



Toward a Greener Future

Nova Scotia's Climate Change Action Plan

January 2009

Printed in Canada

ISBN 978-1-55457-261-8

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Summary

Most of the world's governments accept the 2007 report from the United Nations' Intergovernmental Panel on Climate Change (IPCC). Among its key conclusions is that human activity is warming the planet, with severe consequences. We can expect warmer average temperatures, rising sea levels, and more-frequent extreme storms. Nova Scotia is particularly susceptible to these changes because most of our population lives along the coastline, and much of our infrastructure is located in vulnerable areas.

Nova Scotia's Climate Change Action Plan has two main goals: reducing our contribution to climate change by reducing our greenhouse gas (GHG) emissions and preparing for changes to our climate that are already inevitable.

REDUCING GREENHOUSE GAS EMISSIONS

Target: 5 megatonnes annually by 2020

Nova Scotia aims to reduce GHG emissions by at least 10 per cent from 1990 levels by 2020.

Electricity generation

The greatest single reduction will be achieved by imposing caps on emissions from Nova Scotia Power Incorporated (NSPI), which produces 46 per cent of the province's GHG emissions. The caps will take effect in 2010, 2015, and 2020.

The two most cost-effective means of reducing emissions from power generation in Nova Scotia are straightforward: generating less electricity and generating it from clean, renewable sources.

We will also reduce our dependence on fossil fuels, which are expected to rise in cost over the long term.

Transportation

Transportation is the second-biggest source of GHG emissions in Nova Scotia. This plan focuses on increasing the efficiency of our vehicles, encouraging alternatives,

and planning our communities to reduce the need for transportation. The province's response will include

- by 2010, a Sustainable Transportation Strategy that will build on existing work
- a pilot project to help make commercial trucks more efficient
- incentives for consumers to choose cars and trucks that use less fuel and produce less air pollution
- by 2010, regulations setting fuel consumption and emissions standards for new vehicles

Air pollutants

Because efforts to reduce air pollutants and GHG emissions can affect each other, this plan takes an integrated approach to controlling both types of emissions. It includes new air pollutant caps for 2015 and 2020.

Other actions

Numerous other initiatives will encourage energy efficiency, government leadership, and public education.

ADAPTING TO CLIMATE CHANGE

Our climate will continue to change. We will have to adapt to warmer average temperatures, higher sea levels, and weather events that are more frequent and more extreme.

This plan includes nine actions devoted to adaptation, starting with the creation of an Adaptation Fund for research and development.



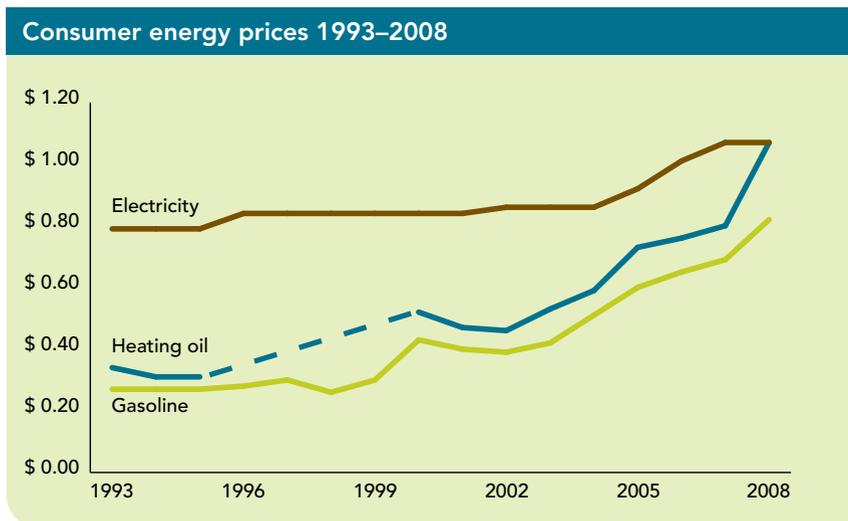
I. Why we must act

When it comes to climate change, Nova Scotia faces a triple threat:

- Because most of the energy we use comes from fossil fuels, we have an unusually long way to go in curbing the emissions that cause climate change.
- We're at the northern end of the Atlantic hurricane track, where more storms similar to Hurricane Juan could hit us as the planet warms.
- With 7600 km of coastline, we are exceptionally vulnerable to rising sea levels caused by climate change.

Our reliance on fossil fuels also makes us vulnerable to price spikes, as affordable supplies dwindle and markets swing. In the summer of 2008, oil prices reached historic highs, straining our economy and household budgets.

When it unanimously passed the Environmental Goals and Sustainable Prosperity Act, the Nova Scotia House of Assembly recognized that getting off fossil fuels isn't just the right thing to do, it's the smart thing to do. Establishing Nova Scotia as one of the cleanest and most sustainable environments in the world by 2020 is our best ticket to a prosperous economy for ourselves, our children, and our grandchildren.



Assumptions

- Gasoline is regular unleaded price per litre for Halifax.
- Heating oil is price per litre for Halifax.
- Electricity is price per 10 additional kilowatt hours above the 200 kilowatt hour per month threshold in the residential class.
- Prices exclude taxes.

Source: NSPI, NRCAN Fuel Focus, and MJ Ervin

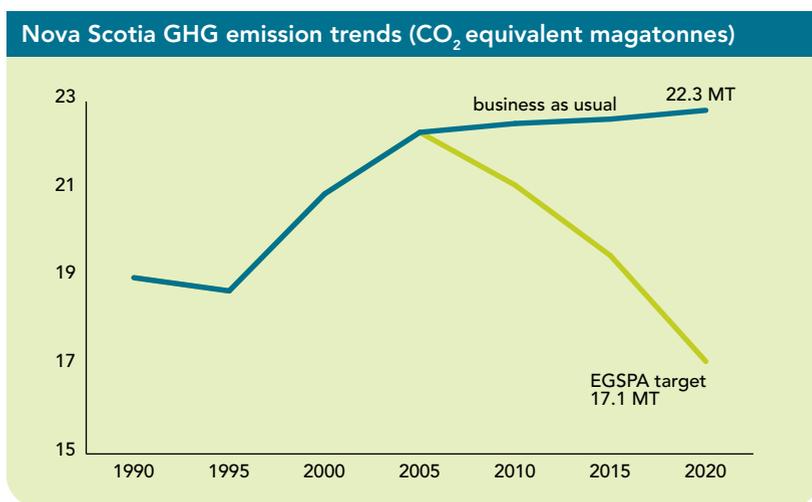
The act requires that, by 2020, we reduce Nova Scotia’s GHG emissions to a point at least 10 per cent below 1990 levels. That’s about 20 per cent below current levels. This is also a goal shared by the New England governors and eastern Canadian premiers.

GHG emissions are measured in tonnes of carbon dioxide, the gas most responsible for human-made climate change. To comply with the law, we will have to eliminate about five megatonnes (MT)—or five million tonnes—of carbon dioxide emissions from our current production. It’s a tall order, and it will require a big effort.

