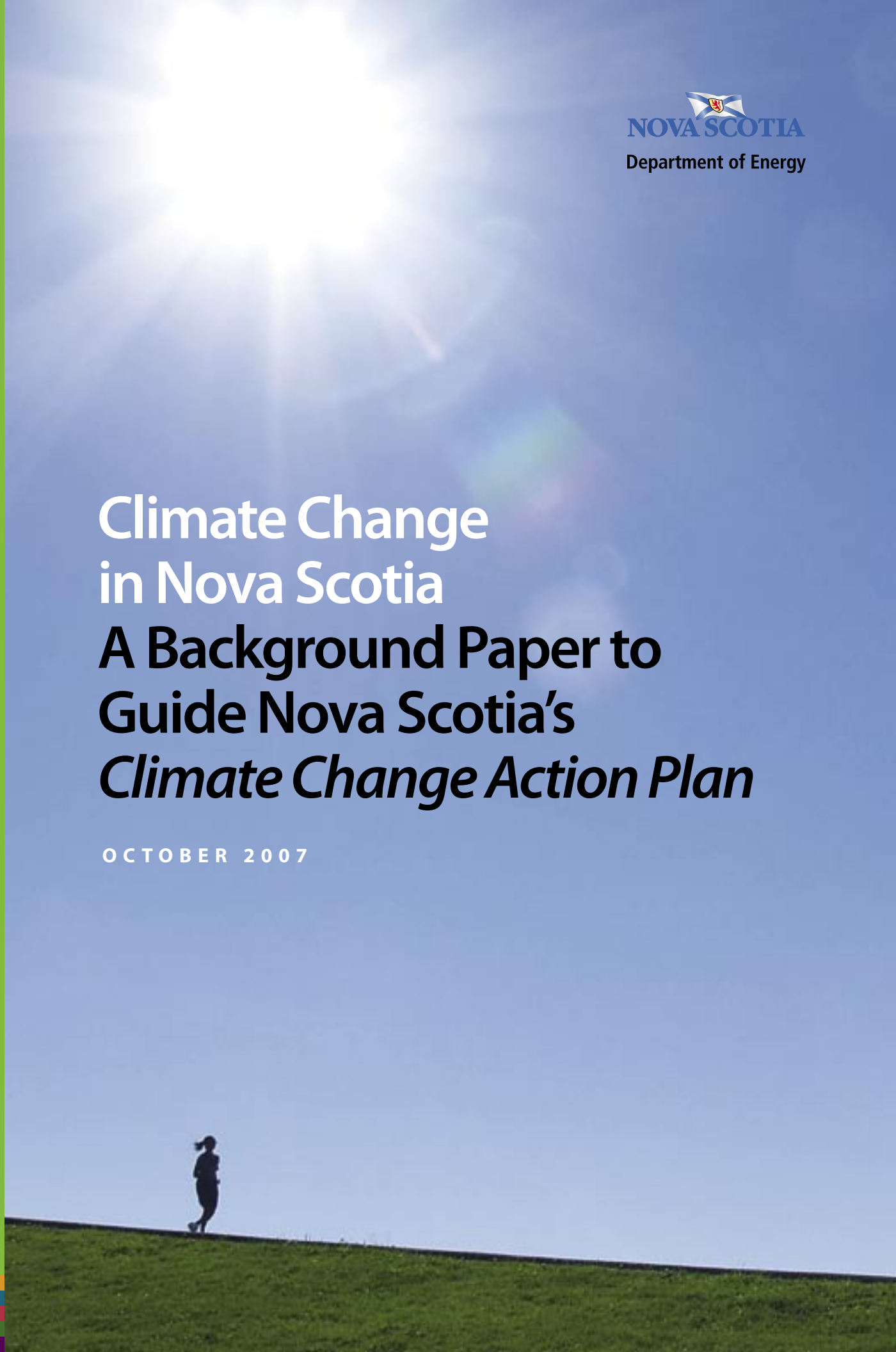
BACKGROUND PAPER

NOVA SCOTIA
Department of Energy

Climate Change in Nova Scotia
A Background Paper to Guide Nova Scotia's *Climate Change Action Plan*

OCTOBER 2007



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A STARTING POINT

Everything we own requires energy in its production, transport, packaging, or use. The more energy we use, the more greenhouse gas we likely produce. The more greenhouse gas emissions we release into the atmosphere—from energy and other sources—the more our climate is likely to change.

This change includes the temperature of the earth, the level of the sea, and the frequency of extreme weather conditions. This change will affect all aspects of life in Nova Scotia.

Dealing with climate change, therefore, has two sides:

- cutting greenhouse gas
- planning for change

The province recently released the Environmental Goals and Sustainable Prosperity Act. Addressing climate change is a key element of achieving our sustainable prosperity goals outlined in the act.

