

8 October 2010

To Whom It May Concern:

Over the past year, several items have emerged in provincial and federal policy spheres that have the potential to have a direct impact on Plan A of the NSPI's 2009 IRP Update and subsequent IRP Action Plan update.

Be reminded that the 2009 IRP Update (NSPI IRP Analysis Results, 2009) was premised on four key pillars:

1. Investments in renewables over the first decade are required (2010-2020)
2. Success in DSM is a critical component
3. Maintaining and upgrading NSPI facilities is economic
4. Additional information is required to inform the long-term plan; environmental, technological and economic developments will continue to be monitored to determine viable demand and supply alternatives over the long term

Previously,

IRP analysis has been improved and expanded through the inclusion of transmission cost information, updated emissions constraints and updated and expanded technology options (ibid).

In this submission the EAC argues that:

1. NSPI must more clearly and thoroughly articulate within the IRP how renewable sources of electricity (RE) or non-emitting imports will be undertaken by the utility within the next 5 to 10 years to meet important provincial 2020 RE and GHG reduction goals and targets, while potentially having to support the federal government's proposed 2015 phase out of coal-based electricity, and more broadly providing information for planned succession to coal-based electricity in Nova Scotia, on an aggressive but realistic timeline;
2. NSPI and Efficiency NS must continue to support an aggressive ramp up of DSM that thus far DSM has proven to be a cost-effective mechanism assisting the reduction in demand in NS. Substantial opportunities for innovative electric and non-electric fuel substitution present themselves within the mandate of the new agency;



3. Beyond maintaining and upgrading NSPI's facilities, the EAC argues that NSPI must more aggressively engage in scenario planning that will see rapid and sustained move away from coal-based electricity, and other emitting sources of electricity production such as biomass, requiring that Plan A be revised to include more aggressive action for non-emitting sources of electricity;
4. Substantially more information is required to inform NSPI's long-term planning and NSPI should more broadly engage in meaningful research, development and implementation of non-emitting, renewable electricity technologies as has been shown cost-effective and realistic in other jurisdictions, both nationally and internationally.

The IRP Action Plan update does not give clear articulation from NSPI about how it will respond to emergent policy developments and processes, with respect to the level (and kind) of investment it will make in renewable electricity. Furthermore the plan does not address how NSPI will undertake additional long-term planning and information-gathering to plan for phasing out NSPI coal-burning facilities, (beyond maintenance and upgrading costs), in the interests of rapid and sustained greenhouse gas reductions, for the future benefit of Nova Scotia's environment and our province's citizen's health. The IRP document does not address provincial energy security and green economic development aspirations, required for the long-term sustainable prosperity of Nova Scotia. Specific comments on the IRP Action Plan follow in subsequent sections of this letter.

Best Regards:

Brennan Vogel

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The Ecology Action Centre (EAC) has acted as a leading voice for Nova Scotia's environment for over 38 years. The EAC was voted #1 Activist Organization by readers of The Coast magazine for six years running. Since 1971, the EAC has been working to build a healthier, more sustainable Nova Scotia. Today we have over 1000 members, 250 volunteers and staff, and seven active teams and committees. The Ecology Action Centre works closely with social and natural scientists and makes strong use of science in communicating its message to the public. Our current areas of focus include Built Environment, Marine Issues, Coastal Issues, Wilderness, Food, Transportation and Energy Issues.

Part I Development of resources pre-2013

Support pursuit of DSM consistent with the IRP trajectory and Board approved plans as interim Administrator until the new DSM Administrator, Efficiency Nova Scotia Corporation, is operational, which is expected to occur by February 2011 in time for the proposal of the 2012 DSM programming plan (p.1)

The EAC argued in its DSM submission to the Board (April, 30 2010) that: “thus far & based on the evidence, DSM programs as administered in the interim by NSPI have performed adequately, cost-effectively meeting energy savings targets. DSM is economical and environmental and presents considerable opportunities for innovation and economic development. Energy efficiency is Nova Scotia’s most cost-effective energy resource. By investing in energy efficiency and conservation today, we avoid the need to build new coal fired power plants in the future.”

Furthermore, the EAC stated in its submission that: “DSM is an important component of developing the province’s innovative potential and ‘green’ economic import substitution markets... while ultimately, DSM is meant to aid with Nova Scotia’s responsibility to do its part to reduce the province’s greenhouse gas emissions contribution to the precipitating global climate crisis.”

The EAC notes that the previous IRP proposed that efficiency would cancel load growth. At 2% growth, that’s 260 GWhr a year. The current DSM result is about 20% of this value. The EAC advocates for aggressive DSM given these discrepancies.

