

Review of Nova Scotia Department of Energy's "Nova Scotia Energy Strategy - Progress Report II"

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Abstract

Early in March 2004, the Nova Scotia Department of Energy released its Progress Report II on the Nova Scotia Energy Strategy. The latest progress Report, in keeping with the 2003 Report, contains a selective, sanitized review of activities in Nova Scotia's energy sector in 2003. The following paper examines the 2004 Progress Report in light of the original energy strategy and some of the activities that took place in Nova Scotia's energy sector in 2003.

1. Introduction

This is the second year that the Department of Energy has released a Progress Report on the Nova Scotia Energy Strategy. The original Energy Strategy document, *Seizing the Opportunity*, released in December 2001, described a path towards a "world-class" energy sector based upon the offshore energy sector.

This is also the second year that the Energy Research Group has performed an analysis of the Department of Energy's Progress Report. The conclusions of last year's analysis of the first Progress Report included the following recommendation (Hughes, 2003a):

If future 'Progress Reports' are to be of any use to Nova Scotians, they must tell the true state of the provincial energy sector. Hiding or glossing over controversial issues is inexcusable, given the importance of energy in our day-to-day lives.

The Department of Energy has made some progress towards meeting this recommendation. Although this year's Progress Report is as vague as last year's, it does state that (NSDOE, 2004a, page 2):

... a full detailed reporting of each action item identified in the Energy Strategy is available on the Department of Energy website at www.gov.ns.ca/energy.

No "action items" are identified in the Progress Report, although it does include the following "current priorities", each of which corresponds to a header in the Progress Report (NSDOE, 2004a, page 2):

- *improving regulatory efficiency*

- *building a more competitive oil and gas industry*
- *managing our energy resources*
- *addressing Climate Change*
- *improving energy efficiency*
- *ensuring secure, reliable energy*
- *informing Nova Scotians*

The Department of Energy's web site makes no explicit mention of these topics (nor for that matter does the original Energy Strategy refer to "*action items*" or "*current priorities*"). However, the Department of Energy's web site includes a 100-page supporting document (Progress Report II - Detailed Items) that states (NSDOE, 2004b):

This document contains detailed information on the action items developed by the Energy Strategy in December 2001. As the energy sector continues to grow and evolve, a number of the items have been combined with other items to avoid duplication or have been completed or eliminated.

Explanations for these particular items are included in this update.

Future updates and progress reports on the implementation of the Strategy will be provided each year in the Department of Energy's Business Plan and Accountability Report.

Each page of the Detailed Items report consists of a description of an issue related to the Energy Strategy (each issue refers to a "Matrix"; however, the Matrix does not appear anywhere in the Department of Energy's web site). There is no easy way to associate the "*action items*" (or "*current priorities*") with the "*detailed items*".

Last year's analysis from the Energy Research Group also called on the Department of Energy to develop indicators to show whether the province was meeting its goal of becoming a "world-class" energy player. Neither the Progress Report nor the Detailed Items Report makes any mention of indicators¹. Without indicators, it is impossible for anyone to determine whether Nova Scotia is reaching the goals outlined in the original Energy Strategy².

¹ The Auditor General of Nova Scotia, after reviewing the Department of Energy and its 2003 Progress Report, came to a similar conclusion, "*However, we believe it falls short of being a performance reporting document because it does not clearly set out targets to be achieved and actions needed to achieve them, or provide explanations for cases where targets were not met*" (AGNS, 2003).

² The Energy Strategy's goals are: 1) to achieve a world class energy sector that achieves sustainable economic development in balance with high social and environmental standards; 2) to optimize financial, social, and economic benefits in the province's rapidly expanding offshore energy sector; and 3) to improve the province's environment and enhance the quality of life of Nova Scotians (NSDOE, 2001).

The next part of this paper examines a number of sections in the Progress Report; the headings of the sections examined are presented in ***bold-italics***. Statements made in the Progress Report are presented in *italics* followed by the associated page number. Comments and analysis are placed after the statements. The remainder of the paper consists of two parts. First, it highlights some energy issues not covered in the Progress Report and second, it discusses how renewable energy could help meet Nova Scotia's greenhouse gas reduction targets.

Unless otherwise indicated, all references to "Report" refer to the Progress Report for 2004. When necessary, to distinguish between the 2003 and 2004 reports, each report is prefixed by its year (e.g., 2003 Report). Any material taken from the Detailed Items report is referred to as "Matrix". Since the Matrix does not include page numbers, only the Matrix number is included.

2. Review of "Progress Report II"

The Report consists of 10 pages. In keeping with previous Energy Strategy documents, the emphasis is on "*world class*". From "*world class energy industry*" to "*world class energy research projects*" -- the phrase is used seven times in the Report, although the Matrix makes no mention of "*world class*" (although "*world wide*" and "*world scale*" do appear).

Introduction

The first page of the Introduction discusses the state of the offshore natural gas industry. The Introduction stretches to a second page, where a few sentences are devoted to electricity, natural gas distribution, climate change, and ends with the usual platitudes:

Together, we are working to build a strong, diverse energy sector that enables us to find new energy resources, manage the energy we use wisely, and build a healthier, more prosperous, self-reliant province.

[2004 Report - Page 2]

The 2004 Report downplays problems with the offshore and gives misleading production figures. For example, the 2003 Report (reporting on 2002 production data) stated:

Just a few years ago, natural gas development and production was simply a topic for discussion—today it is a reality. The Sable Offshore Energy Project is currently producing more than 500 million cubic feet of natural gas each day and is expected to continue for the next 20 years.

[2003 Report - Page 3]

While the 2004 Report (reporting on 2003 production data) states:

With the Alma production platform now online, production at the Sable Offshore Energy Project was brought up to approximately 500 million cubic feet each day.

[2004 Report - Page 1]

It is unclear how SOEP's 2003 production was "brought up to approximately 500 million cubic feet" when 2002's production was "more than 500 million cubic feet".