Cutting greenhouse gas emissions has everything to do with how we manage energy use. Much of this work, both policy and action, is already underway to help meet Nova Scotia's target of a **10 per cent reduction in greenhouse gases from 1990 levels by the year 2020**.

The Nova Scotia Department of Energy is working on two major plans right now:

- *Climate Change Action Plan*
- *Renewed Energy Strategy*

The *Climate Change Action Plan* will focus on reducing greenhouse gases from all sources. It will give guidelines to industries, businesses, government, and all Nova Scotians about what they must do to meet the 2020 target. The *Renewed Energy Strategy* will guide all energy-related policy, with an eye on both our environment and our economy. Consultation on both is scheduled for the fall of 2007, with release dates scheduled for the spring of 2008.

Planning for the changes to our natural world is a broader and more complex discussion, involving areas as diverse as farming, coastal habitat, forestry, and real estate. And the list goes on.

This document is intended as a starting point for discussion around climate change, both for our immediate consultations around greenhouse gas and energy policy, and also for our next order of business—planning for change.

GLOBAL CLIMATE CHANGE

Climate change is real—and it is happening right now.

The temperature of the earth is rising. The sea level is rising. Extreme weather conditions are more common. And it will continue.

The debate is over. More than a thousand of the most distinguished international scientists agree: warming of the climate system is "unequivocal" and human activity is to blame (IPCC 2007).

We can already observe many symptoms of climate change.

Buds on the trees are appearing earlier in spring. Habitat conditions for thousands of ocean and land species are changing. Glaciers and ice caps are melting. Sea levels are rising more rapidly. Droughts are becoming more frequent, and precipitation heavy and sporadic. Stronger storms and more frequent floods and heatwaves are following closely in tow (IPCC 2007).

Not only is climate change real, it is accelerating. The warmest global temperatures recorded since 1850 occurred in 11 out of the last 12 years (1995–2006).

These temperatures are projected to increase (IPCC 2007).

These and other early warning signs vary by region, and they will affect everyone differently. Africa will likely be hit the hardest by climate change, and it is the poor who will be affected the most. The Canadian Arctic is also extremely sensitive to temperature increases, which could cause the northern landscape to change dramatically. A few regions will actually experience short-term benefits—for most the opposite will be true (IPCC 2007a).

According to the Stern Report, the most extensive study on the economic impact of climate change, damage globally is expected to cost anywhere between 5 and 20 per cent of global GDP. The cost of inaction will far outweigh the cost of doing something about climate change (Stern 2006).

NOVA SCOTIA CLIMATE CHANGE

Warmer temperatures may present some temporary opportunities for Nova Scotia, such as a longer summer growing season and milder winters. The cost, however, is expected to outweigh the benefits (Environment Canada 2007a).

As a coastal province, we are vulnerable to sea-level rise, storm surge, and erosion along the coast. We will experience heavy and erratic rainfall, droughts, and flooding. We can expect storms to increase in severity (Environment Canada 2007a).

These and other changes will affect the quality of life in Nova Scotia. Buildings, homes, roads, and other landmark infrastructure are at risk of damage or complete deterioration, particularly in low-lying coastal areas. Interruptions in electricity and communications are at risk of increasing, as are health care costs from injuries and deaths relating to severe weather events (Lipp et al. 2005 & deRomilly et al. 2005).

The natural landscape around us will alter and with it some of the flora and fauna that is unique to our region. Fresh water, food, and fish resources are also at risk of declining in quality and availability. If Nova Scotians are not prepared to deal with these changes, economic opportunities in our resource and tourism sectors could decline (deRomilly et al 2005 & Environment Canada 2007a).

NOVA SCOTIA'S FOOTPRINT

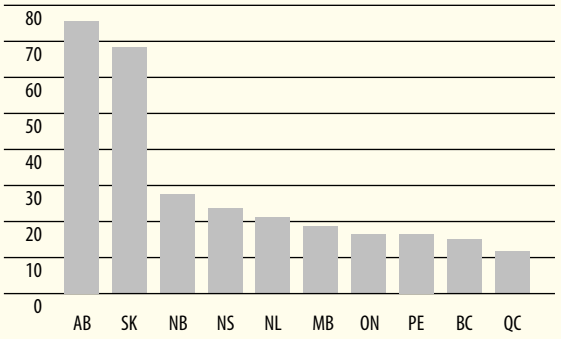
The Ecological Footprint is a measure of the "load" imposed by a given population on nature. It represents the land area necessary to sustain current levels of resource consumption and waste discharge by that population. (Wackernagel & Rees, 1996)

Our footprint is sustainable if we can maintain the natural balance of our resources. If our footprint is unsustainable, our resources deteriorate and so does our quality of life. We consume resources and produce pollution when we manufacture, generate, and distribute energy, though not all forms of energy impose on nature as much as others. The resources used and the pollution generated from the manufacture and distribution of windmills or solar panels, for instance, does not compare to the amount of resources consumed and waste generated from the use of fossil fuels. Generally, the more energy we consume and the more polluting the source of energy, the larger and more unsustainable our footprint.

