



Conservation Council of New Brunswick
Conseil de conservation *du* Nouveau-Brunswick
www.conservationcouncil.ca

Climate Action Plan for New Brunswick

A path to a Low-Carbon Economy that creates jobs and sustains families and communities

By Louise Comeau
Director of Climate Change and Energy Solutions

June 2016

Contents

Executive Summary	3
CCNB’s Climate Action Plan	5
Electricity	5
Provincial Investment Plan	6
Provincial Policy Package.....	8
What’s the problem?.....	11
We Need to Live Within our Means	18
Doing our Fair Share	20
A Climate Action Plan for New Brunswick.....	22
Where will the reductions come from?.....	25
CCNB’s Climate Action Plan	26
Electricity	26
Provincial Investment Plan	28
Provincial Policy Package.....	29
Conclusion	32
About the Conservation Council.....	32

Figures

Figure 1	4
Figure 2:	12
Figure 3:	12
Figure 4:	13
Figure 5:	15
Figure 6:	17
Figure 7:	17
Figure 8:	19
Figure 9:	20
Figure 10:	23
Figures 11a and 10b:	24

Executive Summary

There is a strong scientific consensus that the climate is becoming unbalanced mostly because of human activity. We need policies and programs that are fair and cut waste by making polluters use clean energy and practice more sustainable agriculture and forestry. If we act together we can limit the risks to our health and communities from a more extreme climate and help each other thrive.

Climate change has no boundaries. It will affect us all even if to varying degrees depending on how rich we are or where we live. The poor, the old and the sick will be hurt the most even here in Canada and New Brunswick, but especially in poorer nations. It will affect us whether we contribute a lot or a little to the problem. And we all have a role in the solutions: as citizens, consumers, business and community leaders, policy makers and elected representatives. As citizens we can support the policies called for by the Conservation Council of New Brunswick to show governments and community leaders that we are ready to move forward. As consumers we can support the transition to a low-carbon economy by redirecting our purchases to products that use less energy and help us transition to renewable energy. As business and community leaders, policy makers and government leaders we can collaborate to build social consensus so we do our fair share.

The most important thing citizens, business leaders and policy-makers can do right now is to support federal and provincial/territorial governments in taking the action we need to bring greenhouse gas emissions way down. We have an opportunity over the next few months to work with other provinces and the federal Government to really move Canada forward toward a climate friendly economy and lifestyle. This is because the federal Government is negotiating provincial and territorial contributions to Canada's overall goal of reducing national emissions 30% below 2005 by 2030. New Brunswick also has agreed to a regional goal of 35% to 45% below 1990 by 2030. That regional goal represents an average of 6.5 million tonnes of reductions from New Brunswick that could go toward meeting our regional and national goal¹.

Our province has an opportunity to work with the federal Government to do its fair share, but also to secure help in doing so. New Brunswick should aim to secure a Memorandum of Understanding with the Government of Canada that commits the province to securing 6.5 million tonnes of greenhouse gas reductions.

¹ 1 ton of carbon dioxide gas would fill a sphere 10 metres in diameter.



1 tonne of carbon dioxide would fill a sphere 10 metres in diameter¹; cutting our greenhouse gases by an average of 40% in less than 15 years is like shedding 6.5 million 10-meter spheres from our diet. It's a big, but achievable weight loss. Fortunately, we won't be doing this alone: Canada and the world will also be shedding comparable amounts of greenhouse gases.

Figure 1

In exchange for New Brunswick's commitment to 6.5 million tonnes of greenhouse gas reductions, it would receive a one-time payment of \$130 million to \$195 million to support reduction efforts (at an assumed payment price of \$20 to \$30/tonne). In addition, the federal Government has promised to ensure a consistent carbon price across the country. Provinces not having a carbon price will be required to put a system in place or accept a federal system. A provincial carbon price of \$20 to \$30 tonne covering 80% of emissions would generate an additional revenue stream of between \$238 million to \$357 million initially that would decline over time as coal is phased out of electricity and vehicles transition off gasoline.

Putting a price on carbon is just one part of a comprehensive package of actions needed to make our economies and lifestyles less reliant on fossil fuel energy and unsustainable approaches in forestry and agriculture. We have done this before. Think about when government put a price on leaded gasoline in the 1980s so that unleaded gasoline was cheaper. The result was lower emissions of a serious toxin affecting brain development in children.

To put the province on a pathway to a low-carbon economy that creates jobs and sustains families and communities we need a comprehensive climate action plan. The Conservation Council of New Brunswick has some ideas for the Province's leaders and citizens to consider. The ideas we propose here will be further analysed to identify the pathway to reaching our 6.5 million greenhouse gas reduction goal that creates the most jobs and generates the greatest social and economic gains for the province. This first report identifies the options that the Conservation Council of New Brunswick believes that represent a comprehensive approach and that we believe are required for an effective climate action plan.

CCNB's Climate Action Plan

We propose a three-part climate action plan covering electricity, investments and policy.

Electricity

The electricity program would be supported by investing the one-time federal contribution of \$130 million to \$195 million as follows:

1. Allocate \$56 million to \$84 million (based on \$20 and \$30/tonne and a contribution of 2.8 million tonnes from coal phase out) to NB Power or a combination of NB Power and an independent agency with an efficiency and low-carbon economy mandate to invest in:
 - a. An economy-wide investment in energy efficiency through building retrofits in social housing, the residential, commercial/institutional/government (including municipal), and industrial sectors; and equipment and appliances. The goal would be to advance NB Power's Reduce and Shift Demand objective of 609 MW by 2038 to 2020 to 2025². NB Power should also be given the mandate to invest in energy efficiency targeting natural gas and oil dependent buildings. These investments would target the 6% of provincial emissions coming from these fossil fuel heating sources. Retrofits of these buildings could generate additional greenhouse gas reductions of about 360,000 tonnes assuming a 40% reduction in fossil fuel energy demand. Energy efficiency investments are cost effective (4 to 5 cents kWh).
 - b. Coal phase-out and the use of non-fossil-fuel-fired electricity for exports. The date for coal phase-out would be determined pending further provincial and regional analysis and negotiations with the Government of Canada, but the objective is to align with Alberta's commitment to phase coal out by 2030, which is expected to inform federal planning for national coal phase-out.
 - c. Electrification of the New Brunswick economy using clean electricity. The province is already the second most electricity-intensive economy after Québec. We can build on this foundation to significantly, accelerate investments in the Smart Grid (the Energy Internet) to give the electricity system the capacity it needs to significantly increase the supply of renewable energy (aiming for 100% renewable). The Smart Grid is central to managing a more distributed energy system, as well as providing load balancing services to Nova Scotia, PEI and New England. The electrification strategy, or roadmap, can build on work completed under the Atlantic Energy Gateway Initiative and take advantage of new federal support aimed at identifying opportunities for regional electricity cooperation³. Our electrification roadmap needs to be regionally focused, particularly because Nova Scotia will also need to phase out coal, and include a regional and long-term

² <https://www.nbpower.com/media/102794/irpjuly2014-english.pdf>, p.128

³ <http://www.acoa-apec.ca/eng/publications/ResearchStudies/Pages/Home.aspx#aeg>; Federal budget 2016 provided \$5 million over two years to engage provinces and utilities in assessing regional electricity cooperation opportunities

system investment plan (i.e. modernizing and integrating regional transmission networks, as well as regional targets for renewable energy to replace the loss of coal-fired generation. Acceleration of Smart Grid investments could advance installation of additional renewable energy technologies along with installation of next generation meters, hot water heaters and storage devices using telecommunications systems to manage a distributed load (including micro-grids; beyond what is already currently funded). Expanded regional investment in renewable energy would include accelerated solar rooftop targets. A stretch target for New Brunswick could be 200,000 kilowatts (kW) of cumulative installed commercial and residential solar power by 2025 (100,000 kW each for residential and commercial, grid connected and off-grid), with NB Power working with suppliers to develop home equity loan and/or leasing, and power purchase agreements packages aimed at lowering payback periods from the current 13 to 15 years to between 5 and 10 years.⁴

- d. Accelerated scale up of electricity transportation infrastructure and incentives to increase the sale of electric plug-in and low-emission hybrid vehicles. Québec has a legislated target of putting 100,000 electric vehicles on the road by 2020: that's about 1.2% of the total fleet of over 8 million vehicles registered or about 16% of new car sales in 2020.⁵ A similar scheme for New Brunswick would set a goal of 10,000 electric vehicles on the road by 2020, with the number of electric car sales increasing each year so that by 2030 there would be 140,000 to 150,000 electric vehicles would be on the road.⁶ A vehicle driven 20,000 kilometres a year generates about 5 tons of greenhouse gases. A rough estimate of the emissions reduction potential is at least 500,000 tonnes.⁷

Electricity-related investments would be complemented by a provincial investment plan.

