative or the condominium association, as the case may be. Building residents would have shared access to the vehicles through a booking system. This could work particularly well for residents who only need occasional, rather than daily vehicular transportation. Rules, ownership models, coverage of costs and other variables would have to be examined, as would the most suitable method for Government to assist, but such a shared vehicle program could have significant potential in terms of replacing combustion engine vehicles with ZEVs in the parking lots of MURBs.

⁷ Statistics Canada. 2017. "Total – Occupied private dwellings by structural type of dwelling." *Prince Edward Island [Province] and Canada [Country]* (table). *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. The 18,195 total indicated includes private dwellings that are apartments in buildings with 5 or more storeys, apartments in buildings with fewer than 5 storeys, semi-detached houses, row houses, apartments/flats in duplexes, and other single-attached houses.

⁸ In 2019, there were 1,504 new housing starts, of which 899 were apartments and row housing. *Province of Prince Edward Island 46th Annual Statistical Review*. Page 16.

https://www.princeedwardisland.ca/sites/default/files/publications/asr_2019.pdf

Assistance toward the installation of chargers at workplaces should also be explored. This could be tailored and targeted according to the number of employees that must physically commute to the workplace and the parking area reserved for the workplace. Partnerships with both larger and smaller employers have potential. In terms of municipalities, high-traffic facilities such as town halls and rinks are another area where assistance would likely be worthwhile.

Overall, further study is needed to determine whether the Quebec *Roulez vert* model should be replicated exactly in PEI, particularly in terms of funding level per charging station, an appropriate program budget given the existing and anticipated building supply, and building eligibility criteria. This incentive should be delivered in concert with the electric vehicle purchase incentive and ZEV mandate, so that it corresponds to increasing demand and supply.

4. Your committee recommends government undertake a public education campaign on ZEVs.

Increasing public knowledge and understanding of zero emissions vehicles is key to their adoption, alongside ensuring supply and boosting demand. With these vehicles being new technology, people may be unfamiliar with how they work, the various options available, their maintenance, and how they generally resemble and differ from conventional vehicles. Unfortunately, there are also myths about electric vehicles that sometimes cause hesitation. Public education must be provided to familiarize Island drivers with electric vehicles, to dispel myths, and to communicate the high degree of satisfaction that new electric vehicle owners report. Quebec has engaged in significant public education alongside the rollout of its provincial electric vehicle incentive, and one of the most important lessons learned is that test driving an electric vehicle is often the best form of education on them.

Your committee supports the allocation of just under \$100,000 from the Climate Challenge Fund to All EV PEI to carry out an education, outreach and experiential program on the climate and ownership benefits of electric vehicles. All EV is likely the best local source of knowledge on these vehicles and best positioned to provide test drive opportunities, and thus it makes sense for All EV to provide free education sessions for prospective drivers. However, to achieve the electrification of transport to the degree necessary and over the timeframe involved, major public education is needed, and a one-time allocation of funding to a reasonably small organization is likely not enough to ensure the full reach of education needed. Your committee recommends that Government be ready to assist and amplify this public education campaign as necessary. Government should work closely with All EV to determine the best ways it can assist; these may include production of educational materials, staffing assistance to increase the frequency of education sessions, media campaigns, and other measures. Partnerships with other organizations would be worthwhile to ensure outreach to specific audiences, such as newcomers, seniors, residents of rural areas and more. Opportunities for Government to supplement the educational effort through its own departments and agencies should be embraced; Efficiency PEI appears to be an obvious candidate.

Your committee suggests an annual funding commitment of at least \$100,000 in this regard, for at least of 3-5 years, depending on penetration and uptake of ZEVs in the PEI market over that time. An education program could be delivered as an ongoing contract with All EV, through other means, or as a combination of both.

5. Your committee recommends government develop significant disincentives for high fuel consumption internal combustion engine vehicles through purchase and registration levies.

Even with purchase incentives, increased supply and public education, some may still opt for conventional vehicles that contribute to GHG emissions every time their engines are started. Disincentives to choosing these vehicles are a necessary complement to incentives that favour lower or zero-emissions alternatives. Governments are traditionally reluctant to apply penalties to consumer decisions, but those decisions have consequences for more than the individual consumer themselves, and in the case of gasoline and diesel vehicles, those consequences are negative.

Disincentives should be both upfront and ongoing, and the simplest means of accomplishing this would be an added tax or fee levied at the point of purchase or lease, and a higher cost to register the vehicle year after year.

Fuel efficiency ratings should be used to determine which vehicles are subject to purchase and registration disincentives. Each year Natural Resources Canada produces a publicly accessible fuel consumption guide for light duty vehicles of that model year, and has fuel consumption ratings for vehicles dating back to 1995. Ratings are expressed in litres of fuel/100km, and vehicles are grouped in ten classes, ranging from two-seater and subcompact cars to pickup trucks and vans. Disincentives could be charged on any vehicle that has a higher consumption rating than a specified threshold within its class and model year. To begin, that threshold could be set at the average for the class and model year. For example, if the average combined city/highway consumption for 2021 vehicles in the mid-size class is 7.9 L/100 km, then any 2021 mid-size vehicle with a higher combined L/100km rating than 7.9 would incur a purchase levy, and would continue to incur a levy each year it is registered. However, mid-size vehicles with ratings below 7.9 would not incur these levies. This way, consumers whose needs are not yet met by an electric vehicle (for example, someone who needs a pickup truck for their work), could still purchase and register a conventional vehicle without penalty, provided they choose one that is equal to or better than the average vehicles in its class and model year in terms of fuel efficiency.