Assumptions

- We assume little or no growth in population from 2010 to 2020, and assume NSPI estimate (IRP) of 2% annual growth in electricity use.
- Total reductions from business as usual 2020 of 22.3 MT (DOE estimate) must be 5.2 MT to meet EGSPA target of 17.1 MT.

Source: Environment Canada and Nova Scotia Department of Environment



The Environmental Goals and Sustainable Prosperity Act also reflects public concern about health impacts linked to air quality. It requires cuts in pollutants known to harm health, including nitrogen oxides (NO_x), sulphur dioxide (SO₂), mercury, fine airborne particles, and chemicals that produce ground-level ozone. Airborne particles and ground-level ozone are the main components of smog.



II.

A Climate Change Primer

GHG

s—mainly carbon dioxide, methane, and nitrous oxide—trap energy produced by the sun. When these gases are present in the air, they act like the glass roof of a greenhouse, allowing sunlight to reach the Earth, but preventing heat from radiating back out into space. Ever so slowly, this causes our planet to warm.

In 2007, the United Nations' Intergovernmental Panel on Climate Change (IPCC) produced a report on climate change that most world governments regard as authoritative. Among its key conclusions:

- The Earth is getting warmer, and human activity is causing most of the change.
- Melting icecaps and warmer ocean waters are causing sea levels to rise.
- The amount of greenhouse gas in the atmosphere is now far higher than at any time over the past 650,000 years.
- Most of the increase in average temperatures since 1950 is very likely due to increases in GHG concentrations caused by humans.
- The chance that natural climatic processes alone caused this warming is less than 5 per cent.
- Future increases in temperature and sea level depend mainly on how much fossil fuel we use.
- There is a lag between the production of GHGs and climate change. So even if we stabilize GHG production, the Earth will continue to warm, and seas will continue to rise.

The implications for Nova Scotia are sobering:

- In the 20th century, the average temperature in the province rose by half a degree Celsius. In the 21st century, we can expect it to rise by another 2° to 4° C. Many scientists believe that the upper end of this range entails catastrophic, irreversible consequences.
- Over the last 100 years, the sea level rose 25 cm; it is likely to rise a

further 60 cm or more by 2100. That means water levels may be almost a metre higher than they were in 1900.

- Extreme rainfalls that occurred only once every 50 years in the last century are likely to occur once every 10 years in this century.
- Storm surges that occurred only once in the 20th century may occur up to 10 times in the 21st century.



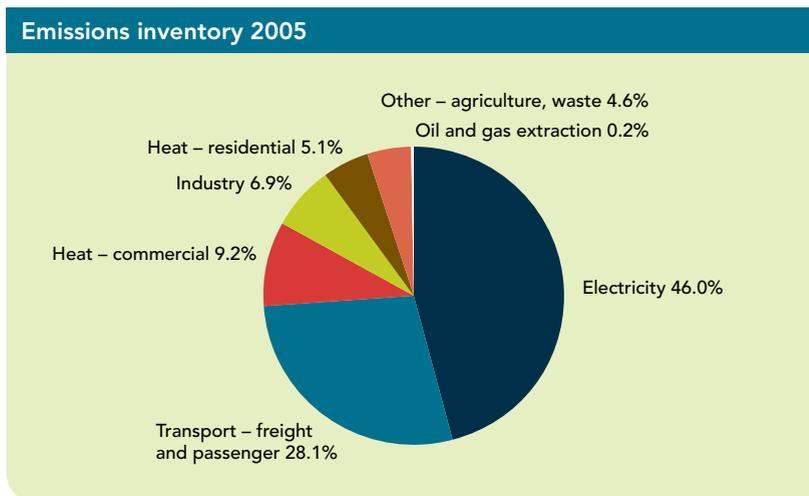


III. Plan Overview

A generation ago, faced with steep increases in the cost of oil, Nova Scotia committed to producing electricity from coal. The policy made sense. It replaced an imported fuel (oil) with a local fuel (coal). The production of coal employed a lot of Nova Scotians in communities with severe unemployment. At the time, few people had even heard the notion that burning coal could affect our climate.

GHG emissions are an unforeseen legacy of this policy. Today, the production of electricity accounts for about half of Nova Scotia’s GHG emissions. Transportation, chiefly through the use of gasoline and diesel fuel, accounts for about 25 per cent of our GHG production.

The Climate Change Action Plan concentrates on these two sectors to meet our GHG target and also includes measures to reduce GHG emissions from heating homes and commercial buildings.



Source: Environment Canada, revised May 2008

The plan takes a practical approach by investing in energy efficiency and renewable energy—the most cost-effective actions with the greatest impact on the production of GHGs.

It sets short-term, medium-term, and long-term targets that we can use to measure our progress.

SHORT-TERM TARGET

By 2015, the province will be at least half-way to our 2020 target by reducing GHG emissions by 2.5 million tonnes from today's levels.

MEDIUM-TERM TARGET

By 2020, the province will reduce GHG emissions to at least 10 per cent below 1990 levels.

LONG-TERM TARGET

By 2050, the province will reduce GHG emissions from human sources by up to 80 per cent below current levels, guided by the most up-to-date scientific consensus on required reductions.

ACHIEVING THE GHG TARGET

The Environmental Goals and Sustainable Prosperity Act requires the province to reduce GHG emissions to a point at least 10 per cent below 1990 levels by 2020. The Climate Change Action Plan and the Department of Energy's 2009 Energy Strategy are the tools by which the province will achieve that goal.

Short-term actions, to be implemented by 2013, include the following:

- caps on Nova Scotia Power Inc.'s GHG emissions by 2010
- the 2013 Renewable Energy Standard, which will require NSPI to add new renewable energy sources by the end of that same year
- requiring NSPI to allow greater use of two-way meters (net metering), which encourage small producers of clean energy
- starting to upgrade the Nova Scotia electrical transmission system to permit greater use of renewable energy
- improvements to the energy efficiency of new and existing homes and buildings

- conversions to natural gas
- new transportation policies

Medium-term actions, to be implemented after 2013, include the following:

- 2015 and 2020 GHG caps for NSPI
- upgrading Nova Scotia's electrical transmission grid to permit stronger connections with neighbouring provinces
- ensuring that at least 25 per cent of our electricity is generated from renewable energy sources by 2020
- possible importation of clean power from other provinces
- new technologies, such as ways to capture carbon produced by coal-fired plants before it is released to the air in GHGs
- reducing GHGs from other energy sources

The 2020 target will require reductions of at least five megatonnes per year.

Long-term actions, to be implemented after 2020:

We need to position ourselves for even greater reductions—up to 80 per cent by 2050.

It is difficult to predict how we will achieve targets we may have to meet after 2020, but there is a precedent for setting important environmental goals without certainty on how they will be reached. In 1963, the United States Congress passed the Clean Air Act, setting stringent limits for automobile exhaust. At the time, industry and environmental groups alike predicted that the automobile industry would be unable to meet the targets. Researchers later invented the catalytic converter, and the targets were exceeded.

GETTING TO 2020

Nova Scotia's 2009 Energy Strategy and its Climate Change Action Plan are closely linked in a shared goal of reducing greenhouse gas (GHG) emissions to at least 10 per cent below 1990 levels by 2020. This 2020 goal translates to at least 5 megatonnes (MT) of GHG reduction per year.