Provincial Investment Plan

Province-wide investments using carbon pricing revenue could be in the form of tax incentives, grants, and/or loan guarantees to generate emissions reductions from transportation, industry, waste, agriculture, and forestry. Investments could include:

2. Industrial telecommunications technologies to support electrification and management of industrial processes (Industry 4.0 or the Internet of Things, Big Data management, Cloud-

⁴ <https://www.nbpower.com/media/169863/dsm-plan-2016-18.pdf>; represents stretch target for achievable potential

⁵ <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ58a-eng.htm>; assuming at 50,000 new car sales a month = 600,000 a year so 100,000 electric vehicles in 2020 would be equivalent to at least 16% of all new sales

⁶ Assuming at 5,000 new car sales a month or 60,000 a year that 16% would be 9600 vehicles so rounding to 10,000

⁷ Assuming 2017: 1k, 2018: 2k, 2019: 3k, 2020: 4k (cumulative = 10k), 2021: 6k, 2022-2030: 8k rising to 20k/year for a total of 140,000 to 150,000 electric vehicles on the road and declining greenhouse gas reductions from fleet fuel economy standards.

based services), as well as carbon capture technologies appropriate to industrial processes as part of an overall shift to closed-loop manufacturing. This effort should be integrated as appropriate with investment in Smart Grid⁸. Setting a 40% emissions improvement target from the industrial sector by 2030 could generate reductions of 1.7 million tonnes of greenhouse gases.

3. Transportation investments to accelerate the sale of energy-efficient vehicles beyond what will occur naturally as a result of Canada's Corporate Average Fuel Economy standard. The federal regulation which is in line with the US, Europe, Japan and China requires that new vehicles sold in 2025 to be twice as efficient as they are today. New Brunswick's goal would be to encourage consumers to purchase energy-efficient vehicles now to keep their operating costs low once the carbon pricing regime takes effect. Heavy trucks and transit vehicles should be a priority for programs aimed at more electric options, as well as biofuels. The goal here should be to generate an additional 1 million tonnes of reductions by 2030.
4. Waste investments could include methane capture in landfills and wastewater treatment plants, composting programs to reduce future methane emissions from landfills and improved recycling programs to reduce the use of virgin materials in manufacturing.
5. Agriculture investments could be tied to development of farm-management plans that include incentives for methane and fertilizer management (to reduce nitrous oxide emissions), as well as soil conservation through organic and mixed crop practices, as well as riparian zone protection. Additional initiatives could include:
 - a. Pasture management, including grazing strategies and mixed forage to reduce methane emissions and increase carbon sequestration and water retention.
 - b. Restore/protect wetlands, riparian buffers, shelterbelts/swales, increase tree cover to improve water quality (less fertilizer/pesticides in water bodies) and mitigate storm water and floods. Modify agricultural practices (e.g. pasture management), contributing to water quality improvement and storm water and flood management.
 - c. Mitigation technologies (methane digestors) and renewables (wind and solar) on agricultural lands. Biofuel development should avoid compromising food security by focusing on marginal lands and include a climate cost-benefit analysis to yield high-efficiency/high-value biofuels (e.g., limiting water and energy resource inputs, minimizing loss in energy conversion, etc.).
 - d. Increase understanding of, support for, and access to new markets (e.g. organic, foreign, and domestic).
6. Forestry operations already rely extensively on biofuels, but forestry operation vehicles and equipment could operate on biofuels. Changes to harvesting practices to better protect soil combined with increased silviculture, including of hardwoods, would diversify our forests making them more resilient to climate change and generating an increase in carbon

<http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ58a-eng.htm>

⁸ <http://www.mckinsey.com/business-functions/operations/our-insights/manufacturings-next-act>

capture capacity through photosynthesis. A combination of reducing emissions and increasing soil and forest sequestration, as well as actions in the waste and agriculture sectors could generate a further 500,000 tonne contribution to our provincial greenhouse gas target for 2030.

The measures described so far could secure the 6.5 million tonnes of greenhouse gas reductions needed but require the policy environment to be successful. A provincial policy package must be implemented for our climate action plan to be successful.

Provincial Policy Package

For New Brunswick to contribute its fair share to Canada's national objectives and meet our commitment to cutting emissions 35% to 45% below 1990 by 2030, additional Government actions are required. These include:

1. Making climate action legally required through passage of a Climate Action Act that establishes the provincial greenhouse gas emissions reduction target of 35 to 45% below 1990 levels by 2030 and puts in place the mechanisms needed to implement the climate action plan, including carbon pricing. This legislation would require entities generating more than 10,000 tonnes of greenhouse gas emissions per year to report those emissions. The current reporting threshold is 50,000 tonnes. The change to a 10,000 tonne threshold is in line with legislated reporting requirements in Ontario, Québec and British Columbia.
2. Establishing an economy-wide carbon pricing regime (either through a carbon levy or cap and trade and/or hybrid). Critical to this effort will be to coordinate implementation within the Atlantic region and potentially within New England if the province chooses a cap and trade system. Regardless of the system chosen, the Climate Action Act should require that revenue from the levy or the sale of allowances be invested in low-or-zero emitting investments just as Ontario and Québec have done. Revenue could be placed in a Green Fund (we could use the Province's Environmental Trust Fund) as Québec has done or legislation could establish investment requirement categories and keep some of the revenue within Government and to seed a Green Investment Bank as Ontario has done.
3. Reforming the Energy Utilities Board to remove barriers to reducing electricity demand through mechanisms that decouple NB Power revenue from throughput or volume sales through performance-based ratemaking that includes energy efficiency and conservation performance metrics.
4. Requiring lifecycle assessment of all infrastructure projects, including the impacts of climate change and more extreme weather and the implications for greenhouse gas emissions and biodiversity compared to other options to find the best available solution. Green infrastructure such as restoration and enhancement of natural features (e.g. wetlands, sloughs, swales, buffers) for water quality and flood/storm water mitigation should be considered alongside traditional infrastructure solutions.

5. Including water conservation requirements in all investments in water and wastewater treatment facilities to save energy and to reduce emissions, including methane.
6. Adding low-carbon requirements to all government procurement.
7. Adopting the Energy Code for Buildings in the year it is released nationally and investing in training of inspectors to ensure adequate enforcement. The goal should be to:
 - a. Update national and provincial building codes for all new construction to meet nearly zero energy standards by 2025.
 - b. Require electric vehicle charging infrastructure and solar readiness
 - c. Establish a performance-based standard for retrofits, triggered by major renovation.
 - d. Incorporate the use of carbon sequestering or low-embodied carbon materials into building code requirements, and ensure that new construction and retrofitted buildings can withstand the changing climate by reflecting stronger winds and heavier rainfall in building codes.
 - e. Set best-in-class energy and water use standards for equipment and appliances.
 - f. Require home energy labeling and audits at point of sale, using the national EnerGuide protocol.
8. Investing in formal and informal education and training that demonstrates to New Brunswickers the causes of climate change, the opportunities for all citizens to participate in solutions and that supports retraining and training of workers, particularly in the trades, including general contracting, electrical engineering, renewable energy technicians, software engineers (for Smart Grid and other electricity-related innovations). A just transition for workers should be a priority with displaced energy and electricity sector workers the first in line for training and work in low-carbon economy jobs.
9. Adopting smart community land-use planning requirements and Smart City (integrated communications and telecommunications to manage infrastructure, transportation, and communications just like the Smart Grid manages the electricity internet and Industry 4.0 manages industrial processes more efficiently) to reduce climate pollution and to adapt to climate change impacts; encourage in our larger cities and towns investing in multi-modal transportation (encourage car sharing and shift to public transit, and active transportation (like walking, cycling).
10. Assess the potential of Property Assessed Clean Energy (PACE) financing to help home and business owners who are reluctant to invest in energy upgrades due to a lack of available capital⁹. PACE uses property taxes as a repayment vehicle for financing energy improvements from public or private third party capital pools. The property tax assessment placed on the property for the term of the PACE contract stays with the property until it is repaid. In the event of a default, the municipality can exercise a tax impact against the property. This makes property assessed financing programs extremely secure, with low default rates. Access criteria are often based on the property value and history of tax

⁹ <http://www.pacenation.us/>

payments and are often independent of a participant's personal credit. Thousands of PACE projects have been financed across the US since the start of the first programs, and thirty states now have enabling legislation in place.

11. Increasing public education – both formal and informal – about how to prepare for more extreme weather, including supporting efforts to ensure all New Brunswickers take seriously the need to prepare by having on hand supplies sufficient to survive at least 72 hours and perhaps seven days.
12. Reforming disaster relief programs to require community adaptation to climate change and working with the insurance industry to develop shared cost mechanisms to manage the costs to the economy, our communities and our families from extreme weather events. The shift over the last 50 years to relying on imported food also makes us more vulnerable when systems break down. Programs to increase the availability of local, sustainably produced food is good for the economy and lowers greenhouse gas emissions associated with transporting food over long distances.
13. Expanding investments in research and development related to the development of a bio-refining and bio-processing innovation hub in New Brunswick, Smart Grid; Smart Industry and Smart Cities and potentially renewable energy component recycling (such as with solar panel components).
14. Developing a New Brunswick/Atlantic Canada roadmap for exports of clean technology, including clean electricity from our region.¹⁰

The Conservation Council of New Brunswick's Climate Action Plan is designed to generate the greenhouse gases reductions now that are needed to protect us from a more extreme climate. Our plan would achieve our environmental goal while stimulating our economy and creating long-term sustainable jobs to keep our young people and their families here in New Brunswick where they want to be.