To avoid incurring unsustainable levels of pollution, our energy resources would ideally emit zero emis-

sions. But as the graph below illustrates, emissions from greenhouse gases alone are 24 tonnes per person. We're a Bigfoot for our size and population. Compared to other provinces in Canada, Nova Scotia in 2005 was the fourth largest per capita emitter of greenhouse gases (GHGs).

GHG Emissions per Capita, 2005
(tonnes per person)

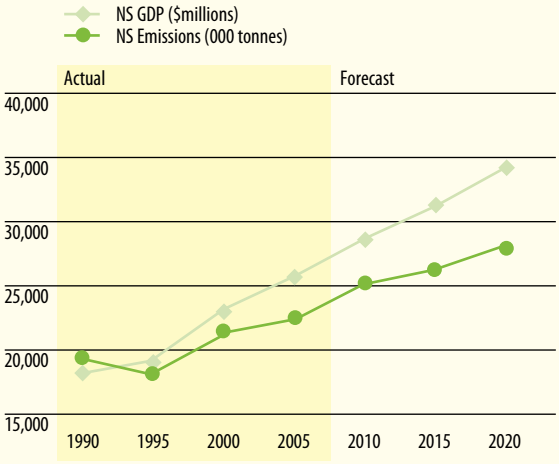


Source: Natural Resources Canada (2006)

Nova Scotia's footprint was relatively smaller in 1990. But over the years, economic activity and rising consumption has influenced a growth spurt in our footprint. Total emissions in Nova Scotia rose 16.2 per cent between 1990 and 2005 (Environment Canada, 2007).

The graph below illustrates the correlation between historic economic growth and greenhouse gas emissions. As economic activity increases, emissions follow. The 16.2 per cent increase between 1990 and 2005 is charted on the left. From 2005 onwards, it projects how greenhouse gas emissions are likely to rise, if economic activity and energy production and consumption rates remain much the same.

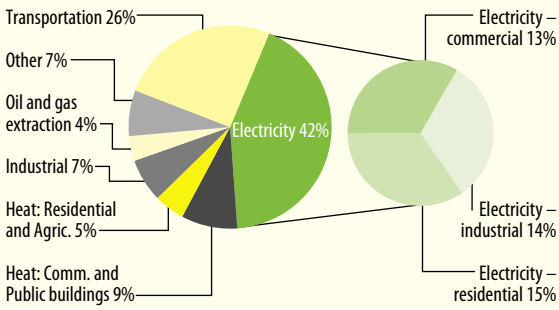
Nova Scotia Emissions – Compared to Economic Growth (GDP)
(actual and forecast)



Source: Natural Resources Canada (2006)

All sectors of the economy are responsible for this upward trend in emissions. However, some sectors emit more greenhouse gases than others. The following illustration shows how much greenhouse gases were coming from each sector of the economy in 2005.

Sources of Greenhouse Gas
Nova Scotia 2005



Source: Natural Resources Canada (2006)
Note: "Heat" is furnace oil. "Industrial" includes refineries.

As the graph demonstrates, power generation for electricity at 42 per cent is the primary contributor of greenhouse gas emissions, whereas transportation at 26 per cent is the second biggest source of emissions in the province.

By contrast, the transportation sector is usually the largest source of emissions in other Canadian provinces and not electricity, partly because other provinces tend to have more hydro-electricity and natural gas (cleaner fuels) for power generation, and do not rely as heavily on coal.

AIR POLLUTANTS

While reducing greenhouse gases (GHGs) is our chief priority for dealing with climate change, other air pollutants also contribute to climate change and poor air quality. These other air pollutants add to our ecological footprint.

Burning fossil fuels such as coal, for instance, releases other air pollutants such as nitrogen oxides (NO_x), sulfur dioxide (SO_2), and particulate matter (PM). These pollutants can lead to other serious environmental and health concerns, such as the acidification of lakes and ground level ozone, which is a contributor to smog.

Sometimes projects that reduce air pollutants, such as a scrubber on a coal-fired power plant, can lead to increased energy use and greenhouse gas emissions, because of the extra power it requires from the power plant to filter out those pollutants. Alternatively, activities that increase energy efficiency and lower greenhouse gas emissions, such as driving a diesel car, can increase the release of air pollutants.

It is essential that all air emissions are considered when developing projects so that we do not solve one problem at the expense of another. This can only be achieved if we target air pollutant reductions at the same time that we reduce GHGs.

To reduce our energy footprint now and in the future—and to profit from that reduction—requires moving towards a lower carbon and less polluting economy. Doing that will require major changes to the way we supply and demand energy.

WHERE DO WE GET OUR ENERGY?

It is not surprising that our GHG footprint is relatively large, given the fact that 89 per cent of Nova Scotia's energy comes from fossil fuels (NRCan, 2006). The illustration below shows the different resources we use for energy in Nova Scotia and how GHG-intensive each resource is.

