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Preparing for the Peak: Energy Security and Atlantic Canada [1]

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Abstract

Canada is one of the handful of countries that is still able to export crude oil and refined petroleum products. Perhaps because of this, the Canadian federal government and most, if not all, provincial governments do not have energy policies that recognize the need for energy security.

Atlantic Canada is one region that will be particularly vulnerable to peak oil, since almost all of the region's oil is imported from the North Sea and Venezuela. Although crude oil is being extracted from the Grand Banks of Newfoundland and Labrador, this offers little hope in achieving energy security, as most of the production is destined for markets outside the region.

This paper examines some of the potential impacts of peak oil on Atlantic Canada. First, the present energy mix is considered in terms of regional supply and demand (almost three-quarters of the region's energy requirements are supplied by refined petroleum products). The basic energy policies of the four provincial governments are shown how they do nothing to discourage the reliance on refined petroleum products for space heating and transportation.

When peak oil production is finally confirmed, there will be a knee-jerk reaction, trying to find substitutes. The paper considers some of the possible substitutes, such as agricultural bio-fuels; which, under ideal circumstances, could meet about one-seventh of the region's energy needs.

1 Introduction

As world demand for crude oil continues to rise and production levels appear to plateau, it is expected that the cost of most forms of energy will rise dramatically. How individuals, regions, and nations will respond to this is open to debate; however, in a northern, resource-based country such as Canada, the effect could be catastrophic:

- Residential space heating is the major component of most residential energy bills, as many parts of Canada are subject to prolonged periods of sub-zero temperatures during the winter months. Furthermore, about 70 percent of Canadian homes are heated by some type of fossil fuel (natural gas, electricity from thermal sources, or fuel oil).

- Although Canada is one of the most highly urbanized countries in the world, land use policies have encouraged dispersed urban development, thereby making the transportation sector the country's largest consumer of energy. The transportation sector is almost completely dependent on fossil fuels (conventional, and to a growing extent, synthetic crude oil).

- A growing percentage of low- and fixed-income Canadians are in need of assistance to meet their winter space heating requirements; as a result, Low Income Fuel Assistance (LIFA) programs are becoming more commonplace.
- Much of Canada's industrial sector relies on low-cost energy, a low-valued dollar, or both. This is especially true in the forest products sector that was quite healthy until the increase in energy prices and the concomitant rise in the Canadian dollar (a result of the Canadian dollar becoming a so-called "petro-currency"). Mounting production costs coupled with lower-cost goods from China are making Canadian industries less competitive (CIBCWM, 2006).

By themselves, any of these factors would make meeting the challenge of increased energy costs difficult; when taken together, the challenge will become Herculean.

Atlantic Canada, consisting of the four most easterly Canadian provinces (Newfoundland and Labrador, New Brunswick, Nova Scotia, and Prince Edward Island), exhibits energy consumption patterns similar to those found in the rest of the country; however, there are differences that will complicate the challenge of rising energy costs.

First, the housing stock in much of Atlantic Canada is of much older vintage than that found in the rest of Canada. As a result, the energy intensity of the residential sector is much higher than in most other regions of the country. Upgrading these houses to meet minimum EnerGuide standards will be a costly exercise (Dodge, 2006).

Second, although Atlantic Canada's population is in decline, there is still a relatively large rural component, where people are required to rely on private, rather than public, transportation. In addition, most markets for goods produced in Atlantic Canada (such as Ontario and the New England states) are on the order of 1,000 kilometres away. Transportation also becomes an issue when there is very little backhaul traffic returning from the United States because of the region's small population (Beal, 2006).

Third, the region is treated as a colony when it comes to its indigenous energy sources. Almost all of the electricity generated from Churchill Falls, NL is sold at $0.00254 per kilowatt-hour to Quebec-Hydro (TD, 2005). About 85 percent of Newfoundland and Labrador's offshore oil production is shipped to markets in Quebec and New England,

the remainder is refined in Saint John, NB. Nova Scotia's much vaunted offshore natural gas has proven to be a disappointment, with rapidly declining reserves, little prospect for new exploration, and most of the natural gas being shipped to New England (Hughes, 2006a).

Renewable sources of energy, such as wind and biomass, have yet to make major contributions to the regional energy mix. Even the government of Prince Edward Island, the one province with a major commitment to wind energy and legislation requiring that 100 percent of provincial electricity will come from renewables by 2015, has stated that if by 2013 it appears that the 100 percent target cannot be met, the law will be changed (Belfry, 2005). On the other hand, Nova Scotia Power has successfully negotiated a deal with the province limiting the level of competition from independent power producers to no more than 1.6 percent of its total generation in 2000 (NSES, 2001).