The 2003 Report made no secret about the royalty estimates (between \$1.6 and \$2.3 billion) and their expected economic impact on the province. The 2004 Report makes no mention of the royalty estimates; instead, one finds:

... Shell Canada's announcement of a reduction in the estimated reserves, reducing the production forecasts and the royalties Nova Scotians can expect to receive from the fields currently associated with the project.

[2004 Report - Page 1]

To be of any value to Nova Scotians, every Energy Strategy Progress Report should include a table of the royalty revenues generated-to-date and possible future revenues based upon these new projections.

There is some concern noted regarding the state of exploration licenses:

A significant number of exploration licenses are nearing expiration, and we must work to encourage more exploration.

[2004 Report - Page 1]

Offshore licenses are granted for five years (referred to as 'Period 1'). A license can be extended by either one year if the license holder requests an extension or for an additional four years if an exploration well is drilled in the first five years ('Period 2') (CNSOPB, 2000). Without an increase in offshore activity, almost all of Nova Scotia's Period 1 licenses will have expired by the end of December 2006 (Enachescu, 2004; CNSOPB, 2004). Clearly, if license holders were interested in the Nova Scotia offshore, there should not be any need to "encourage more exploration". The exploration license information was found on the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) web site rather than the Department of Energy's web site.

Improving Regulatory Efficiency

With an estimated 40 trillion cubic feet of natural gas, existing production infrastructure, and proximity to a major North American market, Nova Scotia's potential is attractive.

[2004 Report - Page 3]

Although no source is given, the claim of "an estimated 40 trillion cubic feet" appears to be based upon results from a 2002 report commissioned by the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB, 2002). The report

describes a series of mathematical simulations of the known and presumed geology of the deep-water Scotian slope.

The CNSOPB report presents “unrisked recoverable values” ranging from a low of 31 TCF (trillion cubic feet) through a high of 53 TCF, with a mean of 41 TCF. By “unrisked” the authors mean an oil or gas field whose geological characteristics are well known and there is little risk in exploration or extraction. Since the geology of the deep-water Scotian slope is not well known, the authors also estimated “risked recoverable values” with a low of 5 TCF to a high of 28 TCF and a mean of 15 TCF.

Although the authors of the CNSOPB report state that the deep-water slope has a “potential for between 15 and 41 trillion cubic feet (TCF) of gas”, the Report opts for the high value (“*estimated 40 trillion cubic feet*”).

A working group of industry and government is now implementing improvements to our regulatory process and examining ways to reduce drilling costs.

[2004 Report - Page 3]

The Report makes no suggestions about how the drilling costs will be reduced. Weakening environmental or health and safety regulations should not be an option.

In October 2003, legislation was introduced to provide offshore workers with the same kind of occupational health and safety legislation as those working on land. We are now reviewing the legislation while we consult broadly with Nova Scotians.

[2004 Report - Page 3]

In February 2003, the 2003 Report announced that “*Offshore workers will soon have the same kind of occupational health and safety legislation as those working on land*”. Now, a year later, the 2004 Report states that the proposed legislation is being reviewed. This means that Nova Scotians are still being allowed to work in the offshore without the protection of health and safety legislation. Apparently, there is an end in sight, as the discussion on health and safety in Matrix item 42 states “*Bill prepared for Nova Scotia fall session of legislature*”.

Work continues on Nova Scotia’s Energy Act, which will contain a number of improvements, bringing together many different pieces of legislation relating to energy issues under one Act.

[2004 Report - Page 3]

Things appear to move slowly in the Department of Energy --- the 2003 Report also stated that “*Work continues on Nova Scotia’s Energy Act, which will contain a series of efficiency improvements*”. In keeping with the 2003 Report, the 2004 Report makes no mention of what is meant by “*efficiency improvements*”.

According to Matrix item 43, the completion date of the new Energy Act will be “*Fall of 2004*”, and that there will be “*Public/stakeholder consultation in summer of 2004*”. The Report makes no mention of consultations to be held regarding

the Energy Act. Similarly, there is no indication of who (or what) constitutes a “stakeholder”.

Building a More Competitive Oil and Gas Industry

The Department of Energy provided the Nova Scotia Community College Nautical Institute with \$500,000 for the purchase of a dynamic positioning simulator.

[2004 Report - Page 4]

Although the Report and the Matrix both refer to the \$500,000 for the dynamic positioning simulator, they differ in the way this amount is presented. The Report states that the \$500,000 was “provided”, whereas Matrix number 21 states that \$500,000 was “contributed toward the purchase”. Neither indicates whether there were any other partners in the purchase of the simulator, nor the total cost of the simulator.

Our Energy Training Program for students continues to bring together post-secondary students with local employers to provide on-the-job energy related experience in their chosen fields. In 2003, 54 students found work at 17 companies, bringing the total participation in the program to 103 students and 30 companies over two years.

[2004 Report - Page 4]

The list of companies where these students worked is not made available in either the Report or the Matrix. However, Matrix numbers 18 and 19 do state that the Energy Training Program has cost \$220,000. Although the Matrix is intended to provide “full detailed accounting” for the 2004 Report, the two documents differ on the number of student participants:

The Energy Training Program for Students completed its first year of operation. Approximately seventy (70) students were provided co-op and summer positions by about thirty (30) employers. About \$270,000 in additional student payroll was leveraged by the program’s \$220,000 investment, resulting in 48,000 personhours of direct, energy-sector work experience for Nova Scotian post-secondary students.

[Matrix - numbers 18 and 19]

On page 44 of volume 1 of its Energy Strategy, the provincial government announced that they would “host an Energy R&D Forum in 2002 to examine the research communities interests and industry requirements”. The Forum did not take place. The 2003 Report announced that “work has already begun in this area by bringing together representatives from research institutions, government, and the private sector to review current energy-related research and development activities and identify areas of discussion for an Energy R&D Forum to be held in late spring or early fall”. This Forum did not take place either.