The EAC presented three key issues for Board consideration in the 2010 DSM submission.

1. TRANSPARENT AND ACCOUNTABLE ADMINISTRATIVE TRANSFER OF DSM PROGRAM MANAGEMENT FROM NSPI TO EFFICIENCY NOVA SCOTIA IS REQUIRED

The EAC finds that NSPI and Efficiency NS have fulfilled transparency and accountability in the transfer of DSM program management and encourages NSPI and Efficiency NS to maintain transparency and accountability in the preparation of the 2012 DSM plan and ongoing DSM



efforts by broadly engaging a wide-variety of stakeholders in sector-based approaches to energy efficiency and conservation and considering the spectrum of possibilities for non-electric fuel substitution in the province.

2. INNOVATIVE, ACCOUNTABLE & EFFECTIVE DSM PROGRAM DESIGN AND IMPLEMENTATION IS REQUIRED

The EAC advocates that equitable distribution of the costs in service provision between governmental/institutional, industrial, commercial, residential and low-income ratepayers be maintained and enhanced in future DSM program design and implementation.

The EAC encourages that DSM programs should include the integration and widespread dispersion of innovative and learning-based pilots for the development of domestic energy efficiency and conservation initiatives & markets that comprehensively and progressively can meet the needs of all Nova Scotian rate-payers in such a way that continues the momentum of ambitious and aggressive ramping up of strategic and comprehensive DSM programs through Efficiency Nova Scotia.

The EAC advocates that this includes:

- i. Strategic opportunities for import & electric and non-electric fuel substitution as well as including,
- ii. A diversified and comprehensive array of DSM activities that will develop key sectors of Nova Scotia's green economy, such as for example, market development opportunities for solar technology retrofits for residential customers, geothermal heat pumps and high efficiency public lighting,
- iii. A responsible and consistent ramping up of DSM as per the terms of the IRP (2009) and evidence-based recommendations for the administration of DSM in NS on an ongoing basis of DSM planning and Board review and approval.
- iv. DSM design should integrate meaningful opportunities for low-income and renter populations to take advantage of DSM programs.

Residential DSM program opportunities to advance distributed generation (through solar PV) combined with aggressive efficiency attacking electric hot water and electric



baseboard heat could greatly assist in building resilient, decentralized electricity, while assisting NSPI in its emissions reductions targets.

The EAC also encourages the regulator to include consideration of new methods for cost-effectiveness testing (i.e. Utility Cost Test, and other societal cost tests that include consideration of further externalities such as greenhouse gas mitigation imperatives) in future IRP planning for DSM activities at NSPI, as well as within the DSM new administrator.

Participate with other stakeholders to assist in the evaluation of biomass supply and sustainability, and evaluation of technical constraints by government. The Company anticipates that this ongoing work will continue in 2010. (p.4)

The EAC respectfully takes the perspective that 'biomass and sustainability' extends beyond the 'sustainability' of biomass fuel supply and biomass economic parameters to holistically include the ecological implications of biomass on carbon life-cycles and provincial greenhouse gas reductions and targets. Ultimately, the EAC reiterates the point that there is a substantial risk to supporting a technology is not carbon neutral and, as such, ratepayers may have to carry the costs of such an unscrupulous expenditure well into the future.

It is the position of the EAC that large scale forest biomass for renewable electricity has little alignment with provincial climate change goals and objectives, which include a 10%, GHG emissions reduction below 1990 levels, by 2020. Be reminded that currently Nova Scotia is substantially above this target and emissions have yet to begin decreasing. Consumptive demand is reported to be increasing at a rate of 1% a year. On the current track, Nova Scotia's emissions could be as high as 20% above 1990 levels by 2020.

As NSPI is responsible for almost half of the province's GHGs, NSPI should be required (by way of planning, policy and regulation) to pursue renewable electricity options that meaningfully contribute to GHG reductions in a sustainable fashion, over the short term.

In the IRP Update (2009), Plan A modelling/analysis for lowest cost scenario was assumed to be the path that NSPI was pursuing. In Plan A, biomass was presented as largely being



employed for co-firing within NSPI plants, in the near-term, and considered for PPA (15MW by 2030) over the long-term.

NSPI's current pre-occupation with biomass within IRP Plan A, is attributable to its own scenario planning, which is most aggressively reflected within the Department of Energy Renewable Electricity Plan (REP) and proposed renewable electricity (RE) regulations inclusion of biomass.

From the perspective of the EAC, the consideration that has been given to carbon life-cycles and provincial greenhouse gas reductions and targets within the IRP, the REP and subsequent RE regulations has been wholly inadequate.