Energy security is defined as "government actions or policies to ensure that a community has access to reliable and secure sources of energy at a reasonable price" (Hughes, 2006b). With no oil or a natural gas pipeline connecting to Canada's western energy wealth, and only limited access to Quebec's hydro electric resource, there are few prospects of becoming energy secure using Canada's energy wealth. Therefore, any solution must be home-grown, at a minimum addressing the need for space heating and transportation.

The objective of this paper is to examine these challenges and the rapidly diminishing range of possible solutions to the problem of peak oil. The paper will show that what once would have been a discussion on energy security now appears to be one of energy survival.

2 Energy demand in Atlantic Canada

Over the past 20 years, the Atlantic Provinces have undergone significant changes, most notably in the fishing industry, which has collapsed due to overexploitation of the fish stocks. Other sectors of the economy are also under pressure, including forest products (restrictions on lumber exports to the United States and the aforementioned problems with forest products), energy production (the collapse of Nova Scotia's Sable Offshore project and the problems Newfoundland is having with its Hebron offshore project), and

the lack of employment opportunities, causing many young people to leave the region to seek employment in western Canada (notably Alberta).

There has been a gradual decline in the region's population over the past decade. It reached a peak of 2.385 million in 2004; since then, there has been a steady decline. The population in 2003 (2.342 million) is less than it was in 1990 (2.348 million). Despite this decline, there has been a steady increase in energy demand in the region (see Figure 1). As a result, the energy intensity per capita has increased from 196 terajoules (TJ)/person to 216 TJ/person between 1990 and 2003.[2,3]

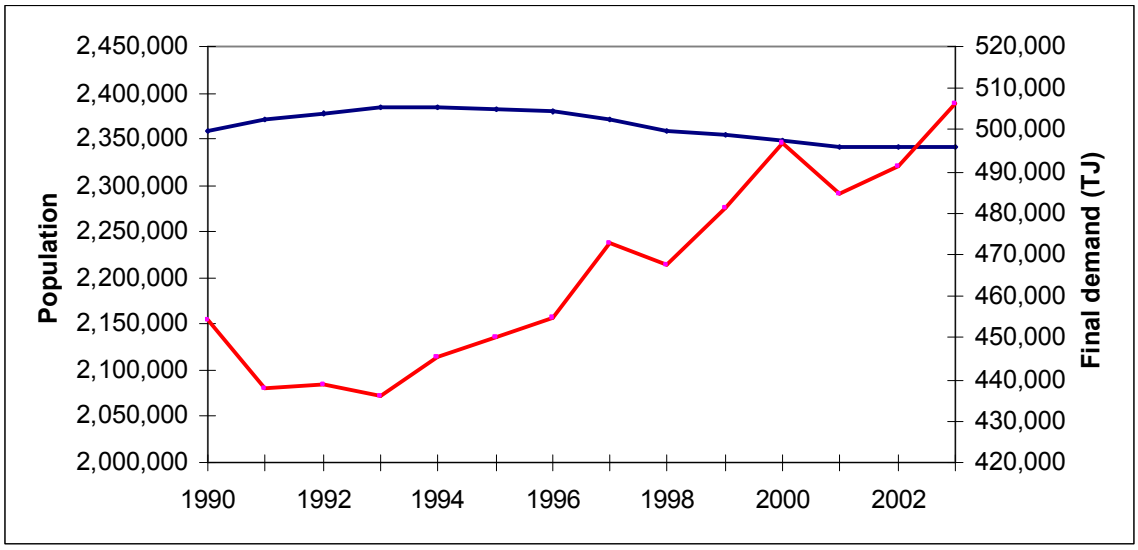

Figure 1: Population and final energy demand in Atlantic Canada
(StatsCan 2005a, StatsCan 2005b)

2.1 Demand

The principal source of primary energy in Atlantic Canada has been and continues to be refined petroleum products[4] (see Figure 2).

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[2] The base year for the data used in this paper is 1990, as this allows for the measurement of greenhouse gas emissions and their influence on climate policy and energy policy.

[3] The data used in this paper comes from Statistics Canada's ESTAT database. At the time of writing, the energy tables had data values up to December 2003.