In keeping with their earlier comments, the 2004 Report states:

Another important forum, addressing research and development in the energy sector, will be held in May 2004, bringing experts in energy research and development together to identify ways to improve our R&D capacity and develop world-class research projects that have both scientific and commercial value.

[2004 Report - Page 4]

This Forum is scheduled to take place in May 2004 at St. Francis Xavier University.

The repeated announcement of the upcoming energy forum is another example of how the Progress Reports focus on what will happen rather than what has taken place.

Managing Our Energy Resources

As the owners of our natural resources, the people of Nova Scotia deserve to know how much royalties are paid and how the royalty agreements are administered. Our royalty estimates are officially released by the Department of Finance each quarter and updated on the Department of Energy website.

[2004 Report - Page 5]

One cannot argue with the statement, “*the people of Nova Scotia deserve to know how much royalties are paid*”. In fact, one would think that an excellent place to announce the royalties would be in the annual Energy Strategy Progress Reports. Instead, the people of Nova Scotia are told that they must visit one of two web sites to get this information. (To make searching for this information more difficult, the Report does not list the URLs of the web sites.)

The graph in Figure 1 shows the actual and projected royalties from offshore oil and natural gas in Nova Scotia (from (AGNS, 2003)).

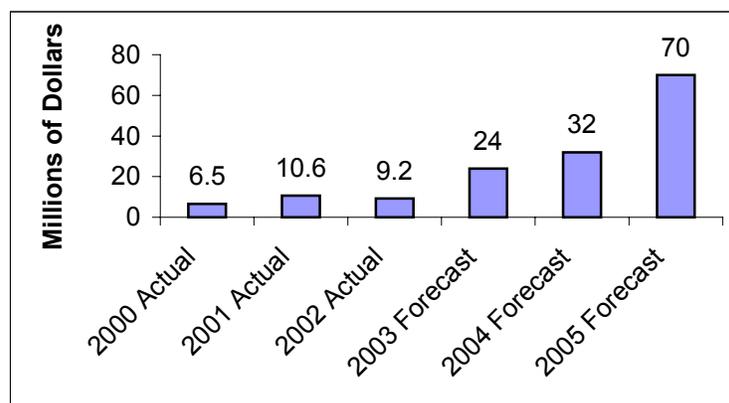


Figure 1: Nova Scotia's offshore royalties - actual and forecast

The fact that royalties actually fell in 2002 (from \$10.6 to \$9.2 million) may be a reason for the provincial government downplaying this information in the Report.

Our highly trained audit staff continue to work with the Sable Offshore Energy Partners to validate costs and revenues for royalty purposes. We have added resources to improve this process and are ensuring that Nova Scotians are well served through this extensive process—a process that ensures that our royalty regime remains both fair and competitive.

[2004 Report - Page 5]

This claim is misleading, in view of the fact that the Auditor General's audit of the Department of Energy found "*The royalty meters, which measure the amount of gas coming ashore, have not been fully audited*" (AGNS, 2003). Royalties are measured by the Department of Energy "*comparing reported production volumes with volumes received by gas customers*" (AGNS, 2003). Apparently the Department of Energy "*derives some assurance from this method of measuring production volumes*" (AGNS, 2003).

Climate Change

In 2003, Canada became the 100th country to ratify the Kyoto Protocol, making a commitment to cut 240 megatonnes of greenhouse gas emissions between 2008 and 2012. Although there are questions as to whether or not Russia will ratify and what impact that will have on the protocol, it is clear that there is a national commitment to addressing climate change. It is a commitment we share.

Nova Scotia plays a lead role in the federal, provincial, and territorial discussions on building a national climate change approach, co-chairing several committees. The focus of these discussions is to develop an approach that reaches the emission reduction targets while not placing an unreasonable burden on any one region.

While climate change discussions continue at the national level, the Department works with Clean Nova Scotia and supports the Climate Change Centre in increasing awareness of greenhouse gas emissions and global warming throughout the province.

[2004 Report - Page 6]

It has been over six years since the Kyoto protocol was drafted in December 1997 and Canada became a signatory. Its compliance period (2008-2012) and Canada's target (94 percent of 1990 emission levels by the compliance period) have been known since then.

Figure 2 shows Nova Scotia's emissions between 1990 and 2001 (Olsen, 2002). The reduction target is 18,236 kt CO₂-eqv (94 percent of the 1990 level of 19,400 kt CO₂-eqv). The dip in the mid-1990s was due to a recession, while the drop between 2000 and 2001 can be attributed to a decline in emissions from electrical generation and the rising price of gasoline (reducing transportation emissions).

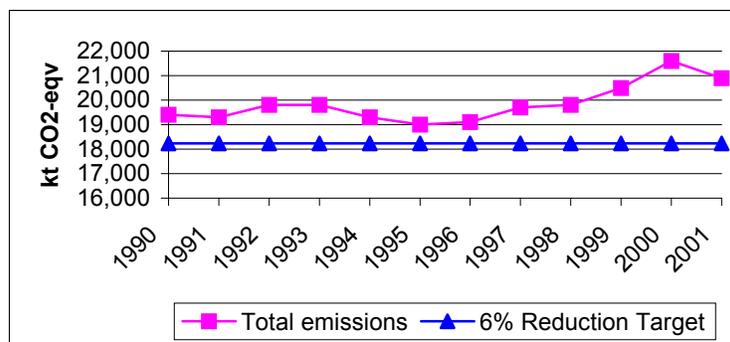


Figure 2: Nova Scotian greenhouse gas emissions (1990-2001)

Although there are five Matrix numbers devoted to climate change, there is little suggest that Nova Scotia is doing nearly enough to achieve the reductions that will be necessary to stabilize, let alone reduce, provincial greenhouse gas emissions (see Table 1). Nova Scotia's poor progress towards meeting any emissions target was confirmed by Nova Scotia's Minister of Energy in August 2003 (Lightstone, 2003).

