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Green Action Centre's Response to *TomorrowNow**

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* <http://greenactioncentre.ca/2012/green-action-centre-recommendations-for-tomorrownow-green-plan/>

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On Becoming a Clean and Green Energy Hub*

Green Action Centre applauds the intention of *TomorrowNow* to make clean and green energy a cornerstone of Manitoba's economy. In general terms, we support the initiatives described, with qualifications that follow in the remarks below. Manitoba needs a well-informed and optimized energy strategy to transition to a more sustainable, fair and prosperous economy.

An energy strategy should include an understanding of the physical, economic and social dimensions of energy systems. Physically, they involve infrastructure and a sequence of energy transformations from sources to end-uses as well as the by-products, emissions and impacts associated with each stage. Economically, the components of energy systems often dominate the marketplace of goods and services, costs and revenues. Socially, they underpin the way we live and are subject to policies and regulation that should, ideally, reduce the harms and enhance the benefits of energy systems.

Creating sustainable energy systems lies at the core of a green economy. Manitoba Hydro obviously has a central role to play, but its full potential can be realized only in conjunction with other green economy players and power smart pricing of energy. Our remarks begin with a valuation of Manitoba's hydropower and how to make the most of it as a contributor to green prosperity in Manitoba. We then extend the analysis to other aspects of building a clean and green energy hub in Manitoba.

1. The value of Manitoba's hydropower

Manitoba Hydro is one of Manitoba's most important assets and a key engine of our prosperity. This asset combines Manitoba's natural endowment of lying at the convergence of multiple watersheds draining the mid-continent with extraordinary engineering achievements that convert water flows to delivered power in a highly controlled system. The historic core of Hydro's business is the supply and sale, at home and abroad, of its premium product – reliable, storable, renewable, dispatchable low-carbon hydroelectric power – and the provision of associated energy services to Manitobans.

This high-value product energizes our homes, institutions, commerce and industry. Moreover it will electrify a growing portion of Manitoba's transportation fleet as electric vehicles are deployed.

Despite a significant environmental footprint from the re-configuration of waterways and the social disruptions created, Manitoba's hydropower is relatively clean per kilowatt hour in comparison with other sources. Its adjustable output and storage capacity can match variable

* by Peter Miller

market demand and prices and make feasible and economic other clean but intermittent sources like wind and solar power. This firming capability serves as a multiplier for Manitoba's capacity to produce clean dependable electricity for domestic consumption or export. Manitoba's new and growing premium export product is a compound of renewables that can displace fossil fuel generation while earning dollars for Manitoba.

The potential to firm and store wind power is reflected in Manitoba Hydro's recently announced contract with Minnesota Power, which has a provision for MH to store power from a wind farm in North Dakota owned by MP's parent company Allete. MH does the same for wind power purchased from Manitoba producers and it has the potential to do much more.

At the same time, wind and solar power diversify Manitoba's generation sources and mitigate hydropower's multi-billion dollar risk -- extended drought. Although intermittent over hours and days, wind and solar are much less variable than hydro in annual energy, since they are not subject to drought cycles. And solar power production is highest during hot summer days when export demand peaks to cool buildings in the central U.S.

Thus, although the historic core of Manitoba Hydro's business is the delivery of hydropower (supplemented by thermal resources), its present and future are interwoven with complementary alternative renewable energy technologies, further diversification of uses, and increasing efficiency.

Finally we should recognize that electricity from all sources, as delivered to consumers, is very high grade energy - instantly available at the flick of a switch, carefully regulated in frequency and voltage, and capable of driving lights, magnets, motors, sophisticated electronics and the global information and communications systems that modern societies utterly depend upon - as well as providing heat through resistance. Lower grades of energy from the combustion of biomass and fossil fuels and from solar thermal and geothermal directly provide only heat, some of which is, however, convertible (inefficiently) into electricity by thermal generation. For this reason, the efficiency guru, Amory Lovins, likens using electricity for heat to chopping up your Chippendale furniture and throwing it into the wood stove. A more efficient matching of energy sources and end-use needs is to serve space and water heating with direct heat energy sources and, *other things being equal*, save electricity for the multiple higher order uses for which it is uniquely qualified.

Summary

- An energy strategy should include an understanding of the physical, economic and social dimensions of energy systems.
- Energy solutions that mitigate harms and enhance benefits lie at the core of a green economy.
- Manitoba Hydro has a central role to play in combination with other green economy players.

- Manitoba's hydropower is one of our most important natural and economic assets, energizing our economy with high quality power and mitigating GHG emissions at home and abroad.
- Manitoba's hydropower falls short of its potential if it is squandered or fails to integrate other complementary renewable energy sources which can multiply clean energy production and reduce drought risk.

2. Making the most of Manitoba's hydropower

It is important to ensure that our Hydro asset and its premium product, hydroelectric power, are properly valued as a high-grade energy source, that the benefits of power are optimized—not squandered, that Manitoba Hydro and its assets and future development are protected from major risks, that Hydro's enabling potential for other renewable energy sources is effectively realized, and that costs and benefits are distributed justly and to maximum advantage to Manitoba and beyond.