Your committee suggests that the purchase levy disincentive for conventional vehicles not meeting the average fuel efficiency of vehicles in their class and year be set at a maximum of \$5,000. The levy should be scaled according to how much the vehicle exceeds the average fuel consumption rating of its class and year. In this way, using the above example, a 2021 mid-size vehicle with a rating of 8.0 L/100 km would incur a purchase levy because it exceeds the 7.9 L/100 km average, but it would be scaled down to a reasonable rate in recognition that the vehicle comes close to average. However, if more fuel inefficient vehicles are chosen, the levy rate would proportionally increase as the rating rises above average, until it reaches the \$5,000 maximum. For registration fees, the levy could also be scaled so that it increases according to fuel consumption rating above average, until it reaches double the standard registration fee, which is \$100 for most light duty vehicles.

Over time, as more electric vehicle options and types become available, and as their prices come down, the threshold for the purchase and registration disincentives could be progressively reduced by incremental amounts below average. Eventually the threshold could be reduced to zero, so that the purchase of any gasoline or diesel fueled light duty vehicle will incur the purchase and registration disincentives.

The purchase and registration levies for fuel inefficient vehicles should be announced with an effective date set perhaps one or two years in the future. In the lead up to that date, ample public education should be provided so that consumers can make fully informed choices, vehicle dealerships can plan accordingly, and the administrative framework of the disincentives can be set up. That said, the lead up

period should not be any longer than necessary, as the longer fuel inefficient vehicles remain on the road, the longer GHG emissions reduction will be delayed.

The logical use of the revenues collected by these disincentives would be to contribute to the funding of the Universal Electric Vehicle Incentive, public education on zero emissions vehicles, assistance toward charging infrastructure, and/or any additional efforts directly aimed at reducing transportation GHG emissions in the province. Some administrative costs may arise to implement this disincentive system, but they are not expected to be significant given the existing tax remittance and vehicle registration systems, and free data from Natural Resources Canada.

Additional Transportation Recommendations

6. Your committee recommends that a whole-Island, public transit system be developed, with low- or no-cost fares for riders.

Your committee recognizes that even with incentives, not everyone can afford their own vehicle, and some choose not to own one. Public transit is an important service in this regard, and it does have a role to play in reducing provincial emissions. Your committee supports the five Urban and Rural Transit Actions in the Sustainable Transportation Action Plan⁹, and is pleased that a \$250,000 rural transit pilot program to begin in fall, 2021 was included in the 2021-22 Budget. Indeed, your committee recommended in a previous report that an Island-wide public transit corridor be expedited. That said, with less than a decade remaining to bring annual GHG emissions down to 1.2 Mt CO₂e or less, with a provincial stock of over 100,000 registered light duty vehicles as of 2019¹⁰, and an average of over 8,000 new vehicle sales per year over the 2016-2020 period¹¹, your committee sees reducing or eliminating the emissions of personal vehicles as the area of both the greatest need and potential within the transportation sector. Even if public transit is vastly improved through the actions of the Sustainable Transportation Action Plan, ridership is not guaranteed, and it seems less certain that, on its own or as the primary among multiple solutions, public transit can displace our established reliance on personal vehicles in under a decade. For this reason, your committee places greater emphasis on the preceding recommendations aimed at replacing conventional vehicles with zero emissions vehicles. That said, one lesson from other jurisdictions with successful transit systems, which was consistently emphasized by witnesses before your committee, is that having no- or low-cost fares is key to promoting ridership.

7. Your committee supports efforts to promote an Island-wide active transportation corridor, and alternative commuting; however, your committee notes that lack of access to high-speed internet remains a barrier to telecommuting for many.

Your committee also sees active transportation and alternative commuting, particularly telecommuting, as beneficial contributors to GHG reductions in the transportation sector. Witnesses before your committee recommended such things as promoting carpooling through public education and incentives,

⁹ The actions are: 1) Work with transit operators and community transportation partners to make transit systems safe, affordable and convenient for all users; 2) Increase affordable, safe and inclusive community transportation services in rural areas; 3) Promote and increase transit use through education and social marketing; 4) Improve efficiencies and reduce emissions in the school transit system; 5) Remove barriers to sustainable transportation for people with a low income.

¹⁰ Statistics Canada. [Table 23-10-0067-01. Vehicle registrations, by type of vehicle](#)

¹¹ Statistics Canada. [Table 20-10-0001-01. New motor vehicle sales](#)

and partnering with municipalities to facilitate active transportation. Actions in these areas are included in the Sustainable Transportation Action Plan, and your committee hopes they can be carried out quickly. Certainly the pandemic has shown that telecommuting is more feasible for many than previously thought. That is not the case for everyone, however, and one factor that is outside the transportation plan, but is nonetheless necessary, is the availability of high-speed internet and cellphone reception throughout the province. Through provincial agreements with two major ISPs and various specialized local efforts, progress is being made in this regard, but many people in rural areas still face a 1-2 year wait, by current estimates, before telecommuting via high-speed Internet will truly be a possibility.