Our Climate Action Plan is comprehensive because climate change is a big problem that requires big solutions. We need to act urgently to change how we use energy and manage our natural resources. In the next section, we explain why.

¹⁰ Clean technology refers to products, procedures, processes, and services that minimize the use of non-renewable resources and use resources in ways that reduce costs, waste, and pollution, leading to sustainable development. They include using renewable energy sources such as wind, solar, hydro, and geothermal, as well as low-carbon fuels; water management, and recycling technologies; waste management techniques; and environmentally friendly buildings and transportation.

What's the problem?

Our lives depend on energy. We use electricity to heat and cool our homes, generate light so we can read bedtime stories to our children, and to cook a special meal for our friends. Enjoying a hot shower or a cold beer at the end of the day depends on electricity or natural gas. We rely on gasoline and other liquid fuels to run vehicles, planes, trains and buses so we can get to work or school, go on holidays or to conferences, and to visit the grandchildren. Industry employers need electricity, oil and natural gas to make and ship products to stores for consumers. It's not an overstatement to say that our entire way of life depends on energy.

Unfortunately, there are some unintended consequences from depending on this kind of energy.

Most of our energy comes from fossil fuels: carbon-based coal, gasoline, and natural gas. When we burn fossil fuels to generate energy we also produce pollution that affects air quality and changes the climate.

Air quality is affected because burning fossil fuels generates small particles and volatile organic compounds that react in sunlight to create smog and that make rain more acidic. Special pollution control equipment placed on smoke stacks and in cars can reduce this kind of pollution and once this pollution is reduced air quality can improve quickly. But producing and burning fossil fuels also releases greenhouse gases like carbon dioxide, methane and nitrous oxide affecting the climate. These emissions are not easily captured by end-of-pipe technologies.

With the global population rapidly increasing over the last 100 years and with a growing and globalized economy so much fossil fuel is being burned that a lot of pollution is going into the air that we breathe. Globally, over 40 billion tonnes of carbon dioxide was emitted in 2014.¹¹ In Canada, over 80% of the 732 million tonnes of greenhouse gas emissions that we generated in 2014 came from the energy we produce and use, about the same proportion as globally.¹² In New Brunswick the proportion of our almost 15 million tonnes of emissions in 2014 from energy use was somewhat higher at about 90%¹³

We add the remaining 10 to 20% by changing the land either by cutting trees to make products or to grow food. This happens because through photosynthesis trees and plants absorb carbon dioxide when they grow and release it when they die or are disturbed. Rotting food in landfills and using too much fertilizer also add to the problem by releasing greenhouse gases called methane and nitrous oxide.

¹¹ Intergovernmental Panel on Climate Change, Core Writing Team, Pachaur, R. K., & Meyer, L. A. (Eds.). (2014). *Climate change 2014 synthesis report: Summary for policymakers*. Geneva: Intergovernmental Panel on Climate Change (IPCC).

¹² Environment Canada. (2016). *National inventory report: Canada's greenhouse gas sources and sinks 1990 - 2014*. Ottawa; <https://www3.epa.gov/climatechange/ghgemissions/global.html>

¹³ <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/BuildingAStrongerResponseToClimateChange.pdf>



Figure 2:

The oil we dig out of the ground and ship by rail or pipeline is processed in refineries like this one in Saint John and then pumped into our cars at gas stations. The entire process of producing oil and making gasoline and then burning it to make our vehicles run generates greenhouse gas emissions that are destabilizing the climate.



Figure 3:

When we burn coal to generate electricity to heat and cool our buildings and run our equipment and appliances we also add greenhouse gases to the air. A solution would be to make our electricity from cleaner sources like hydro, wind, solar, tidal power and bioenergy and to use electricity to run our vehicles so we can phase out using oil except for products like plastics and other important things.¹⁴

¹⁴ <http://beaconenergynews.ca/energy-news/irving-oil-to-announce-plans-for-major-maintenance-project-for-refinery/>;
<http://www.cbc.ca/news/canada/new-brunswick/fredericton-bridge-repairs-cause-long-traffic-delays-1.2684228>;
https://www.google.ca/search?q=belledune+generating+station&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj5wOP557bNAhVm2IMKHQH2CQUQ_AUICigD&biw=1366&bih=623#imgrc=XvjKQfpVQOgvBM%3A;
<https://www.google.ca/search?q=moncton+aerial+images&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwiPpOm25LbNAhUG8IMKHbROAuMQsAQILA&biw=1366&bih=623#imgrc=FKIEwbqc3t81KM%3A>

We all contribute to the greenhouse gas emissions that scientists know with certainty are changing our climate through our industrial, forestry and agriculture practices, and the way we build our communities and consume and throw away products. This is because greenhouse gases like carbon dioxide, methane and nitrous oxide have a special talent: they hold heat and that is mostly a good thing. Naturally occurring greenhouse gases keep the planet's average temperature just right for life to thrive. More heat energy trapped in the atmosphere because of too many human-generated greenhouse gases, however, is unbalancing the climate system making us less safe from high-energy extreme weather and changes to sea level.



Figure 4:

When we bury garbage, especially food waste in landfills a gas called methane is produced as the waste decomposes. When we cut forests to make pulp we remove living plants and trees that absorb carbon dioxide as they grow and release it when they die through a process called photosynthesis. When we cut forests faster than they can grow back we add more greenhouse gases to the air because there are fewer trees to absorb carbon dioxide and the exposed soil decomposes faster releasing more carbon dioxide. When we use too much fertilizer another greenhouse gas called nitrous oxide is created as nature breaks it down. A solution would be to put less food waste in landfills, use fertilizer more efficiently, as well as more organic methods, and to reduce clear cutting and increase forest conservation and regeneration.¹⁵

15

<https://www.google.ca/search?q=agriculture+fertilizer+new+brunswick+images&tbm=isch&tbo=u&source=univ&sa=X&v>

All those greenhouse gases from human activities are adding too much of a good thing to the atmosphere. When these gases get into the air it takes the Earth a long time to process them: up to 100 years or more for carbon dioxide, and for some greenhouse gases, it can take thousands of years.

The world's leading climate scientists are absolutely certain – as certain as 95 to 100% that humans are the primary cause of the pollution increasing global temperatures:

“Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely (95 to 100%) to have been the dominant cause of the observed warming since the mid-20th century” (Intergovernmental Panel on Climate Change, Core Writing Team, Pachaur, & Meyer, 2014, p. 3)

While it might sound complicated, think of what we're doing as putting an extra blanket around the Earth. Greenhouse gases from burning fossil fuels act like a blanket keeping heat at the surface so the Earth gets hotter and we go from being cozy to sweating. Unfortunately, when the thicker greenhouse gas blanket makes the Earth too hot, we can't take it off. We're better off in this case to not add any more blankets.

[ed=0ahUKEwjz5OE67bNAhVLRlIKHYohBqQQsAQIHA&biw=1366&bih=623&dpr=1#imgrc=VPqfuegTpxaFRM%3A;](https://www.google.ca/search?q=clear+cut+images+new+brunswick&biw=1366&bih=623&tbn=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwiO6dvv6rbNAhUcA1IKHSXICFsAQIHQ&dpr=1#imgrc=dRx8b1G1MyBq5M%3A;)
<https://www.google.ca/search?q=clear+cut+images+new+brunswick&biw=1366&bih=623&tbn=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwiO6dvv6rbNAhUcA1IKHSXICFsAQIHQ&dpr=1#imgrc=dRx8b1G1MyBq5M%3A;>
https://www.google.ca/search?q=garbage+landfill+new+brunswick+images&source=lnms&tbn=isch&sa=X&ved=0ahUKEwiZk7P26bbNAhVQXVIKHVvWDVgQ_AUICcgB&biw=1366&bih=623#imgrc=JCJSvt_GGo3zM%3A;
https://www.google.ca/search?q=pulp+production+new+brunswick&source=lnms&tbn=isch&sa=X&ved=0ahUKEwi9xd7V7bbNAhVIGlIKHaxcDZ8Q_AUICcgB&biw=1366&bih=623#imgrc=IV2zjXom1A6J-M%3A



Global warming is caused, in part, by the man-made blanket of carbon dioxide that surrounds the earth and traps in heat. It is thickened by burning large quantities of fossil fuels – coal, oil and natural gas. By burning these fossil fuels, we release Carbon Dioxide (CO₂) and other greenhouse gases into the air where it builds up, the globe warms and the atmospheric balance that keeps the climate stable is disrupted.

Source: Frameworks Institute. [How to talk about Climate Change and Oceans: A Frameworks Message Brief](#)

Figure 5:
Adding greenhouse gases to the air is like adding a human-made blanket over the Earth.