In the course of a decade of interventions before the Public Utilities Board on Manitoba Hydro rates, policies and programming, Green Action Centre has developed a number of recommendations to meet the above objectives. We summarize these in the following paragraphs.¹

Guiding Principles

In addition to other economic and social considerations, Green Action Centre has been guided in its interventions by principles of sustainability and justice.

Sustainability

Manitoba is fortunate to have a Sustainable Development Act, which sets out principles and guidelines for sustainable development. Among them are the following: (1) Integration of environmental and economic decisions; (2) Stewardship - managing for the equal benefit of present and future generations; (3) Global responsibility - think globally when acting locally, recognizing many kinds of interdependence while developing comprehensive and equitable solutions to problems; (4) Efficient use of resources - which means (a) encouraging and facilitating development and application of systems for proper resource pricing, demand management and resource allocation together with incentives to encourage efficient use of resources; and (b) employing full-cost accounting to provide better information for decisionmakers.

¹ A recent statement of our positions can be found at <http://greenactioncentre.ca/2011/green-and-fair-energy-rates-for-manitoba-hydro>.

Fairness and Justice

Justice is not a singular concept but rather balances a number of principles including (1) the just distribution of benefits and costs across different people and groups, as when hydro customers are asked to pay their fair share of the costs of the utility to serve them, (2) intergenerational equity (the Stewardship principle above), and (3) social justice, i.e. meeting basic human needs and providing equality of opportunity and respect.

The concept of sustainable development (meeting the needs of the present without compromising the ability of future generations to meet their own needs) reflects both intergenerational equity and the societal purpose to meet basic human needs.

These concepts are illustrated by asking what is the fairest distribution of Manitoba Hydro's export profits. Currently the remainder of profits after deductions is used to subsidize domestic energy consumption, so that the largest users get the greatest subsidy (or, more colloquially, the biggest piggy gets the most slop). But the largest users are precisely those who cost Manitoba Hydro the most by reducing the power available for higher value export sales and by hastening the day when more expensive new power from new dams or other sources is required. We have to ask, is it fair that the benefits of export profits should be given unequally to those who consume the most electricity and also thereby cost Manitoba Hydro, and thus all customers, the most? Is there more social equity in subsidizing the plasma TVs, hot tubs and giant homes of high energy consumers by giving them a greater subsidy from exports or is it more equitable to allocate these earnings to low-income customers with a high energy burden (especially those locked into electric heat) and to reducing the basic charge and first block rates of all residential customers equally? Green Action Centre thinks it is obvious, given a robust concept of equity including social justice and a fair distribution of benefits, that the latter allocations are more equitable than the former. They also provide better Power Smart incentives by creating a faster payback on efficiency or alternative energy investments for high consumers who want to reduce their high consumption.

Efficiency and Synergy

The Manitoba Hydro Act mandates “economy and efficiency in the development, generation, transmission, distribution, supply and end-use of power.” On one reading, this is simply the least-cost provision of the benefits of electric power. However the mandate becomes considerably more complicated when it is qualified by multiple technical requirements and alternatives, corporate goals, temporal perspectives, and societal and environmental values. With conjoint objectives at stake, optimal solutions will often be those that synergistically realize multiple objectives at once.

Power Smart programs are often described in these terms. A Power Smart investment lowers the cost of power to consumers, increases power available for export sales (thereby increasing the flow of dollars into Manitoba), and reduces environmental impacts of the electrical system through GHG mitigation from displaced coal generation in export markets and forestalling impacts of new generation and transmission. But the potential synergies don't stop there. By adding Power Smart rates and an affordable energy program for low-income customers

(described below) to complement Power Smart DSM initiatives, Manitoba Hydro can better fulfill its mandate and multiply its social and environmental benefits.

Aggressive Power Smart Efficiency and Conservation Measures

Green Action Centre acknowledges that Manitoba Hydro has done some fine work on DSM in the past, although it has been undercut by historic rates. We are concerned, however, by a precipitous decline in the forecast savings in the immediate future, as shown in the following graph (Figure 1) produced from MH data by Green Action Centre consultant Paul Chernick in the 2010-2012 GRA. Mr. Chernick further compared Manitoba Hydro to other leading programs in North America (Table 1). He noted that most jurisdictions have targeted savings in excess of 1%. Several jurisdictions have targets over 2%. Mr. Chernick noted that Manitoba Hydro's forecasts begin at 0.6% and then decline to 0.2%.