Energy Supply	**GHG intensity:** most current data (2004) (CO_2 equivalent- kilograms/Kwh)
Coal	1.04
Natural Gas	0.55
Petroleum	0.87

Fossil fuels, such as coal, make up such a large portion of our energy supply, because most of our energy infrastructure is set up to use that source, and because it's comparatively cheaper from other more green sources of energy on the world market.

The local resources available in Nova Scotia are in fact much more diverse than our supply mix shows, but we don't necessarily use all these local, potentially greener sources of energy, because it would make the price of energy go up.

Another reason why we use so much fossil fuel is that, unlike other provinces in Canada, Nova Scotia is not endowed with large hydro resources, which provide clean energy and green development opportunities. Nova Scotia has large coal reserves, and only recently gained access to natural gas.

But because Nova Scotia is heavily dependent on fossil fuels, we also have a greater opportunity to reduce our GHG emissions through energy efficiency and conservation. Energy efficiency is also one of the easiest and most cost-effective ways to reduce emissions.

Renewable energy also has great potential to play a larger role in our provincial energy supply. We have some of the best wind, tidal, and solar regimes in all of Canada. But while the use of renewable energy is advancing in the province, it also faces some challenges. Wind blows when it wants to, the tide offers power regularly but not constantly, the sun depends on

time-of-day and weather. Because of its intermittent nature, renewable energy requires a reliable and consistent back up source of energy (a base-load) on which to switch to when renewable sources slow down.

Hydro-electricity is the most effective back-up source, because it can ramp up quickly and provide energy almost immediately, unlike coal or nuclear. Unfortunately Nova Scotia does not have a large hydro resource. Natural gas, another widely used back-up source of energy, can be expensive, driving the cost of electricity up.

Back-up challenges, energy prices, and technology are just some of many hurdles we need to overcome in our quest to green Nova Scotia's energy supply.

WHO USES ENERGY?

Our energy supplies four different types of energy consumers:

- **residential** users—to heat homes and power lights and appliances
- **commercial** users—to heat and power public office buildings, schools, hospitals, and private businesses
- **industrial** users—to power plants and factories
- **transportation** users—to run cars, trucks, trains, boats, and airplanes

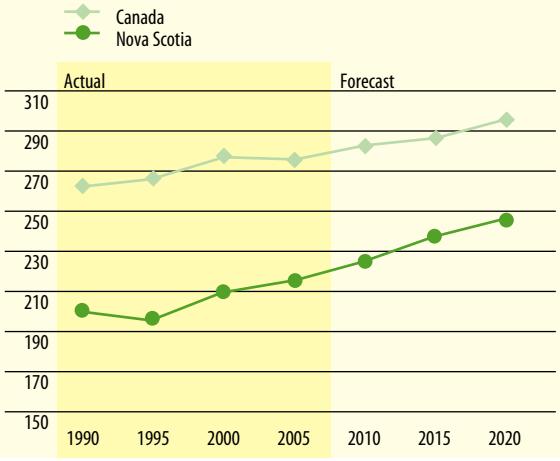
These consumers demand different forms of energy, including home heating fuel, gasoline, and electricity. Over time, all these energy users have dramatically increased their consumption of energy. As businesses grow, as people buy bigger homes and more appliances, people travel farther and use energy more lavishly, our total populations' demand for energy increases.

The graph on the right (top) compares Nova Scotia's per capita energy demand with that of Canada. Energy demand is lower here compared to the national average, but both show an upward trend in demand.

The desire for more energy is not just coming from commercial or industrial businesses. Individuals and households are also demanding more energy. This is best illustrated in the electricity sector, where total demand has risen 31 per cent between 1990 and 2005 and is expected to increase a further 24 per cent between 2005 and 2020.

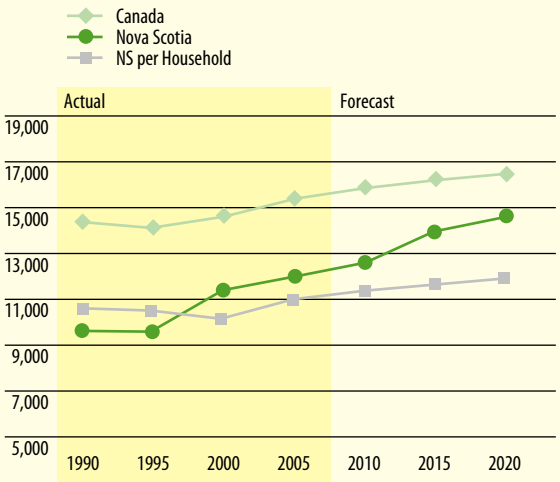
Total Energy Demand – per Capita

(gigajoules, actual 1990-2005, forecast 2010-2020)



Electricity Demand per Capita and per Household

(kilowatthours, actual 1990-2005, forecast 2010-2020)



THE CHALLENGE

Our habits today will determine the fate of our future and how livable our planet remains.