Scientists specializing in understanding how the climate system works understand well the physics of how greenhouse gases affect temperature. And because each molecule of greenhouse gas has a specific capacity to hold heat, scientists can calculate within a range, and with confidence, how much warming is likely to result from different projections of greenhouse gas emissions. Scientists can also calculate the potential influence of higher temperatures on how much moisture the atmosphere can hold. With 71% of the Earth covered by oceans, scientists calculate that for every 1

degree Celsius increase in temperature the atmosphere can hold 7% more water and that extra water is expected to increase the volume of precipitation by 1 to 2% per degree of warming.¹⁶

We can see how these basic facts about climate change are affecting the province that we all care about. The Government of New Brunswick reports that temperatures have “increased by 1.5°C relative to historical norms and seasonal temperatures have increased in all parts of the province”. Most of this warming (1.1 degrees Celsius) has occurred in the last 30 years. When scientists peer into the looking glass using highly sophisticated climate models, the results suggest there is a strong chance that by 2100, New Brunswick’s mean annual temperature will increase by as much as 5°C. The number of very hot days (+35°C) is also expected to increase dramatically in some parts of the province. From 2000 to 2010, there were more extreme rainfall events (50 millimetres or more of rain over a 24-hour period) in Fredericton and Moncton than any other decade on record. Climate models project that New Brunswick will experience less frequent but more intense precipitation events, increasing the annual total precipitation throughout the province.”¹⁷

The climate is changing now and New Brunswickers are vulnerable whether it is from higher temperatures threatening the health of very young children and older people, or those with health problems¹⁸. More intense rainfall is causing flooding and damaging our homes; ice and wind storms are knocking out our power risking our safety in winter and our food supply in summer interrupting our lives and economy. Sea level rise and coastal erosion are changing where communities can be located. Experiencing extreme events that disrupt our lives also can harm our mental health, as well as our pocket books.

The cost of post-tropical storm Arthur exceeded \$12.5 million dollars, according to the province’s flood history database. Combined with damage costs from other flooding events since 2010, total damage costs exceed \$80 million.¹⁹ Insurance and government have limited capacity to cover all these damages: each of us will bear the cost of climate change either through higher insurance premiums, taxes and/or direct payment. And these kinds of costs are going to increase over time. According to the province’s 2014 climate action plan update “the annual cost of damage to homes due to coastal flooding is expected to reach \$730 to \$1,803 per New Brunswicker by 2050, higher than any of the other Atlantic Provinces and five times higher than the Canadian average.”²⁰

¹⁶ <https://www.theguardian.com/environment/2011/dec/15/climate-change-rainfall>

¹⁷ <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/BuildingAStrongerResponseToClimateChange.pdf>, p. 9

¹⁸ <http://www.thelancet.com/commissions/climate-change>

¹⁹ <http://www.elgegl.gnb.ca/0001/en/Flood/Search?LocationName=St.+Stephen;>

<http://globalnews.ca/news/1681031/new-brunswick-to-help-pay-for-damage-caused-by-post-tropical-storm-arthur/>

²⁰ <http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/ClimateChangeActionPlan2014-2020.pdf>

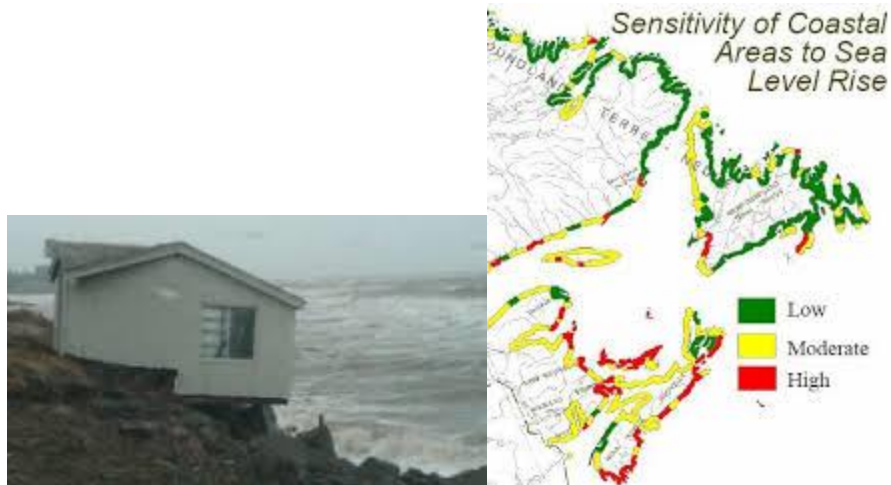


Figure 6:
*New Brunswick is already affected by climate change. Coastal erosion is just one problem that is going to get worse as sea level rises because the oceans receive more water from melting glaciers and expand as they get warmer. These changes mean, for example, that there is more energy in the ocean making waves more powerful. Coastal erosion is already affecting northern communities like Cap-de-Cocagne and our shores are at moderate to high risk in the future.*²¹

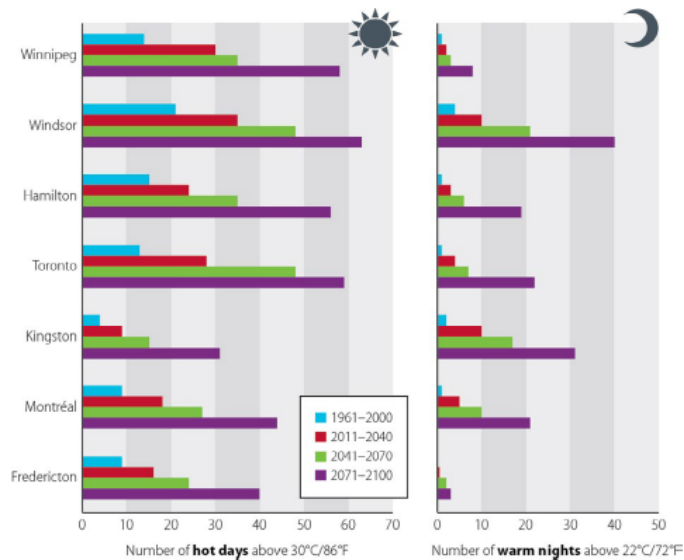


Figure 7:
*New Brunswick residents will experience more days per year over 30 degrees Celsius with climate change.*²²

²¹ <http://www.cbc.ca/news/canada/new-brunswick/new-brunswick-coasts-are-at-risk-climate-change-report-says-1.2661881>; <http://www.elements.nb.ca/theme/climate07/jon/jon.htm>

²² Warren, F. J., & Lemmen, D. S. (2014). *Canada in a changing climate: Sector perspectives on impacts and adaptation*. Ottawa: Natural Resources Canada.

From St. Stephen to Lamèque disruption from flooding and loss of shoreline is an increasing fact of life. We need to work together to keep our communities safe. We can do that by being more prepared for extreme events and supporting governments in setting new rules for land-use that severely limit development on flood plains and on at-risk shoreline. We need to ensure all infrastructure investments account for projected climate change impacts, as well as the greenhouse gas emissions they might generate over the course of their operation compared to less polluting options.

We Need to Live Within our Means

As a province, we also need to do our fair share to cut our contribution to climate altering pollution and we need to show we take the problem seriously so others will too. New Brunswick has the third highest per capita emissions after Alberta and Saskatchewan²³. We need to cut our greenhouse gas emissions in collaboration with governments in Canada, North America and around the globe because we can't protect the people and communities we care about without national and international collaboration. Slowing growth in greenhouse gas emissions is not enough. We need to work together get global greenhouse gases to levels the Earth's oceans and land can absorb.

Think of a bathtub with the taps fully turned on and water nearly overflowing. If you only turn the taps slightly to slow the water flow, the tub will still overflow. To stop the bathtub from overflowing you have to turn the taps off and to get the water level down you will need to pull the plug. If you think of the atmosphere like a bathtub, we have to lower greenhouse gas pollution enough to slow or stop the flow (turning the taps off) and we have to increase the capacity of the Earth to absorb carbon particularly through increasing green cover with forests and perennial plants (pulling the plug).

23

http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/canadas_2nd_biennial_report.pdf

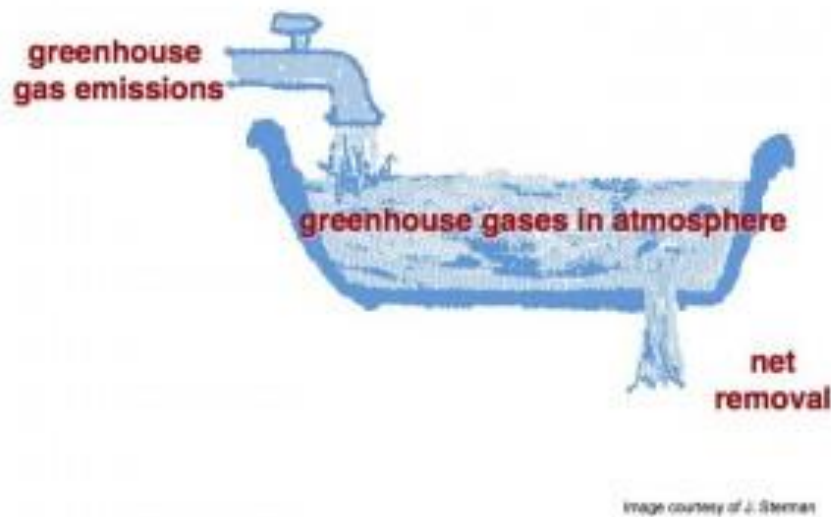


Figure 8:

If we want to stop the bathtub from overflowing we have to turn the taps off and pull the plug to lower the water level. We can think of the total amount of water a tub can hold before overflowing as a water budget. The same idea applies to the atmosphere. There is a total amount of greenhouse gas pollution that the atmosphere can hold before temperature increases become dangerous. The global carbon budget is being used rapidly meaning we have to cut the emissions going into the air (turning off the taps) and we have to pull the plug to suck up more carbon (increase sinks).