Figure 1: Manitoba Hydro's Planned DSM Savings

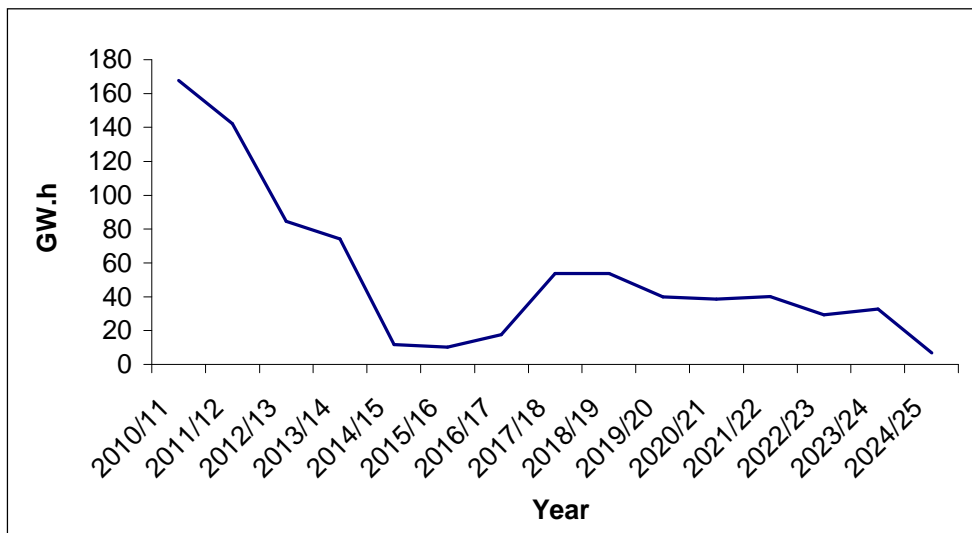


Table 1: Comparison of DSM Target Savings Ratios

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AZ		1.03%	1.02%	1.20%	1.58%	1.56%	1.54%	1.51%	1.49%	1.47%	1.45%	1.43%
CA	1.31%	1.26%	1.27%	1.28%	1.41%	0.92%	0.88%	0.90%	0.90%	0.91%	0.90%	0.89%
CO	0.53%	0.76%	0.80%	0.85%	0.90%	0.95%	1.00%	1.05%	1.10%	1.15%	1.20%	1.20%
CT	1.0%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
DE	0.5%	0.8%	1.3%	2.5%	3.0%	3.0%	4.0%					
HI	0.6%	0.6%	0.8%	0.8%	1.0%	1.0%	1.3%	1.3%	1.5%	1.5%	1.8%	1.8%
IL	0.4%	0.6%	0.8%	1.0%	1.4%	1.8%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
IN		0.3%	0.5%	0.7%	0.9%	1.1%	1.3%	1.5%	1.7%	1.9%	2.0%	2.0%
IA	1.0%	1.2%	1.3%	1.4%	1.4%							
MD	1.0%	1.2%	1.7%	2.2%	2.7%	2.6%	3.1%					
MA	1.0%	1.5%	2.0%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
MI	0.3%	0.5%	0.8%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
MN		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
NM		0.9%	0.9%	0.8%	0.8%	0.8%	0.6%	0.6%	0.6%	0.6%	0.8%	0.8%
NY	2.1%	2.1%	2.2%	2.2%	2.2%	2.2%	2.3%					
OH	0.3%	0.5%	0.7%	0.8%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%	2.0%	2.0%
PA			1.0%	1.0%	1.0%							
RI	1.2%	1.2%	1.1%									
TX	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
VT	2.6%	2.6%	2.6%									
WA	0.7%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
MB	0.6%	0.7%	0.6%	0.3%	0.3%	0.0%	0.0%	0.1%	0.2%	0.2%	0.1%	0.1%

Targets have not been set for the years in grey.

Sources: "Advancing Energy Efficiency in Arkansas," M. Neubauer, et al., American Council for an Energy-Efficient Economy, June 2010, Table 14; Manitoba savings from Appendix 9.1, Appendix A.3; Manitoba sales from Appendix 7.1, Table 1.

Green Action Centre commends the province for the creation of several tools in Bill 24 *The Energy Savings Act* that could improve future DSM performance and produce additional social benefits. How well these mechanisms work will depend on how they are exercised. Green Action Centre recommends the convening of a working group of knowledgeable stakeholders and provincial and Hydro officials to advise the Minister on how to achieve best results from the mechanisms introduced by Bill 24.

Power Smart Rates - Sustainable and Affordable Electricity Pricing

Guideline 1 of Manitoba's *Sustainable Development Act*, *Efficient Use of Resources*, calls for "encouraging and facilitating development and application of systems for proper resource pricing, demand management and resource allocation together with incentives to encourage efficient use of resources."

Yet Manitoba Hydro's current rates are at odds with its Power Smart DSM program. On the one hand the virtues of conservation are preached and various incentives offered to persuade customers to implement efficiency measures. On the other hand, because of the volumetric price

subsidies mentioned earlier, Manitoba Hydro continues to offer an increased share of export earnings as a subsidy to customers who increase their consumption.

Electric rates that fail to provide appropriate price signals to conserve energy undermine the performance of Power Smart DSM programs by offering contrary incentives. If incremental use of electricity is underpriced, the true costs of consumption growth imposed on other users, the utility, the province and the global environment are hidden and conservation and self-generation options become less cost effective and suffer a longer pay-back period. It is important to bring incentives contained in rates into accord with the conservation objective of Power Smart programs (and Manitoba Hydro's legislated mandate). A guiding principle of rate design that promotes conservation and reflects the costs of incremental usage is that most customers should face the marginal cost of consumption on their bills (including external environmental costs, we add). We call rates that are so structured Power Smart rates.