It starts with all of us making small but significant changes to the way we live and work, to the way we do business, and to the way we think and behave—regardless of the limitations and what other people and businesses may think or do.

The potential solutions are out there. We can reduce emissions by conserving energy, increasing efficiency, investing in renewable energy, and making our existing fuel supply less polluting. We can also manage the risks of climate change through effective planning and coordination between a variety of public and private stakeholder groups.

These options are explored in more detail in the document Discussion Paper: *Nova Scotia's Renewed Energy Strategy + Climate Change Action Plan*. The challenge will be to weigh these options not only in terms of their potential to reduce GHG emissions and other air pollutants, but based also on the affordability, reliability, and accessibility of different energy options and their contribution to wider social, environmental, and economic goals.

All of us as individuals, as consumers, and as businesses in Nova Scotia need to think critically about how we can reduce our own carbon footprint and make Nova Scotia's transition towards a low-carbon economy as smooth as possible. Time is of the essence.

NOVA SCOTIA'S APPROACH

The Environmental Goals and Sustainable Prosperity Act (2007) includes many goals that respond to climate change while at the same time create economic growth. The act includes the following key goals by 2020:

- 10 per cent less greenhouse gas emissions than 1990 levels
- one of the cleanest and most sustainable environments in the world
- economic performance to the Canadian average or better

Sustainable prosperity means meeting our needs today without compromising tomorrow's. It means creating a long-term vision where human activity and the environment support and enhance each other. Climate change is a key part of sustainable prosperity, along with pollution, wildlife, biodiversity, natural resources, population, and economy.

This approach means placing climate change together with other elements of our environment and economy. We need to reduce greenhouse gas emissions without increasing air pollution, or increasing the price of electricity beyond the reach of tenants, homeowners, and businesses. We need to keep the big picture in mind.

Looking at climate change within this context, the province must address six key areas:

1. **Use less energy:** Our demand for energy is increasing. If we want to cut emissions, we need to reverse this trend. That is what "energy efficiency" and "energy conservation" are all about.

2. **Use renewable energy:** We can also cut emissions by using greener sources of energy. The wind, sun, tides, and earth are potentially limitless sources, and emission free.

3. **Use cleaner energy:** To meet our energy demands, we still need fossil fuel. To deal with that reality, we need practical approaches now, such as using natural gas and recycling wasted heat. We also need to explore ways to trap emissions from coal.

4. **Use nature to clean:** Not all emissions come from energy use. Plants and animals produce greenhouse gas when they grow and die. Plants and forests also absorb greenhouse gas. So agriculture and forestry have a large role to play in managing emissions.

5. **Lead by example:** As the largest purchaser and employer in the province, government can play a role not only in cutting emissions, but also in creating a market for greener products and services.

6. **Plan for change:** Cutting emissions now may prevent a disaster down the road, but we must accept that our climate will continue to change in the near future. How will that change affect us? What can we do to get ready? How must we adapt? These questions need research and planning—and collaboration with communities and businesses.

ACTIONS UNDERWAY – GOVERNMENT OF NS

Many provincial government departments, agencies, and offices are already involved in climate change. Here's what they are doing right now:

Approach	Project/Program/Strategy/Study	Department
Use less energy	Energy efficiency and conservation programs	Conserve NS
	Demand side management (DSM) potential in NS study	Conserve NS/Energy
	Development of vehicle fuel/emissions standards	Conserve NS
	Development of building energy standards	Conserve NS
	Development of ecoTrust projects	NS Environment and Labour (NSEL)/Energy
Use renewable energy	Renewable Energy Standard (RES)	Energy
	In-stream tidal demonstration facility	Energy
	Solar water heating program	Conserve NS
	Wind integration study	Energy
	Development of ecoTrust projects	NSEL/Energy
	Biofuels	Energy
Use cleaner energy	Provincial air quality regulations	NSEL/Energy
	Gas market development fund	Energy
	Development of greenhouse gas regulations	NSEL/Energy/Federal
	Development of ecoTrust projects	Conserve NS/NSEL/Energy
Use nature to clean	Forest carbon sequestration	DNR
	Soil management	Agricultural College
	Livestock management	Agricultural College
	Development of ecoTrust projects	NSEL/Energy

Lead by example	Procurement	NSED/NSEL
	Vehicles	TPW/CNS/Energy/NSEL
	Buildings	TPW
	IT and communications	NSEL/NSED/Energy
	Food	Agriculture/Energy
	Behavioural change: "Rethink"	Energy/Conserve NS/NSEL
	Development of ecoTrust projects	NSEL/Energy
Plan for change	Adapting to climate change in NS: vulnerability assessment	Energy/NSEL
	Provincial adaptation framework consultation	Energy/Federal
	Development of natural resources strategy	Natural Resources
	Development of water strategy	NSEL
	Detailed coastline mapping	Energy/HRM
	Municipal climate change risk management toolkits	Energy/HRM/SNSMR
	Developing a coastal management framework	Fisheries and Aquaculture

FUNDING SOURCES

Responding to and planning for climate change will take money. Here are some public funds already earmarked for climate change related activity:

- ecoTrust for Clean Air and Climate Change: **$42.5 million (total)**. The ecoTrust for Clean Air and Climate Change will support projects that reduce greenhouse gas emissions and other air pollution.
- Conserve Nova Scotia: **$10 million (annual)**. Conserve Nova Scotia funds energy efficiency and conservation initiatives.