Partnerships with Agriculture

Within PEI's GHG emissions inventory, agriculture accounts for the second largest portion, at 26% as of 2018. Depending on the activity or source, emissions in this sector may involve methane (CH₄), nitrous oxide (N₂O) and/or carbon dioxide (CO₂). Compared to carbon dioxide, methane has 25 times the global warming potential, and nitrous oxide has 298 times the potential.¹² However, through land management, agriculture can also account for GHG reductions via sequestration of carbon in soil, and through best management practices in various areas, reductions in nitrous oxide and methane can be achieved. Agriculture provides a great opportunity to counteract climate change by both reducing emissions and removing GHGs from the atmosphere.

Government recently announced the PEI Agriculture Climate Solutions Program, which will provide assistance to the agriculture industry toward implementing best management practices (BMPs) that reduce GHG emissions and/or promote soil carbon storage. The program is built upon BMPs identified in a 2019 report by the PEI Federation of Agriculture in collaboration with Dr. David Burton of Dalhousie University, entitled "Developing Best Practices to Reduce or Remove Greenhouse Gas Emissions on Island Farms" (the PEIFA report). The Climate Solutions Program will receive federal-provincial funding of \$215,000 in 2021-22. Your committee supports the launch of this program as a government and industry shared effort to reduce GHGs associated with agricultural activity. Your committee also recognizes that GHG reductions may be achieved, either as the objective or as a co-benefit, through other provincial programming, particularly the Agriculture Stewardship Program, the Alternative Land Use Services (ALUS) Program, and the Perennial Crop Development Program, all of which receive federal-provincial funding through the Canadian Agricultural Partnership.

Your committee sees the PEIFA report is an excellent resource. More than a simple list of possible BMPs to adopt, it provides a solid scientific basis for its recommendations in terms of the state of knowledge and GHG reduction potential of each BMP; considers the PEI agricultural context and which BMPs producers will be most able and likely to adopt; identifies potential barriers to adoption; and factors in timeframes for actual GHG reduction. The report can be seen as a PEI-tailored roadmap for climate change mitigation in agriculture. It identifies reducing nitrogen fertilizer use, reducing methane produced by ruminant livestock, and maximizing soil carbon storage as the three areas with greatest potential for emissions reduction. The report puts forward nine over-arching BMPs for GHG reduction, several of which contain sub-categories. The tables in the Appendix of this report lists these and the estimated GHG reductions they could achieve, and provides the identical or closely comparable BMPs

¹² "Global warming potentials." Government of Canada. <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/quantification-guidance/global-warming-potentials.html>

included in the Climate Solutions, Agriculture Stewardship, ALUS and Perennial Crop Development Programs and the level of assistance provided with each BMP.

Based on the apparent BMP gaps across programs, and other findings and recommendations in the PEIFA report, your committee puts forward the following recommendations regarding agriculture:

8. Your committee recommends that an incentive for the purchase and use of chisel plows be provided to producers in order to promote conservation tillage.

Minimizing or eliminating soil disturbance is the aim of conservation tillage, as this reduces GHG emissions from the soil and decreases erosion. In tilling, a chisel plow is less soil disruptive than a traditional mouldboard plow. The PEIFA report recommends the use of chisel plows, as well as plowing in spring instead of the fall, as part of an overall effort to reduce the depth and intensity of tillage. A BMP for no-till planting into an existing crop is featured in the Climate Solutions Program, and both that program and the Agriculture Stewardship Program promote winter cover crops, which would entail spring instead of fall plowing. However, it appears none of the programs addresses the plowing equipment used, and an incentive for producers, or groups of producers, to purchase and use chisel plows at the appropriate time of year could address this.

9. Your committee recommends that an amendment be made to the *Agricultural Crop Rotation Act* to lengthen the minimum regulated crop rotation from three to four years; that the amendment be made to take effect as of January 1, 2025; and that a temporary incentive be provided to producers to shift to a four-year rotation until the amendment comes into effect.

Shifting to a rotation in which potatoes and any other regulated crops are planted only once every four years is part of the PEIFA report's recommended actions to increase soil organic matter content. Increasing soil organic matter content has beneficial effects in terms of GHG emissions. The barrier to making this change, for producers, is financial; decreasing the frequency by which a more profitable crop may be planted decreases the return on harvests. A change to the *Agricultural Crop Rotation Act* could be implemented without delay, but it could leave producers with a sudden and unplanned financial shortfall. Phasing in this change instead, and assisting producers to incorporate new crops with potentially new markets into their rotations, would allow the best management practice to be implemented without undue financial hardship.

10. Your committee recommends that the Department of Agriculture and Land work with producers to identify shorter season, more nutrient-efficient potato varieties that will grow well in PEI, and identify marketing opportunities for them.