Table 1: Matrix numbers associated with climate change

| Matrix numbers | Issue |
|---------------------|---|
| 2, 3, 65, 75 | Energy education and public awareness. |
| 50, 51, 52, 53, 130 | Work to understand implications of implementing Kyoto and then ensure that any burdens are shared equally. Continue to participate in the national climate change process and contribute to the National Implementation Strategy (NIS). Make Climate Change a part of government decision-making. |
| 68, 80 | Increase participation in the Voluntary Challenge and Registry through dissemination of information and assisting industry with requirements for participation. |
| 88 | Encourage climate change related research. |
| 101 | Work with NSPI on its plans to meet environmental targets. |

Given the growing body of evidence for climate change, one would like to think that the province would be beyond the "increasing awareness of greenhouse gas emissions and global warming" stage.

Air quality continues to be a focus for the Province of Nova Scotia and the Department of Energy, the Department of Environment and Labour, the Office of Economic Development, Nova Scotia Business Inc., Nova Scotia Power, and other industry representatives continue working together to reduce emissions of mercury, sulphur, nitrogen, and ozone.

[2004 Report - Page 6]

Although air quality is of vital importance, it is unclear why the Report includes it under 'Climate Change', since the emissions listed (*mercury, sulphur, nitrogen,*

and ozone) have little to do with climate change. In light of its importance, air quality deserves a section of its own.

The fact that the Report confuses climate change and air quality raises questions about the level of knowledge of these matters in the Department of Energy. It also calls into question the Department's planned energy awareness programme.

Improving Energy Efficiency

Our work continues with Clean Nova Scotia, supporting home audit programs that help Nova Scotians find ways to improve the energy efficiency in their homes and save money at the same time. Working with the federal government, we participate in promoting Natural Resources Canada's EnerGuide for Houses program, which is expected to result in thousands of audits over the next three years.

[2004 Report - Page 6]

The EnerGuide for Houses programme costs a homeowner \$150 for an energy audit that checks for air leaks in the person's house. Once the audit has taken place, the homeowner can take steps to decrease the air infiltration (insulation and weather stripping); any upgrades must be paid for by the owner. The maximum grant that the programme will pay is \$3,400 (the average is in the range of \$500 - \$750 for older homes), depending upon the improvements detected after a second audit (Wentzell, 2004).

The EnerGuide for Houses programme is geared towards people with sufficient funds to meet both the energy audit and the upgrade costs. Although the programme is open to all Nova Scotians, those with limited means may not be able to afford the audit, let alone purchase the materials required to upgrade their home.

In order to allow low-income homeowners access to the EnerGuide for Houses programme, the provincial government should consider paying for the audit and covering the cost of the upgrade; both of these costs could be recovered:

- **Audit cost.** During very cold winters, the provincial government has offered low-income Nova Scotians a \$50 home heating rebate (SNSMR, 2001). If the upgrade was successful in reducing the home's space heating requirements, the province could recoup the audit costs over three years by not having to pay the homeowner the home-heating rebate.
- **Upgrade cost.** The provincial government could receive the grant paid from the EnerGuide for Houses programme.

... which is expected to result in thousands of audits over the next three years.

[2004 Report - Page 6]

In keeping with its spirit of vagueness, the Report gives no indication of the actual number of audits that have been done or are expected to take place. Assuming that the “*thousands of audits over the next three years*” average about 1,000 audits per year, then based upon Nova Scotia’s approximately 400,000 dwellings (NSDOF, 2003), it will take about 400 years to audit all the homes in the province.

In 2003, the U-Pass project was launched at Saint Mary’s University. Supported by the Department of Energy, the program provides bus passes to students at a nominal fee to encourage use of public transit.

[2004 Report - Page 6]

A low-cost bus-pass programme should be available to all university and college students in the Halifax Regional Municipality (HRM), not only to those at Saint Mary’s University. While a good first effort, the Saint Mary’s U-Pass project as a prototype requires some rethinking, particularly as a plebiscite is needed to bring it into force (or to rescind it, as some Saint Mary’s students were threatening to do (Bruhm, 2003)).

Given the rising cost of tuition, HRM council should require Metro Transit to offer the equivalent of the U-Pass to all university and college students, regardless of their place of study.

The Province of Nova Scotia is also improving energy efficiency with the installation of energy-efficient LED traffic lights throughout the Halifax Regional Municipality, the use of biofuels, and has received awards for energy efficiency measures in some government buildings.

[2004 Report - Page 6]

Although light emitting diodes (LEDs) are extremely efficient when compared to most other light sources, no indication is given about the number of traffic lights that have switched to LEDs, nor to the energy savings. Similarly, the “*use of biofuels*” does not necessary equate with energy efficiency; for example, switching to B-10 (biodiesel: 10% biological and 90% diesel) without changing driving habits and distances is no more energy efficient than driving using regular diesel.

Matrix number 113 refers to a plan operated by TPW (Transportation and Public Works) in which:

- *all new installations of TPW traffic signals are LED*
- *changeover of all existing TPW traffic signals from incandescent lamps to LED lamps. Expected completion date March 2004.*

[Matrix - number 113]

Although the Report refers to “*the installation of energy-efficient LED traffic lights throughout the Halifax Regional Municipality*”, the Matrix refers only to TPW’s traffic signals (lights) not those for which the municipality is responsible. Again, no indication is given of the number of traffic lights that have switched to LEDs, nor to the energy savings.

Ensuring Secure, Reliable Energy³

The Electricity Marketplace Governance Committee (EMGC), formed in May 2001 as follow-up to the energy strategy commitments, was chaired by Dr. Robert Fournier of Dalhousie University and consisted of representatives from a broad stakeholder group.

[2004 Report, Page 7]

The stakeholder group did not include representatives from environmental organizations. For example, the only mention of Kyoto and greenhouse gases is found early in the EMGC Report (section 3, “External Influences on the Nova Scotia Electricity Market”). There is no other reference to these topics in any of the recommendations.