In the absence of a clear and definitive scientific basis underscoring Nova Scotia's renewable energy plans for forest biomass or other potentially more viable alternatives, the EAC questions the prudence of government policies and utilities regulation proceeding on biomass.

As such the Board should mandate that NSPI explain how biomass investments are aligned with sustained reductions in greenhouse gases, consistent with the 2020 target of 10% below 1990 levels. In the absence of such analysis, biomass utilization for renewable electricity is a redundant distraction from the potential of other more meaningful mechanisms to rapidly address the problem of greenhouse gas mitigation in the province of Nova Scotia.

Consider the recommendations arising out of the Nova Scotia government-led stakeholder process "N.S. Renewable Energy Consultations" (re: evolving renewable energy targets) and their effect on planning, if any. A Report is anticipated to be completed by Dr. David Wheeler in December 2009. (p.6)

Wheeler & Adams (2009) noted that, "...renewable energy standards be reviewed based on scientific assessments of carbon life cycle considerations". From this recommendation, the REP (2010) stated:

Government will approach the development of biomass for electricity production **with caution**. Electricity produced from co-firing biomass will play a role in meeting the 2015 target, but will undergo review for post-2015 use. ***To ensure sustainability, pending***



release of the Natural Resources Strategy, this plan caps new electricity generation from forest biomass at 500,000 dry tonnes (~600-700 GWh) above current uses. Co-firing in thermal plants is capped at 150,000 dry tonnes (150 GWh) (emphasis added)

The EAC takes note that:

1. Scientific assessment of carbon life-cycle considerations have been negligible with respect to the inclusion of large scale forest biomass for renewable electricity in the province of Nova Scotia (for a recent example of a reasonable alternative policy approach to forest biomass, please see Manomet Study & Massachusetts Energy & Environmental Affairs Commissioner's ruling, July 7 2010¹);
2. The government of Nova Scotia has not resolved the lack of alignment between the proposed renewable electricity regulations and the release of the provincial Natural Resources Strategy (as of yet, incomplete).
 - a. It is the belief of the EAC that forest biomass should not be included as a renewable fuel until the harvest limits have been determined through the Natural Resource Strategy. Government processes should yield to each other and, at a minimum, any forest biomass renewable electricity projects currently under consideration should be placed on hold until the conclusion of the RE electricity regulatory process is clear.
 - b. A recently released Natural Resources Phase II Report (Glube et al., 2010) recommended fundamental changes in how Nova Scotian forests are managed, including recommendations that have implications for the future of forest biomass harvesting practices. These include such recommendations as ending whole-tree harvesting, regulating clear cutting, and promoting uneven-aged management.
3. Controversially, an NSPI/NPPH biomass regulatory hearing began just three days after the comment period for RE regulations closed.
 - a. The EAC questions if it was an appropriate process for NSPI and the province to be forging ahead with a biomass project proposal hearing, in the absence of

¹ <http://solveclimate.com/blog/20100616/dirtier-coal-under-fire-institute-clarifies-its-claim-about-biomass>

"The findings of the Manomet study have changed the policy landscape for biomass energy...", states the Massachusetts Government in a letter detailing the policy changes to come. These changes include minimum efficiency of biomass plants, and minimum reductions of green house gas emissions relative to a new natural gas facility.



clear RE regulations and provincial policy directives on biomass based on sound science or reasonable policy precedents from other jurisdictions (like Massachusetts).

Wheeler & Adams (2009) noted that:

“There is significant concern within some stakeholder groups that the use of forest biomass for any larger-scale energy generation will result in irreparable ecological damage to Nova Scotian forests” and in their consultation with stakeholders, they noted that, “73% of respondents would be less likely to support forest biomass energy if it involved more clear cutting” (Wheeler & Adams, 2009).

Furthermore, Wheeler & Adams (2009) observed that a path forward on the issue of forest biomass was, and is:

“...contingent on the ability of stakeholders to come together in a consensual way to identify and define sustainable harvesting practices, and pursue the win-win opportunity that we believe most definitely exists. Currently there appears to be a lack of willingness and/or capability on the part of key stakeholders to secure such a consensus. In the absence of such a consensus emerging ***we must rely on Government Departments to bring forward the ‘high level standards’ that will provide guarantees on ecological integrity and work with all stakeholders to implement such standards in the shortest timeframe.*** Other guidelines and standards can be developed over time” (emphasis added).