CONCLUSION

The more energy we use, the more our climate is likely to change—change that will affect all aspects of life in Nova Scotia. This puts Nova Scotia at a crossroad: we know we must respond, and yet we continue to demand more energy.

How do we proceed? Some things are clear. We know we must

- use energy more efficiently
- use renewable energy
- use cleaner energy
- use nature to clean
- lead by example
- plan for change

All these approaches need further discussion, clarity, and action. This document is intended to inform that process.

The Government of Nova Scotia has set a deadline to lower emissions to 10 per cent below 1990 levels by 2020. While the government clearly needs to do more work to get there, the key to our success will come down to individual action.

Each of us needs to lower our annual emissions by an average of 20 per cent, from 24 tonnes to 19 tonnes per person each year. That will require personal decisions—about the homes we heat, the cars we drive, the food we eat, and the lives we live.

Our climate is changing. What are we each willing to do about it?

GOVERNMENT PLANNING

The **Deputies Forum** on Sustainable Prosperity coordinates the implementation of the Environmental Goals and Sustainable Prosperity Act. The Forum includes deputies from key departments involved in sustainable prosperity issues.

A **Senior Officials** working group has also been created from these departments to analyze key issues and move projects forward.

Meeting Our Greenhouse Gas Emissions Goals

As mentioned earlier, the **Department of Energy** is working on two major plans right now:

- *Climate Change Action Plan*
- *Renewed Energy Strategy*

Many, if not all, departments of government will have a role to play in meeting our climate change goals, but some will be especially critical to our success.

The **Conserve Nova Scotia** agency was created to implement energy efficiency and conservation programs. The agency is currently delivering a number of programs that will increase energy efficiency and reduce GHG emissions and is working to better understand the potential to reduce our demand for energy in the province. New programs will be developed to capture more of the cost effective energy efficiency and conservation opportunities available to Nova Scotians.

The **Department of Economic Development** released a renewed economic growth strategy called Opportunities for Sustainable Prosperity in 2006 and is currently working on an implementation plan. The strategy and implementation plan will provide us with the vision and tools needed to grow our economy in a way that reduces our greenhouse gas emissions and enhances our natural and social systems.

The **Department of Environment and Labour** is the lead on Nova Scotia's Environmental Goals and Sustainability Act and regulates other air pollutants, and it is essential that we address greenhouse gas emissions and air pollutants at the same time.

Planning for change

Our *Climate Change Action Plan* will also focus on how we will address climate change impacts and adaptations. Climate change will affect many areas of the province and will require action by governments at all levels as well as the public and the private sector.

Identifying actions to reduce future effects of climate change will, therefore, require the involvement of many provincial government departments, municipalities, and companies and the engagement of our universities and other research institutions.

The Action Plan will coordinate and identify impacts and adaptations strategies and actions for a number of departments. For example, the **Department of Natural Resources** will be exploring the implications of climate change as it develops new strategies that address parks, forestry, biodiversity, and minerals.

As well, the **Department of Environment and Labour** will develop a Water Resource Strategy. The strategy will address all water issues associated with climate change, including more frequent and intense storms, drought, sea-level rise, run-off, and drinking water.

Service Nova Scotia and Municipal Relations has recently hired a sustainability coordinator who will work with municipalities to both prepare for climate change impacts and adaptations and reduce greenhouse gas emissions.

APPENDIX B

CLIMATE CHANGE SCIENCE IN BRIEF

What is global climate?

Global climate is the expected weather we can experience over periods of days, months, or years in particular parts of the globe—the average weather over time.

If we are considering averages over long periods of time, our view of weather is fairly predictable. Weather is characterized by relatively stable micro climates and "typical weather" in various regions. We can expect a tropical climate near the equator and an arctic climate near the poles.

What does a change in climate mean?

On a global scale, we experience a stable average temperature of 14° C (Kieh & Trenberth 1997). When it changes, all the associated weather conditions and patterns begin to change with it.

Changes in global temperature are not new. Over the course of 4.5 billion years, all kinds of natural circumstances have caused earth's temperature to fluctuate. This has been due to continents drifting apart, changes in ocean currents, changes in the tilt of the earth, changes to the amount of solar output from the sun, and volcanic eruptions.