The committee met over a period of 14 months and submitted its final report in October with 89 recommendations that included advice on how we open up our electricity market to competition, add new generation capacity, open our transmission system, encourage renewable energy, and encourage options for co-generation.

[2004 Report, Page 7]

The opening of Nova Scotia’s electricity market and transmission system is being driven by New Brunswick. In the late 1990s, the Federal Energy Regulatory Commission (FERC) started a process intended to result in the eventual restructuring of the electricity market in the United States. FERC 888, the first of two major rulings regarding electricity, requires utilities to open their transmission systems to other utilities (the Open Access Transmission Tariff or OATT). To be FERC compliant, all electricity generators using the OATT in the United States must offer competing companies access to their transmission system (reserving capacity on the transmission system is done through an Open Access Same-Time Information System or OASIS). In order to ensure that a utility charges the same transmission tariff to itself and other utilities, FERC 889 stipulates “Standards of Conduct” that effectively splits every utility into two parts: generation and transmission-distribution. Canadian utilities that sell electricity to the United States (this includes NB Power), are required to be “FERC compliant” (i.e., have adopted FERC 888 and 889).

³ The review of the EMGC report was written with the assistance of Jeff Bell, Joel Good, Alain Joseph, Judy Lipp, Howlan Mullally, Ariesta Ningrum, Jaspreet Singh, and Anne Warburton.

NB Power, wanting to continue selling electricity to the United States, has established a FERC-compliant OATT. The New Brunswick Board of Commissioners of Public Utilities has stated that if NSPI is to continue selling electricity to New Brunswick or New England, it must become FERC-compliant by 1 January 2005 (EMGC, 2003, page 17).

The EMGC's recommendations for Nova Scotia becoming FERC-compliant are somewhat surprising. For example, the transmission tariffs "... *should initially include a scheduling and information system that need not be an OASIS*" (Recommendation 17) and "... *develop towards eventual FERC compatibility*" (Recommendation 18). These recommendations are weak and raise the question about whether Nova Scotia will be sufficiently FERC-compliant to meet New Brunswick's requirements.

New generation is also discussed in the EMGC Report and begins by proposing that new generators should operate in a 'bilateral market' where "... *eligible Nova Scotia buyers should arrange for competitive supply through bilateral contracts with eligible sellers*" (Recommendation 4). Despite the existence of the 'bilateral market' model, the EMGC expects NSPI to "*offer backup supply service to competitive generators, at a price that is cost-based and regulated by the UARB*" (Recommendation 75). Furthermore, NSPI is required to "*create a top up and spill system for cogenerators and competitive entrants, under which it buys or sells uncontracted power at a cost-based rate, as approved by the UARB*" (Recommendation 76).

These recommendations raise a number of issues:

- Requiring NSPI to offer backup supply service for every new generator is a potentially costly exercise for NSPI and dangerous to the supply of electricity in the province.
- Forcing NSPI to buy and sell electricity from competitors at a "cost-based" rate defeats the concept of a market in electricity, something that FERC promotes.

These two recommendations weaken EMGC's arguments for a 'bilateral market' model. One of the market models rejected by the EMGC was the 'single buyer' model, in which all market participants sell to a single buyer (NSPI) since "*a pure single buyer model does not allow for any contracting between market participants*" (EMGC, 2003, page 30). Since the proposed 'bilateral market' model is clearly inefficient, a different market model should be adopted.

The EMGC Report also made a number of recommendations regarding the generation of renewable electricity. One of which is "net metering", a scheme whereby a customer can be both a consumer (sometimes using electricity from the grid) and a generator (sometimes supplying electricity to the grid). Net metering has been driven, in part, by the availability of low-cost wind turbines for residential and industrial use. When supplying electricity to the grid, the customer-generator is said to be 'banking' electricity. At the end of each billing period, the customer-generator either owes money to the utility (that is, the

customer-generator has consumed rather than supplied electricity to the grid) or has an electricity credit. The credit is applied to the next billing period.

NSPI already has a net metering programme, allowing customer-generators to connect equipment with a maximum capacity of 10 kW. The EMGC suggested increasing this to 100 kW (Recommendation 56). Anyone becoming a customer-generator must make a formal one-year agreement with the distributor (i.e., the owner of the customer's grid, typically NSPI). If, at the end of the year there is a credit, it is lost without any compensation for the customer-generator (Recommendation 58).

There is another disincentive to anyone wanting to participate in the EMGC's net metering programme -- since the electricity generated by the customer-generator is renewable (Recommendation 55), it can gain emission credits if it offsets the generation of electricity from non-renewable sources. The EMGC recommends that any emission credits associated with the production of electricity by the customer-generator become the property of the distributor (Recommendation 61). The EMGC's reason for this recommendation is that the customer-generator gains benefits from interconnecting with the grid at the utility's expense.

The EMGC has clearly failed to understand net metering and the purpose of emission credits. Emission credits are awarded to generators who displace the generation of electricity from non-renewable sources. If the electricity produced by a customer-generator results in NSPI generating less electricity from, say, a coal-fired facility, NSPI has saved money and reduced emissions by not burning the fuel. Furthermore, if this "clean" electricity put onto the grid is consumed by a customer, NSPI gains revenue from the electricity despite the fact that it did not generate the electricity in question. In this situation, the customer-generator deserves any emission credits associated with the production -- failure to do so does little to "*encourage renewable energy*".

After reviewing the recommendations, the government accepted all recommendations, recognizing that the EMGC provided a long-term framework for a cautious, collaborative approach to increasing competition in a way that protects the security and reliability of the electricity system in Nova Scotia.

[2004 Report, Page 7]

The EMGC recommendations were accepted without question or change by the provincial government in November 2003.

Renewable energy was an important part of the EMGC recommendations, and the Department of Energy is working with Nova Scotia Power Inc. to reach the voluntary renewable energy target for new renewable generation totalling approximately 50 megawatts. This process will be monitored for three years and a renewable portfolio standard will be implemented in 2006.

