

The following letter was sent on 7 June 2006 to Mr. Laurent Le Pierrès of the Chronicle-Herald in response to his article “Can Canada Wing its way to energy superpowerdom?”, which appeared in the Chronicle-Herald on 2 June 2006.

Dear Mr. Le Pierrès,

Re: Can Canada Wing its way to energy superpowerdom? (Herald, 2 June 2006)

An interesting question, one that Mr. Raymont of EnergyINet and Mr. Henry of Dalhousie University undoubtedly wanted you to ask; however, not only is this the wrong question to be asking, it has next to nothing to do with Nova Scotia.

Before discussing the right question, it is instructive to examine a number of statements made in your piece:

The Europeans are pioneers in conservation – i.e. lowering energy demand – “partly because they’ve faced higher prices than we have for long periods of time,” says Mr. Raymont. “But because they don’t have the natural resources ... even today they’re not leaders in energy supply in a responsible, economic and environmentally sensitive way. There’s no work that I’m aware of in the whole of Europe going on, on how to better extract oil from the oil sands or on gas hydrates.”

This is an absurd statement – there isn’t any work taking place on how to extract oil from the tar sands in Europe for the simple reason that there aren’t any commercially viable tar sands deposits in Europe.

Europeans lead the world in wind energy research, development, and sales. If this isn’t an example of being a leader in “energy supply in a responsible, economic, and environmentally sensitive way”, please give me an example of something that is.

Mr. Raymont says an intelligent energy policy is an integrated one. For example, two-thirds of the energy in a lump of coal is wasted on its way to heating your home. In a smart economy, we would recapture that waste heat and reuse it. If we don’t burn smart, then we can expect more massive power failures like the one that paralyzed Ontario and much of the northeastern U.S. three years ago.

In this paragraph, Mr. Raymont talks about the need to improve our energy intensity by using the waste heat from the generation of electricity, while earlier he is criticizing the Europeans for not being leaders in energy supply. Perhaps Mr. Raymont is unaware that many countries in northern Europe use cogeneration to produce both electricity and hot water for district heating (a system of underground pipes in villages, towns, and cities).

It is unclear how a power failure in August 2003 can be attributed to not burning “smart”, when it was generally agreed that the failure was caused by the grid being overloaded.

Canada, says Mr. Raymont, has it all. It just doesn’t know what to do with it all. In effect, we’re sitting on our assets – a motherlode of diverse natural resources from oil, natural gas, coal and uranium, to wind, tidal and hydro power. Instead of simply tapping into these resources, we should be figuring out value-added ways to exploit them.

There is an interesting subtext to this – to which of these energy sources can we “add value”, as they are all essentially primary energy sources?

If Mr. Raymont is proposing more electrical generation in Canada for export to the United States (that is, adding value to the primary energy source by turning it into electricity), he’s a bit late, as most electrical energy suppliers bordering the United States already subscribe to FERC 888 and 889, allowing literally unlimited export of electricity to the United States.

Of course, if Mr. Raymont is referring to the tar sands, value is definitely being added to the product, in that the bitumen is being extracted and turned into synthetic crude.

“I believe we can make huge strides forward if for no other reason than we have those natural resources in the ground,” he told The Chronicle Herald editorial board. “And if we rely on other countries to develop the technology, and all we’ve got to do is dig them up and ship them offshore, we’ll have environmental challenges galore or we’re simply not going to realize the potential of those energy resources.”

So it’s acceptable to dig stuff out of the ground for export as long as we’re using Canadian technology? Most of the technology for use in the tar sands (such as SAGD – steam assisted gravity drainage) has been developed by Canadians, while a large percentage of what is being extracted is being shipped offshore. On the other side of the equation, these processes are causing “environmental challenges”, from wasting northern Alberta, to Alberta’s high greenhouse gas emissions, to the exploitation of the natural gas from the Mackenzie delta.

And while we’re at it – CBM (coal bed methane) is proving to be a cause of major environmental degradation in Alberta, ruining farmland and polluting groundwater.

But the problem is that as standards of living rise, people in the developed and developing world become worse energy gluttons by the day. They buy gadgets, computers and refrigerators. And while you can design a better vehicle, middle-class people end up buying two. They defeat the purpose of energy efficiency.