On July 26, 2010, NSPI & New Page began regulatory approval hearings on a 60MW forest biomass for renewable electricity project proposal. This proposal – meant to assist NSPI in meeting 2013 RE supply obligations – included a proposed 40 year power purchase agreement between the project proponents, and projected an increased forest biomass harvest of 144,000+ dry tonnes. Currently, two-thirds of New Page’s supply is supplied by clear-cut. An estimated capital expenditure of 208 million CAD is required to retrofit New Page’s facility to accommodate this new use. Throughout this process, carbon-life cycles were not subject to any scrutiny, while other outstanding economic and supply issues articulated during the deliberations, have clearly underscored the imprudence of this project at this time (see UARB



proceedings, most importantly debt financing 330 million/yr of New Page Ohio, the Port Hawkesbury parent company).

In light of recent events, the EAC reiterates its belief that the Wheeler/Adams recommendations detailing concerns about additional clear-cutting and need for consensus building among all stakeholders has neither occurred, nor resulted in a positive mutual agreement on the issue of forest biomass in the province of Nova Scotia. The EAC maintains that this is an imprudent mechanism and poor choice for renewable electricity, given the ultimate objective of RE is to reduce GHGs in the short-term (as recent energy/environmental policy precedents in Massachusetts have re-enforced).

As such the EAC contends that if any form of biomass is to be used in the short-term for electricity or non-electric fuel substitution, high-efficiency parameters should be set, and ideally should be limited to small scale co-generation and primary heating applications for individuals, farmers and community district-heating applications. The EAC commends the small-scale efforts along these lines currently afoot and broadly supports efforts to scale up these sustainable alternatives.

Nova Scotian government leaders and regulators must exercise leadership to ensure that all stakeholders are in agreement with regards to the high level standards that guarantee the ecological integrity of Nova Scotian forests for future generations, and strategic plans that will reduce GHGs in the short-term. Currently, Nova Scotia lacks this level of consensus. As such, NSPI has been left in a policy-vacuum with regards to prudent and sustainable mechanisms for procuring renewable electricity. Additionally, since NSPI has legislated emission targets it must meet, it must be better reflected in IRP and financial planning.

The EAC wishes to reiterate and encourage government and regulatory leadership to address these issues of questionable process regarding, in particular, the issue of forest biomass. A poor regulatory precedent now sets a low-bar for the future of RE in Nova Scotia and certainly is not in the best interests of sustainable social and economic prosperity of Nova Scotians and the long-term sustainability of the Nova Scotian environment.



Ultimately, this requires that the province and the regulator need to take greater consideration of non-cost variables such as carbon, forest sustainability, environmental progress and sustainable prosperity policy directions in regulatory decision-making criteria. As Wheeler/Adams (2009) recommended, this may require a Mandate Review of the Public Utilities Act in the event of conflict to ensure appropriate regulatory oversight is enshrined.

This particular recommendation was based on the following observations:

1. The current mandate of the UARB does not provide clear or adequate direction in relation to the integration of renewable energy into the supply mix for the Province, including the ability & authority to set FIT prices.
2. The government must clearly communicate to the UARB the importance which the government wishes the UARB to give to the long term price stability and security of energy supplies in the Province... ***The UARB or any other body charged with this responsibility would still require clear policy criteria to work from*** (emphasis added, given the argument presented above – what are the policy criteria UARB is meant to be working from?).
3. The issue of who should be providing renewables and at what level (NSPI, Independent Power Producers or Community Enterprises) is also a matter for Provincial Government policy. ***Government must set out clear policies related to energy procurement, FITs and technology specific RFPs or Expressions of Interest.*** (emphasis added – while government has done so, the EAC continues to question the prudence and rationality of the government's choices given outstanding issues argued above).

This mandate review process would need to include greater consideration of how environmental compliance and other non-cost (ecological) variables such as carbon life-cycles, are reflected within the mandate of the provincial regulator. Looking to other jurisdictions that utilize full-cost accounting approaches (through a UARB mandate review process) is fully supported by the EAC. This would include greater considerations of how to integrate carbon life cycle considerations and provincial greenhouse gas reductions policy targets within the regulatory planning, policy and implementation processes.

In the absence of such analysis or regulatory mechanisms, the EAC encourages the UARB to show leadership on its own internal mandate issues as well as mandating that NSPI IRP should show greater consideration of cost variables for emissions-reductions targets compliance (and related timelines) as well as non-cost sustainability variables of fuel supplies in current and future scenario planning.

Part II – prepare for post 2018 requirements

Examine opportunities for large non-emitting PPA including associated transmission upgrades, such as opportunities with respect to the Lower Churchill Falls project and/or largescale imports from New Brunswick. (p.9)

The EAC advocates that non-emitting imports to the Nova Scotian electricity market are an important part of Nova Scotia's transition away from GHG emitting sources of electricity, such as coal. Now that the province has announced its intentions to upgrade the electricity inter-tie to New Brunswick, using rate and taxpayers subsidization for improved interconnection, the EAC wonders why NSPI is not providing further details on how firm, reliable imports from NB Hydro and Hydro-Quebec could backstop an aggressive campaign to phase-out coal-fired generating plants as a part of the IRP Plan A assumptions, to providing a greater role for intermittent wind energy in the domestic electricity supply, within the next 10 years.