This discrepancy has been well-documented before the Public Utilities Board. In a 2005-2006 Cost of Service hearing for Manitoba Hydro, MH cited research indicating that "Short run elasticities based on more current studies show a range of -0.20 to -0.44 for Residential; -0.12 to -0.38 for Commercial and -0.39 to -0.69 for Industrial. Long run elasticities based on more current studies range from -0.35 to -2.23 for Residential; - 0.29 to -1.65 for Commercial and - 0.76 to -2.87 for Industrial."

Energy consultant Jim Lazar drew the implications of the price elasticity of consumption by showing hypothetically what the conservation and revenue implications might be if Manitoba Hydro's rates were to reflect 100% of the marginal costs plus a \$20/tonne opportunity cost for displacing CO₂ in the export market, assuming a conservative -0.25 arc elasticity.² Mr. Lazar calculated that, under these hypothetical conditions, and assuming the then-average export price of 5.5 cents/kW.h, Manitobans would reduce their consumption by a third (which is in the order of magnitude of Conawapa's prospective output) and the province would earn an additional \$388 million annually from export sales. The PUB and MH, in reply, noted that the export interties did not have the capacity to deliver at peak hours all the additional power that would be freed up through conservation, so off-peak pricing would reduce the estimated export revenue (PUB Order 117/06, 62-63). But the example illustrates the opportunity costs to the province of low domestic rates, especially when marginal costs are not reflected in marginal prices through inclined rates. And the intertie constraint will be relieved under the planned new "package" of export contracts plus new transmission and generation.

Because of the importance of pricing to energy conservation and fair allocation of costs, numerous utilities, including sister hydroelectric utilities BC Hydro and Hydro Quebec, have inclined (or "inverted") rates for their residential customers, in which a second higher-cost tier better represents utility marginal costs. One of the best examples of a publicly-owned hydro utility that takes both its conservation and affordability mandates seriously is Seattle City Light. The tables below compare the SCL rate structure with Manitoba Hydro's.

² The example was hypothetical and not recommended for implementation by Mr. Lazar. A presentation of Mr. Lazar's calculations can be found at <http://greenactioncentre.ca/wp-content/uploads/2011/07/Creating-Social-Value-through-Full-Cost-Pricing-of-Electricity-1.pdf>.

Rates Effective January 1, 2012 (http://www.ci.seattle.wa.us/light/Accounts/Rates/ac5_rt2k24.htm)

Seattle City Light Rate Schedules – Effective January 1, 2012

Rate Class	All Months
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Residential: City [RSC]

First Block *	\$ 0.0476	kWh
End Block **	\$ 0.0987	kWh
Base Service Charge per Day	\$ 0.1192	X30 = \$3.576 per month

Residential Elderly/Disabled & Low-Income: City [REC/RLC]

First Block *	\$0 .0200	kWh
End Block **	\$ 0.0366	kWh
Base Service Charge per Day	\$ 0.0597	X30 = \$1.791 per month

*\$/kWh: first 10 kWh/day in Summer (April-September); first 16 kWh/day in Winter (October-March)
= first 300 kWh/month in Summer; first 480 kWh/month in Winter

**\$/kWh: all additional kWh/day

Compare current Manitoba Hydro residential rates (September 1, 2012)

First Block***	\$0.0694	kWh
Second Block***	\$0.0694	kWh
Basic Service Charge	1/30 = \$0.2283/ day	\$6.85 (\$13.70 over 200 amp)

***Note: MH now has a single energy rate and thus no separate blocks. Formerly MH set the first block size at 900 kWh/month with no difference between summer and winter.

We can see that, for standard residential customers, the basic service charge in Seattle is just over half of MH's per month, the first block is 2/3 of MH's flat rate and the second block is 40% higher than MH's flat rate. Thus electricity for modest consumers in Seattle is significantly cheaper than in Manitoba, while higher consumers in Seattle pay more, reflecting the marginal costs of the system. On top of that, low-income customers pay only 40% of what regular customers do. Thus modest consumers of electricity and low-income customers have far more affordable rates than do Manitobans. Green Action Centre believes that Seattle City Light shows the direction Manitoba Hydro needs to go to have truly sustainable and affordable electricity pricing. Aggressive Power Smart conservation measures should continue to complement rate reform, with a special focus on helping high-consuming and high-energy-burden customers reduce consumption and thus their bills. A further benefit from inclined rates contributing to Manitoba's green prosperity is that green businesses and green jobs will be stimulated when efficiency and renewable energy measures become more cost-effective in comparison to continuing high energy usage at fully priced tail-block rates.