All it takes is a slight change in the earth's temperature to cause the difference between a warming period and an ice age.

How is today different?

What is unique about this pattern of climate change is the speed at which the temperature is increasing and the fact that human activity is the primary cause of the rapid warming trend. In the northern hemisphere, the last 50 years were likely warmer than any other 50-year period in the last 1000 years (IPCC 2007).

This period of climate change has correlated almost exactly with the rise of the industrial revolution and the surge in western economies. Without the addition of the greenhouse gases produced by human activity over the past 150 years, this warming would not have happened (IPCC 2007).

What are greenhouse gases?

Greenhouse gases absorb long waves of light and re-emit them to the earth's surface and the surrounding atmosphere. The earth warms and radiates heat and, in turn, warms the atmosphere. Such an effect reaches a balanced state at which our global temperature stabilizes at 14 degrees Celsius. If it were not for these gases, the earth would be 30 degrees Celsius colder and uninhabitable.

An increasing amount of greenhouse gases causes just the opposite. The greenhouse effect becomes enhanced and the atmosphere heats up.

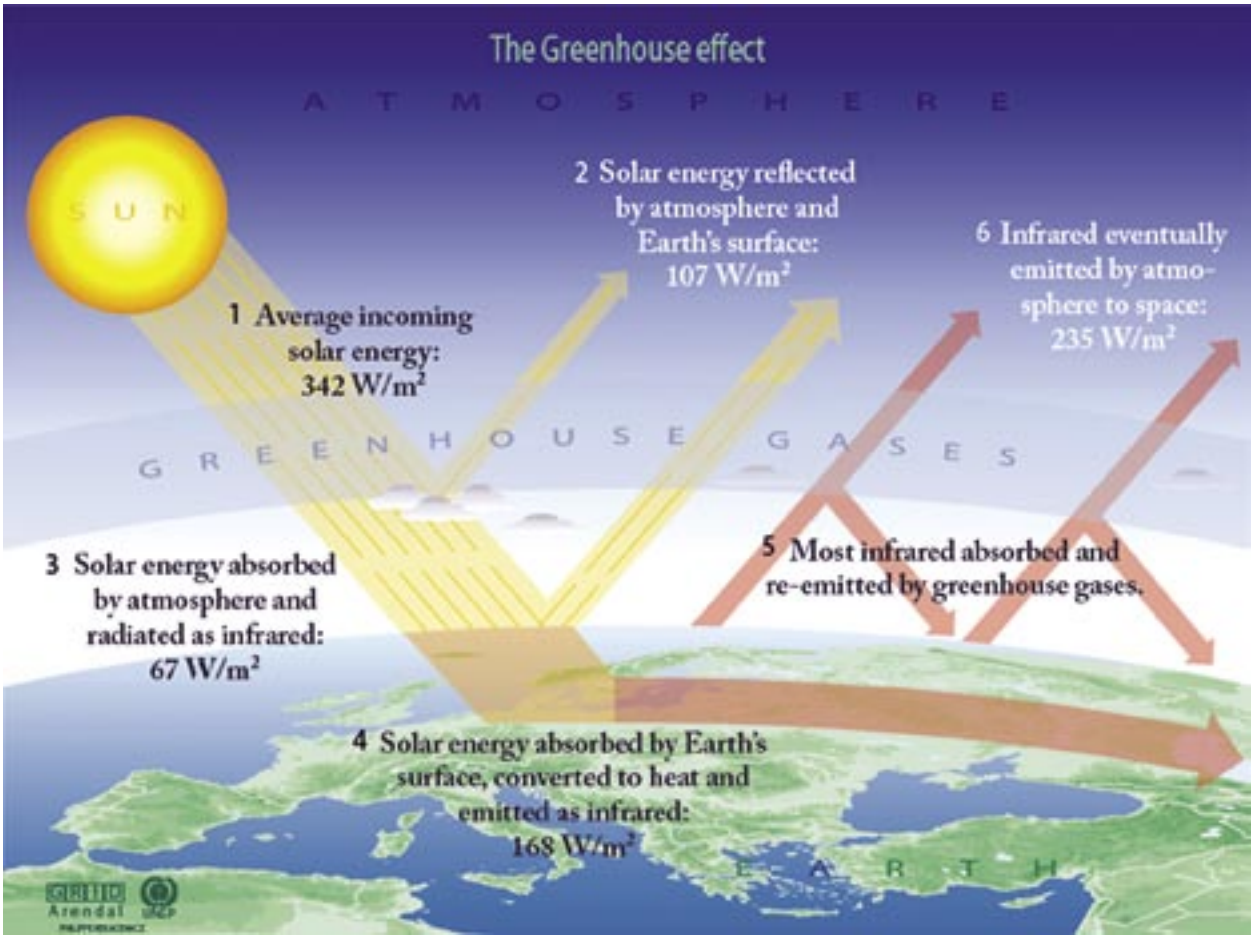
Six greenhouse gases result from human activity. Each has a different lifespan and ability to absorb light.