[4] Refined petroleum products are the products of refined crude oil; for example, gasoline, diesel fuel, and heating fuel.

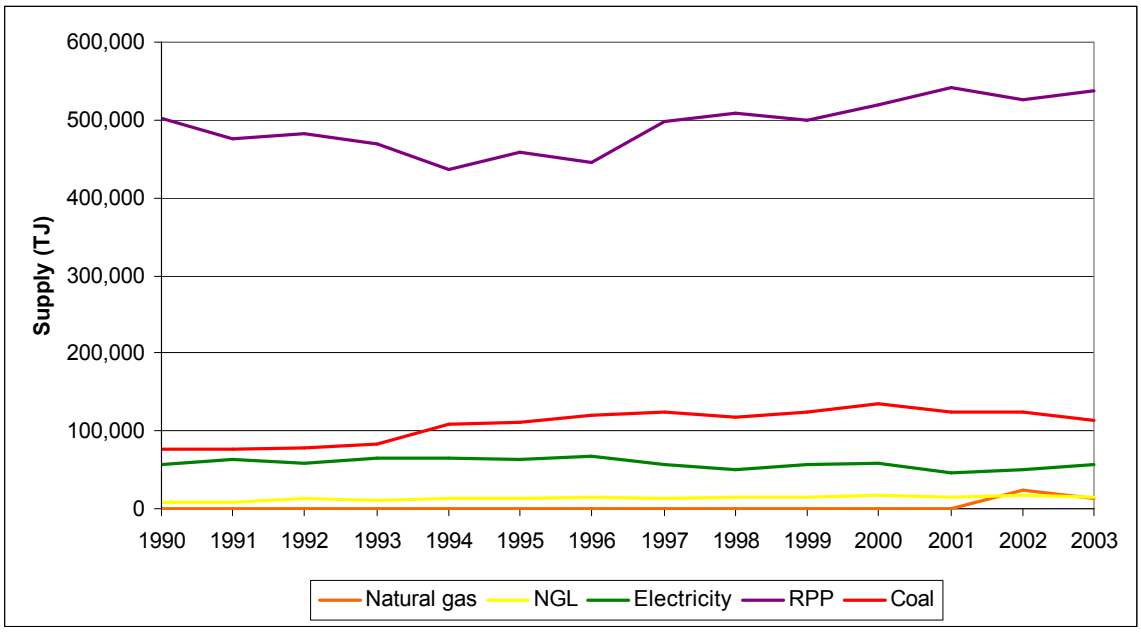

Figure 2: Primary energy demand in Atlantic Canada (StatsCan, 2005b)

In 2003, the demand for primary energy in the region was met from the following sources: refined petroleum products (73%), coal (16%), hydroelectricity and nuclear power (8%), with the remainder coming from natural gas and natural gas liquids. The net primary energy demand was 737,425 TJ and the net final energy demand[5] was 506,319 TJ.

Each sector of the region's economy uses energy products; the final energy demand per sector is shown in Figure 3. The two principal sources of energy used in the region are refined petroleum products (used in all sectors) and electricity (used in all sectors except transportation).

[5] Net final demand is defined as the total primary energy demand minus the energy used in creating electricity from thermal sources (such as coal, oil, or natural gas generating stations) plus the electrical energy from these thermal sources. The net final demand is always less than the total primary energy demand given the inefficiencies in generating electricity from thermal generating stations. The net final demand would equal the total primary energy demand if the electricity could be generated from non-thermal sources such as hydroelectricity, nuclear, or renewables.