Many energy observers are cognizant of the danger that the new intertie and potential for green energy exports pose to Nova Scotia. It could be the situation that Nova Scotia will increase its RE portfolio over the coming years while little is done by NSPI to address the issues of coal-based electricity generation and subsequent emissions with long-lasting environmental and human health impacts. From this perspective of the EAC this is inappropriate and out of line with provincial desires for domestic energy and economic security based on renewable electricity.

Since NSPI is not currently mandated by the provincial government to substantially reduce coal-based electricity production, and explicit policy and regulatory provisions to capture the non-economic variables (i.e. mercury carcinogenic impacts, long-term fuel supply issues, long-term GHG impacts of carbon-emission based electricity supply) are lacking within policy and



regulation; and since recent policy precedents do not bode well for provincial ambition to phase out carbon-based fuel supplies through policy mechanisms (i.e. mercury target delay, biomass non-consideration of carbon, inclusion in RE portfolio despite Massachusetts precedent); the EAC maintains a healthy scepticism about the considerable rhetorical gaps between planning, policy and practice with respect to our province's admirable environmental targets, supposedly to come to fruition in 2020.

As such, the EAC maintains that there is considerable work to be done by the utility, the province and regulator to show how NSPI will realistically and feasibly have integrated resource scenario planning that is on track to meet the EGSPA 2020 RE and CO2 targets.

However, it is important to recognize that federal regulatory regimes, with significant implications for NSPI, remain forthcoming. Should, for example, Trenton Unit 5 150MW coal boiler (ca 1969) at 46 years of age and the end of its useful life (under the proposed CEPA regulatory regime for 2015 implementation) be required to be shut down as a result of the federal mandate to phase out coal-based electricity production as a part of Canada's national climate change action plan, the EAC advocates that:

NSPI should clearly articulate how hydro imports (or other RE activities) could underscore the 150 MW phase out of the Trenton coal boiler as a part of clearly articulating a broader coal phase-out strategy. These matters should be articulated by NSPI, within the IRP planning process, and where further research and policy development is required, it should be so undertaken.

Evaluate the need for environmental retrofits to meet 2018 requirements. (p.9)

The EAC contends that the recent changes to mercury regulations by the provincial government were a lost opportunity to address a long-standing environmental health issue that has negative consequences for Nova Scotians' and the Nova Scotia environment. While this extends beyond the scope of the IRP process, the EAC reiterates that greater consideration should be given to the creative policy and regulatory mechanisms that require NSPI to meet environmental compliance targets, in a way that does not unnecessarily burden consumers and that fulfills NSPI's social contract to operate in the province of Nova Scotia.



Such mechanisms could include: revision to NSPI's guaranteed rate of return to assist in meeting NSPI's environmental compliance costs, before shareholder profits are collected; greater consideration of efficiency and conservation regulatory standards for consumers, for example, as reflected in 'average' rate of consumption and price penalization for excessive consumers.

Currently no such level of analysis or research exists by the regulator, the province or the utility.

The EAC contends that inevitably, prices of electricity will continue to rise and precautionary revisions to Nova Scotia's electricity regulation and markets are required to encourage greater corporate social responsibility and consumer environmental responsibility. The regulator and the utility could both do much better in these regards, as mentioned above.

Under proposed regulations of the Canadian Environmental Protection Act, the federal government has signalled its intention to introduce performance standards for new coal-fired electricity generation units, and units that have reached the end of their economic life (45 years), by 2015.

The EAC points out that NSPI currently has Unit 5 (150MW coal-burning unit from 1969) in operation at Trenton. By 2015, this unit will be 46 years old, and as such, under the proposed regulatory regime, at the end of its useful life. This Trenton boiler is in part responsible for the combustion of 800,000 tonnes of coal per year (imported from volatile markets like the United States and South America). Trenton currently generates approximately 12% of the province's electricity, while producing roughly 10% of the province's air pollution. This pollution includes GHGs and heavy metals, such as mercury with long-lasting and persistent effects on pregnant women, citizens at-large, fish, birds and other forms of life in Nova Scotia.

To the EAC, this seems an opportune and timely moment for NSPI, within its IRP Update & Action Plan process, to clearly articulate how it will begin to phase out coal-based electricity generation in favour of more sustainable alternatives (i.e. natural gas, RE) that are consistent with Nova Scotia's environment and citizenry's health, and provincial policy targets.