One difference from Seattle is that Manitoba has electric heat customers who lack a ready alternative. On several occasions, Green Action Centre has proposed mitigating any disproportionate extra burden on these customers by adjusting the size of the lower cost first block in winter. Moreover a low-income tariff like Seattle City Light's would alleviate costs for low-income customers. Green Action Centre has proposed a more targeted and thus more cost-

effective low-income rate subsidy program than Seattle's. (See [http://greenactioncentre.ca/2011/busting-myths-on-affordable-and-sustainable-energy/.](http://greenactioncentre.ca/2011/busting-myths-on-affordable-and-sustainable-energy/))

For years, the PUB has been urging Manitoba Hydro to move towards inclined rates and for several years Hydro began to do so. In fact Manitoba Hydro's Corporate Strategic Plan commits the utility to "use rate design and targeted price signals to encourage energy efficiency." However, in the 2010-2012 GRA, Hydro hit a brick wall when they failed to introduce bill mitigation measures for electric heat customers along with their inclined rate proposal and the PUB ordered a reversion to a flat rate. What should have been a workshop exercise to develop an optimal rate scenario that considers conservation, affordability and fuel-switching issues together has been defeated in a cumbersome formal PUB process devoid of negotiated solutions derived from well-researched alternatives. There is something profoundly amiss in a Province that paints itself green when the crown utility and regulator cannot implement conservation pricing, which they have both deemed desirable for years!

Summary - Making the most of Manitoba's hydropower

- Green Action Centre has intervened in Manitoba Hydro PUB reviews for the past decade guided by principles of sustainability (as found in Manitoba's Sustainable Development Act) and robust concepts of fairness and justice, which should also guide the Province, the PUB and Manitoba Hydro.
- Current pricing of electricity, which gives the highest subsidy from export profits to the highest energy users, fails to satisfy either of these standards. The biggest piggy gets the most slop and alternative efficiency and renewable energy initiatives are undercut by subsidized tail-block energy rates.
- Successful rate reform, and other measures, will require more synergistic solutions, i.e. applying Hydro's mandate of efficiency to the realization of multiple objectives simultaneously to achieve the greatest overall benefits.
- Aggressive Power Smart efficiency and conservation measures are one area in which the value of creating multiple benefits synergistically has been recognized, yet even here, as of the last GRA, a sharp fall-off of effort and results was planned. Much more is needed to align Manitoba Hydro with the top North American utilities.
- Bill 24 *The Energy Savings Act* provides tools to address this deficiency and enhance the benefits of Power Smart. An effective advisory group could help insure the tools are well-used.
- Manitoba Hydro's current rates are at odds with its Power Smart DSM program and efficiency mandate because they perversely subsidize increasing energy use rather than distributing export benefits more equitably. A different rate structure could potentially be worth hundreds of millions of dollars to Manitoba as well as fairer to its citizen-customers.
- A Power Smart solution that combines affordability with conservation is found in the inclined or "inverted" rates of BC Hydro, Hydro Quebec and Seattle City Light, among

others. The latter has a special low-income rate as well, which prices electricity at around 40% of the rates for regular residential customers.

- Frustratingly, although both the PUB and Manitoba Hydro have acknowledged the virtues of Power Smart inclined rates for years, Manitoba Hydro has been unable to propose a rate tariff that the PUB would accept. Green Action Centre has repeatedly proposed solutions to this impasse to no avail.
- Green Action Centre has also proposed a problem-solving workshop approach to the development of a solution that addresses conservation, affordability and fuel-switching concerns together. Either the PUB or the Province should facilitate such an approach to break the logjam that has so far confined the parties to what they know to be suboptimal rate structures.

The preceding points cover terrain familiar to participants in Public Utilities Board hearings and students of energy policy, although possibly not to others, including provincial officials.

3. Energy Planning - Manitoba's First Energy Strategy

Green Action Centre welcomes a provincial commitment to engage in Manitoba's first energy strategy. Given the high importance of energy in any developed contemporary society, the centrality and value of Manitoba Hydro as a publicly-owned crown, and the increasingly urgent imperative to respond to climate change, such a planning process is indeed timely (or overdue). Moreover the planning needs to break through the hitherto closed loop of electric power planning that takes place between the provincial government and Manitoba Hydro and eschew the overly simplified stances taken in election campaigns.

We believe that Vermont hit the right note in introducing its backgrounder for public consultation for a comprehensive state energy plan concluded last year.

Energy planning is a complex matter; none of us can deny that. The technology is complex, the operational decisions are complex, the financing is complex, and the environmental effects are complex as well. Thus, energy policy and energy decision making, which try to pull together all of these elements, are inevitably complex as well.

Does this mean that we should throw up our hands and leave the decisions to technocrats and monopolists or, perhaps worse, abandon all efforts to plan and pursue a better energy future? Or can we work together, from all parts of Vermont, to seek reliable, affordable, and sustainable power?

This report presumes that Vermonters can do exactly this.

And so can Manitobans, if they are provided with appropriate background information, research and facilitation.

Green Action Centre proposes that, in planning our energy future, we build on Manitoba achievements and the best practices of others. Some guides are Manitoba Hydro's power resource planning process, Manitoba's Consultation on Sustainable Development Implementation (COSDI) recommendations, BC Hydro's Integrated Resource Planning process, Vermont's Comprehensive Energy Plan and Seattle City Light's citizen advisory committee.