ACTION	Estimated GHG Reduction
ENERGY EFFICIENCY/CONSERVATION	
<ul style="list-style-type: none"> ● improvements to existing houses and buildings ● natural gas conversions ● new building standards ● transportation efficiencies 	1.7–3.0 MT
RENEWABLES AND AIR QUALITY	
<ul style="list-style-type: none"> ● 2013 Renewable Energy Standard regulation ● expanded net metering ● air quality regulations 	0.8–1.1 MT
FUTURE CLEANER ENERGY ACTIONS	
<ul style="list-style-type: none"> ● post-2013 renewable energy ● clean energy imports ● cleaner energy options (e.g., natural gas, co-generation) ● NSPI GHG emissions caps and enhanced air quality regulations 	2.5–3.4 MT
TOTAL 2020	5–7.5 MT

ADAPTING TO A CHANGING CLIMATE

There's a lag between the buildup of GHGs in the atmosphere and the impact on climate. Even if we could halt all harmful emissions tomorrow, the impact of past emissions would be with us for some time.

In the 21st century, we can expect warmer average temperatures, rising sea levels, and more-frequent extreme storms. Nova Scotia is particularly susceptible to these changes because most of our population lives along the coast and much of our infrastructure is located in vulnerable areas and wasn't engineered to withstand a higher frequency of extreme weather. Important sectors of our economy like fishing, forestry, and tourism are climate sensitive.

As a result, the Climate Change Action Plan includes practical steps to prepare for and cope with climate changes that can't be averted.

Actions to be implemented by 2013 include:

- an adaptation fund to help Nova Scotia prepare for the effects of a changing climate: we need to better understand the climate future we face and what we can do to prepare for it
- incorporating climate change impacts and adaptation response plans into the strategies and plans of all provincial departments by 2012
- providing municipalities with guidance on land-use issues that cross municipal boundaries

AIR POLLUTANTS

The Climate Change Action Plan is closely integrated with the province's efforts to reduce air pollutants. GHG emissions and air pollution tend to come from the same sources, and managing one can affect our ability to manage the other.

The Environmental Goals and Sustainable Prosperity Act sets out these targets for air pollutants:

- Reduce nitrogen oxide emissions by 20 per cent (from 2000 levels) by 2009.
- Reduce sulphur dioxide emissions by 50 per cent (from sources existing in 2001) by 2010.
- Reduce mercury emissions by 70 per cent (from 2001 levels) by 2010.
- Meet the Canada-wide standard for airborne fine particulate matter by 2010.
- Meet the Canada-wide standard for ground-level ozone by 2010.

The province will set more-stringent emissions caps on nitrogen oxides and sulphur dioxide for 2015 and 2020.



IV.

Climate Change Actions

Nova Scotia has already taken several steps to reduce GHGs and other air pollutants. In 2006, the province launched Conserve Nova Scotia, a government agency that helps Nova Scotians use energy more efficiently, thereby cutting fuel bills and reducing GHG emissions and air pollutants.

In 2007, the province created a Renewable Energy Standard. It requires Nova Scotia Power Inc. to generate an additional 10 per cent of its electricity, by 2013, from renewable sources created after 2001. This will raise the renewable portion of our electricity supply to a minimum of 18.5 per cent.

Also in 2007, with funding from the Government of Canada, Nova Scotia committed \$42.5 million to establish ecoNova Scotia for Clean Air and Climate Change, a fund to support projects that reduce GHG emissions and air pollutants.

The Climate Change Action Plan brings these significant achievements together with 68 actions that focus on eight key areas: cleaner energy, energy efficiency, renewable energy, transportation, air quality, government leadership, public engagement and education, and adapting to climate change.

CLEANER ENERGY

Almost half of the province's GHG emissions come from the production of electricity, and about half of our GHG reductions will come from Nova Scotia Power Inc.

About 75 per cent of our electricity comes from burning coal, our dirtiest fuel. However, the province does not intend to prescribe which fuels NSPI must use in its business. What we will prescribe are the results. The Climate Change Action Plan will establish increasingly stringent limits on the amount of GHG and air pollutants the utility can emit. This will encourage NSPI to use all of the tools at its disposal—energy efficiency, renewable energy, and cleaner fuels—to achieve our sustainable prosperity goals.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

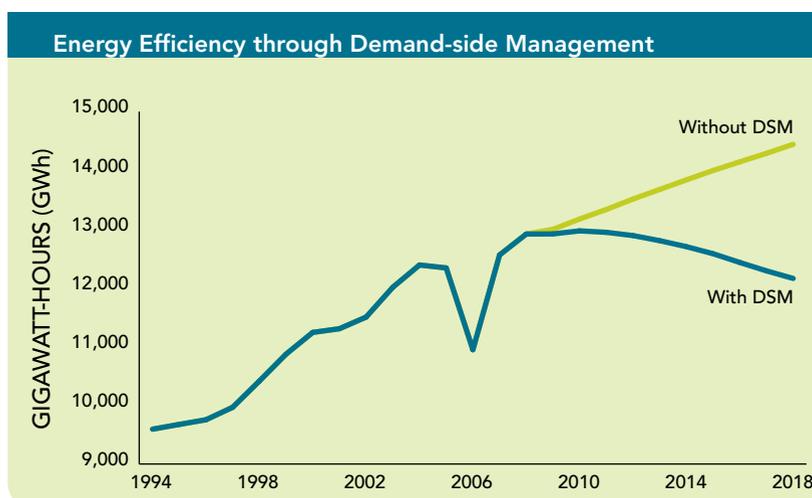
Action 1

Impose increasingly stringent absolute caps on NSPI's GHG emissions for 2010, 2015, and 2020.

Action 2

Target GHG and air pollutant emissions from sources other than coal-generated electricity, by working with stakeholders to develop policies and regulations.

Source: www.nspower.ca/documents/rate2009/SR%20Combined%20REDACTED.pdf



ENERGY EFFICIENCY

Nova Scotia now uses about 14 per cent more energy than it did in 1990. As a result, our GHG emissions have also risen. It is essential that we level off our energy consumption. The challenge is to do this while allowing our economy to grow. Energy efficiency and conservation are the best tools at our disposal. Projects that reduce energy consumption serve Nova Scotia's economic and environmental goals in three ways: they save money, they save energy, and they curb GHG production.

The province recently funded a study of ways to improve energy efficiency in Nova Scotia. The study found lots of potential for improving the efficiency of our use of all energy

sources, not just electricity. It identified commercial buildings as a particularly attractive target for investment in energy-saving programs. Last year's spike in energy prices underscored the need to improve the energy efficiency of our homes and vehicles as well.

The province supports a recent Utility and Review Board order requiring NSPI to spend ratepayer dollars on an electrical energy efficiency program called Demand-Side Management. Under this program, up to 5 per cent of Nova Scotia Power Inc.'s revenues will be spent on efficiency and conservation measures. It is predicted that by 2018, ratepayers could be saving 2,300 gigawatt-hours (GWh) of electricity per year. That's like eliminating—or not having to build—a 400-megawatt coal-fired generating plant. By comparison, NSPI's total generating capacity is about 2,300 megawatts.