Finally, in the 2009 IRP Update “Final Basic Assumptions – Future Supply Side” NSPI identified Additional Technology Alternatives Under Watch For Future Consideration (p. 73). These technologies that NSPI deemed eligible for future assessment included: landfill gas, solar (photovoltaic), fuel cells, cogeneration, distributed generation / micro turbines, and energy storage. While it appears in the IRP Action Plan update that NSPI has devoted significant resources to actively monitor and participate in technology developments such as carbon capture and storage research, participate in tidal demonstration projects, development of wind as a significant RE source as well as support for the widespread dispersion of Demand-Side Management activities; the EAC contends that NSPI needs to devote considerably more time and resources to show a genuine and sustained interest in moving alternative technologies forward. This should include greater emphasis on storage technologies (Compressed Air Energy Systems) and ocean wave energy, as considerably more efforts on Solar PV.

Regarding Solar PV potential in Nova Scotia:

According to the latest international data, (Gipe, 2010) Germany's solar industry added another 1,000 MW during July and August. This brings the total for the eight-month period from January through August to 4,900 MW from nearly 175,000 solar installations. This is nearly 1% of Germany's electricity from Solar PV in 8 months alone. Gipe offers that the German model clearly shows solar PV can indeed scale where the policies are designed to do so.

Here at home on the national front, Ontario has completed the world's largest solar farm at 80 MW in Sarnia, Ontario (CBC, October 5 2010). CBC reports that the project, (originally built as a 20 MW facility by First Solar Inc. under the Renewable Energy Standard Offer Program (RESOP) from the Ontario Power Authority (OPA), was recently upgraded by 60 MW by Enbridge Inc. and will continue to be operated by First Solar. The farm consists of 1.3 million panels covering 950 acres. With 80 megawatts of output, the site now generates enough energy to power more than 12,000 homes. More than \$400 million was invested in the Sarnia expansion, creating 800 jobs, the government of Ontario has said. Ontario now generates 100-200MW of electricity from solar PV. ² It is estimated that total solar PV capacity in Ontario could

² Unfortunately under the new Feed-in Tariff (FIT) program that replaced RESOP, the OPA can no longer enter into contracts for energy generated by ground-mounted solar facilities greater than 100 kW in size that are located on Class 1 and 2 agricultural soils and specialty crop areas. While larger projects are permitted on Class 3 soils, no more than 500 MW in total in Ontario are permitted. The prohibition on use of farm land will remain in place until further regulations are prescribed under the *Electricity Act, 1998*.

reach nearly 700 MW by the end of 2011 ([ClearSky Advisors](#)). Total PV installations could reach 3,000 MW by 2015. If a similarly aggressive and integrated approach were to be undertaken in Nova Scotia, this would be equivalent to replacing the total electricity supply of NSPI, with solar PV, in 5 years. Clearly, this Ontario/Canadian precedent provokes cause for greater consideration of the feasibility of solar PV by policy-makers, energy planners and regulators here in Nova Scotia.