This is another weak argument, despite the fact that there is a modicum of truth in it. If you purchase a refrigerator today, you’ll find that it is several times more efficient than ones produced 15 years ago. Similarly, people can purchase compact fluorescent lights that use much less electricity and produce similar lumens when compared to higher wattage incandescent bulbs.

One of the drivers behind energy efficiency is the cost of energy. As energy prices increase, so does energy efficiency – look at European energy usage when compared to that of North America.

That’s what Andrew Henry is doing. He’s EnergyINet’s newest point man in Atlantic Canada. He’s also managing director for energy research at Dal – a two-year-old project “putting together interdisciplinary teams of energy researchers to tackle some of the larger energy challenges in this region.”

As an energy researcher at Dalhousie, I would be most interested in learning more about what Mr. Henry considers to be “some of the larger energy challenges in this region.”

And while he's at it, perhaps he can explain why, over the past 12 months, two academics that specialize in energy research left Dalhousie for other universities – primarily because they received no support from Dalhousie.

Now, with respect to your question, which I believe is the wrong one to be asking and that has little bearing on Nova Scotia.

Many energy analysts make the mistake of treating Canada as a monolith when it comes to national energy resources. This error often occurs because Canada is a net exporter of energy. Many parts of Canada, notably the western provinces and Quebec, do export vast quantities of energy, in particular oil, natural gas, and electricity; other regions, such as the Maritime Provinces, are not so blessed and are net importers of energy.

Take Nova Scotia as an example.

Nova Scotia imports practically all of its primary energy from overseas: coal (Columbia, Venezuela, and the United States) and oil (crude and refined from various sources including the North Sea, the Middle East, and Venezuela). Most of the electricity generated by Nova Scotia Power Inc. is from imported sources of coal and oil; the exception being the small percentage of hydroelectricity and, to a far lesser extent, wind.

Nova Scotia is not connected to the rest of Canada through any significant energy pipeline, meaning that energy from western Canada (oil and natural gas) is not available and energy from Quebec (hydroelectricity) can be purchased only at a premium rate.

Despite the lack of indigenous energy sources, Nova Scotia is able to survive on other people's energy – an example of the benefits of globalization and also of its weaknesses. As long as the market is stable and everyone plays by the rules, Nova Scotia will benefit.

As most Nova Scotians are aware, over the past few years the market has become unstable in that one major new player has emerged (Asia, dominated by China, and to a lesser extent India and some smaller Asian countries). This, coupled with a tightening of energy supplies as production struggles to keep up with demand, is causing some producers to play by different rules, as was seen last January when Russia cut off natural gas supplies to Ukraine. If that isn't enough to convince you, consider the recent actions in Venezuela, Bolivia, Chad, Nigeria, and Iran.

Without belaboring the point any longer, the question that should have been asked was, "Can Canada wing its way to energy security"?

In order to understand the importance of this question, it is necessary to understand what "energy security" means.

Energy security is defined as government actions to ensure that the members of a community have access to reliable and uninterrupted sources of energy at a reasonable price.

Which leads us to the nub of the problem: Nova Scotia's reliance on non-indigenous energy supplies makes it energy *insecure*. To achieve energy security, the province must have reliable, secure, and affordable sources of energy. Achieving energy security won't be easy:

- Nova Scotia (and the rest of the Maritimes) does not have a major energy “pipe” to the rest of Canada and it is unlikely that any federal government would promote the development of major energy pathways to connect the Maritimes with the declining stocks of energy in western Canada.

