Risk and Ratepayers: Merchant Plants and Price Takers – Hydro's Preferred Development Plan

CAC Manitoba – Affordability, Transparency, Sustainability – Ethical Consumer Choices

Over the past sixty years, CAC Manitoba has been a voice for Manitoba consumers. In its activities, CAC Manitoba is guided by the eight consumer rights that are accepted by consumer organizations internationally. Among these rights are:

- **The right to satisfaction of basic needs** - To have access to basic, essential goods and services: adequate food, clothing, shelter, health care, education, public utilities, water and sanitation.
- **The right to choose** - To be able to select from a range of products and services, offered at competitive prices with an assurance of satisfactory quality.
- **The right to information** - To know enough about products and services BEFORE we buy, so we can make sound purchasing decisions.
- **The right to be heard** - To have consumer interests represented in the making and execution of government policy, and in the development of products and services.
- **The right to consumer education** - To acquire knowledge and skills needed to make informed, confident choices about goods and services, while being aware of basic consumer rights and responsibilities and how to act on them.
- **The right to a healthy environment** -To live and work in an environment that is non-threatening to the well-being of present and future generations, and to choose products and service that are less harmful to the environment.

For more than twenty years, CAC Manitoba has sought to represent the consumer interest in regulatory proceedings relating to Manitoba Hydro before the Public Utilities Board and the Clean Environment Commission. Given Hydro's retail monopoly, regulatory proceedings are the one forum where consumers can exercise their right to choose and to be heard.

How does CAC Manitoba perceive the consumer interest in this particular hearing? It is always in the interest of consumers to receive fair value for the money we spend, so Manitoba Hydro's business case for development, and the risk it presents to Manitobans, are issues of paramount importance. A key element of this is the ability to access sufficient information to determine the merits of that business case.

Affordability and accessibility, for all consumers, of essential services and programs is integral to consumers' interests, so the impact of Manitoba Hydro's development plans on electricity rates, and access to DSM programs that could help consumers control their costs, are central areas of concern. CAC Manitoba has a long standing interest in the affordability of electricity for all Manitobans including persons of modest means, persons on fixed incomes and all Manitobans who seek to live within their means while balancing many competing demands. The organization has been at the forefront in seeking to reduce barriers faced by low income Manitobans in accessing energy efficiency programming.

Ethical consumption and sustainable consumption have become important aspects of consumers' right to choice and to a safe and healthy environment, as consumers learn more about the impacts of their purchasing decisions on producers and communities involved in the production of products, and on the environment. The regulatory process has become the proxy for consumer choice when it comes to

electricity in Manitoba. The socio-economic and macro-environmental aspects of the hearing are integral areas of concern for CAC Manitoba.

The CAC MB concern with affordability extends to a variety of other consumer goods. CAC MB has been active in regulatory proceedings relating to payday loans and government cheque cashing. In collaboration with Winnipeg Harvest, it has been active in recent efforts to ensure that low income Manitobans have access to such basic necessities as phone service.

The Development of the position of CAC Manitoba in this proceeding

The ultimate position of CAC MB is developed by the CAC Manitoba Board after an extensive consultation process. As the Board will be aware, CAC Manitoba employs a number of basic mechanisms to develop its position in regulatory meetings. The first tool is the daily interaction that CAC Manitoba has with Manitoba consumers whether through its Information Centre or its consumer education programs targeted at new Canadians.

The second vehicle for input is the retention of an expert legal team and expert advisors. The CAC Manitoba executive director meets regularly with these advisors to obtain the benefit of their views. CAC Manitoba takes the insight from its advisory team and seeks input from Manitoba consumers through a series of focus groups. Over the past four years, CAC Manitoba has undertaken numerous focus groups addressing the human, economic, financial and environmental implications of Manitoba Hydro's capital programs. The focus groups are intended to be demographically representative of the many spectrums of consumer opinion. Over the last year, CAC Manitoba has run a number of separate focus groups which seek to represent the geographical diversity of this province with groups focused on both Southern and Northern consumers.