[2004 Report - Page 7]

A renewable portfolio standard (RPS) is a legislative means whereby a utility is required to meet a certain percentage of its generation from renewable sources by a given date. There are numerous examples of RPS, notably in the United States (DSIRE, 2003).

The starting date of the Nova Scotia RPS is 2006 (Recommendation 40):

The EMGC recommends that the province of Nova Scotia adopt a mandatory RPS to take effect in 2006.

The 2006 starting date means a delay of three years (from the release of the EMGC report) before the RPS comes into force. There is no good reason for the delay, other than the fact that the original Energy Strategy stated in 2001 (NSDOE, 2001):

... a short-term, voluntary, renewable energy target for new IPPs totalling 2.5% of NSPI's generation capacity, or approximately 50 MW. The government and NSPI will monitor the voluntary process for three years and then establish a longer-term renewable energy portfolio standard (RPS) target.

The “voluntary, renewable energy target” (started by NSPI in 2001) has been a disappointment, since NSPI originally intended this for a 50 MW wind project and has since reduced it to about 30 MW. When this was first proposed in 2001, a 50 MW wind project would have produced about 153 GWh of electricity⁴. This would have been about 1.4 percent of NSPI's total generation of 10,906 GWh in 2001 (Emera, 2003).

The RPS target is 5 percent of all electricity generated by 2010 (Recommendation 43):

The EMGC recommends that the province of Nova Scotia require each LSE to obtain RPS tags certifying that the fraction of its electric energy from renewable sources by 2010 is equal to the actual base of renewable electric energy at 2001 plus 5.0%.

Although not mentioned in the recommendation, the RPS is based upon:

- A voluntary target of 1.2 percent of generation by 2005. The target is (presumably) still 50 MW of capacity or 153 GWh of generation; however, since NSPI's generation is increasing, the initial voluntary target has fallen from 1.4 percent to 1.2 percent⁵.

⁴ A 50 MW wind farm operating at 35% capacity factor would generate 50 MW x 8760 hours/year x 0.35 or about 153,300 MWh/year.

⁵ NSPI will have to work very hard to reach this value by 2005. According to NSPI's most recent annual report, production volume in 2003 was 12,329 GWh (Emera, 2004). 153.3 GWh represents 1.24 percent of NSPI's production. Given the growth in demand, it is likely that the voluntary, renewable energy target of 50 MW will fall short of the proposed voluntary target of 1.2 percent.

- NSPI's expected annual growth rate of 1.5 percent per year between 2006 and 2010. The EMGC states that "*NSPI projects average load growth to be approximately 1.5% per annum, so the RPS target was set at 0.75%*" (EMGC, 2003, page 66).

Why the annual RPS target was set at one-half of the annual load growth (0.75%) is never explained by the EMGC.

Table 2 shows how the RPS of 5 percent is obtained.

Table 2: Annual RPS growth and percentage of generation

| Year | Annual growth | Cumulative percentage |
|------|---------------|-----------------------|
| 2005 | 0.0 | 1.20 |
| 2006 | +0.75 | 1.95 |
| 2007 | +0.75 | 2.70 |
| 2008 | +0.75 | 3.45 |
| 2009 | +0.75 | 4.20 |
| 2010 | +0.75 | 4.95 |

In order to show that the LSE (or Load Serving Entity -- essentially NSPI) has met its RPS target, each LSE is expected to obtain RPS-tags. Electricity generated from certified renewable sources produce both electricity and 'tags' (for example, a 'tag' could be associated with a given number of kilowatt-hours), as described in Recommendation 41:

The EMGC recommends that electricity from renewable resources have RPS tags that can be created and traded separately from the electricity itself. The RPS tag is a certificate that a quantity of electricity has the attribute of coming from a certified renewable resource within Nova Scotia.

Note that the EMGC requires that each tag come from Nova Scotian sources.

The proposed RPS has a number of drawbacks that were overlooked by the EMGC:

- There are no penalties for non-compliance. That is, if a LSE fails to meet the 0.75 percent target in a given year (or the overall 5 percent target for that matter), they are not penalized. The EMGC Report suggests that "*the determination of the amount of penalties for non-conformity to be established by a subsequent process*" (EMGC, 2003, page 64); however, this is *not* part of a recommendation.

What the EMGC does recommend is that NSPI make annual progress reports (Recommendation 44):

The EMGC recommends that, to encourage the development of a stable renewable energy sector, and meet the environmental goals established by the RPS, that NSPI be required to annually report to the UARB as to its progress toward meeting its goals and that the

UARB have the authority to issue directions to NSPI to ensure that these goals are met.

Again, there are no penalties, although the EMGC Report subsequently states that the “*fraction increase to 3% by 2008*” (EMGC, 2003, page 67); this is not included as a recommendation. (Why the 2008 target is “3%” is not clear, since the fraction should be 3.45 percent by 2008, as shown in Table 2).

- Requiring LSEs to purchase Nova Scotia tags may be problematic for a number of reasons:
 - If the number of tags produced in one year is less than the number of tags the LSEs are expected to purchase, it may not be possible for a LSE to meet its renewable percentage.
 - If a renewable generator produces more tags than are required in Nova Scotia, there should be a means whereby the tags can be traded outside the province.
 - If a renewable generator can get a better price for a tag outside Nova Scotia, they should not be restricted to selling tags within the province. Similarly, if a LSE can obtain a better price for a tag outside Nova Scotia, they should be permitted to purchase the lower-cost tag. (This is the basic concept of ‘the market’.)
- The EMGC makes no distinction between electricity generated within the province and electricity generated outside the province. With the EMGC’s push for FERC, a LSE could sell electricity generated outside the province in Nova Scotia, raising the question -- are tags required for electricity imported into the province?
- Making the annual target a percentage rather than a fixed amount will lead to a number of problems since the amount will vary from year to year:
 - As this past winter has shown, forecasting demand is difficult for any utility, including NSPI. Basing the annual target on an inaccurate forecast will affect both renewable generators and the LSE.
 - Potential renewable generators will have difficulty planning for facilities with capacities of unknown size. Approaching a lending institution for a loan or ordering equipment becomes problematic if the size of the facility in a given year cannot be predicted.
 - Renewable generators could be penalized for overbuilding and not getting revenues for the electricity or tags produced.
 - Monitoring is complicated by the fact that each year has a different target, depending upon the expected growth for the year.
- The objectives and purpose of the proposed RPS are not stated, although Recommendation 44 does require NSPI to report annually to the UARB to “*meet the environmental goals established by the RPS*”. However, there are

no environmental goals explicitly associated with the RPS in the EMGC Report.