You can think of the total amount of water that a bathtub can hold as a water budget. Scientists think of the atmosphere in a similar way when they think about how much greenhouse gas can be released into the atmosphere before exceeding dangerous increases in global temperature which, in turn, would have serious impacts on the climate. There is now a general scientific and political consensus that the world should act to keep global temperature increases to “well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.”²⁴ This is what countries around the world, including Canada, agreed to at the United Nations climate change negotiations held in Paris, France in 2015. The world has already seen global average temperature increase by 1 degree Celsius above pre-industrial levels (and in Canada and New Brunswick we have warmed more than that amount), and global emissions are still increasing.

Climate experts have calculated how much carbon dioxide, or carbon budget, is available to have a 66% chance of staying below 2 degrees Celsius: 21 years is all that remains and it declines every year. If we account for other greenhouse gases; or want to have a greater probability of success (would you get in a plane that had a 33% chance of crashing?); or aim to keep global temperature

²⁴ http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf, p.5

increases closer to 1.5 degrees Celsius then the budget is even smaller and the timeline shorter (less than 7 years; Figure 8). The implications are clear: by 2030 the world (and that means Canada and New Brunswick), needs to be well on the way to phasing out fossil fuels and transitioning to a cleaner, more efficient and renewable energy system.

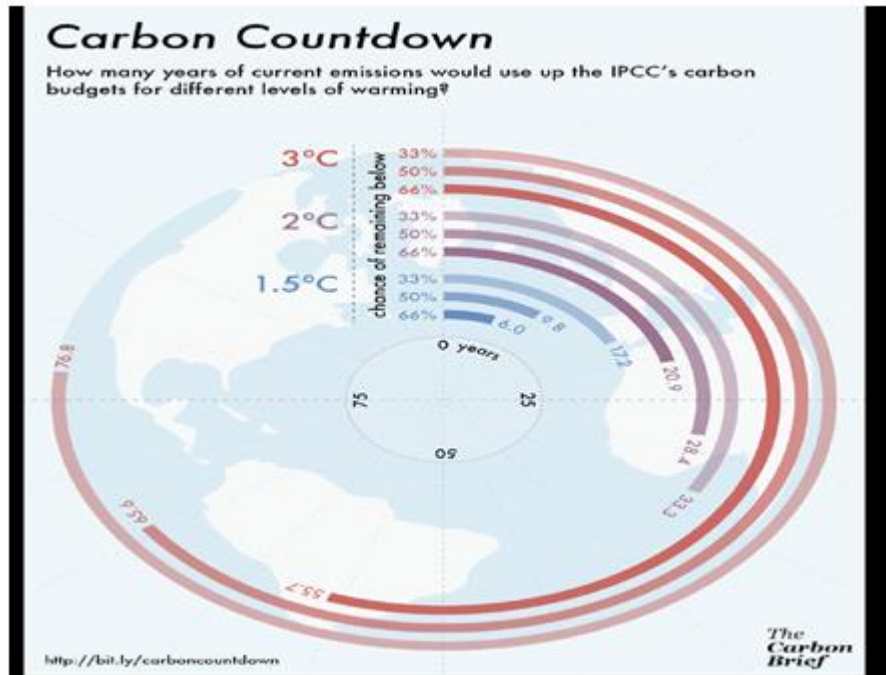


Figure 9:
If we want to a 66% chance of keeping global temperatures well below 2 degrees Celsius above pre-industrial levels then at current global emission levels there is just 21 years remaining. The Paris Climate Agreement only slows emissions a little: after full implementation 75% of the global carbon budget will have been used up.

Doing our Fair Share

If we want to protect our communities, families and businesses from the negative effects of climate change we need to be part of the global and Canadian effort to find solutions. The transition from a fossil-fuel-based lifestyle and economy will be more rapid than people understand, especially if we are serious about limiting temperature increases. That's because government commitments to cut greenhouse gas pollution under the Paris Agreement do not yet put the world on track to staying well below 2 degrees Celsius warming.

Analysis by the United Nations Climate Change Secretariat, the body that manages the climate negotiating process and the International Energy Agency both note that global emissions continue to grow, although at a slower pace, AFTER implementation of the commitments governments

promised in the Paris negotiations. In fact, 75% of the global carbon budget will be used up after accounting for current government commitments.²⁵ The hard reality of climate change is that much more must be done. Our efforts to cut greenhouse gas pollution must be accelerated and that includes in Canada and New Brunswick.

As efforts to slow climate change accelerate by cutting greenhouse gas emissions (a process called decarbonization) demand for oil, for example, will decline likely keeping the price per barrel at or below the \$40/barrel range. At this price point, the National Energy Board expects oil production in Canada to peak after 2020²⁶ because it is more expensive than \$40/barrel to develop the oil sands. Energy analysts expect that the vast majority of the oil sands will never be developed²⁷.

The good news is that the transition away from fossil fuels toward a modern energy system is already creating more jobs than in traditional energy development. Clean Energy Canada's 2016 Tracking the Energy Revolution report notes that in 2015 \$325 billion USD was invested in clean energy with \$161 billion of that investment in solar energy; \$110 billion in wind; \$42 billion in large hydro and almost \$4 billion in small hydro. The cost of solar has declined 82% and wind by 61% since 2009 making these sources of electricity increasingly cost-competitive. With 96 cities, states, and countries already committed to going 100% renewable, the puck is going into the renewables net.²⁸

Energy experts analysing pathways to deep decarbonization in Canada find that it spurs investments that double the size of the national electricity system²⁹. That's because the new energy system will rely more on electricity generated from renewable energy like solar, wind, hydroelectricity and biofuels than it does on coal, oil and natural gas. Investment spending could be as high as \$13.5 billion a year to generate the clean electricity we will need to run our homes, vehicles and factories. Sadly, investment in renewable energy in Canada was only \$4 billion in 2015; a level far below what researchers say is needed to meet our climate goals. A 2015 report from the United Nations Industrial Development Organization and the Global Green Growth Institute concludes that:

As a general proposition, countries that sustain a 1.5 percent of GDP level of annual investments in energy efficiency and clean renewables will also be able to maintain economic growth at healthy rates while providing a sufficient supply of energy resources to undergird growth.

²⁵ https://www.iea.org/media/news/WEO2015_COP21Briefing.pdf;

<http://unfccc.int/resource/docs/2015/cop21/eng/07.pdf>

²⁶ <http://www.neb-one.gc.ca/nrg/ntgrtd/ftr/2016/index-eng.html>

²⁷ McGlade, C., & Ekins, P. (2015). The geographical distribution of fossil fuels unused when limiting global warming to 2°C. *Nature*, 517, 187-193.

²⁸ <http://cleanenergycanada.org/work/tracking-the-energy-revolution-global-2016/>

²⁹ <http://www.cmcghg.com/wp-content/uploads/2015/07/Final-Canada-DDPP-Country-Report-July-14.pdf>

These investments in energy efficiency and renewable energy will also be a net new source of job opportunities. More specifically, new investments in energy efficiency and renewable energy will generate more jobs for a given amount of spending than maintaining or expanding each country's existing fossil fuel sectors³⁰.

Canada's economy generated 1.9 trillion dollars of activity in 2014; New Brunswick \$32 billion.³¹ At 1.5% of gross domestic product (GDP), Canada should be investing \$28.5 billion in energy efficiency and clean energy a year, and New Brunswick should be investing \$500 million annually at least until the energy revolution is well underway.

Blue-Green Canada, an alliance of labour and environmental groups, calculate that for every \$1 million invested in the fossil fuel sector two jobs are created; and 15 jobs are created in the clean energy sector³². If we use those numbers as a guide then New Brunswick could create up to 7500 jobs a year in clean energy. Compare this potential to the Energy East pipeline. The Conference Board of Canada in a report for TransCanada finds that total potential job creation of 6,570 direct (3,248 during construction and 3,322 during operation) in total over 20 years.³³ Clearly, the real job growth potential for New Brunswick is in clean energy.

A Climate Action Plan for New Brunswick

To create jobs in the growing clean energy sector Canada and New Brunswick must regulate steep greenhouse gas emissions reductions to stimulate innovation and creativity.