CAC Manitoba also benefits from the input of a stakeholder group. While participation can be fluid, perspectives represented include groups representing low income persons, seniors, environmental concerns and those concerned with the implications of Hydro development on Northern communities. Recent additions to the stakeholder groups have been persons from directly affected northern First Nation communities.

CAC Manitoba also has benefited from regular contact with organizations representing business interests including small business and rural landowners. For the purposes of recent Hydro proceedings, CAC Manitoba has met with representatives of the wind industry as well as with a number of former public officials.

Introduction – Dreams Have Consequences

It's fair to say we're advocating a position.[1]
(Mr. Scott Thomson, President and CEO, Manitoba Hydro)

I dream about Pathway 5.[2]
(Mr. Ed Wojczynski, Manitoba Hydro)

Perhaps the most striking aspect of the NFAT hearing has been the apparently inalterable attachment of Hydro representatives to their Preferred Development Plan which has been defined in the NFAT Terms of Reference to include "the Keeyask and Conawapa Generating Stations, their associated domestic AC transmission facilities and a new Canada-USA transmission interconnection."[3]

The past few months have not been easy for these who zealously advocate for the preferred plan. As observed by the Independent Expert Consultant's La Capra, having:

> *the value of the Preferred Development Plan move [from] the point of being beneficial in the excess of a billion dollars to being negative is clearly a substantial change in the outlook for that plan.*[4]

Notwithstanding the painful evidentiary blows that the Preferred Development Plan has suffered, the Corporation has demonstrated a robust inventiveness in developing justifications in its support.[5]

There can be no doubting the fervour of Hydro's commitment to a vision of Nelson River Hydro-Electric expansion which has been many years in the making. As part of a broader vision of northern Hydro-electric expansion, the Preferred Development Plan is clearly the culmination of many years of Hydro planning and many dreams of Hydro staff.

The analytic underpinnings of Hydro's Northern Vision have suffered many setbacks in recent years including a significant escalation in capital costs and a dramatic drop in revenues from the US export market. Notwithstanding the evident adverse effects upon ratepayers, Manitoba Hydro has maintained an undaunted commitment to expansion. The monopoly has committed to the Bipole III project despite material adverse cost developments. Manitoba Hydro has pre-spent roughly $1.6 Billion on Keeyask and Conawapa while the projects await regulatory approval.

Hydro's NFAT business case was filed in August 2013 and involved significant effort by Hydro staff. Despite Hydro's efforts, an extraordinary flaw lay at the heart of the business case - the failure to treat demand side management as an integral element of resource planning. When coupled with a palpable bias against other renewables and challenges in recognizing ongoing developments in the US marketplace, the resultant planning document was highly compromised.

Following the filing of the business case, all parties laboured toward a March 2014 hearing date

[1] Hydro (ST), p. 211. Mr. Thomson was asked whether Hydro's approach was presented in a disinterested way or it was
[2] Hydro (EW), p. 4239. Mr. Wojczynski went on to say "I hate to say, all the other ones too. You do not want to have my dreams."
[3] NFAT Terms of Reference.
[4] La Capra, NFAT Transcript, p. 5895 (emphasis added)
[5] The late breaking concept of embedded equity is one of the most recent and among the most puzzling.

recognizing that the regulatory process already was highly stressed by a requirement to provide a report to the Province of Manitoba by June 2014.

In the last of weeks of February and the early weeks of March 2014, the regulatory process was turned "on its ear" by adverse capital developments for Keeyask and Conawapa in the range of $800 million. These negative results were coupled with material changes in estimated energy efficiency savings and a significant revision in the domestic need date. It became clear that the driving justification for Manitoba Hydro's plan was an export opportunity rather than domestic need.

This in turn has necessitated a better understanding of the Preferred Development Plan as being more analogous to a merchant investment opportunity. Contrary to long standing Hydro claims, it would appear that the "deferral" or "no build" option is indeed a realistic alternative.

Over the past two or three months, all hearing participants have engaged in a "mad scramble" to make sense of a business case in disarray. In effect, the Manitoba Public Utilities Board has been forced to conduct an Integrated Resource Planning exercise "on the fly" as the Corporation tries to resurrect its case.