The PEIFA report indicates that planting potato varieties with shorter growing seasons and more efficient nutrient uptake than the Russet Burbank variety would contribute to better nitrogen fertilizer management and allow more time in the fall for planting cover crops, and thus help to lower emissions. The barrier to doing this is lack of demand for these potatoes; major buyers still favour the Russet Burbank variety. However, this could be overcome by emphasizing the environmental benefits of shorter-season, more efficient varieties in marketing, to appeal to consumers looking for more sustainably produced food. Alternatively, further testing of these varieties could be carried out to find types that meet the specifications of major buyers but also grow more quickly and with less fertilizer dependence than Russet Burbanks.

11. Your committee recommends that the Department of Agriculture and Land work with agricultural organizations to evaluate ways to increase the production, distribution and land application of compost within the industry.

Applying soil amendments is another effort toward increasing soil organic matter content suggested in the PEIFA report. Island Waste Management Corporation produces 7,800 – 10,800 tonnes of compost per year, which is mostly used for agricultural purposes. The PEIFA report estimates that over 70 kt of CO₂e emissions, over a five-year period, could be reduced if 45 tonnes of compost per hectare were applied on 5,000 hectares. This significantly exceeds the typical annual supply of IWMC compost. Some individual producers have on-farm compost production systems, and your committee suggests that Government and industry work together to examine how compost production could be increased and overcome any barriers to its distribution and application as well.

12. Your committee recommends that an incentive for the purchase and use of commercial compost turners be provided to producers in order to promote composting of solid manure windrows.

Improving manure management and use is a key part of reducing emissions of methane, a potent greenhouse gas. The PEIFA report identifies different practices that can improve on-farm manure management, and some of these are addressed in BMPs of the Climate Solutions Program and the Agriculture Stewardship Program. However, one practice that is not addressed by the programs is the management of solid manure stored in field windrows, and the PEIFA report indicates that there is a good composting opportunity in these. Some farms in PEI employ a windrow turner machine to do this, with good results. To promote more solid manure composting, your committee recommends that an incentive for the purchase of commercial compost turning machines be provided to producers. The report notes that manure windrows do not need to be turned overly frequently, which means that several producers in close proximity could partner to jointly own and use a turner. Any incentive in this regard should also be available in such cases of joint ownership.

13. Your committee recommends that incentives for the installation of Liquid Manure Storage Covers (Climate Solutions Program BMP #5) be increased, and that the necessary legislative or regulatory changes be made to require construction of any new storage containers to include a cover.

The PEIFA report recommends that liquid manure storage containers, as are common in dairy and hog operations, be covered in order to limit exposure to precipitation and reduce off-gassing of methane into the atmosphere. The Climate Solutions Program features incentives to assist with the cost of this BMP. Your committee is concerned they may not be enough, however, given the substantial cost of covering storage containers, especially if a permanent concrete cover is to be constructed. While producers may well understand the environmental benefit of this BMP, it does not appear to have direct or indirect monetary benefits that can offset the capital cost. The PEIFA report notes that this is a particular barrier to adoption for the hog industry, which has very tight profit margins mainly due to the cost of transporting hogs off-Island. To allow for greater uptake, your committee suggests increasing the Climate Solutions Program incentive for this particular BMP to at least 50% of costs (from 35%), to a maximum of \$45,000 (from \$30,000) over the life of the program. At the same time, regulatory or legislative changes should be made to require that any liquid manure tanks to be constructed in the future include some form of appropriate and effective covering.

14. Your committee recommends that the Climate Solutions Program be expanded to include not only demonstration projects for the inclusion of feed additives in ruminant livestock diets, but support to expand use of locally produced, seaweed-based additives.

There are many options for feed additives to reduce methane emissions caused by ruminant livestock digestion, and they are likely to have a range of effectiveness. Trials and demonstration projects are thus in order. That said, seaweed-based additives, such as those produced by North Atlantic Organics in western PEI, have already been shown to reduce emissions by 20% when added to feed at a rate of 5%, according to the PEIFA report. Your committee sees no reason not to promote widespread use of these additives in ruminant livestock operations now, rather than waiting for further information on additional additives. Support in this regard could be rebates for producers on the purchase of an additive and/or supports for local additive producers, if necessary, to assist with production and distribution.

15. Your committee recommends that a greater, multi-year funding commitment be made to the PEI Agriculture Climate Solutions Program in order to maximize the GHG reduction potential of its best management practices.

The Climate Solutions Program has been announced as a pilot program, with \$215,000 in funding for the current year. Correspondence from the Department of Agriculture and Land to the committee indicates that roughly 30 applicants are anticipated this year. To achieve the potential GHG reductions estimated for the various BMPs of this program, other similar programs, and additional BMPs recommended above, widespread uptake among Island farmers is required. Roughly 40% of Island land is dedicated to agricultural use (as of the 2016 Census) and so there is great opportunity to undertake BMPs across the landscape.

Your committee therefore suggests that the overall budget of the Climate Solutions Program be increased to at least \$1,000,000 per year, and that it be kept consistent for at least the next five fiscal years. The additional funding could be used to increase the number of producers participating, add further BMPs, and/or increase the assistance rates for BMPs that are remain out of the financial reach of producers. Once individual BMPs have achieved maximum uptake and benefit their incentive rates should also be reassessed for opportunities to redistribute funds to other BMPs. As time passes, the program should be continually monitored and evaluated to make these adjustments.