Although these gases occur in small concentrations (parts per million to parts per billion) in the atmosphere, their ability to impact global temperature is dramatic. Even compared to each other, they are not created equal. For example (see table p.13), if we had as much methane in our atmosphere as we have carbon dioxide, we would be experiencing a warming 21 times greater than is currently occurring. This is called methane's "global warming potential" and is why we must pay attention to all greenhouse gases.

Luckily the "man-made" chemicals listed (HFCs, PFCs, and SF6) exist in very small concentrations (parts per trillion), otherwise we would have a much more significant problem due to their "global warming potential."

Before widespread fossil fuel combustion, deforestation, industrial farming, and urbanization, the amount of greenhouse gases reaching the atmosphere was stable and part of a large carbon cycle that included the world's oceans. This amount of greenhouse gases ensured that the temperature on earth stayed relatively constant.

But with soaring populations and increasing demands to heat or air-condition our homes, to fuel our cars, and power our electricity, greenhouse gases, resulting from increasing fossil fuel burning, are now causing the global thermometer to rise.



Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996. Printed with permission from Environment Canada (2007b).

Greenhouse gas	Power	Lifespan	Source
Carbon Dioxide	1 x CO_2	100 years	Human exhalation, decomposing or burning plants, fossil fuel combustion
Methane	21 x CO_2	12 years	anaerobic digestion from humans and animals, compost, also found in the permafrost of the Arctic/Antarctic regions
Nitrous Oxide	120 x CO_2	120 years	aerosol sprays, pesticides, also partial by-product of fossil fuel and biomass combustion
Hydrofluorocarbons (HFCs)	140 to 120,000 x CO_2	1.5 to 264 years	chemical manufacturing
Perfluorocarbons (PFCs)	6,500 to 9,200 x CO_2	3,200 to 50,000 years	chemical manufacturing
Sulphurhexafluoride (SF6)	100 x CO_2	100,000 years	chemical manufacturing

Source: Climate Change 1995, the Science of Climate Change; 2nd Assessment Report, IPCC, p.121

How warm will it get?

Scientists have charted out high and low scenarios, based on varying amounts of greenhouse gases related to how human activity evolves in the future.

They estimate that average global temperature could increase anywhere between a low estimate of 1.8 C and a high estimate of 4.0 C by the year 2100 (IPCC 2007).

Under a high scenario, the planet will warm significantly, causing serious damage. The middle path will also be serious, but more manageable.

The best possible scenario is the low trend, which will mean that we will have curbed the potential for serious climate catastrophe but we will still have to adjust to the climate change we already created.

Why should I care?

The increase of 0.76 C in global temperature over the last century was all it took to accelerate ice caps melting, for sea levels to rise, and for weather patterns to change. It was enough to make hurricanes, droughts, floods, and heat waves more intense, to cause species to go extinct, and others to move to higher and warmer ground. We are only just beginning to see these changes occur —but they will increase with more severity, and in some cases with more frequency, as the climate keeps warming (IPPC 2007a).

If you can remember the last time you experienced or read about extreme weather events, you can appreciate the concern about climate change. Exceptional weather events may be challenging, but a pattern of difficult weather conditions can mean life and death for many people, plants, and animals around the world.

Scientists agree that if global temperatures increase more than 2.0 C it will mean the difference between being able to manage and adapt to climate change or being completely susceptible to the dangers of the weather events to come (IPCC 2007).

APPENDIX C

GLOSSARY OF TERMS

Climate change
A change in average weather over time.

Ecological footprint
A measure of the "load" imposed by a given population on nature, which represents the land area necessary to sustain current levels of resource consumption and waste discharge by that population (Mathis Wackernagel & William Rees 1996)

Energuide
A rating system that shows the energy efficiency of various products

Energy Efficiency
The ability to get the most useful energy and least waste out of energy sources

GHG footprint
The total greenhouse gases emissions released by an individual or population

Greenhouse Gases (GHG)
Gases that absorb long waves of light that re-radiate and warm the earth

Gross Domestic Product (GDP)
Measures the size of the economy based on the income generated from the sale of goods and services produced by a domestic economy

International Panel on Climate Change
The leading scientists on climate change who report to the United Nations and the World Meteorological Association

Leadership in Energy and Environmental Design (LEED)
A Green Building Certification and Rating System

Renewable Energy
Energy that can regenerate itself inexhaustibly (recognizing that the sites projects are built on may be limited, or have otherwise unsustainable aspects to them); sources include wind, solar, tidal, geo-thermal, and wood

Sustainability
A renewable process where by activities can carry on inexhaustibly into the future

Sustainable prosperity
Meeting today's needs without compromising our future. Working together for a strong, innovative economy and a healthy, vibrant environment for individuals, families, and communities

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