- As mentioned above, in 2010, LSEs will be expected to show that they have met their final RPS target by producing tags equivalent to 5 percent of their total generation. In most jurisdictions, the LSE must demonstrate that they have accumulated the tags over a one-year period (typically a fiscal year); at the end of the year, they must start accumulating tags for the next year. The lifetime of a Nova Scotia RPS-tag is described in Recommendation 45:

The EMGC recommends that “RPS tags”, obtained from certified Nova Scotia renewable generators, carry an expiry date set 18 months from the month of generation, by which time they will have been used by an LSE to meet the RPS requirement, or they will have lapsed.

The EMGC recommends that the RPS-tags have an 18-month lifetime. The rationale for this period is unclear. However, it simply adds to the difficulty associated with monitoring the Nova Scotia RPS.

Nova Scotia’s green energy program is now underway with two wind turbine projects and a power purchase agreement with Atlantic Wind Power for 100 gigawatt hours of wind energy from the wind farm to be constructed in Pubnico in 2004.

[2004 Report - Page 7]

The above paragraph describes Nova Scotia Power’s green power programme, not “*Nova Scotia’s green energy program*”:

- The “*two wind turbine projects*” presumably refer to the turbines installed by NSPI in Grand Etang, Inverness County and Little Brook, Digby County.

These turbines were installed after considerable delay and, in one case, local opposition. NSPI planned to sell the electricity generated by the turbines at a premium of \$5.00 per kilowatt-hour as part of their Green Power programme. The programme, officially launched in the summer of 2003, was met with considerable opposition because of the wording of the announcement (it asked for “voluntary” contributions). The programme is to be relaunched in the summer of 2004 (MacDougall, 2003).

- The 100-gigawatt wind farm being constructed in Pubnico Point.

Strait Area Gas continues to work on its franchise application and has filed its agreement with its private sector partner in California with the Nova Scotia Utility and Review Board.

[2004 Report - Page 7]

One would have thought that given the limited penetration of natural gas in Nova Scotia, the Department of Energy would know that the name of the “*private sector partner*” of Strait Area Gas is ARB Incorporated (ORO, 2004).

Informing Nova Scotians

In August 2003, the department conducted a public awareness research study to determine what Nova Scotians know and understand about energy issues, the offshore, climate change, and their own energy use. In addition to establishing a baseline for measuring improvement in energy awareness, the study conducted a review of current energy-related information available from industry, government, and not-for-profit agencies throughout Nova Scotia to identify gaps in information and potential overlap.

[2004 Report - Page 8]

No reference is made to the questions used or the results of the study. A study, conducted with public funds, should be made available to anyone interested in learning more about it. Similarly, the results of the review of “*current energy-related information*” should be publicly available.

The results of the energy awareness study are now being put to work in the development of a multiyear public education plan that will address two key areas: Our Energy Use (including energy efficiency, renewable energy, climate change, electricity, and gas distribution), and Our Oil and Gas Opportunities (careers and skills and the economic benefits of the energy sector).

[2004 Report - Page 8]

The public education plan highlights the province’s shortsighted view of the future; of the two documents, only “*Our Oil and Gas Opportunities*” discusses “*careers and skills and the economic benefits of the energy sector*”. It would appear that the government believes that future employment will be in oil and natural gas as opposed to renewable energy. Similarly, with the limited penetration of natural gas in the Nova Scotia market, it is unclear why “*Our Energy Use*” is to focus on natural gas distribution.

The creation of Nova Scotia’s first oil and natural gas educational video has helped us build a foundation for improving public education and providing valuable information to Nova Scotians. This video, aimed at junior and senior high school students, tells the story of Nova Scotia’s oil and gas industry from the beginning, starting with geology through to exploration, development, production, and energy use. The focus on career opportunities will be useful to students seeking employment information about the industry.

[2004 Report - Page 8]

Although the oil and gas industry is central to this government’s energy policies, a discussion of energy options (including non-renewable fossil fuels and renewable fuel sources) would be of far greater service to junior and senior high school students. To be useful to Nova Scotians, the Report should have included a chart showing the employment in the oil and gas industry in Nova Scotia over the past decade.

A new direct mail campaign will demonstrate to Nova Scotians that “a little energy can save a lot more”. Approximately 150,000 households in the Halifax Regional Municipality and the Cape Breton Regional Municipality will receive electrical outlet foam insulators to help reduce drafts and improve energy efficiency in their homes along with helpful tips for reducing energy use, saving money and keeping warm.

[2004 Report - Page 8]

This announcement is interesting for a number of reasons:

- There is no mention of this direct mail campaign in the Matrix (searches for “outlet”, “foam”, and “insulator” yielded no results), despite the fact that the Matrix “contains detailed information on the action items developed by the Energy Strategy in December 2001”.
- Although energy (in the form of heat) can be lost through poorly insulated electrical outlets, there is no indication of how much energy will be saved because of these insulators.
- There is no indication of the cost of this publicity campaign.