Some energy conservation measures—things like walking to work, taking the bus, or switching to more-efficient compact fluorescent light bulbs—require little or no investment. Other steps—like buying a new appliance or an energy-efficient furnace—require a large outlay before any savings are achieved.

Many individuals and companies don't have the money to pay for such purchases. This is an area where government can help. By subsidizing the upfront costs of investments in energy efficiency, it can help achieve energy savings more quickly. Government can also move the process along by implementing regulations that require new buildings and vehicles to be more efficient. Education programs can help all of us make the right choices for the environment.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 3

Create a new, independent administrator for the electrical efficiency program established by the Utility and Review Board.

Action 4

Commit to increasing overall energy efficiency in the province by 20 per cent over

2008 levels by 2020, and strive to implement all cost-effective steps toward energy efficiency.

Action 5

Expand energy efficiency and conservation programs for homeowners and businesses, and develop new ones. Spending in the current fiscal year will exceed \$17 million.

Action 6

Study rate structures and metering systems that encourage electricity conservation and efficiency, beginning in 2009, to see what will work best in Nova Scotia.

Action 7

Create a Chair in Farm Energy Conservation at the Nova Scotia Agricultural College.

Commercial buildings

Action 8

Effective in 2011, amend the Nova Scotia Building Code Act to require all new commercial buildings of more than 600 m² to exceed the 1997 Model National Energy Code for Buildings by at least 25 per cent, or to adopt the updated version of the 1997 Model National Energy Code for Buildings expected in 2011. This is only a start. The province will work with its partners to strengthen standards on a continuing basis as innovative and cost-effective technologies come to the market.

Residential buildings

Action 9

Require, by December 31, 2009, all new residential dwellings, and all commercial buildings under 600 m², to meet prescriptive or performance requirements that are equivalent to an EnerGuide for New Homes rating of 80 under the Nova Scotia Building Code Act.

Action 10

Require low-flush toilets and permit the use of water-free technologies and the re-use of grey water by December 31, 2009, under the Nova Scotia Building Code Act.

Appliances

Action 11

Implement stricter energy-efficiency regulations for appliances. The new rules, which will also increase the number of appliance categories that are regulated, will be updated every three years to the highest regulatory standards.

RENEWABLE ENERGY

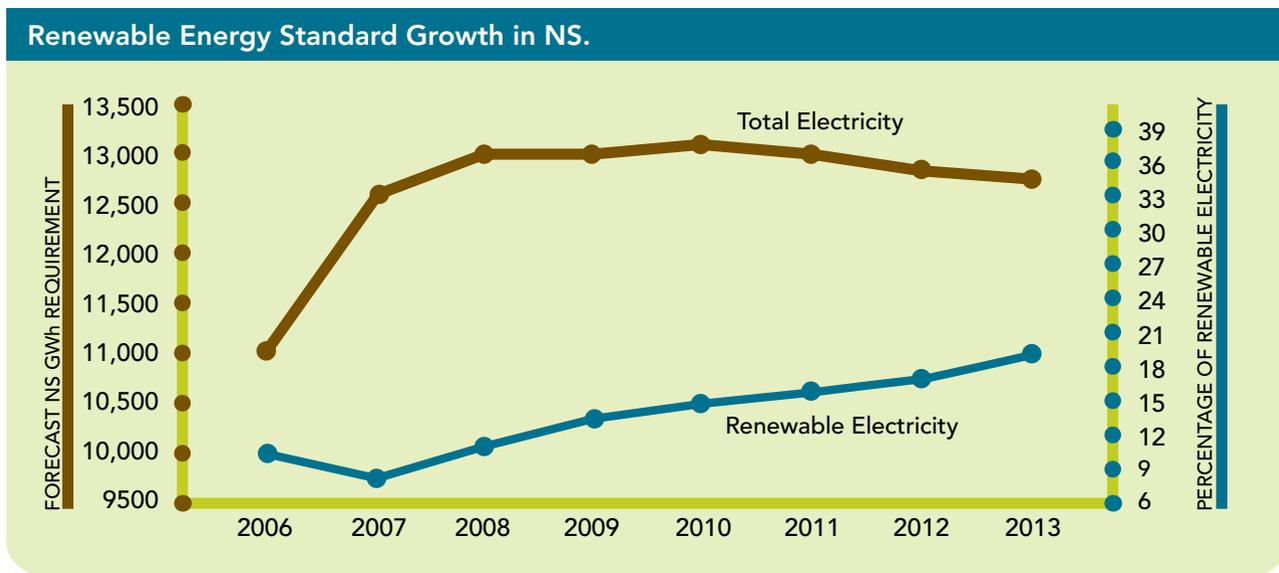
Improving energy efficiency is our quickest route to reduced GHG and air pollutant emissions. The next most effective step is to use a lot more renewable energy, something that will also promote a healthier environment and a more competitive economy. Right now, about 88 per cent of our electricity comes from fossil fuels. This has to change.

Fortunately, there's lots of potential for growth in our renewable energy sources. Nova Scotia has an abundance of wind energy, and the technology for capturing it is rapidly maturing. We have some of the highest tides in the world, positioning us to be a leader in the emerging technology of generating power from the tides.

As noted, the province's Renewable Energy Standard requires Nova Scotia Power Inc. to generate an additional 10 per cent of its electricity, by 2013, from new renewable sources created after 2001. This brings the total to a minimum of 18.5 per cent. The province's wind integration study in 2007 concluded that, with some operational management, this target could be met. To ramp up our renewable energy use after 2013, big investments will be needed in our electricity grid. We also need to determine the most effective means to increase the grid's ability to handle additional intermittent resources after 2013.

The need for grid enhancements arises from the fact that the sun, the wind, and the tide only provide energy when the sun shines, the wind blows, or the tide flows. We can't call them up whenever we need them, only when nature chooses to provide them. That means we need backup power we can draw on when renewable supplies are unavailable.

One possibility is to draw on sources of baseload power outside the province. Right now, in terms of electricity, Nova Scotia is all but an island. We have only a slender 350-megawatt connection with New Brunswick. By contrast, New Brunswick enjoys 1400 megawatts of interconnection with Quebec, Ontario, and New England.



We need a more-robust connection to our neighbouring provinces, so we can sell them clean energy when we have a surplus and call on their clean energy supplies when needed. We also need more capacity to move electricity around Nova Scotia, so that if the wind is blowing in Digby but not Lingan, we can move power from one place to another.

Once we know more about our options for storage, transmission upgrades, and backup supplies, we will develop new policies that require more electricity to come from renewable energy sources. We will make two-way metering more

attractive to encourage small-scale local renewable energy projects. We will work with our counterparts in eastern Canada and New England to create more-robust interconnections, so clean power can be shared regionally.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 12

Produce the 2009 Energy Strategy, a companion piece to this document. Developed by the Department of Energy, it will lead the transformation of Nova Scotia's electricity system to achieve a green energy future where at least 25 per cent of our electricity needs will come from renewable energy sources by 2020.

Action 13

Begin studies on regional electricity integration, known as the Green Grid Initiative, to diversify our energy sources. These studies, led by the Department of Energy, will begin in 2009.