Your committee recognizes that the Climate Solutions Program is jointly funded by the province and Environment and Climate Change Canada's Low Carbon Economy Fund, and other programs are also jointly funded through the Canadian Agricultural Partnership. Finding new or unallocated money for greater program budgets is not a simple task. Increased lobbying of our federal partner will be necessary, as may be provincial budgetary reallocations. Levies on agricultural activities that are counterproductive to emissions reduction, such as fertilizer sales, could also be considered, with revenue directed to the Climate Solutions Program budget.

No matter the method, funding of incentive programs can be a challenge; but emissions from a primary industry, which constitute the second largest portion of our provincial emissions, can't be effectively reduced without an aggressive and ambitious approach. Fortunately, there are many co-benefits to agricultural BMPs that reduce emissions, which accrue to the farmer, the industry, the environment and Islanders. These include increasing soil organic matter content, preventing soil erosion, raising water quality by preventing nutrient leaching, improving crop yields and livestock health, boosting the

sustainability of farms and farming as a livelihood, and raising the profile of one of our most important industries and the Island itself as an agriculturally sustainable province.

Other Areas

After transportation and agriculture, PEI's emissions sources are buildings, industry and waste (20%, 7% and 4%, respectively, in 2018). These are not insignificant contributions to our provincial emissions. Forest land and wetlands also play roles in our emissions inventory; ideally they reduce emissions by sequestering carbon, but this beneficial effect can be undermined by human activities in these natural areas.

Your committee has focused more on addressing the larger emissions sectors of transportation and agriculture, but does have more general comments and recommendations regarding other segments of our provincial emissions inventory:

Reducing Emissions from Buildings

16. Your committee recommends that Government continue the current suite of programs offered by EfficiencyPEI, but take advantage of any opportunity to increase resources, broaden programming and ease restrictions to enable greater access.

EfficiencyPEI is a success story, having helped many Islanders over the years to improve the energy efficiency of their homes and businesses, or to take advantage of renewable energy sources. Programs range from rebates on small energy efficient items for households, to energy efficient heating systems, to solar electric rebates and more. It is a simple statement, but nonetheless worth emphasizing: we should continue on the path of energy efficiency, and do more where possible. One potential area for further development is energy efficiency measures for tenants. A multi-unit residential building efficiency program does exist, but it is aimed at entire buildings and is owner-initiated. It would be worth exploring whether a means of assisting tenants (who may be paying for their own heating and electricity) with energy efficiency measures for their individual units could be developed. Owner cooperation would of course be necessary. A general review of rules on eligibility for programs could also be undertaken to see if restrictions could be eased or removed to increase access; the requirement that buildings must be inhabited for more than six months before they are eligible for the Energy Efficient Rebate is one example of a restriction that could be removed.

17. In terms of energy efficiency in public buildings and infrastructure, your committee recommends any effort to include energy efficiency measures in capital spending on construction and renovation of municipal facilities and provincial buildings, including in schools and institutions, so that they may achieve or at least move closer to net zero energy consumption.

Clearly Government should take the lead on energy efficiency and renewable energy in its own buildings; this should be a standard part of any capital project. The best method to prompt municipalities to do the same may be the establishment of a climate change mitigation and adaptation fund to which they can apply for infrastructure projects.

Your committee also reiterates its previous recommendations related to buildings, from its July 2, 2020 report:

Your committee recommends that no further public investments in biomass energy that is not carbon neutral within a ten-year cycle be pursued.

Your committee recommends that installation of oil heating systems in new construction be prohibited, and that rule changes be made to Efficiency PEI programs to support the installation of low- or no-emissions alternatives in new construction in order to make them cost comparable to oil systems.

Land Protection, Forestry and Wetlands

18. Your committee recommends that Government continue to aim for a higher percentage of protected natural areas in the province, and dedicate the necessary resources to do so.

Natural areas, such as coastlines, wetlands and forests, act as natural carbon filters, and their protection has many co-benefits, from providing habitat for wildlife to preserving the natural beauty of the Island on which the tourism industry depends. In its July, 2020, report your committee issued a similar recommendation on an increased provincial target for natural areas. Government responded that a pathway to protection of 7% of PEI land has been identified, and that the 2020 Corporate Land Use Survey would identify ecologically important areas that merit the addition of protection. Your committee is hopeful that the Corporate Land Survey results will be fruitful, but does not see 7% as a sufficient target. For comparison, the national target is that 17% of terrestrial areas and inland water shall be protected.

19. Your committee recommends that Government continue to recognize the valuable contributions watershed groups make to carbon sequestration via their work in protecting and restoring natural ecosystems, and support them whenever possible.

Government recently increased the operational funding of watershed groups by \$250,000, which your committee fully supports.

20. Your committee recommends that reforestation programs be optimized by planting Acadian forest species and increasing diversity of planted tree/shrub species to increase resilience against pests and changing weather caused by climate change; and that other forestry practices be reviewed and revised to ensure they do not counteract forests' ability to act as carbon sinks.