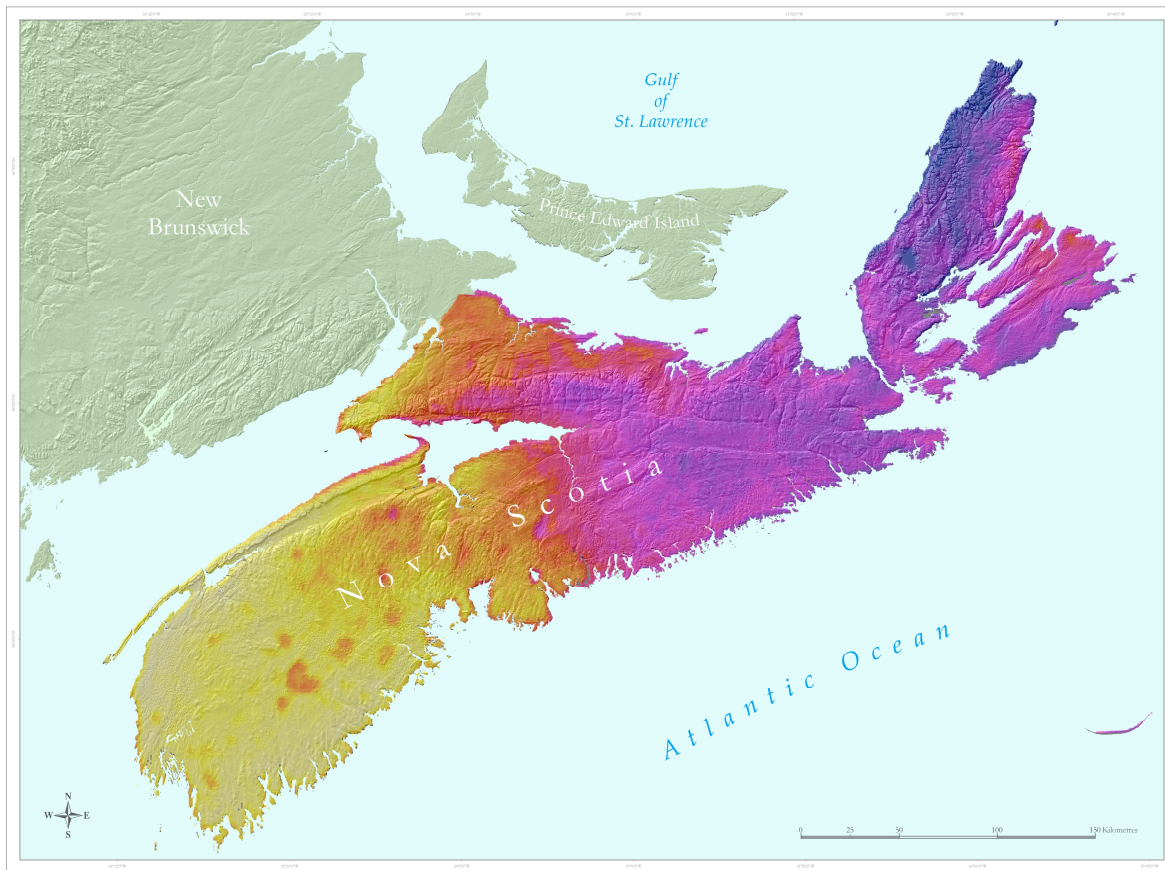


Enbridge Inc. Solar Farm, Sarnia Ontario (Dave Chidley/Canadian Press)

When seen through the lens of sustainable prosperity (i.e. moving from principles to practice in transforming Nova Scotia to be aligned with the EGSPA vision of Nova Scotia being “one of the cleanest, most sustainable jurisdictions anywhere by 2020”) it is very troubling that Nova Scotia continues, in planning, policy and regulation to ignore the best opportunity for the largest sector of the population to engage in electricity production, while building widespread sustainable energy and economic benefits, through solar PV.

Nova Scotia could easily be following in the lead of Germany and Ontario in implementing widespread solar PV programs and incentives, that would capture the vast potential for solar within the province, while building decentralized distributed energy solutions for Nova Scotian rate-payers and consumers. Such an integrated plan could create green economic opportunities and capture the tremendous potential to build sustainable prosperity from Canso to Amherst, Meat Cove to Yarmouth, through solar electricity.

Solar Resource Map of Nova Scotia 2007 - Annual Average



This solar resource map for the Province of Nova Scotia, Canada shows solar energy incident on a horizontal surface (kWh/m²/day) for the 2007 calendar year. The solar resource was calculated based on NASA's Geostationary Operational Environmental Satellite (GOES) images that record cloud cover over a portion of the Earth's surface every half-hour at a spatial resolution of one square kilometre. This map is a result of processing over 8800 GOES images. The solar resource is overlaid transparently on a shaded relief of the Province of Nova Scotia.

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Solar Resource Map of Nova Scotia ³

³ <http://www.greenpowerlabs.com/government.html> A successful implementation of solar resource mapping technology developed by Green Power Labs is the Solar Energy Map for Nova Scotia – a digital map based on the solar radiation resource assessment in the province. This spatially explicit map of solar energy resources presents a high degree of correspondence with existing weather station data (Typical Meteorological Year data). Due to the correction algorithm, integrated in the model, the map of solar energy resources allows us to predict solar radiation accurately, not only in the immediate vicinity of the weather stations, but at any geographical location in the province. The results gained allow for optimizing solar energy applications through consideration of various geographic, topographic and engineering factors. The GreenPowerLabs' Solar Energy Map of Nova Scotia is a first step towards creation of the Atlantic Canada Renewable Energy Atlas.

GreenPowerLabs' Solar Energy Calculator, used for the development of the solar energy maps, is built in the advanced Visual Studio framework. It performs calculations of the hourly radiation, as well as the daily, monthly and average yearly solar energy per square meter of insolated surface. The software works in two modes – single location calculations and serial calculations. Single location mode is the main mode. It allows testing various scenarios of solar collector location, angle and aspect. The result of the calculations is the average annual and monthly solar budget, and a map of solar radiation through every hour of the year. Serial calculation mode is most suitable for spatial assessment of solar energy distribution over an area. Based on continuous information on geographical location, altitude, slope and aspect obtained from GIS, this module provides yearly solar energy per square meter data for mapping purposes. The hourly radiation solar map runs in interactive mode can also serve as an educational illustration of the effects of various input variables on solar energy gain.