Complex long-range planning that achieves its goals - Manitoba Hydro's *Power Resource Plan*

It is noteworthy that, although *TomorrowNow* is largely devoid of targets and timelines, a rather precise 43% increase in hydro-electricity generation (2,300 MW) is forecast over the next 15 years (i.e. in twice the planning horizon of *TomorrowNow*). Why does the province have this longer view in this one area? The answer lies in Manitoba Hydro's *Power Resource Plan*, whose 20 year horizon includes the completion of Wuskwatim, Keeyask and Conawapa with their planned capacities and schedules. Note that, although the Power Resource Plan crystallizes preferred alternatives for generation and transmission to 20 years out, the internal planning horizon extends much further in its consideration of other potential alternatives.

There are many ingredients to Manitoba Hydro's power resource planning, including economic forecasts for the corporation and the wider economy; domestic demand forecasts that aggregate the demand and trends for various types of end-users; the power needed to meet firm export contract obligations; the opportunities for new export contracts; the potential for curtailing demand through DSM measures; the alternative technologies, fuels and sources available for the supply of electricity; and how the various alternatives satisfy the planning criteria that Manitoba Hydro has chosen.

Remarkably, out of these many considerations reaching far into the future and involving many uncertainties and risks, decisions emerge to build new assets to meet future needs. Extensive resources are committed to the planning process before commitments are made and even greater resources to the building of new dams and transmission lines once decisions are made and subject to public review.

The lesson we draw from Manitoba Hydro's power resource planning process is that one way to insure the achievement of other clean energy objectives is to integrate them with the Hydro's planning process. For example, many jurisdictions with predominantly coal-burning utilities have developed renewable portfolio standards (RPFs) to wean off dependence on coal and develop capabilities for alternative renewable technologies and green jobs. Manitoba is blessed with being largely coal-free (except for our imported power), but there are other reasons for encouraging diversification to the system (e.g. rural economic development, drought risk reduction, multiplying Manitoba's clean energy potential, and developing capabilities for alternative technologies and green jobs). Hence it might make sense to introduce a renewable diversification portfolio standard (DPS) for Manitoba.

Conclusions and recommendations

1. Manitoba Hydro's power resource planning demonstrates the power and possibility of creating a future we want, not just through wishful thinking or pronouncements but through careful analysis of alternatives, anticipating contingencies, methodical research and analysis, and dedication of resources necessary to do the job.
2. Just as we should leverage Manitoba Hydro's firming capabilities to backstop other forms of renewable energy and thereby multiply Manitoba's clean energy potential, so should we leverage Hydro's planning capability to realize the other dimensions of a long-range energy strategy such as renewable energy diversification.
3. A missing element in Manitoba Hydro's planning process, illustrated by contrast with other jurisdictions, is a pre-NFAT consultative exploratory process when both the alternatives and criteria for evaluating alternatives are under consideration.

Adding public consultation to long-range energy planning

COSDI - Consultation on Sustainable Development Implementation

COSDI has influenced many planning processes in the province, including land-use planning on the East Side of Lake Winnipeg, watershed planning, municipal planning, and the new era of consultation and joint ownership with northern First Nations in planning new northern dams. But we are not there yet at the level of developing Manitoba Hydro's overall power resource plan. It is the provincial government and Manitoba Hydro alone who make the major resource development decisions without public input. Manitoba Hydro is then supposed to defend these decisions in a public review process before the Clean Environment Commission or other body in an NFAT proceeding.

It is true that Manitoba Hydro has initiated pre-NFAT meetings with several NGOs for the purpose of exchanging information. The purpose is to make NGOs better informed about Manitoba Hydro's planning process and Manitoba Hydro will have a better understanding of NGO concerns when they make their defense at the NFAT. However the NGOs were explicitly told that the process is in no way collaborative, i.e. that they were to have no influence on the planning process itself, e.g. by serving on a steering committee for relevant research projects, as occurred pre-Wuskwatim. So there has been a regression in consultative practice regarding alternatives from a decade ago.

In contrast, COSDI calls for "*effective/meaningful public participation and consultation processes at all levels of planning, significant resource allocation and effects assessment and review....*" and recommended that "*capacity-building mechanisms be developed to enable the meaningful public participation in sustainable development processes.*" In particular, COSDI called for "*early participation*" before significant resource allocations are decided on. Public

input is to be sought both for particular land use and resource decisions before they become irrevocable and "in establishing all public policies, legislation and strategies affecting air, land and water" [<http://www.gov.mb.ca/conservation/susresmb/cosdireport.html#10>].

First Nations have led the way, through the exercise of their constitutional rights, in having defined through court actions what is effective and meaningful consultation. COSDI says that's the way it should be for all of us.

BC Hydro's Integrated Resource Plan

Green Action Centre submits that if the public consultation principles of COSDI were followed, Manitoba Hydro's planning exercise would more closely resemble BC's Integrated Resource Plan development. BC's process developed two-stages of public engagement, first for ideas for input into their draft plan before it was written and later to review a draft Integrated Resource Plan before finalizing it. All the while, technical advisory groups also provided input [http://www.bchydro.com/energy_in_bc/irp.html.]