New Brunswick generated about 15 million tonnes of greenhouse gas emissions in 2014.³⁴ Projections for 2020 and 2030 suggest emissions will grow slightly and then remain flat. These projections might give comfort to people focused on whether New Brunswick will meet its 2020 target of cutting emissions 10% below 1990 by 2020. Government of Canada projections are that New Brunswick's emissions in 2020 could be 17 million tonnes; so more action in the near term is required to reach our goal of about 15 million tonnes of emissions. But we can't stop there. To really deal with climate change we also need a strong 2030 target. Along with New England Governors and other Atlantic Premiers, New Brunswick has agreed to a regional goal of 35% to 45% percent below 1990 by 2030.

³⁰

http://www.unido.org/fileadmin/user_media_upgrade/Resources/Policy_advice/GLOBAL_GREEN_GROWTH_REPORT_vol_1_final.pdf

³¹ https://en.wikipedia.org/wiki/List_of_Canadian_provinces_and_territories_by_gross_domestic_product

³² <http://bluegreencanada.ca/jobs-per-million>

³³ <http://www.energyeastpipeline.com/benefits/jobs-gdp-economy-growth-from-the-energy-east-pipeline-by-province/>

³⁴ Environment Canada. (2016). *National inventory report: Canada's greenhouse gas sources and sinks 1990 - 2014*. Ottawa.

A target of 35% to 45% below 1990 by 2030 implies New Brunswick should aim to lower its emissions to between 9 and 11 million tonnes by 2030. That means we need a climate action plan for the province that cuts approximately 6 to 7 million tonnes from our inventory.

The first place to look is where our emissions come from now. Figure 9 shows that electricity is a big part of the problem (as well as the solution!), followed by industry and transportation. Buildings relying on natural gas also have a contribution to make, as does cutting waste and making agriculture and forestry more sustainable. These numbers do not include the potential to increase absorption of carbon dioxide by increasing soil and forest cover. Figures 10 and 11 show how New Brunswick stacks up compared to other provinces and territories, and where our emissions are expected to go from now until 2030.

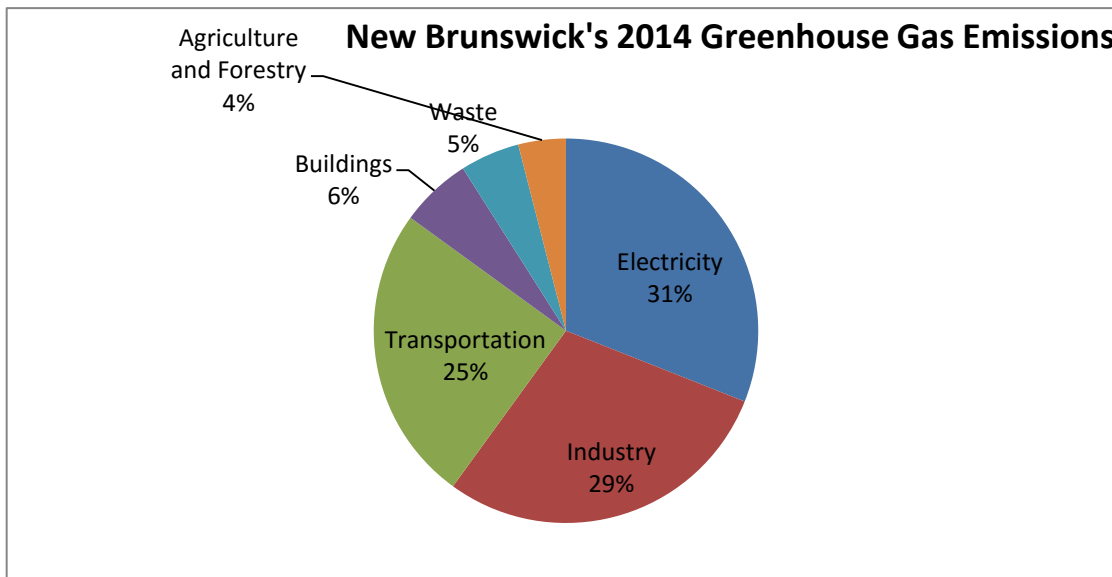


Figure 10: *New Brunswick's greenhouse gas emissions come from burning coal at the Belledune Generating station (2.8 million tonnes in 2014) and heavy oil at Coleson Cove (half a million tonnes) to make electricity; oil and natural gas to process natural resources and manufacture products in the industrial sector; and oil and diesel fuel to run vehicles, trucks and buses.*³⁵

³⁵ http://www.ec.gc.ca/ges-ghg/donnees-data/index.cfm?do=results&lang=en&year=2014&gas=all&fac_name=Belledune&prov=all&city=&naics=all&submit=Submit; Environment Canada. (2016). National inventory report: Canada's greenhouse gas sources and sinks 1990 - 2014. Ottawa.

Per Capita by Province/Territory

TABLE A25: PROVINCIAL AND TERRITORIAL PER CAPITA GHG EMISSIONS: 2005 TO 2030 (T/CAPITA)

	2005	2013	2020	2030	Change 2005 to 2020	Change 2005 to 2030
Newfoundland and Labrador	20.1	16.4	17.7	15.0	-2.4	-5.1
Prince Edward Island	15.3	12.3	12.1	11.4	-3.2	-3.9
Nova Scotia	25.5	19.4	16.2	14.8	-9.3	-10.7
New Brunswick	27.5	20.8	22.4	22.2	-5.0	-5.3
Quebec	11.0	10.1	9.9	9.9	-2.0	-2.0
Ontario	16.8	12.6	11.8	11.5	-5.1	-5.4
Manitoba	17.5	16.9	15.9	15.2	-1.7	-2.3
Saskatchewan	70.0	67.6	63.7	57.6	-6.3	-12.3
Alberta	70.4	66.7	64.1	57.9	-6.3	-12.5
British Columbia	15.4	13.7	14.5	15.3	-0.8	-0.1
Yukon Territory	14.6	9.8	15.4	17.7	0.8	3.1
Northwest Territory	38.2	33.2	41.5	47.3	3.3	9.1
Nunavut	11.4	6.2	8.7	9.4	-2.7	-2.0
Canada	23.2	20.7	20.3	19.8	-2.9	-3.5

Note: Numbers may not sum to the total due to rounding.

Provincial/Territorial Emissions

TABLE A24: PROVINCIAL AND TERRITORIAL GHG EMISSIONS: 2005 TO 2030 (MT CO₂ EQ)

	2005	2013	2020	2030	Change 2005 to 2020	Change 2005 to 2030
Newfoundland and Labrador	10	9	9	8	-1	-3
Prince Edward Island	2	2	2	2	0	0
Nova Scotia	24	18	15	14	-9	-10
New Brunswick	21	16	17	16	-4	-4
Quebec	90	83	85	90	-6	0
Ontario	211	171	171	181	-40	-30
Manitoba	21	21	22	24	1	3
Saskatchewan	70	75	75	73	6	4
Alberta	234	267	297	320	63	86
British Columbia	64	63	72	83	7	18
Yukon Territory	0	0	1	1	0	0
Northwest Territory	2	1	2	2	0	0
Nunavut	0	0	0	0	0	0
Canada	749	726	768	815	18	66

Note: Numbers may not sum to the total due to rounding.

Figures 11a and 10b:

Provincial per capita and total emissions are expected grow slightly to 2020 and remain flat to 2030 compared to 2013 emissions of 16 million tonnes (emissions were 15 million tonnes in 2014).³⁶

36

http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/canadas_2nd_biennial_report.pdf

Where will the reductions come from?

Almost 40% of the reductions we are looking for to meet a 2030 target of 35% to 45% below 1990 should come from phasing coal out of our electricity system³⁷ like Ontario has already done and Alberta will do by 2030. Phasing out coal from the New Brunswick electricity system is a big challenge and one not to be taken lightly. The Conservation Council of New Brunswick takes seriously both climate change and the need for a reliable and sustainable electricity system that keeps bills reasonable for consumers.

Any talk of coal phase out or other changes to the electricity system generally is met with the response that change will increase power rates. Low power rates encourage consumption and actually cost consumers more. Bloomberg, citing World Energy Council and International Energy Agency data, notes that German households pay an average monthly electricity bill of \$96.36, at a rate of 33.88 cents a kilowatt-hour and usage of 284.42 kilowatts. U.S. households, on the other hand, pay an average of \$111.95 a month, at a rate of 11.88 cents per kilowatt-hour and usage of 942.33 kilowatts. In Italy where the average monthly bill is \$65.99, the power rate is 28.84 cents per kilowatt-hour. In France, the monthly power bill is only \$75.64, at an average rate of 17.51 cents per kilowatt-hour³⁸. Clearly, higher rates do not imply higher bills.

The key to lower bills is a comprehensive approach to conservation and energy efficiency that is part of an overall climate plan that benefits consumers and creates jobs while protecting the climate. Here's how CCNB thinks we can get there.