Action 14

Armed with the better understanding of costs and capacity that will result from Action 13, require greater use of renewable energy after 2013.

Action 15

Develop regulations to allow greater use of two-way electric meters after 2009. Two-way meters (net metering) let small producers of intermittent renewable power transmit electricity to NSPI when their generators are operating and receive power from the grid when they are not.

Action 16

Develop a bio-resource strategy by 2011 to determine the best potential uses and the best policies to encourage the use of bio-energy-based fuels. The strategy will take account of GHGs and other air emissions produced throughout the life cycle of various bio-fuels.

Action 17

To support the development of biomass for electrical generation, provide the forest industry with funds from the Community Development Trust to study the feasibility of potential biomass generation projects.

Action 18

To support development of other uses for forest biomass, provide funds from the Community Development Trust to improve our understanding of forest biomass availability and the potential of forest biomass projects to improve site productivity.

TRANSPORTATION

Transportation produces roughly one quarter of the Nova Scotia's GHG emissions. The Climate Change Action Plan focuses on three aspects of transportation:

- increasing the efficiency of the vehicles we use
- encouraging alternative ways of getting around, such as walking, biking, and using public transit
- planning our communities to reduce the need for transportation

Increasing vehicle efficiency is a goal shared by many states and provinces. As a result, cars will get much better fuel economy in the coming years.

Developing new ways of getting around, and reducing the need for transportation in our very rural province, pose much greater challenges. To tackle this problem, we need to ask some hard questions: Are Nova Scotians willing to move closer to work or public transportation? What can we do about communities without public transportation? How can we redesign communities to minimize the need for transportation? Can more-efficient urban layouts for our towns and cities be encouraged by rezoning? What are the appropriate roles for the province and for municipalities?

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 19

Produce a Sustainable Transportation Strategy by 2010 that will build on existing work. A task force headed by Transportation and Infrastructure Renewal, with members from Conserve Nova Scotia, Service Nova Scotia and Municipal Relations, Nova Scotia Environment, and municipal governments, will consult with the public and interested groups. The task force, to be created by March 31, 2009, will consider all aspects of transportation, including public transit, active transportation, funding, and land-use planning.

Action 20

While the Nova Scotia Sustainable Transportation Strategy is being developed, continue to fund public and alternative transportation and expand innovative transportation projects.

Action 21

Following consultation and co-operation with other jurisdictions, introduce regulations by 2010 setting fuel consumption and emissions standards for new vehicles.

Action 22

Develop a program in 2009 to encourage—and support—consumers to choose greener cars and trucks that are more fuel efficient and produce less air pollution.

Action 23

Review the province's park-and-ride lots with the intention of increasing their capacity. There are now about 30 park-and-ride lots at intersections of major highways.

Action 24

Over the next five years, expand the weigh-in-motion program at scale houses throughout the province. These systems save idling time by reducing stops and starts for heavy trucks. The first such system has already been installed at the Canso Causeway.

Action 25

Begin a pilot project to allow double 53-foot semi-trailers to be hauled by a single tractor on four-lane, divided highways between Halifax and the New Brunswick border at speeds of 90 km/h or slower. These trucks reduce emissions and save fuel by allowing one engine to haul two loads.

Action 26

Develop an anti-idling policy for government vehicles and employee vehicles on government business by 2009. A model anti-idling bylaw for use by municipalities will also be developed.

Action 27

Introduce a pilot project to provide incentives for equipment that will improve the energy efficiency of heavy truck fleets and encourage the use of efficient light-duty vehicles in commercial fleets, such as taxis.

AIR QUALITY

The emission of GHGs often goes hand in hand with the production of such health-damaging emissions as sulphur dioxide, nitrogen oxides, volatile organic compounds, airborne particles, and mercury. Efforts to reduce one type of harmful emission can sometimes increase production of another.

The 2001 Energy Strategy included a series of measures aimed at reducing harmful air emissions from our largest emitters. These included curbs on sulphur dioxide, nitrogen oxides, and mercury emissions. Production of these pollutants in Nova Scotia is much lower today than it was a decade ago. The Climate Change Action Plan builds on these improvements.

The Climate Change Action Plan aims to ensure that we move forward on all fronts simultaneously. It takes what's known as an airshed approach that considers the cumulative effect of diverse sources of pollution on the air over Nova Scotia.

Acid rain

The burning of fossil fuels creates sulphur dioxide (SO₂) and nitrogen oxides (NO_x), which mix with water in the air to form acid rain or snow. Acid precipitation reduces forest growth and damages or destroys life in our lakes and rivers. Nova Scotia has a low tolerance for acid precipitation because many of our fresh lakes, streams, and soils have little ability to neutralize the acid deposits. This is especially true in southwestern Nova Scotia.

Despite progress in cutting SO₂ and NO_x emissions, Nova Scotia continues to exceed critical loads—the amount of acid precipitation the environment can receive before lasting damage occurs.

Smog

Smog is a mixture of ground-level ozone (O₃) and airborne particles with a diameter of less than 2.5 microns (known as fine particulate matter or PM_{2.5}). Sulphur dioxide, nitrogen oxides, and other pollutants caused by the burning of fossil fuels contribute to the creation of smog through complex chemical interactions.

Smog aggravates heart and lung conditions, especially in young children and the elderly. This is of special concern to Nova Scotians, because we have some of the highest rates of asthma and heart disease in Canada. Smog can also harm vegetation, forestry, crops, and many materials used in buildings.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 28

Use an airshed approach to manage Nova Scotia's air quality, and consider the combined impact of local and out-of-province emissions. Nova Scotia Environment will lead this effort. The province will work with industry, and others, to reduce local emissions, and with the Canadian government and other provinces to curb out-of-province pollution.

Action 29

To give Nova Scotians better information about the quality of our air, continue its long-term air monitoring and begin to implement the Air Quality Health Index. The system will produce up-to-the-hour information about air quality.

Sulphur dioxide (SO₂)

Action 30

In addition to the cap already in place for 2010, set new, tighter limits on NSPI's sulphur dioxide emissions for 2015 and 2020.

Action 31

Assess the effectiveness of our sulphur reduction efforts by 2011.

Nitrogen oxides (NO_x)

Action 32

In addition to the cap already in place for 2009, set new, tighter limits on NSPI's nitrogen oxide emissions for 2015 and 2020.

Action 33

Continue to require that all utility and industrial boilers install low-NO_x burner technology during upgrades. A clearer definition of "low-NO_x" will strengthen this requirement.

Particulate matter and ozone

Particulate matter is a technical term for tiny airborne particles. Fine particulate matter combines with ozone to create smog.

Action 34

Complete its plan for complying with the Canada-wide standard for particulate matter and ground-level ozone by the end of 2009.

Mercury

Methylmercury is a toxin that accumulates in the food chain. It damages nerve tissue and is particularly harmful to young children. With the other provinces and the Government of Canada, Nova Scotia participated in the development of a new Canada-wide standard for mercury emissions from coal-fired power plants. The Environmental Goals and Sustainable Prosperity Act set limits on mercury emissions to take effect in 2010.