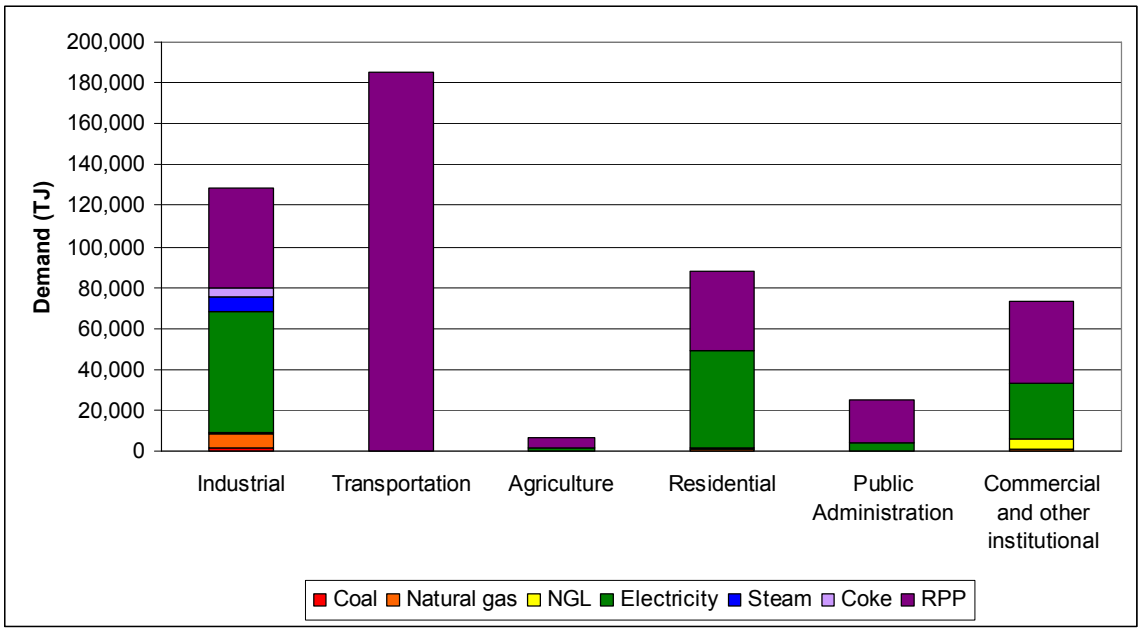

Figure 3: Final energy demand by sector for 2003 (StatsCan, 2005b)

In 2003, a total of 536,773 TJ of refined petroleum products was consumed in the region. Electrical generation from thermal sources (89,885 TJ), and hydroelectric and nuclear sources (56,139 TJ)[6] amounted to 138,361 TJ; the generating facilities consumed 7,663 TJ. The energy required for thermal generation is summarized in Table 1.

Table 1: Energy sources for thermal generation (StatsCan, 2005b)

Source	Energy (TJ)
Coal	113,093
Natural gas	13,654
Refined petroleum products	102,532

2.2 Supply

Atlantic Canada has limited access to North America's major energy grids:

- Churchill Falls to Quebec Hydro (electricity).
- Quebec Hydro to NB Power (electricity).
- NB Power to Maine (electricity).

[6] Statistics Canada makes no distinction between hydroelectricity and nuclear power in their definition of primary energy sources. Atlantic Canada generates electricity from both hydroelectric and nuclear sources.

- Maritimes and Northeast Pipeline from Nova Scotia to New England (natural gas).

Atlantic Canada has no pipeline connections to the rest of Canada and therefore receives neither natural gas nor oil from western Canada.

Although there are limited supplies of coal in New Brunswick and Nova Scotia, almost all coal and petroleum-coke for electrical generation is imported from Venezuela and Russia. Similarly, about 15 percent of the crude oil extracted from Newfoundland and Labrador's offshore is made available to refineries in Atlantic Canada. Almost all of the region's refined petroleum products are obtained from crude oil supplied from Venezuela and the UK's North Sea Brent field.

The Sable offshore energy project is the primary source of natural gas in the region. Most of this is exported to the United States, although some is used in a dual-fuel thermal power station in Nova Scotia. The Sable project, although highly touted by the Nova Scotia government in the late 1990s and early 2000s, has not lived up to expectations and is in terminal decline (Hughes, 2006a).

3 Provincial differences

Although Atlantic Canada has been presented as a monolithic entity, it consists of four different provinces, each with their own governments, policy agendas, and indigenous energy sources.

3.1 Newfoundland and Labrador

Of the four Atlantic Provinces, Newfoundland and Labrador underwent the greatest transformation between 1990 and 2003. First, its population decreased by over 10 percent to 518,350 (StatsCan, 2005a). Second, its traditional offshore fishing industry has all but ceased to exist with the collapse of the cod fishery. Third, it has seen the growth of its offshore petroleum industry with two fields, Hibernia and Terra Nova, producing over 114 million barrels a year (NFLD, 2005). A third field, White Rose has begun production, while the start of Hebron, a fourth field containing heavy crude, has been delayed because of contractual differences between the Government of Newfoundland and Labrador and at least one of Hebron's developers. Output from Hibernia and Terra Nova appears to have peaked (NFLD, 2006).