In Halifax alone, Green Power Labs (a leader in solar electricity planning who are headquartered in Dartmouth) reports that solar radiation is equivalent to 1.230 MW/h per square meter (horizontal) and 1.380 MW/h per square meter (tilted surface). This is arguably one of the best urban solar regimes in Canada. Kentville, Yarmouth and the Halifax International Airport all report 3.0+ on the solar energy resource potential assessment of Atlantic Canada (LA and Miami rank 5.0+ for comparison).

The Wheeler report's downplay that PV is an emerging technology, and subsequent provincial policy-makers hesitations to support solar PV in through renewable electricity regulations and feed-in tariffs is an unfortunate missed opportunity that has long-term energy security implications and lost revenues for domestic economic import substitution markets (solar for coal, like in Ontario who recently shut 4 coal plants).

Planning, policy and regulatory decision-making needs to be based on appropriate information that gives full-consideration to the examples of solar in other similar jurisdictions (like Ontario) and the realistic economic potential of solar feasibility within Nova Scotia.

Green Power Labs offers that:

Whether driven by regulations, customer preferences, or corporate values, solar electricity is becoming an increasingly important renewable resource for electric utilities - and an unprecedented business opportunity for utilities and project developers interested in investment in clean energy generation.

Competition for grid connection and transmission corridors is intense, and financing is tight. Green Power Labs' expertise in industry best practices minimizes risk and maximizes ROI through support of comprehensive site selection, project engineering and energy management. Only utilities and developers who comply with these best practices will be the clean energy success stories for the next decade.

This is an area of policy and planning that has long-been overlooked by successive generations of Nova Scotian decision-makers, and forward thinking policy and planning must give greater consideration to solar potential in building resilient and sustainable domestic energy markets in 21st century Nova Scotia. This point is particularly underscored by the wealth of human resource



and solar infrastructural capital that is being 'left in the cold' by both the Nova Scotia government and the utility, for lack of integrated approaches.

It is in no way keeping with the best interests of the ratepayer or citizen for NSPI and the province to overlook solar PV as a realistic alternative. Planners, regulators and decision-makers must pay immediate attention to potential of solar PV (and solar thermal non-electric fuel substitution within the scope of Efficiency Nova Scotia's DSM program activities), if they are at the same time considering 60MW of biomass (at +\$200 million) as a 'green' source of electricity, despite proven questions regarding cost-effectiveness and long-term ecological prudence, let alone appropriateness of policy (given the outstanding issues).

If in Ontario Enbridge can upgrade a solar facility by 60MW for 400 million, while here in NSPI is proposing investing 200 million in biomass, as well as other multi-million dollar expenditures in experimental tidal technologies and unproven carbon capture and storage technologies, the EAC questions whether the appropriateness of this course and its alignment with the transformative RE targets for Nova Scotia by 2015 and 2020, and more importantly if it is in alignment with the aggressive GHG reductions targets for the province, country and planet which requires an aggressive approach to phasing out coal-based electricity in Nova Scotia, in the foreseeable future.

The EAC observes that there is no indication that NSPI has undertaken substantial research and development or cost effectiveness studies for solar PV potential (in comparison to BAU coal procurement and other RE feasibility such as tidal or biomass), as a reasonable alternative of consideration for Nova Scotia, and as such **encourages the UARB to mandate NSPI to undertake such actions in current and future IRP reporting and projections, in keeping with the scope of the IRP and relevant domestic, national and international policy frameworks.**

Such an undertaking could include consideration of the effect of solar PV in future wind variability studies. Since wind can run stronger at night, an increase in solar power may be able to compensate for daytime demand loads.

Ultimately, the EAC maintains that, as a province, we're missing an important opportunity to build domestic energy security and green economic opportunities for Nova Scotians' by not participating in the Solar Revolution happening elsewhere in Canada and the world.



Ultimately, it is the long-term interests of future generations of Nova Scotians' who will pay the price if global temperatures exceed two degrees as a result of inaction to meet 80%+ below 1990 levels, globally by 2050.

This path of integrated resource planning can be bold, pro-active and forward-thinking or this path can be laden with inaction, stalling and business as usual approaches that undermine principles of inter-generational equity and the unprecedented challenges facing the whole of humanity. Ultimately leadership and political will are required from decision-makers, planners and regulators today with the best interests of Nova Scotians, now and into the future, on the top of mind.