Action 35

Achieve the 2010 cap on mercury emissions, and comply with further strengthening of the Canada-wide standard for mercury emissions. These efforts may include capturing 80 per cent or more of the emissions from coal-fired plants by 2018.

LEADERSHIP BY EXAMPLE

The provincial government is the largest consumer in Nova Scotia. The province buys more than \$800-million worth of goods and services every year—even more when municipalities, agencies, schools, and hospitals are included.

The province owns and operates more than 3,000 buildings, owns 12,000 rental units, and holds approximately 230 leases. These properties comprise about 1.5 million square feet throughout the province. The province owns and leases more than 2,500 vehicles.

As such a large consumer, the province can demand goods and services that meet our climate change and sustainable prosperity objectives. For example, the province can require that our leased spaces, cars, and computers be energy efficient and minimize waste.

The province can also use its market power to foster new technologies and solutions. For example, to fulfil Action 39 below, the province could aim to construct a building so efficient that it needs no net energy and produces no net carbon emissions—a so-called net-zero carbon and energy building.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 36

By the end of 2009, include an assessment of greenhouse gas and air pollutant emissions as part of a “green filter” applied to projects requiring government approval.

Provincial government buildings

Action 37

Require that all new government-owned buildings achieve LEED Silver certification after 2008; achieve LEED Gold certification or equivalent after 2010; and be carbon-neutral after 2020. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a widely used set of standards for sustainable construction.

Action 38

Require any organization seeking government funds for building projects to adopt the LEED Silver standard, or an acceptable equivalent, for energy efficiency and water consumption.

Action 39

By 2015, construct a building that demonstrates a leading standard for energy efficiency and sustainability.

Action 40

Achieve an overall 30 per cent reduction by 2020 in energy consumption for all government-owned buildings constructed before 2001.

Action 41

In support of Action 40, begin a program in 2009 to achieve BOMA BEST * certification, or equivalent, for all of the Department of Transportation and Infrastructure Renewal’s major owned and operated buildings by 2015.

* Building Owners and Managers Association of Canada–Building Environmental Standards

Provincial government vehicles

Action 42

Demonstrate leadership and a commitment to sustainable prosperity by choosing vehicles that are fuel efficient and environmentally responsible after 2008. A policy guiding this commitment will apply to certain types of vehicles and will result in the acquisition by lease or purchase of vehicles in the top 20 per cent of their class for energy efficiency and GHG and air pollutant emissions.

Action 43

Expand the E-Pass employee bus pass program as quickly as possible to all government employees.

Office equipment

Action 44

As part of a broader sustainable procurement policy being developed by 2009, require that all new information and communications equipment bought or leased by the province have Electronic Product Environmental Assessment Tool (EPEAT) silver certification or equivalent. Where EPEAT criteria have not been developed, equipment must meet the applicable ENERGY STAR standard.

ENGAGEMENT AND EDUCATION

The province will work with municipalities, communities, industries, businesses, non-profit groups, and the Government of Canada.

Education will be a major focus. Citizens need information and insight to make the right decisions. This doesn't mean telling people what to do, but giving them the knowledge and tools to make their own sustainable choices.

Our schools must continue to educate about climate change, a cleaner environment, and sustainable prosperity, so future generations can better cope with these issues.

Communities need to understand climate change so they can prepare for expected changes. Farmers need to understand how new weather conditions will affect their choice of crops and farm practices. Builders need to consider rising sea levels and extreme weather events in planning developments.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Municipalities

Action 45

Using funds from the federal Gas Tax Agreement continue to fund a sustainability coordinator for the Union of Nova Scotia Municipalities.

Action 46

Using funds from the federal Gas Tax Agreement provide funding in 2009 to help municipal governments plan for climate change. A key focus will be the impacts of sea-level rise on land-use planning and on the design of wastewater treatment plants.

Action 47

In 2009, work with the Union of Nova Scotia Municipalities on a memorandum of understanding that will address climate change mitigation and adaptation.

Action 48

Amend funding agreements with municipalities by 2010 to require climate change strategies in municipal Integrated Community Sustainability Plans.

Government of Canada

Action 49

Encourage the Government of Canada to support further GHG and air pollutant reductions by funding programs like ecoNova Scotia II and the Greening the Grid project to upgrade transmission capacity. The ecoNova Scotia fund for Clean Air and

Climate Change, which currently supports innovative projects that reduce emissions, is in place only until March 2011.

Action 50

Participate in national and international discussions on climate change and clean air, including those taking a North American approach. This will continue to include participation in the Canadian Council of Ministers of the Environment, the Council of Atlantic Environment Ministers, and the Conference of New England Governors and Eastern Canadian Premiers. Nova Scotia will seek observer status at discussions of the Western Climate Initiative.

Citizens

Action 51

Embark on a public awareness and education program, led by Nova Scotia Environment, to give citizens the knowledge and insight to lead more sustainable lifestyles.

Action 52

Incorporate climate change, sustainability, and complex decision making into the school curriculum. This builds on learning and teaching of these concepts that is already integrated into the curriculum.

ADAPTING TO CLIMATE CHANGE

The United Nations' Intergovernmental Panel on Climate Change (IPCC) concluded that global warming is "unequivocal." Climate changes are already occurring—in some cases more rapidly than scientists projected in the IPCC reports.

In Nova Scotia, we can expect warmer average temperatures, higher sea levels, more extreme rainfalls and storm flooding, and more-frequent and extreme storms.

Some native plants and animals might be unable to survive our new climatic

conditions. Higher water temperatures may render marine animals such as salmon, capelin, and cod increasingly vulnerable to competitors and parasites.

Nova Scotia's supplies of fresh water may be at greater risk of salt contamination from rising sea levels, pollution from runoff caused by heavy rains and snow, and parasites drawn to warmer water temperatures. We can expect increased demand for water and increased competition for it.

The old and the very young are vulnerable to the health effects of air pollution and heat waves. All Nova Scotians will be at greater risk of accidents, injuries, and deaths resulting from extreme weather.

The climate news isn't all bad. Warmer conditions may present opportunities for industries such as tourism and agriculture. But industries that benefit in some areas will have to manage new challenges—securing water supplies, managing pests, preserving heritage sites from weather damage and erosion—in others.

Preparing for a changing climate poses particular challenges in Nova Scotia because most of our population lives along the coastline and much of our infrastructure is located in vulnerable areas. In many cases, that infrastructure was designed to withstand weather events less extreme and less frequent than what we now expect.

We don't know for sure how extreme our weather will be. We need research to better understand the impact of climate change on Nova Scotia. But even with that uncertainty, we have enough information to begin preparing for climate change now.

Many players will be responsible for adapting to climate change, including: the provincial government, municipal governments, the government of Canada, private industry, as well as communities and individuals throughout Nova Scotia.

THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 53

Create an Adaptation Fund within Nova Scotia Environment to encourage adaptation research and development starting in 2009.

Action 54

Develop statements of provincial interest on adaptation by 2010 to provide guidance on land-use planning. This is a formal tool, established under the Municipal Government Act, to protect the province's interest in such areas as land use, water resources, and community planning.

Action 55

Incorporate climate change impacts and adaptation response plans into the strategies and initiatives of all provincial departments by 2012.