Newfoundland and Labrador have considerable hydroelectric resources. Churchill Falls in Labrador sends most of its electricity to Quebec for about a quarter-of-a-cent per kilowatt. Interest has been expressed in developing the lower Churchill for export to Ontario.

3.2 New Brunswick

NB Power, New Brunswick's provincially owned electrical utility has the region's only nuclear power station at Point LePreau, a 600 MW Candu, which will be undergoing a refit starting in April 2008. NB Power has some hydroelectric capacity, but relies heavily on thermal generation using imported petroleum-coke and coal.

New Brunswick has limited coal reserves. Recently, a number of small natural gas fields have been discovered and plans are underway to connect these fields to the pipeline supplying New England.

3.3 Nova Scotia

Ignoring renewables such as hydroelectricity (which is tapped out in the province), Nova Scotia has two sources of indigenous energy: high sulphur coal and offshore natural gas. The coal mines closed in 2000 when Nova Scotia Power opted to purchase imported coal from Venezuela and Russia. There is talk of reopening one of the undersea mines and possibly using the coal in one of Nova Scotia Power's thermal generating stations.

Offshore natural gas production started at the end of 1999 and peaked in November 2001; production is now 30 percent less than at the peak (Hughes, 2006a). Over 90 percent of the natural gas is exported out of the province, with most of the remaining ten percent used in a dual-fuel power station.

The provincial government has shown little interest in pushing Nova Scotia Power towards the use of renewable energy (NSES, 2001). With great reluctance, Nova Scotia Power is purchasing wind-generated electricity from a limited number of independent power producers.

3.4 Prince Edward Island

Prince Edward Island is the smallest of the Atlantic Provinces. It has no indigenous fossil energy, although there appears to be uneconomical pockets of natural gas on the Island.

All energy is imported, including electricity supplied by undersea cable from NB Power (a gas turbine is used for peaking).

Of the Atlantic Provinces, Prince Edward Island is making the greatest strides towards reducing its dependence on imported energy. It is promoting the use of renewable energy primarily through encouraging the development of wind farms.

4 Present energy policies

The energy policies of the individual governments in the region focus on one or more of the following programs:

- Low income fuel assistance to help those in need of help to pay for their heating bills over the winter months. In Newfoundland and Labrador and Nova Scotia, the programs are single, fixed payments made to qualifying individuals and families, ranging from $200 to $250 for the heating season. In New Brunswick, the government recently announced a program that will removes the sales tax from home heating fuels (heating oil, electricity, natural gas, and wood).
- Price regulation, restricting the maximum price increase a fuel supplier can charge. Fuel suppliers are required to submit their proposed price changes (increases or decreases) to a fuel price review board, which can approve or modify the changes. The board can examine the price changes for transportation fuels and home heating fuels. All provinces except Nova Scotia have a fuel price review board, although the provincial government is considering establishing one.
- Programs intended to improve the energy efficiency of residences and businesses. These either work in conjunction with the federal government's EnerGuide for Houses program (for example, matching the federal contribution) or offer advice on how to access the EnerGuide program.

The first two of these programs do little to discourage energy consumption and can actually encourage greater levels of consumption, potentially causing local shortages and forcing the price higher (Hughes, 2006b).

Few people can argue with the need for low income fuel assistance programs; however, they are a short-term solution with long-term implications during a time of rising energy

costs. As fuel prices continue to climb, the level of assistance must increase, while simultaneously, more consumers become eligible for assistance as their energy burdens increase. Governments become trapped in a never-ending cycle of assistance.

A problem with price regulation that is overlooked by its advocates and supporters is that a fuel supplier is under no obligation to sell a product to a specific market. This happened in September 2005, both in Prince Edward Island and Newfoundland and Labrador where the fuel price review boards quickly backed down when faced with the possibility that gasoline would not be distributed in their respective provinces because the oil companies considered the regulated prices too low. In a time of volatile oil prices, thereby creating a sellers market, fuel price review boards would be of little use.

The EnerGuide program is an excellent one in that it can reduce the energy requirements of a residence, thereby lowering the consumer's energy burden. At present, little is being done to assist those on low-income who either own a home or rent accommodation, as the EnerGuide program expects the homeowner to pay a non-refundable $150 audit fee and then finance the home upgrade (usually insulation and caulking); the home is then re-audited, and depending upon the energy improvements, the homeowner will receive payment for all or part of the upgrade. The previous Liberal government had proposed an EnerGuide program for low-income earners; whether the program remains in effect under the new Conservative government has yet to be seen.