The federal Government is negotiating provincial contributions to Canada's overall goal of reducing our national emissions 30% below 2005 by 2030. New Brunswick needs to offer to contribute an average of 6.5 million tonnes toward the national goal. The greenhouse gas reduction offer should form the basis for negotiations with the federal government. The federal Government established in its 2016 budget a \$2 billion Low Carbon Economy Fund and promised to create a national system for carbon pricing with all monies raised in a province being returned to that province for investment in greenhouse gas reductions. If we assume that the national floor price for carbon will be in the range of \$20 to \$30/tonne initially, then a 6.5 million tonne contribution to Canada's national climate change target is worth between \$130 million to \$195 million.

New Brunswick should seek to secure a Memorandum of Understanding with the Government of Canada that commits the province to securing 6.5 million tonnes of reductions in exchange for a one-time payment of \$130 million to \$195 million to support greenhouse gas emission reductions. A provincial carbon price of \$20 to \$30 tonne covering 80% of emissions would also generate between \$238 million to \$357 million initially and decline over time as coal is phased out of

³⁷ If we assume 6.5 million tonnes of reduction (splitting the 6 to 7 Mt requirement down the middle) is required then 2.8 million tonnes which are from burning coal to make electricity contributes 40% to the overall goal.

³⁸ <http://www.bloomberg.com/news/articles/2015-04-22/u-s-power-grid-s-2-trillion-upgrade-needs-european-efficiency>

electricity and vehicles transition off gasoline. Over the first five years or so, however, these combined investments would take the province to the \$500 million annually, or 1.5% of GDP recommended by the United Nations³⁹ Industrial Development Organization and the Global Green Growth Institute to transition to a low-carbon economy.

CCNB's Climate Action Plan

We propose a three-part climate action plan covering electricity, investments and policy.

Electricity

The electricity program would be supported by investing the one-time federal contribution of \$130 million to \$195 million as follows:

1. Allocate \$56 million to \$84 million (based on \$20 and \$30/tonne and a contribution of 2.8 million tonnes from coal phase out) to NB Power or a combination of NB Power and an independent agency with a efficiency and low-carbon economy mandate to invest in:
 - a. An economy-wide investment in energy efficiency through building retrofits in social housing, the residential, commercial/institutional/government (including municipal), and industrial sectors; and equipment and appliances. The goal would be to advance NB Power's Reduce and Shift Demand objective of 609 MW by 2038 to 2020 to 2025⁴⁰. NB Power should also be given the mandate to invest in energy efficiency targeting natural gas and oil dependent buildings. These investments would target the 6% of provincial emissions coming from these fossil fuel heating sources. Retrofits of these buildings could generate additional greenhouse gas reductions of about 360,000 tonnes assuming a 40% reduction in fossil fuel energy demand. Energy efficiency investments are cost effective (4 to 5 cents kWh).
 - b. Coal phase-out and the use of non-fossil-fuel-fired electricity for exports. The date for coal phase-out would be determined pending further analysis and negotiations with the Government of Canada, but the objective is to align with Alberta's commitment to phase coal out by 2030, which is expected to inform federal planning for national coal phase-out.
 - c. Electrification of the New Brunswick economy using clean electricity. The province is already the second most electricity-intensive economy after Québec. We can build on this foundation to significantly accelerate investments in the Smart Grid (the Energy Internet) to give the electricity system the capacity it needs to significantly increase the supply of renewable energy (aiming for 100% renewable). The Smart Grid is central to managing a more distributed energy system, as well as

39

http://www.unido.org/fileadmin/user_media_upgrade/Resources/Policy_advice/GLOBAL_GREEN_GROWTH_REPORT_vol1_final.pdf

⁴⁰ <https://www.nbpower.com/media/102794/irpjuly2014-english.pdf>, p.128

providing load balancing services to Nova Scotia, PEI and New England. The electrification strategy, or roadmap, can build on work completed under the Atlantic Energy Gateway Initiative and take advantage of new federal support aimed at identifying opportunities for regional electricity cooperation⁴¹. Our electrification roadmap needs to be regionally focused, particularly because Nova Scotia will also need to phase out coal, and include a regional and long-term system investment plan (i.e. modernizing and integrating regional transmission networks, as well as regional targets for renewable energy to replace the loss of coal-fired generation. Acceleration of Smart Grid investments could advance installation of additional renewable energy technologies along with installation of next generation meters, hot water heaters and storage devices using telecommunications systems to manage a distributed load (including micro-grids; beyond what is already currently funded). Expanded regional investment in renewable energy would include accelerated solar rooftop targets. A stretch target for New Brunswick could be 200,000 kilowatts (kW) of cumulative installed commercial and residential solar power by 2025 (100,000 kW each for residential and commercial, grid connected and off-grid), with NB Power working with suppliers to develop home equity loan and/or leasing, and power purchase agreements packages aimed at lowering payback periods from the current 13 to 15 years to between 5 and 10 years.⁴²

- d. Accelerated scale up of electricity transportation infrastructure and incentives to increase the sale of electric plug-in and low-emission hybrid vehicles. Québec has a legislated target of putting 100,000 electric vehicles on the road by 2020: that's about 1.2% of the total fleet of over 8 million vehicles registered or about 16% of new car sales in 2020.⁴³ A similar scheme for New Brunswick would set a goal of 10,000 electric vehicles on the road by 2020, with the number of electric car sales increasing each year so that by 2030 there would be 140,000 to 150,000 electric vehicles would be on the road.⁴⁴ A vehicle driven 20,000 kilometres a year generates about 5 tons of greenhouse gases. A rough estimate of the emissions reduction potential is at least 500,000 tonnes.⁴⁵

Electricity-related investments would be complemented by a provincial investment plan.

⁴¹ <http://www.acoa-apeca.gc.ca/eng/publications/ResearchStudies/Pages/Home.aspx#aeg>; Federal budget 2016 provided \$5 million over two years to engage provinces and utilities in assessing regional electricity cooperation opportunities

⁴² <https://www.nbpower.com/media/169863/dsm-plan-2016-18.pdf>; represents stretch target for achievable potential

⁴³ <http://www.statcan.gc.ca/tables-tableaux/sum-som/I01/cst01/econ58a-eng.htm>; assuming at 50,000 new car sales a

month = 600,000 a year so 100,000 electric vehicles in 2020 would be equivalent to at least 16% of all new sales

⁴⁴ Assuming at 5,000 new car sales a month or 60,000 a year that 16% would be 9600 vehicles so rounding to 10,000

⁴⁵ Assuming 2017: 1k, 2018: 2k, 2019: 3k, 2020: 4k (cumulative = 10k), 2021: 6k, 2022-2030: 8k rising to 20k/year for a total of 140,000 to 150,000 electric vehicles on the road and declining greenhouse gas reductions from fleet fuel economy standards.

Provincial Investment Plan

Province-wide investments using carbon pricing revenue could be in the form of tax incentives, grants, and/or loan guarantees to generate emissions reductions from transportation, industry, waste, agriculture, and forestry. Investments could include:

2. Industrial telecommunications technologies to support electrification and management of industrial processes (Industry 4.0 or the Internet of Things, Big Data management, Cloud-based services), as well as carbon capture technologies appropriate to industrial processes as part of an overall shift to closed-loop manufacturing. This effort should be integrated as appropriate with investment in Smart Grid⁴⁶. Setting a 40% emissions improvement target from the industrial sector by 2030 could generate reductions of 1.7 million tonnes of greenhouse gases.
3. Transportation investments to accelerate the sale of energy-efficient vehicles beyond what will occur naturally as a result of Canada's Corporate Average Fuel Economy standard. The federal regulation which is in line with the US, Europe, Japan and China requires that new vehicles sold in 2025 to be twice as efficient as they are today. New Brunswick's goal would be to encourage consumers to purchase energy-efficient vehicles now to keep their operating costs low once the carbon pricing regime takes effect. Heavy trucks and transit vehicles should be a priority for programs aimed at more electric options, as well as biofuels. The goal here should be to generate an additional 1 million tonnes of reductions by 2030.
4. Waste investments could include methane capture in landfills and wastewater treatment plants, composting programs to reduce future methane emissions from landfills and improved recycling programs to reduce the use of virgin materials in manufacturing.
5. Agriculture investments could be tied to development of farm-management plans that include incentives for methane and fertilizer management (to reduce nitrous oxide emissions), as well as soil conservation through organic and mixed crop practices, as well as riparian zone protection. Additional initiatives could include:
 - a. Pasture management, including grazing strategies and mixed forage to reduce methane emissions and increase carbon sequestration and water retention.
 - b. Restore/protect wetlands, riparian buffers, shelterbelts/swales, increase tree cover to improve water quality (less fertilizer/pesticides in water bodies) and mitigate storm water and floods. Modify agricultural practices (e.g. pasture management), contributing to water quality improvement and storm water and flood management.
 - c. Mitigation technologies (methane digestors) and renewables (wind and solar) on agricultural lands. Biofuel development should avoid compromising food security by focusing on marginal lands and include a climate cost-benefit analysis to yield

<http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ58a-eng.htm>

⁴⁶ <http://www.mckinsey.com/business-functions/operations/our-insights/manufacturing-next-act>

- high-efficiency/high-value biofuels (e.g., limiting water and energy resource inputs, minimizing loss in energy conversion, etc.).
 - d. Increase understanding of, support for, and access to new markets (e.g. organic, foreign, and domestic).
6. Forestry operations already rely extensively on biofuels, but forestry operation vehicles and equipment could operate on biofuels. Changes to harvesting practices to better protect soil combined with increased silviculture, including of hardwoods, would diversify our forests making them more resilient to climate change and generating an increase in carbon capture capacity through photosynthesis. A combination of reducing emissions and increasing soil and forest sequestration, as well as actions in the waste and agriculture sectors could generate a further 500,000 tonne contribution to our provincial greenhouse gas target for 2030.