Your committee sees great value in the provincial Buffer Zone Planting, Forest Enhancement, Greening Spaces, and Hedgerow Planting programs. The Carbon Capture Tree Planting Program, with its aim to plant native trees on 250 hectares of abandoned fields and marginal lands, is of course commendable for its primary purpose of GHG reduction. Your committee hopes that all of these programs promote the planting of diverse native species that are expected to be resilient in the face of the climatic changes we are experiencing and will continue to experience over this century. Monoculture plantations will not fare as well nor provide the same benefits. Planting more trees is a straightforward way to sequester carbon, and there is little reason not to maximize the planting potential of available land. In fact massive reductions in our GHG inventory could be achieved with a sole focus on planting tens of millions more trees per year. However, there are the practicalities of production volume, labour and available land. Your committee feels it is necessary to address the sources of our provincial emissions more directly, but is always in support of tree planting.

Unfortunately, the beneficial effects of tree planting can be counteracted by excessive or intensive tree cutting. Clearcutting is still evident in PEI. Our forest practices on provincial land should be reviewed and if they are not already in line with an ecological approach that provides GHG reductions, revised to that effect. Many forests are privately owned in PEI, which means that management decisions are not within Government's purview. Clearcutting for monetary benefit can be enticing for many landowners. Ways for Government to discourage this, in partnership with groups such as woodlot and agricultural associations and watershed groups, should be examined and pursued. Nova Scotia's recent Independent Review of Forest Practices Report (the Lahey Report), which the Nova Scotia government has indicated will be implemented by the end of this year, may contain lessons and recommendations on management of both public and private forests that are transferable to PEI.

21. Your committee recommends that greater emphasis be placed on wetland protection in general, and that it be carefully considered whether it is truly appropriate to allow any expansion of peat moss extraction if our wetlands are to return to a state of net carbon sequestration.

Protecting and restoring wetlands, bogs and salt marsh habitats can help store large amounts of carbon and have co-benefits such as protection against erosion and rising sea levels. Peatlands (i.e. wetlands covering plant matter decomposing slowly to form peat) are the planet's largest natural terrestrial carbon storage system; in fact they store more carbon than all other vegetation types in the world combined, according to the International Union for Conservation of Nature. When these lands are drained, they release carbon dioxide into the atmosphere and become an emissions source rather than a sink. Since the mid-1990s, PEI's wetlands have been a source of approximately 20-40 kT CO₂e emissions per year, when they should be contributing to GHG removals. Your committee understands that this is primarily due to the practice of peat extraction in PEI. Wetlands can be restored, but it takes far too many years for them to return to a state of net GHG reduction, especially while they otherwise continue to be drained and damaged. There is a significant peat moss harvesting operation in western PEI, and your committee is reluctant to dictate that any individual enterprise should no longer continue. But any new peat moss extraction operations, or expansion of the existing operation, may not be advisable if we are to reverse the trend of our emissions from wetlands in the province.

Energy Generation and Storage

22. Your committee looks forward to the incorporation of Smart Metering and Time-of-Use Pricing for electrical load management.

Maritime Electric has communicated to your committee that it sees electrification of transportation and space heating as essential and effective ways of reducing GHGs. To accommodate the increased electrical load that will result, new technologies and pricing mechanisms to flatten system peak and shift loads to non-peak periods are required. Maritime Electric is pursuing smart metering to achieve this. It will take several years, and it will be costly, but should have long-term benefits in deferred system expansions and additions, improved system reliability and visibility, and the potential to enable customer load control.

23. Your committee recommends that Government look for opportunities to promote vehicle-to-grid demonstration programs aimed at the 20-100 vehicle-fleet level.

Your committee previously recommended that Government use any electric school buses it purchases in a pilot project for vehicle-to-grid technology; Government responded that no school bus vendors currently have vehicle-to-grid technology available. If that is the case, and there are no other opportunities to employ this electrical storage technology using Government's own electric vehicles, your committee suggests that Government could find partners in the private sector and assist with the creation of demonstration projects in their fleets. This has been done successfully in other countries, and with the proliferation of electric vehicles and the growing demand on our electrical grid, it makes sense to take advantage of the potential for EVs to not only draw energy from the grid, but also contribute to it.

Carbon Pricing

24. Recognizing that carbon pricing costs less than alternative mitigation policies, in both the short- and long-term, your committee recommends that the new provincial carbon pricing system, expected to be announced in September, 2021, be enhanced to make it broader and therefore more effective in reducing emissions.

Conclusion

Your committee thanks the many members of the public who presented their ideas on greenhouse gas reduction thoughtfully and passionately, whether in writing or in a meeting before the committee. The knowledge shared by the many subject matter experts, both here and in several other jurisdictions, was invaluable. This was a very challenging task for a small committee of members, and this report would not have been possible without the guidance provided by a diverse range of people locally and around the world.