5 The impact of peak oil

Atlantic Canada receives almost 73 percent of its energy from refined petroleum products, most of which are imported from Venezuela and the North Sea:

- Venezuela is presently engaged in a war-of-words with the United States and is looking south (to South America) and east (to China) as possible new markets for its crude oil. Venezuela's oil production peaked in 1970, although the production of its heavy crude and oil sands is returning output to near its peak (BP, 2005).
- The Brent field in the North Sea peaked in 1999 and its output has been falling steadily since then (BP, 2005).

This reliance on imported refined petroleum products makes the region vulnerable to both

rises in the cost of crude oil and the possibility of oil shortages:

Transportation. Like most of North America, those living in Atlantic Canada rely on the private automobile for transportation. Despite a decline in population, the volume of gasoline sold in the region is increasing. The transportation of goods into the region relies on diesel fuel as almost all goods are moved by road transport.

Space heating. Over half of those living in Atlantic Canada depend on heating oil for residential space heating, a similar quantity of heating oil is consumed by commercial businesses and most public buildings (such as hospitals and schools) for space heating.

Electrical generation. About half of the 89,885 TJ of electricity generated from thermal sources in the region comes from refined petroleum products; this is about one-third of all the electrical energy generated.

The above list does not include the industrial or agricultural sectors, both of which rely on refined petroleum products.

6 Addressing peak oil

In (Hirsch, 2005), impact of three different peak oil scenarios are examined, each dealing with the time in which the United States government addresses the issue of peak oil:

- Action is not initiated until peaking occurs. This will leave the world with "a significant liquid fuel deficit for more than two decades". How the global community would deal with this is anyone's guess.
- Action is initiated 10 years before peaking. If this could be achieved, it "helps considerably but still leaves a liquid fuels shortfall roughly a decade after the time that oil would have peaked".
- Action is initiated 20 years before peaking. This "appears to offer the possibility of avoiding a world liquid fuels shortfall for the forecast period".

Of course, the problem with the scenarios is that no one knows when the peak will occur: it may be occurring now or it may happen in 20 years. Hirsch's proposed solution is a reasonable one: action should begin now since it is impossible to determine when the peak has occurred until several years after the event (Deffeyes, 2003).

The solutions proposed by Hirsch are intended for the United States, focusing on the development of liquid fuels for transportation, and include things such as increasing the output of non-conventional oil supplies (such as Alberta's tar sands) and adopting new transportation technologies (diesels and hybrid vehicles).

It makes little sense for Atlantic Canada to wait for the United States to take action as there is no guarantee that the benefits would flow to the region. Furthermore, the solutions may not address the needs of Atlantic Canadians.

Broadly speaking, the solutions open to those living in Atlantic Canada fall into two categories: demand reduction and fuel substitution.

6.1 Demand reduction

A natural outcome of increases in the price of refined petroleum products will be a decline in their use. Two sectors of immediate concern will be:

Private transportation. When regional gasoline prices approached $1.50 per litre in the aftermath of hurricane Katrina's destruction of the U.S. Gulf coast oil production facilities, many people started looking for alternate modes of transportation. These concerns were soon forgotten when prices fell below $1.00 per litre.

If prices rise again but fail to drop back or plateau at a level which people cannot afford, the first action of governments will be to subsidize drivers or remove taxes to reduce the price of gasoline. These solutions are unsustainable over the long-term, especially if prices remain high.

A long-term solution, starting immediately, will be the reintroduction of public transportation throughout the region. In its simplest form, a regional bus network would be developed to offer alternative means of moving people and small goods. In the few areas where rail lines still exist, mixed trains could be run, carrying people and goods. In those areas where the roadbed still exists, lines could be re-laid, if ties and rail could be found. The biggest advantage of rail is that is can be powered by a number of fuels, including electricity (Kunstler, 2005).

Residential space heating. Anyone heating with fuel oil will be directly affected by the rising cost of oil. The impact of high energy costs on low-income consumers is

widely documented (for example, see (Indeco, 2004)); with peak oil, the energy burden will reach the point where many people will be forced to chose between "heating and eating".

Without adequate policies in place, governments will be forced to take action, initially through increasingly costly subsidies; when this proves unsustainable, through the opening of emergency "heating shelters" in schools and other public buildings to assist people through the coldest part of the winter. As with subsidizing private transportation, these solutions are not sustainable over the long-term.