The measures described so far could secure the 6.5 million tonnes of greenhouse gas reductions needed but require the policy environment to be successful. A provincial policy package is must be implemented for our climate action plan to be successful.

Provincial Policy Package

For New Brunswick to contribute its fair share to Canada’s national objectives and meet our commitment to cutting emissions 35% to 45% below 1990 by 2030, additional Government actions are required. These include:

1. Making climate action legally required through passage of a Climate Action Act that establishes the provincial greenhouse gas emissions reduction target of 35 to 45% below 1990 levels by 2030 and puts in place the mechanisms needed to implement the climate action plan, including carbon pricing. This legislation would require entities generating more than 10,000 tonnes of greenhouse gas emissions per year to report those emissions. The current reporting threshold is 50,000 tonnes. The change to a 10,000 tonne threshold is in line with legislated reporting requirements in Ontario, Québec and British Columbia.
15. Establishing an economy-wide carbon pricing regime (either through a carbon levy or cap and trade and/or hybrid). Critical to this effort will be to coordinate implementation within the Atlantic region and potentially within New England if the province chooses a cap and trade system. Regardless of the system chosen, the Climate Action Act should require that revenue from the levy or the sale of allowances be invested in low-or-zero emitting investments just as Ontario and Québec have done. Revenue could be placed in a Green Fund (we could use the Province’s Environmental Trust Fund) as Québec has done or legislation could establish investment requirement categories and keep some of the revenue within Government and to seed a Green Investment Bank as Ontario has done.
16. Reforming the Energy Utilities Board to remove barriers to reducing electricity demand through mechanisms that decouple NB Power revenue from throughput or volume sales

through performance-based ratemaking that includes energy efficiency and conservation performance metrics.

17. Requiring lifecycle assessment of all infrastructure projects, including the impacts of climate change and more extreme weather and the implications for greenhouse gas emissions and biodiversity compared to other options to find the best available solution. Green infrastructure such as restoration and enhancement of natural features (e.g. wetlands, sloughs, swales, buffers) for water quality and flood/storm water mitigation should be considered alongside traditional infrastructure solutions.
18. Including water conservation requirements in all investments in water and wastewater treatment facilities to save energy and to reduce emissions, including methane.
19. Adding low-carbon requirements to all government procurement.
20. Adopting the Energy Code for Buildings in the year it is released nationally and investing in training of inspectors to ensure adequate enforcement. The goal should be to:
 - a. Update national and provincial building codes for all new construction to meet nearly zero energy standards by 2025.
 - b. Require electric vehicle charging infrastructure and solar readiness
 - c. Establish a performance-based standard for retrofits, triggered by major renovation.
 - d. Incorporate the use of carbon sequestering or low-embodied carbon materials into building code requirements, and ensure that new construction and retrofitted buildings can withstand the changing climate by reflecting stronger winds and heavier rainfall in building codes.
 - e. Set best-in-class energy and water use standards for equipment and appliances.
 - f. Require home energy labeling and audits at point of sale, using the national EnerGuide protocol.
21. Investing in formal and informal education and training that demonstrates to New Brunswickers the causes of climate change, the opportunities for all citizens to participate in solutions and that supports retraining and training of workers, particularly in the trades, including general contracting, electrical engineering, renewable energy technicians, software engineers (for Smart Grid and other electricity-related innovations). A just transition for workers should be a priority with displaced energy and electricity sector workers the first in line for training and work in low-carbon economy jobs.
22. Adopting smart community land-use planning requirements and Smart City (integrated communications and telecommunications to manage infrastructure, transportation, and communications just like the Smart Grid manages the electricity internet and Industry 4.0 manages industrial processes more efficiently) to reduce climate pollution and to adapt to climate change impacts; encourage in our larger cities and towns investing in multi-modal transportation (encourage car sharing and shift to public transit, and active transportation (like walking, cycling).
23. Assess the potential of Property Assessed Clean Energy (PACE) financing to help home and business owners who are reluctant to invest in energy upgrades due to a lack of available

capital⁴⁷. PACE uses property taxes as a repayment vehicle for financing energy improvements from public or private third party capital pools. The property tax assessment placed on the property for the term of the PACE contract stays with the property until it is repaid. In the event of a default, the municipality can exercise a tax impact against the property. This makes property assessed financing programs extremely secure, with low default rates. Access criteria are often based on the property value and history of tax payments and are often independent of a participant's personal credit. Thousands of PACE projects have been financed across the US since the start of the first programs, and thirty states now have enabling legislation in place.

24. Increasing public education – both formal and informal – about how to prepare for more extreme weather, including supporting efforts to ensure all New Brunswickers take seriously the need to prepare by having on hand supplies sufficient to survive at least 72 hours and perhaps seven days.
25. Reforming disaster relief programs to require community adaptation to climate change and working with the insurance industry to develop shared cost mechanisms to manage the costs to the economy, our communities and our families from extreme weather events. The shift over the last 50 years to relying on imported food also makes us more vulnerable when systems break down. Programs to increase the availability of local, sustainably produced food is good for the economy and lowers greenhouse gas emissions associated with transporting food over long distances.
26. Expanding investments in research and development related to the development of a bio-refining and bio-processing innovation hub in New Brunswick, Smart Grid; Smart Industry and Smart Cities and potentially renewable energy component recycling (such as with solar panel components).
27. Developing a New Brunswick/Atlantic Canada roadmap for exports of clean technology, including clean electricity from our region.⁴⁸

The Conservation Council of New Brunswick's Climate Action Plan is designed to generate the greenhouse gases reductions now that are needed to protect us from a more extreme climate. Our plan would achieve our environmental goal while stimulating our economy and creating long-term sustainable jobs to keep our young people and their families here in New Brunswick where they want to be.

⁴⁷ <http://www.pacenation.us/>

⁴⁸ Clean technology refers to products, procedures, processes, and services that minimize the use of non-renewable resources and use resources in ways that reduce costs, waste, and pollution, leading to sustainable development. They include using renewable energy sources such as wind, solar, hydro, and geothermal, as well as low-carbon fuels; water management, and recycling technologies; waste management techniques; and environmentally friendly buildings and transportation.

Our Climate Action Plan is comprehensive because climate change is a big problem that requires big solutions. We need to act urgently to change how we use energy and manage our natural resources.

Conclusion

There is a strong scientific consensus that the climate is becoming unbalanced mostly because of human activity. We need policies and programs that are fair and cut waste by making polluters use clean energy and practice more sustainable agriculture and forestry. If we act together we can limit the risks to our health and communities from a more extreme climate and help each other thrive.

Climate change has no boundaries. It will affect us all even if to varying degrees depending on how rich we are or where we live. The poor, the old and the sick will be hurt the most even here in Canada and New Brunswick, but especially in poorer nations. It will affect us whether we contribute a lot or a little to the problem. And we all have a role in the solutions: as citizens, consumers, business and community leaders, policy makers and elected representatives. As citizens we can support the policies called for by the Conservation Council of New Brunswick to show governments and community leaders that we are ready to move forward. As consumers we can support the transition to a low-carbon economy by redirecting our purchases to products that use less energy and help us transition to renewable energy. As business and community leaders, policy makers and government leaders we can collaborate to build social consensus for action and commit to doing our fair share.

The most important thing citizens, business leaders and policy-makers can do right now is to support federal and provincial/territorial governments in taking the action we need to bring greenhouse gas emissions way down. We have an opportunity to work with other provinces and the federal Government to really move Canada forward toward a climate friendly economy and lifestyle. Let's make sure that New Brunswick is part of it.

For more information, contact: Louise Comeau, louise.comeau@conservationcouncil.ca; 506 238 0355

About the Conservation Council

As a partner in New Brunswick's Climate Action Plan and a RenewablesNB hub member, CCNB is committed to doing its part to help New Brunswick move to a 100 % renewable energy future. Join the Conservation Council of New Brunswick. Your local environmental organization is working on supporting the transition to clean energy in New Brunswick.

Contact the Conservation Council of New Brunswick

180 St. John St., Fredericton, NB E3B 4A9 Canada

Phone: 506 458-8747; Email info@conservationcouncil.ca Visit: conservationcouncil.ca