The above recommendations reflect what your committee feels to be the most effective, attainable and relevant approaches to meeting our GHG reduction target by 2030. It has not been a simple task; there are many competing ideas, and sometimes competing interests, when it comes to choosing the best ways to adjust across communities, industries and society in general. Successful implementation of these recommendations will require people to make different choices in some cases. They may not please everyone, and some may question why PEI, which accounts for a minor part of Canada's emissions inventory, and an even smaller part of the global inventory, should go to the trouble of effecting such changes. Your committee would answer that climate change is a global problem, and no province, territory, state or community can ignore it. We benefit greatly from our right to self-determination as a provincial jurisdiction, but it also entails a responsibility to do our part alongside our neighbours, whether large or small. Leaving action to others is not an option, and the costs of not meeting our targets will be far more expensive than any effort to meet them. We must also consider the many co-benefits of actions to reduce greenhouse gas emissions. Changing our modes of transport, the sustainability of food growing system, our energy sources, the buildings we inhabit and the way we treat our natural areas will have many good consequences. Cleaner air and water, more productive soil, more efficient use of energy, restoration of habitat and biodiversity, and new economic opportunities are but a few of the positive outcomes that can accompany climate change mitigation. The current pandemic is undoubtedly a crisis, but also an opportunity to make changes to the unsustainable aspects of the way we live. Your committee hopes the recommendations it has put forward under its mandate can be a major part of that.

PEIFA Report – Recommended BMPs	Estimated GHG Reductions	Comparable BMPs - PEI Agriculture Climate Solutions Program	Comparable BMPs – PEI Agriculture Stewardship Program	Comparable BMPs – PEI Alternative Land Use Services (ALUS) Program or Perennial Crop Development Program
BMP 1 – Use of Cover Crops to Increase Soil Organic Matter, Reduce Residual Soil Nitrogen, and Control Disease in Potato Rotations				
A) Planting a non-legume cover crop in the fall, after the forage crop is harvested, and letting it over-winter before incorporating it into the soil in the spring, pre-potato planting	12.6 kt CO ₂ e annually, 63 kt over 5 years, if done on 10,000 hectares annually ¹		Winter Cover Crop BMP - \$35/acre, up to \$1,000/field, \$3,000/year and \$6,000 over duration of program	
B) planting a non-legume cover crop in the fall, after the potato crop is harvested, and letting it over-winter	5.39 kt CO ₂ e annually, 27 kt over 5 years, if done on 10,000 hectares annually ¹		Spring Tillage of Forages BMP - \$25/acre, up to \$1,000/field and \$2,000/year, and \$5,000 over duration of program (Incorporating Soil-Building Crops Into Rotations BMP [see below] also involves cover cropping)	
C) Planting a nurse crop alongside or in-between a commercial row crop to extend duration of soil cover	12.7 kt CO ₂ e annually, 64 kt over 5 years, if done on 10,000 hectares annually ¹	BMP 1 – Establishment of Nurse Crops - \$60/acre up to \$1,000/field, \$3,000/year per applicant		
BMP 2 – Increasing Soil Organic Matter Content				
A) Reducing intensity, depth and timing of tillage (i.e. conservation tillage) by shifting from fall to spring tilling of the crop that precedes potatoes, and using a chisel plow instead of a mouldboard plow	One-time reduction of 73 kt CO ₂ e and 1.7 kt CO ₂ e per year in years following (81 kt CO ₂ e over 5 years), if done on 10,000 hectares annually ¹	(BMP 3 - No-till Planting of Crops comparable, but different as it involves no-till planting into living or crimped crop - \$50/acre up to \$1,000/field, \$3,000/year per applicant)		
B) Shifting from a rotation involving potatoes planted every third year, to every fourth year	3.3 kt CO ₂ e annually, until carbon storage equilibrium can be established over 20 years, equalling 66 kt CO ₂ e, if done on 10,000 hectares annually ¹			
C) Applying compost	73 kt over 5-year period if 45 tonnes compost per hectare applied on 5,000 hectares; may be offset by increased N ₂ O emissions			

PEIFA Report – Recommended BMPs	Estimated GHG Reductions	Comparable BMPs - PEI Agriculture Climate Solutions Program	Comparable BMPs – PEI Agriculture Stewardship Program	Comparable BMPs – PEI Alternative Land Use Services (ALUS) Program or Perennial Crop Development Program
BMP 3 – Increased Use of Soil-Building Crops and Perennial Cropping Systems				
A) Using full-season soil-building rotation crops	55.6 kt CO ₂ e, if done on 10,000 hectares over 5 years	BMP 2 – Extending Rotations with Soil-Building Perennial Crops - <i>\$100/acre up to \$2,000/field, capped at \$5,000/year per applicant</i>	Incorporating Soil-Building Crops Into Rotations BMP - <i>\$60/acre, up to \$1,800/field, \$4,000/year, \$8,000 over duration of program – or if rotation is extended, \$100/acre, up to \$3,000/ field, \$7,000/year, \$14,000 over duration of program</i>	
B) Permanently shifting land from annual to perennial crop production	41.8 kt CO ₂ e over 5 years, if done on 1,000 hectares			Perennial Crop Development Program: Assistance to establish or improve production of perennial crops - <i>50% of costs, up to a maximum of \$40,000 per project.</i>
BMP 4 – Improved Nitrogen Fertilizer Management Through Implementation of 4R Management				
A) Using enhanced efficiency fertilizers so that the amount of nitrogen fertilizer can be reduced and more attuned to plant needs	10 kt CO ₂ e annually, or 50 kt CO ₂ e over 5 years, if 25% of potato producers replaced 33% of their nitrogen fertilizer rate with enhanced efficiency fertilizer each year		Nutrient Management Planning BMP – <i>50% of planning consultant’s fees, up to \$2,500/ year or \$5,000 over duration of program</i>	
B) Splitting application of nitrogen fertilizers between planting and hilling of crops	4 kt CO ₂ e annually, or 20 kt CO ₂ e over 5 years, if 50% of potato producers reserved 33% of their nitrogen fertilizer application until just before hilling		Nutrient Management Demonstration Trial BMP - <i>\$500/acre, up to \$4,000 per trial or year, and \$8,000 over duration of program</i>	
C) Using irrigation to mitigate drought-caused crop loss and consequential emissions from applied but unused nitrogen fertilizer	6 kt CO ₂ e over 5 years, if irrigation sufficient to protect against drought-caused yield reduction that may occur once every five years is installed on 10,000 hectares		Irrigation Efficiency BMP - <i>30% of costs up to \$15,000 over duration of program</i>	
D) Planting potato varieties that are more fertilizer efficient with shorter growing seasons than Russet Burbank variety	11.1 kt CO ₂ e annually, or 55 kt over 5 years, if done on 10,000 hectares annually ¹			