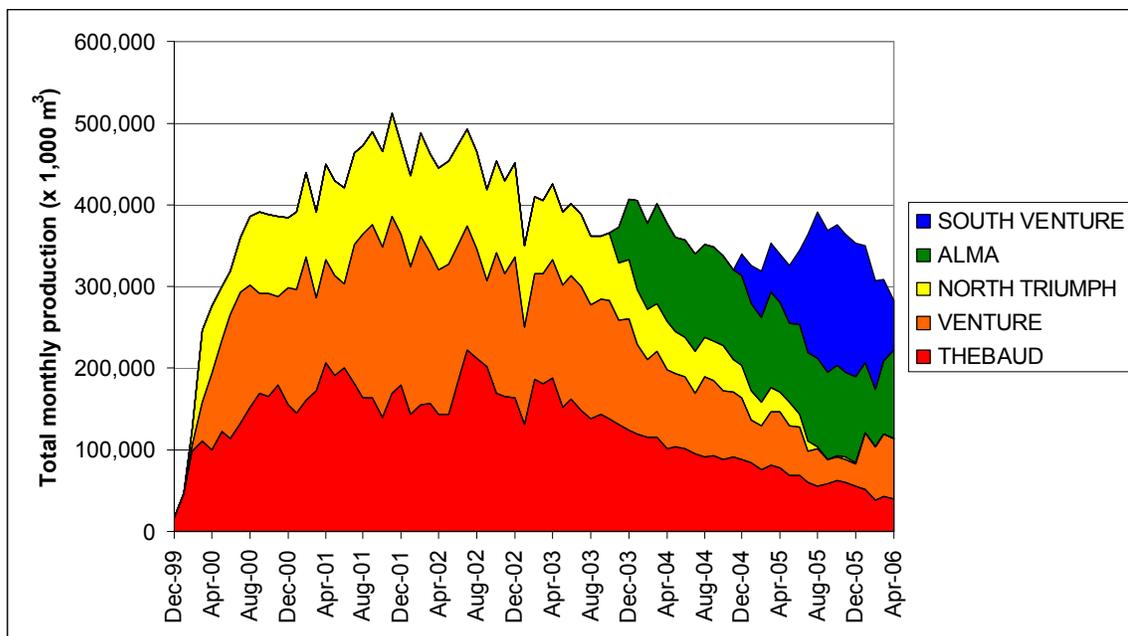
Don't believe me?

Last February at the end of a G-8 energy ministers meeting in Moscow, the Canadian government announced its support for a deal between PetroCanada and Gazprom to ship liquefied natural gas (LNG) from St. Petersburg in Russia to Gros Cacouna in Quebec. The natural gas in this pipeline will flow to Quebec and Ontario.

- It is unlikely that the offshore will produce sufficient quantities of natural gas to meet the need of energy needs of Nova Scotians: Sable's output is declining rapidly and there is insufficient ongoing exploration to replace what is being extracted.

Don't believe me?

Here is Sable's production graph since its inception in December 1999. Production from Sable peaked in November 2001 at just over 500 million cubic metres per month. In April of this year, production was down to 282 million cubic metres.



The five names (South Venture and so forth) refer to the various fields that make up the Sable project. Unless a new discovery is made within the next year or so, the Maritimes and Northeast Pipeline will be hard pressed to remain in business after 2012.

- Even if LNG could be considered as a secure substitute for offshore natural gas (filling the pipeline), neither the Anadarko project (Bear Head) nor the Petroplus/4Gas/Maple project (at Guysboro, formerly the joint venture between Petroplus and Keltic Petrochemical) look in particularly good shape.

Don't believe me?

The Chronicle-Herald and the Report on Business both announced Emera's plan to build a pipeline to carry natural gas from Irving and Repsol's LNG regasification facility being built in Saint John. Anadarko can't find a supplier and Petroplus isn't really in the business of shipping LNG – Repsol has the supplies and will be shipping them from Trinidad and Tobago.

So how will Nova Scotia become energy secure?

This will be no easy task, given that energy issues only appear on the radar when prices rise, and that neither of the two major provincial parties are willing to address the issue (if they were, would they have cut the HST on home heating fuels at a cost of \$75 million to the province?).

There are four areas of energy demand that must be addressed: heating, lighting, food, and transportation. Here are some examples of what needs to be done (this is taken from a report I wrote recently on addressing the issue of peak oil in Atlantic Canada):

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 last September, 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 it can be powered by a number of fuels, including electricity.

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; with peak oil, the energy burden will reach the point where many people will be forced to choose 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 sustainable only over the short-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.

Fuel Substitution. 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 should 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.

If you would care to discuss energy security further, please feel free to give me a call. I can be reached at 494.3950 or electronically at larry.hughes@dal.ca. You might also want to visit my energy and environment website: <http://lh.ece.dal.ca/enen>.

Sincerely,

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