Action 56

Establish criteria in 2009 for the consideration of climate change during Nova Scotia Environment's environmental assessment process and develop a guide to climate change for project proponents.

Action 57

Launch a web-based clearinghouse of information and tools to support adaptation to climate change in Nova Scotia in 2009.

Action 58

Begin work on a provincial vulnerability assessment and progress report on adaptation to climate change in Nova Scotia. This report, which will be updated biannually, will provide updates on the latest climate research, review critical information gaps, and provide policy direction for the province.

Action 59

Continue to work with the other Atlantic provinces on common adaptation goals.

Action 60

Create an interdepartmental steering committee and external advisory committee responsible for coordinating adaptation efforts and providing adaptation policy advice, in 2009.

Action 61

Ensure that design standards and plans for new provincial construction, and for the renewal of existing provincial infrastructure, reflect projected climate trends, not historical records, by 2010.

Action 62

Release a Sustainable Coastal Development Strategy by 2010. A major part of the strategy will focus on strengthening our resiliency to climate change impacts along our coast.

Action 63

Take sea-level rise into consideration and place priority on conserving coastal wetlands in preparing a policy to prevent net loss of wetlands. The Environmental Goals and Sustainable Prosperity Act requires that this policy be developed by 2009.

Action 64

Develop a strategy to ensure the sustainability of the province's natural capital in forests (forestry), minerals (mining), parks, and biodiversity by 2010. This strategy will be led by the Department of Natural Resources.

Action 65

Develop a comprehensive water resource management strategy by 2010. As a key priority, the strategy will consider climate change impacts on water quality and quantity.

Action 66

Lead, through the Department of Natural Resources, an interdepartmental and forest industry working group on forest carbon management and forest adaptation to climate change.

MEASUREMENT AND ACCOUNTABILITY

Our ability to measure progress and hold someone accountable is key to a project as large and significant as the Climate Change Action Plan. Fortunately, there are a number of generally accepted methods for tracking GHG emissions, and Nova Scotia already has an accountability mechanism.

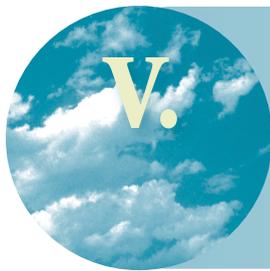
THE PROVINCE WILL TAKE THE FOLLOWING ACTIONS:

Action 67

With advice from the Nova Scotia Round Table on Environment and Sustainable Prosperity, assess progress toward meeting our GHG reduction target as part of the Environmental Goals and Sustainable Prosperity Act annual progress report. The effectiveness of the target will be assessed every five years through a public review by the Round Table.

Action 68

Establish a Climate Change Directorate within Nova Scotia Environment. This office will work with provincial departments and municipalities, agencies, schools, and hospitals to reduce GHG emissions and ensure that effective adaptation measures are being implemented.



Conclusion

The Climate Change Action Plan and Nova Scotia's 2009 Energy Strategy are not "business as usual." They set out important steps in bringing sustainable prosperity to Nova Scotia's economy and environment.

Nova Scotia aims to reduce its GHG production to at least 10 per cent below 1990 levels by 2020. That's a reduction of more than 20 per cent compared to our current levels, and even more compared to where we would be in 2020 if we continued with our current habits.

In 2020, our province and our population will be better off: our efforts will have reduced the threat from climate change, our air will be healthier, and our energy supply will be more predictable, more stable, and quite likely more affordable than it would otherwise be. So, rather than make sacrifices, we will make changes, individually and as a community.

And this is something we have shown we can do. Our decision to dramatically reduce the amount of waste we send to landfills is the best example. The arrival of green bins at our homes and the need to sort our waste before taking it to the curb were enormous changes to our daily routines. But now we don't even think about it. This kind of stewardship has become second nature for Nova Scotians, and nobody in Canada does it better.

We believe other changes will become second nature to Nova Scotians as we follow through on the Climate Change Action Plan. We'll make different choices in lighting and electrical appliances. We'll plan our errands and work lives to eliminate unnecessary car trips. When we can, we'll walk or ride a bike. And the toughest questions car dealers will face from us will be about fuel efficiency and emissions.

The Climate Change Action Plan contains targets that, by conventional wisdom, will prove to be a daunting challenge. But conventional wisdom ignores the potential of a motivated community. We believe in that potential. We believe that once Nova Scotians get behind the Climate Change Action Plan, its targets will some day be seen as mere milestones on the way to even greater achievements.

Appendix: Climate Change Actions

Cleaner Energy

The province will take the following actions:

Action 1

Impose increasingly stringent absolute caps on NSPI's GHG emissions for 2010, 2015, and 2020.

Action 2

Target GHG and air pollutant emissions from sources other than coal-generated electricity, by working with stakeholders to develop policies and regulations.

Energy Efficiency

The province will take the following actions:

Action 3

Create a new, independent administrator for the electrical efficiency program established by the Utility and Review Board.

Action 4

Commit to increasing overall energy efficiency in the province by 20 per cent over 2008 levels by 2020, and strive to implement all cost-effective steps toward energy efficiency.

Action 5

Expand energy efficiency and conservation programs for homeowners and businesses, and develop new ones. Spending in the current fiscal year will exceed \$17 million.

Action 6

Study rate structures and metering systems that encourage electricity conservation and efficiency, beginning in 2009, to see what will work best in Nova Scotia.

Action 7

Create a Chair in Farm Energy Conservation at the Nova Scotia Agricultural College.

Commercial buildings

Action 8

Effective in 2011, amend the Nova Scotia Building Code Act to require all new commercial buildings of more than 600 m² to exceed the 1997 Model National Energy Code for Buildings by at least 25 per cent, or to adopt the updated version of the 1997 Model National Energy Code for Buildings expected in 2011. This is only a start. The province will work with its partners to strengthen standards on a continuing basis as innovative and cost-effective technologies come to the market.

Residential buildings

Action 9

Require, by December 31, 2009, all new residential dwellings, and all commercial buildings under 600 m², to meet prescriptive or performance requirements that are equivalent to an EnerGuide for New Homes rating of 80 under the Nova Scotia Building Code Act.

Action 10

Require low-flush toilets, and permit the use of water-free technologies and the re-use of grey water by December 31, 2009 under the Nova Scotia Building Code Act.

Appliances

Action 11

Implement stricter energy-efficiency regulations for appliances. The new rules, which will also increase the number of appliance categories that are regulated, will be updated every three years to the highest regulatory standards.

Renewable Energy

The province will take the following actions:

Action 12

Produce the 2009 Energy Strategy, a companion piece to this document. Developed by the Department of Energy, it will lead the transformation of Nova Scotia's electricity system to achieve a green energy future where at least 25 per cent of our electricity needs will come from renewable energy sources by 2020.

Action 13

Begin studies on regional electricity integration, known as the Green Grid Initiative, to diversify our energy sources. These studies, led by the Department of Energy, will begin in 2009.

Action 14

Armed with the better understanding of costs and capacity that will result from Action 13, require greater use of renewable energy after 2013.

Action 15

Develop regulations to allow greater use of two-way electric meters after 2009. Two-way meters (net metering) let small producers of intermittent renewable power transmit electricity to NSPI when their generators are operating and receive power from the grid when they are not.