PEIFA Report – Recommended BMPs	Estimated GHG Reductions	Comparable BMPs - PEI Agriculture Climate Solutions Program	Comparable BMPs – PEI Agriculture Stewardship Program	Comparable BMPs – PEI Alternative Land Use Services (ALUS) Program or Perennial Crop Development Program
BMP 5 – Site-Specific Right Rate N Recommendations				
Using testing to determine site-specific nitrogen fertilizer needs	11.3 kt CO ₂ e annually, or 56.5 kt over 5 years, if site-specific testing leads to more precise fertilizer applications at a rate of 50 kg in nitrogen applied per hectare over 30,000 hectares	BMP 7 - Development of Site-Specific “Right Rate” Nitrogen Fertilizer Recommendations - <i>Cost share ratio is project dependent</i>		
BMP 6 – Willow Plantations in Field Edge and Riparian Areas				
Planting willows in field edge and riparian areas to reduce N ₂ O emissions from agricultural activity, sequester carbon and improve nutrient use efficiency	9.7 kt CO ₂ e over five year period, if 50 hectares of riparian or riparian adjacent area are planted in willows each year over a five year period	BMP 4 - Willow Plantations in Field Edges and Sensitive Areas - <i>35% of eligible expenses up to \$5,000 over the life of the program</i>	Erosion Control Structures BMP – <i>55% of costs, up to \$20,000 per structure and \$100,000 over duration of program</i> Merit-Based Soil Conservation BMP <i>– 75% of costs up to \$25,000/producer per year</i>	ALUS incentives: -Buffer zone expansion (\$185/hectare/year); -Non-regulated grassed headlands (\$185/hectare/year); -Grassed natural hollows (\$ unspecified); -Retirement of high-sloped crop land (\$150/hectare/year); -Retirement of crop rotation land to establish soil conservation structures (\$250/hectare/year)
BMP 7 – Improved Manure Management and Utilization				
A) Various best practices on storage, covering, turning, nutrient testing and application of manures to reduce CH ₄ , N ₂ O and other emissions	Estimated at 50-70% CH ₄ reduction		Manure Storage BMP - <i>50% of costs up to \$35,000 over duration of program</i> (There is also assistance for BMPs on silage storage, feedlot covering, and exercise yard impermeable bases, to reduce runoff from silage leachate and manure)	
B) On-farm manure windrow composting using a commercial compost turner				
C) Installing covers on liquid manure storage tanks		BMP 5 - Liquid Manure Storage Covers - <i>35% of eligible expenses up to \$30,000 over the life of the program</i>		

PEIFA Report – Recommended BMPs	Estimated GHG Reductions	Comparable BMPs - PEI Agriculture Climate Solutions Program	Comparable BMPs – PEI Agriculture Stewardship Program	Comparable BMPs – PEI Alternative Land Use Services (ALUS) Program or Perennial Crop Development Program
BMP 8 – Animal Management for GHG Reduction				
A) Reducing ruminant livestock methane through feed additives	Estimated at 30-60% CH ₄ reduction (Seaweed additive at 5% rate shown to reduce CH ₄ by 20%)	BMP 8 - Demonstration of Feed Additives in Ruminant Livestock Diets - <i>Cost share ratio is project dependent</i>		
B) Grazing management	Not specifically estimated	BMP 6 - Improved Grazing Management Practices - <i>35% of eligible expenses up to \$5,000 over the life of the program</i>		
BMP 9 – Alternative Energy Sources for Farms				
Implementation of whole farm or specific building/component alternative energy systems (wind or solar) following energy audit	2.5 kg of CO ₂ e avoided per kW generated	<i>2021-22 Provincial Budget includes funding to provide free farm energy audits; Farms also eligible for Efficiency PEI's Solar Electric Rebate, Business Energy Rebate, and Community Energy Solutions Programs</i>		

Notes:

1. 10,000 hectares annually represents roughly one third of the land that is planted in potatoes each year.