The long-term solution for the residential space heating problem will be to maximize the use of solar energy. This can be done by ensuring that all new buildings (residential, commercial, and public) are designed to maximize their use of solar energy for space heating. Existing buildings that cannot be retrofitted for solar energy must be insulated to improve their energy efficiency. If the oil peak is more than ten years into the future, district heating systems could be installed.

6.2 Fuel substitution

Hirsch's main concern is with the development of fuels that can be used in place of today's conventional refined petroleum products; for example, he is advocating the use of oil-shale or coal to produce gasoline and diesel fuel. There are a number of issues involved in the conversion of one type of energy into another, including the amount of energy required to perform the conversion and whether the fuel could be used elsewhere.

For example, in Atlantic Canada there are a number of coal deposits that could be mined and used as an energy source. In a time of rising oil costs, the coal could be used in any number of ways: electrical generation, space heating (individual home as well as district heating), and synthetic oil production. If coal mining could not keep up with demand, choices would have to be made about which processes could access the coal.

A similar issue arises with woody biomass from forests: should the biomass be used in the creation of ethanol as a gasoline substitute or additive? Or should the biomass be used for space heating or electrical generation? Some of these questions may have a simple answer in that if the technology does not exist or is too expensive to install, the

fuel production process could not be employed to make the fuel in question.

Perhaps the most contentious issue will be the production of energy from agricultural crops, especially if they are grown in place of food crops. At present, Atlantic Canada does not grow sufficient food to feed itself; the majority of foodstuffs eaten by residents of Atlantic Canada are imported from outside the region. If energy prices reach the point where it is no longer economic to transport food from California, Mexico, or New Zealand to Atlantic Canada, it will become necessary to increase local food production.

There are about 1 million hectares of farmland in Atlantic Canada; the most intensively farmed is in Prince Edward Island, although the greatest area devoted to agriculture is in Nova Scotia (see Figure 4).

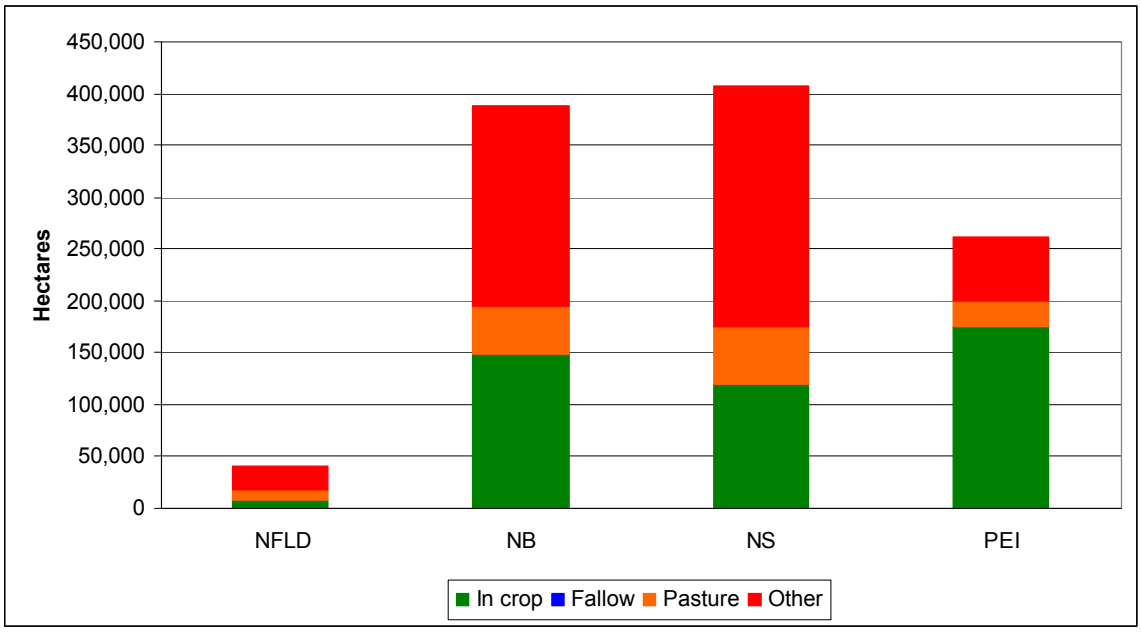

Figure 4: Agricultural land available in Atlantic Canada (Census, 2001)

If agricultural yields could be sustained at 10 tonnes per hectare, the energy yield could be about 100,000 TJ or about one-seventh of the region's net primary energy demand[7]. Whether such a yield could be sustained is another matter; if the yield fell to 1 tonne/ha, the amount of energy produced, 10,000 TJ would be sufficient to meet existing

[7] At one million hectares with a yield of 10 tonnes/ha, the annual yield would be 10 million tonnes. Assuming that each tonne of agricultural biomass had an energy content of 10,000 megajoules (MJ) per tonne, then the available energy would be 100,000 TJ. This is about one-seventh of the 727,435 TJ consumed by the region in 2003.

agricultural energy demands.