Action 16

Develop a bio-resource strategy by 2011 to determine the best potential uses and the best policies to encourage the use of bio-energy-based fuels. The strategy will take account of GHGs and other air emissions produced throughout the life cycle of various bio-fuels.

Action 17

To support development of biomass for electrical generation, provide the forest industry with funds from the Community Development Trust to study the feasibility of potential biomass generation projects.

Action 18

To support development of other uses for forest biomass, provide funds from the Community Development Trust to improve our understanding of forest biomass availability and the potential of forest biomass projects to improve site productivity.

Transportation

The province will take the following actions:

Action 19

Produce a Sustainable Transportation Strategy by 2010 that will build on existing work. A task force headed by Transportation and Infrastructure Renewal, with members from Conserve Nova Scotia, Service Nova Scotia and Municipal Relations, Nova Scotia Environment, and municipal governments, will consult with the public and interested groups. The task force, to be created by March 31, 2009, will consider all aspects of transportation, including public transit, active transportation, funding, and land-use planning.

Action 20

While the Nova Scotia Sustainable Transportation Strategy is being developed, continue to fund public and alternative transportation and expand innovative transportation projects.

Action 21

Following consultation and co-operation with other jurisdictions, introduce regulations by 2010 setting fuel consumption and emissions standards for new vehicles.

Action 22

Develop a program in 2009 to encourage—and support—consumers to choose greener cars and trucks that are more fuel efficient and produce less air pollution.

Action 23

Review the province's park-and-ride lots with the intention of increasing their capacity. There are now about 30 park-and-ride lots at intersections of major highways.

Action 24

Over the next five years, expand the weigh-in-motion program at scale houses throughout the province. These systems save idling time by reducing stops and starts for heavy trucks. The first such system has already been installed at the Canso Causeway.

Action 25

Begin a pilot project to allow double 53-foot semi-trailers to be hauled by a single tractor on four-lane, divided highways between Halifax and the New Brunswick border at speeds of 90 km/h or slower. These trucks reduce emissions and save fuel by allowing one engine to haul two loads.

Action 26

Develop an anti-idling policy for government vehicles and employee vehicles on government business by 2009. A model anti-idling bylaw for use by municipalities will also be developed.

Action 27

Introduce a pilot project to provide incentives for equipment that will improve the energy efficiency of heavy truck fleets and encourage the use of efficient light-duty vehicles in commercial fleets, such as taxis.

Air Quality

The province will take the following actions:

Smog

Action 28

Use an airshed approach to manage Nova Scotia's air quality, and consider the combined impact of local and out-of-province emissions. Nova Scotia Environment will lead this effort. The province will work with industry, and others, to reduce local emissions, and with the Canadian government and other provinces to curb out-of-province pollution.

Action 29

To give Nova Scotians better information about the quality of our air, continue its long-term air monitoring and begin to implement the Air Quality Health Index. The system will produce up-to-the-hour information about air quality.

Sulphur dioxide (SO₂)

Action 30

In addition to the cap already in place for 2010, set new, tighter limits on NSPI's sulphur dioxide emissions for 2015 and 2020.

Action 31

Assess the effectiveness of our sulphur reduction efforts by 2011.

Nitrogen oxides (NO_x)

Action 32

In addition to the cap already in place for 2009, set new, tighter limits on NSPI's nitrogen oxide emissions for 2015, and 2020.

Action 33

Continue to require that all utility and industrial boilers install low-NO_x burner technology during upgrades. A clearer definition of “low-NO_x” will strengthen this requirement.

Particulate matter and ozone

Action 34

Complete its plan for complying with the Canada-wide standard for particulate matter and ground-level ozone by the end of 2009.

Mercury

Action 35

Achieve the 2010 cap on mercury emissions, and comply with further strengthening of the Canada-wide standard for mercury emissions. These efforts may include capturing 80 per cent or more of the emissions from coal-fired plants by 2018.

Leadership by Example

The province will take the following actions:

Action 36

By the end of 2009, include an assessment of greenhouse gas and air pollutant emissions as part of a “green filter” applied to projects requiring government approval.

Provincial Government Buildings

Action 37

Require that all new government-owned buildings achieve LEED Silver certification after 2008; achieve LEED Gold certification or equivalent after 2010; and be carbon-neutral after 2020. The Leadership in Energy

and Environmental Design (LEED) Green Building Rating System is a widely used set of standards for sustainable construction.

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Provincial government vehicles

Action 42

Demonstrate leadership and a commitment to sustainable prosperity by choosing vehicles that are fuel efficient and environmentally responsible after 2008. A policy guiding this commitment will apply to certain types of vehicles and will result in the acquisition by lease or purchase of vehicles in the top 20 per cent of their class for energy efficiency and GHG and air pollutant emissions.

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Engagement and Education

The province will take the following actions:

Municipalities

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Using funds from the federal Gas Tax Agreement continue to fund a sustainability coordinator for the Union of Nova Scotia Municipalities.

Action 46

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Encourage the Government of Canada to support further GHG and air pollutant reductions by funding programs like ecoNova Scotia II and the Greening the Grid project to upgrade transmission capacity. The ecoNova Scotia fund for Clean Air and Climate Change, which currently supports innovative projects that reduce emissions, is in place only until March 2011.

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Action 52

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Adapting to Climate Change

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Action 65

Develop a comprehensive water resource management strategy by 2010. As a key priority, the strategy will

consider climate change impacts on water quality and quantity.

Action 66

Lead, through the Department of Natural Resources, an interdepartmental and forest industry working group on forest carbon management and forest adaptation to climate change.

Measurement and Accountability

The province will take the following actions:

Action 67

With advice from the Nova Scotia Round Table on Environment and Sustainable Prosperity, assess progress toward meeting our GHG reduction target as part of the Environmental Goals and Sustainable Prosperity Act annual progress report. The effectiveness of the target will be assessed every five years during a public review by the Round Table.

Action 68

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Acknowledgments

Many people and groups contributed to this plan. In November and December 2007, Dalhousie oceanographer Bob Fournier facilitated 13 public consultation workshops to obtain public comments on the province's Climate Change Action Plan and a companion project, the 2009 Energy Strategy. More than 250 people took part in workshops held across the province from Yarmouth to Cheticamp. Notes on these public consultation workshops are available on the Energy Department's website at www.gov.ns.ca/energy/energy-strategy.

Department staff also met with 19 companies and organizations with a particular interest in climate change. These included energy producers, major energy consumers, and environmental groups. The department also encouraged groups and individuals to make written submissions. We received 145 written comments. These, too, are available on the energy strategy website.

The use and production of energy are deeply ingrained in the way we live and work. Making adjustments on the scale required to head off climate change has far-reaching—and sometimes unexpected—consequences. To ensure that we have a firm grasp of the action plan's implications, representatives of 14 provincial departments—including Energy, Transportation and Infrastructure Renewal, Finance, Service Nova Scotia and Municipal Relations, Natural Resources, Fisheries and Aquaculture, and Economic Development—participated in our deliberations.

Nova Scotia Environment thanks all those who took part.