Vermont's Comprehensive Energy Plan

BC Hydro's IRP and Manitoba Hydro's PRP are both electric power plans for generation and transmission initiatives. Vermont's Comprehensive Energy Plan, on the other hand, covers all energy uses, in particular adding transportation, heat and industrial processes to the range of energy uses. [See <http://publicservice.vermont.gov/pub/state-plans-compenergy.html>.]

The plan was commissioned by Governor Shumlin when elected as a first-year priority and was completed in the course of 2011. Several noteworthy aspects of the plan are:

- It plans to move Vermont from 25% at present to 90% renewable energy by 2050
- Some of the objectives of the plan are
 - Fostering economic security and independence by creating local jobs in efficiency and renewables and cutting dependence on price-volatile and dirty fossil fuels.
 - Safeguarding their environmental legacy and leading by example
 - Drive in-state innovation and job creation
 - Increase community involvement and investment
- The plan recognizes four drivers of progress: Finance and Funding, Innovation and Expertise, Outreach and Education, and Regulatory Policies and Structures. Each must be addressed in all sectors.

Like BC Hydro's Integrated Resource Plan, Vermont's Comprehensive Energy Plan necessitated educating the public with background material, but also received much technical input from knowledgeable experts.

Seattle City Light's Review Panel

Tackling comprehensive long-range energy planning is a major undertaking. The creation of education and consultation engagements with the public are additional requirements, but necessary in a democracy and beneficial in identifying angles that might otherwise go unremarked and in creating public buy-in when it is evident that the final product is responsive to concerns raised, well-researched, and thoughtfully constructed.

Seattle City Light also provides for continuous citizen review of its policies and operations and participation in strategic planning through a Review Panel of knowledgeable volunteer citizens appointed by Seattle's Mayor and Council [<http://www.seattle.gov/citylightreviewpanel/>]. Said Councilmember Mike O'Brien, chair of the Energy & Technology Committee of the City Council, "The nine-member City Light Review Panel made up of individuals representing all of the utility's customer classes spent two years working with City Light to develop this plan and to talk with customers throughout City Light's service territory about what is in the plan. It's an excellent example of a thorough public process."

A look at the qualifications of the Review Panel's volunteer members shows that Seattle maintains a very cost-effective expert oversight of its electric utility, which has borne fruit in Seattle City Light's very progressive conservation, affordability and pricing policies. It provides a model for Manitoba to examine as we develop and implement a provincial energy strategy.

Conclusions and recommendations

Manitoba's COSDI recommendations on early public input on energy planning have not yet been fulfilled with respect to power resource planning in Manitoba, which still occurs in a closed loop between Manitoba Hydro and the provincial government. BC Hydro's Integrated Resource Plan, Vermont's Comprehensive Energy Plan and Seattle City Light's Review Panel provide three models of how this can be done.

4. Other remarks

The foregoing sections provide a framework for energy planning in Manitoba and observations about optimizing Manitoba Hydro's value and role. Most of the other sections of *TomorrowNow* can be handled within this framework, but we will make a few brief remarks on some of them.

New generation hydro strategy

Two questions about new hydro generation are whether it should be done and, if so, how should it be done?

The answer to the first question should be an output of power resource planning and an NFAT process that assesses power needs and evaluates alternative portfolios by multiple criteria, including costs, risks, and technical, environmental and social considerations. That evaluation

has yet to take place in a satisfactory manner and a previous PUB panel expressed skepticism about the projected costs, returns and rate impacts for Manitoba Hydro's preferred development scenario. Green Action Centre is concerned that new northern generation investments not displace investments in demand reduction, efficiency and alternative renewables. We are concerned that a steady 1.6%/year annual increase in power demand is ultimately unsustainable for a renewable, but finite hydropower resource.

On the other hand, if new northern generation can be justified, Green Action Centre reiterates the conclusion we drew at the Wuskwatim hearing.

Past hydroelectric projects, which benefited southern communities with energy, had disproportionate negative impacts on northern Aboriginal communities and ecosystems located near projects. A partnership that exercises greater care over local ecosystems and promises a share in the dividends is certainly an improvement over the past.

Of course we would welcome partnerships with First Nation communities for home efficiency retrofits, new construction and alternative renewable energy sources as well.

An improved electrical grid

Green Action Centre accepts the need for enhanced grid reliability. The evidence and testimony at the last Manitoba Hydro GRA indicated to us that enhanced interties and transmission into (and from) the U.S. are the most convincing benefit of the proposed package of new generation and export sales because of the great improvement in reliability it offers in case our northern transmission is compromised and because it permits more of Manitoba's surplus energy to be sold on-peak for better returns to Manitoba. We have not had the opportunity sufficiently to research other alternatives for generation and transmission to endorse any one. We are concerned that demand reduction, efficiency improvements and alternative renewable generation will get subordinated to and displaced by new dams.