3. What was not covered

Many topics dealing with Nova Scotia’s energy sector that occurred during 2003 were omitted from the Report, including:

- EnCana’s decision to delay the Deep Panuke yet again (Myrden, 2004b)
- The growing interest in using the Maritimes and Northeast pipeline to carry Liquefied Natural Gas (LNG) (Myrden, 2004c).
- The reflagging of drilling vessels to appear ‘Canadian’ (Myrden, 2004a).

In addition to the above, the Report fails to mention a number of items being pursued in the Matrix, most notably “clean coal”.

4. Meeting Nova Scotia’s Kyoto commitments using RPS⁶

In 2002, NSPI generated about 73 percent of its electricity from coal-fired thermal power stations or about 8,862 GWh of electricity (Emera, 2003). Previous work has shown that Nova Scotia will be between two and three megatonnes over its Kyoto target by 2012 (Hughes, 2003b), with the primary source of CO₂ emissions being electrical generation (about 44 percent) (Olsen, 2002). In order to meet part of our Kyoto commitment, it will be necessary to make reductions in emissions from electrical generation.

⁶ This section originally appeared as part of a series of recommendations to the EMGC on their proposed RPS (released in their second interim report). The recommendations can be found at www.dal.ca/~lhughes2/environment/rps.pdf. The EMGC ignored all the recommendations.

Although the EMGC was aware that using a renewable portfolio standard could help Nova Scotia meet part of its greenhouse gas emissions target, they failed to make this a reason for adopting the RPS.

If Nova Scotia will be required to make a reduction of between two and three megatonnes of CO₂ by 2012, then asking NSPI to meet part of this reduction, say one megatonne, seems reasonable.

To achieve a one-megatonne reduction, Nova Scotia would be required to replace 1,000 GWh from coal by 1,000 GWh from renewable sources (Hughes, 2003b). The proposed RPS would require that, at the target date, LSEs produce tags amounting to 1,000 GWh of electricity (1,000 GWh is equivalent to the output of a single 115 MW power station running at 100 percent capacity, that is, continuously).

In order to achieve such a target by 2012 (i.e., the Kyoto deadline), it would be most appropriate to introduce the renewables in a staged fashion. For example, starting in 2003 and ending in 2012 -- a total of 10 years -- would mean that 100 GWh of renewables would have to be added each year:

| Year | GWh added | Cumulative GWh |
|------|-----------|----------------|
| 2003 | 100 | 100 |
| 2004 | 100 | 200 |
| ... | ... | ... |
| 2012 | 100 | 1,000 |

As an example, 100 GWh of annual generation can be achieved by operating a single 30 MW wind farm at 35 percent capacity factor -- the size of the Pubnico Point wind farm (contracted to sell NSPI electricity for the next 10 years).

Each year the LSE(s) would issue a call for 100 GWh of certified, renewable, low-impact electricity. Potential generators would then bid for a multi-year contract (say 10 years, with an option to renew) that would guarantee a rate of return in exchange for the renewable low impact electricity (that is, the LSE would obtain the tags).

A common complaint about renewable electricity is that it is intermittent and is not necessarily available to meet the demand. It has been demonstrated in Denmark that by combining good meteorological forecasting and wind technology with biomass cogeneration, the intermittent nature of wind can be handled (Jensen, 2002). With this in mind, it would be advisable to incorporate a mix of renewable generation sources each year.

4.1 Recommendations for a Nova Scotia RPS

The following recommendations should be put in place for a provincial RPS:

- The RPS target should be for a one-megatonne reduction in CO₂ emissions, starting immediately and continuing to 2012.
- There should be a single-buyer market.

A single-buyer market (each LSE buys electricity from renewable generators for sale to its customers) simplifies the overall design since it is an extension of what already exists today. Competition between generators exists, since each LSE is required to issue a call for its part of the 100 GWh of renewable electricity each year.

A benefit of the single-buyer market is that competitive bidding will allow the LSEs to obtain the best-priced tags, thereby minimizing increases in the cost of electricity for their customers.

The cost of the renewable electricity would be rolled into the LSE's cost-of-service base.

- All LSEs must obtain sufficient renewable low impact electricity from provincial generators to meet their proportional fraction of the 100 GWh. LSEs can generate their own renewable low impact electricity to meet part or their entire fraction.
- LSEs that fail to meet their proportional fraction of the 100 GWh will be penalized at twice the average provincial tag value in the annual compliance period for each missing kWh.

5. Concluding Remarks

A progress report should give a clear indication of whether the intended goals of the individual or organization are being met. This year's Energy Strategy Progress Report and the accompanying Matrix, fail to do so.

Last year's analysis of the first Progress Report recommended that the Department of Energy develop indicators to demonstrate the progress towards meeting the goals of the Energy Strategy (Hughes, 2003a). These suggestions were ignored -- neither the Progress Report nor the Matrix refer to indicators or to their development.

One could argue that the goals of the Energy Strategy are not being met and the government wants to hide this fact. This could well be the case, in view of the emphasis on "*world-class energy sector*" and "*the province's rapidly expanding offshore energy sector*".

To improve the reporting of the state of the energy sector in Nova Scotia, the Department of Energy should:

- Develop indicators for the Energy Strategy. Nova Scotians have a right to know the state of their energy sector. If there are problems, they should be informed of them.
- Progress Reports should focus on the previous year's activities in the energy sector. Vague promises about future activities are of little help to Nova Scotians.
- Clear, understandable connections need to be made between future Progress Reports and the Matrix. The Matrix document appears to have been hurriedly put together and makes little sense (other than perhaps to its authors).

- The Department of Energy's web site is difficult to navigate. Furthermore, important, energy-related material cannot be found on the Department of Energy's web site.
- The EMGC Report should be reexamined. Ideologically driven deregulation has not produced the promised results in jurisdictions such as California, Alberta, and Ontario.

Perhaps the most important issue that the Department of Energy must address, but fails to do so, is Nova Scotia's energy future. Energy is central to everything we do -- from heating to lighting to transportation. A truly forward thinking government would start planning for these issues now, in light of both environmental impacts and the rising price of energy.

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