7 Concluding remarks

About 73 percent of Atlantic Canada's energy needs are met from refined petroleum products. Although the region extracts crude oil from offshore Newfoundland and Labrador, over 85 percent of the production is destined for external markets, meaning that the majority of Atlantic Canada's oil requirements are met from overseas suppliers.

The region's two principal suppliers of oil, Venezuela and the North Sea, are both facing problems: Venezuela is engaged in a war-of-words with the United States that could escalate if either side pushes the other too far, while the North Sea has peaked, meaning that obtaining supplies may become problematic. Adding to the region's oil supply problems is the lack of a major pipeline connecting to energy supplies in western Canada.

To compound the problem, the region's provincial governments have yet to institute anything approaching a policy to address the issue of energy security (and hence, peak oil). Instead, existing policies are intended to keep oil prices low to reduce the impact of rising oil prices; this may be good politics, but it is poor policy:

- Subsidizing consumption may work for limited numbers of consumers and low oil prices; however, as the number of consumers increase and oil prices rise, the cost of subsidizing consumption becomes unsustainable.
- Holding oil prices constant during a time of rapidly increasing costs is guaranteed to fail, as oil suppliers can sell their products anywhere.
- Even if maintaining artificially low prices through subsidies were possible, there can be unexpected side effects, such as local shortages caused by increased consumption and greenhouse gas emissions.

From this paper, it should be apparent that peak oil will affect all sectors of the region's economy. How the problem of peak oil is dealt with will depend upon how seriously the issue of energy security is taken by those in government. There are three areas of immediate concern:

Space heating. About 60 percent of residential energy usage is for space heating; most

of this comes from the combustion of fossil fuels, notably oil (as heating fuel for residential furnaces and Bunker C in thermal power station) and coal. Any increases in the price of refined petroleum products will affect most residents of Atlantic Canada.

Policies are needed to ensure that new house construction takes advantage of solar energy, existing houses are retrofitted to become as energy efficient as possible, and cogeneration plants are built to maximize energy efficiency.

Failure to implement such policies will result in the need for "heating shelters", where those unable to heat themselves can go for warmth. Fuel subsidies are a short-term panacea that will offer no appreciable benefits and are unsustainable.

Food. Most food consumed by those living in Atlantic Canada is imported from outside the region. Agriculture in the region is on the decline, as few people show an interest in the demanding work and limited financial rewards associated with farming. As transportation costs increase, imported food will become more expensive and potentially in short supply.

A regional energy security policy must recognize the connection between energy, transportation, and food. Such policies must ensure that there is sufficient energy for farmers to expand their production for local consumption.

Transportation. As with most, if not all of North American society, transportation (in the form of the private automobile) is the single largest consumer of refined petroleum products in Atlantic Canada. With the increase in motive fuel prices, people will lose both mobility and accessibility. The question facing governments and the general public is how long can this dominance remain? Existing government policies that try to cap price rises are unsustainable since suppliers can sell their products elsewhere. Subsidies are equally unsustainable.

Any energy security policy must ensure that society has access to a transportation network that supports both mobility and accessibility. Such a network must be able to evolve away from the consumption of refined petroleum products to using other fuels, notably electricity. This will mean the reemergence of rail as a carrier of both people and freight.

In addition to the above, there are other sectors of the economy that must be taken into account. For example, what types of industry are possible when oil becomes too expensive to operate a factory? On the other hand, what types of industry can flourish in this type of region?

Although many pundits have put a date on when peak oil will occur, the simple fact of the matter is, no one really knows when this will happen. Furthermore, the peak will become apparent only after it has occurred; for example, it could be taking place now or it may not occur for another 10 to 15 years. If governments begin to address the problem now by developing policies for regional energy security, there is a possibility that its impact will be mitigated. Without such policies, one can only guess at what the effect of peak oil will be.

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