Green Action Centre believes the grid should be constructed to insure the capability for Manitoba Hydro to perform an enhanced role in support of renewable alternatives, geothermal, district heating, demand management, electrification of transportation, and various smart grid attributes that permit the more efficient, reliable, and cost-effective use of power.

Stronger Power Smart Program

Green Action Centre is a long-time supporter of and advocate for Power Smart improvements for the reasons outlined earlier and in *TomorrowNow*. We also believe that Bill 24 has provided tools for strengthening the Power Smart program, particularly if they are used in combination with Manitoba Hydro incentives and low-income support and extended from residential to commercial customers.

We believe that a more aggressive Power Smart program is possible (a) by operating in resource acquisition, not just customer service mode; (b) by enhanced standards for new construction that correspond to passive house, LEED, or R2000 standards and are zero-net-energy ready; (c) by improving the economic incentives through Power Smart rates; (d) by better targeting of high consumption and high energy burden customers; (e) by improved financing options such as are enabled by Bill 24; (f) by initiating contractor programs for large-scale DSM resource acquisition; and (g) by exploring new configurations of denser housing and district energy systems.

We believe that a semi-expert stakeholder advisory group (on the Seattle City Light model) with research support would be useful for proposing and evaluating demand reduction, efficiency enhancement, and alternative renewable energy programs and delivery channels.

More green heat through geothermal

On the face of it, geothermal has two attractions from an environmental standpoint: (a) it makes more efficient use of electricity for heating than direct electric resistance heat, allowing the saved power to be exported to the US where it will largely displace electricity generated by fossil fuels, thus reducing global GHG emissions, and (b) it displaces GHG emitting natural gas heat in Manitoba. However, since Manitoba power is interconnected to the midwestern U.S. where coal generation dominates, in fact, by Manitoba Hydro's calculations, the extra power consumed by geothermal pumps and supplemental resistance heat requires replacement from coal and gas generation in the US, which emit more GHGs than natural gas heating in Manitoba.³ Hence, with the current composition of generation in the total Midwest Independent System Operator (MISO) market in which Manitoba Hydro participates, geothermal replacing electric resistance heat has a favourable impact on global emissions but no impact on Manitoba's GHGs, whereas geothermal replacing natural gas heat from high efficiency furnaces actually increases global GHG emissions, although reducing those occurring in Manitoba. In addition, each of these switches has economic consequences for Manitoba Hydro, the customer, and the province.

It is clear, then, that geothermal and electric heat policies are far from straightforward in their environmental and economic costs and benefits, although geothermal is clearly superior to electric resistance in most circumstances. Moreover, policy solutions must take a longer range view to consider scenarios and possible trajectories towards a green future. This is an area in which a policy working group should be looking at the research and forecast scenarios to develop sound, robust policies for Manitoba, including those governing the future of natural gas in Manitoba. Climate change mitigation policies must quintessentially take both a local and a global perspective to achieve "glocal" solutions. That is why the issue of preventing "leakage" of GHG emissions from one jurisdiction to another used to be an important topic of climate change

³ See *Economic, Load, and Environmental Impacts of Fuel Switching in Manitoba* at http://www.hydro.mb.ca/regulatory_affairs/electric/gra_2012_2013/Appendix_26.pdf.

policy discussions. We believe that it is still important and needs a thorough investigation. Furthermore we believe that sound environmental policy should be based on the best available knowledge and include long-range and global perspectives. Avoiding "inconvenient truths" should not be an option.

In the meantime, we propose the following rules of thumb.

- Investments in demand management and energy efficiency are unequivocal in their positive GHG mitigative effects and should precede any energy technology and fuel sourcing.
- Other renewables than grid electricity, like solar thermal, solar electric and biomass, can have positive GHG mitigative effect.
- A geothermal deployment policy should ensure that installations to replace electric resistance heat are sufficient to compensate for the extra electric demand created by replacing natural gas heat. In that way, the net results of the province-wide policy need not yield a net increase in global emissions.

Electric vehicle leadership

Transportation is Manitoba's largest GHG emitting sector. Demand reduction, fuel-efficiency and GHG efficiency through natural gas engines, such as those used by Emterra's garbage and recycling trucks, are three ways to address this issue, but ultimately the electrification of transportation while cleaning up the GHGs to produce electricity are on the most compelling path to a cleaner transportation system. Transportation electrification also offers a promising economic opportunity, particularly for Manitoba's bus industry, and a very low-cost fuel for consumers.

Along with range anxiety, vehicle cost still remains a significant barrier to individual retail adoption. In addition to the measures mentioned in *TomorrowNow*, attention should be paid to permitting and promoting lower cost electric vehicle options, such as small commuter vehicles and electric bicycles and scooters.

Increased biofuel production and use

Please see the response to this topic in our Climate Change brief.

Green mining in Manitoba

Classic sustainable development theory contemplates the investment of a portion of income from non-renewable resources into innovation at a sufficient rate to enable a transition into renewable substitutes. Other considerations are to pace the exploitation of non-renewables so as to have a longer term economic base for communities dependent on this source and pollution prevention.