Over the course of the hearing, it has become readily apparent that the economics of the preferred plan are not robust, with the risks associated with the plan making it practically untenable in current circumstances.

With clear evidence that the economics associated with an investment in Conawapa following Keeyask are not currently viable, what remains to be determined are three central issues:

- Is the record sufficiently robust to make a judgement call on the merits of leading alternatives to the preferred plan?
- If so, is there a clearly preferable pathway taking into account existing economic projections, alleged ratepayer impacts as well as macro-environmental and socio-economic considerations?
- Given the demonstrated challenges in Hydro's planning practice, how can we best protect Manitoba Hydro ratepayers and the Province?

In assessing the merits of different alternatives, there remains a central issue of credibility. Given its self-designated role as an advocate for the preferred plan, is the advice of Manitoba Hydro credible?[6]

What is driving projected ratepayer impacts?

I think it is good for us, as a consumer, to know what is the basis of the rate increases, what is the plan or what is the rate they are going to impose. And I think what it really affects not only to the consumers, but also in the environment, I think.[7]

The ongoing dialogue of CAC MB with MB consumers has been driven by two recurring questions:

[6] CAC Manitoba also believes it is important to identify a related issues of credibility going to the NFAT process itself. Have challenges related to the hearing process compromised our collective ability to give good advice to the Province?
[7] J Salamisan, NFAT Transcript, p. 7655

- What is driving the potential rate increases under all plans? and,
- Why do Manitoba consumers have such poor alternatives?

To answer these questions, it is important to understand not only the Hydro Preferred Development Plan but its role within the larger corporate vision of Northern Hydro-electric expansion (the Northern Vision).

"Win/Win/Win" - New Generation as "Manitoba's Oil" and as Vehicle for Reconciliation

As CAC Manitoba understands the Northern Vision, a central element has been the development of new hydro-electric generation on the Burntwood and Nelson Rivers. Projects such as Wuskwatim and Keeyask would be built in advance of their domestic need date to take advantage of opportunities in the US export market. The much larger Conawapa project would come later. It was expected to be even more economically reliant upon expected export sales. In the specific context of the Preferred Development Plan, the business case and economic analysis are expressly reliant upon export sales. As explained by Hydro:

> *Hydro's projections assume that they are able to sell dependable power at long term export prices.*[8]

> *Manitoba Hydro fully expects that two (2) years and five (5) years and ten (10) years from now, that, assuming we have firm surplus available in the future, we'll find export sales and we'll be able to sell it. And the -- the price would be the market price then.*[9]

While new generation plans were premised on an economic business case, it was anticipated that the proposed new projects would bring significant social and economic benefits via partnership agreements with selected First Nations communities who had suffered adverse effects from historic hydroelectric developments. This coupled with the simulative effects of construction activity was anticipated to create a "Win/Win/Win" situation for Hydro ratepayers, First Nation partners and the Province.

To the knowledge of CAC Manitoba, no economic analysis of the impact of related rate increases upon the Province as a whole or northern and aboriginal communities was ever undertaken.[10] As explained by Elder Flora Beardy during the MKO presentation in Thompson, there are some concerns that the ratepayer impacts of the Preferred Development Plan were never explained to northern First Nations.

> *The proposed Manitoba Hydro rate increases will be a hardship, especially for those who are on fixed incomes such as senior citizens. I do not recall Manitoba Hydro talking with us about these rate increases.*[11]

Transmission Infrastructure as the Pathway to New Opportunities

Two major transmission projects were integral to the achievement of the Northern Vision. To enable the transmission of massive amounts of new energy from Keeyask and Conawapa to the American marketplace, a new transmission link was needed between Manitoba's north and south along with

[8] Hydro (EW), NFAT Transcript, p. 4120).
[9] Hydro (EW), NFAT Transcript, p. 2309.
[10] MPA (DC), NFAT Transcript, p. 7338-7340
[11] MKO, Presentation of Elder Flora Beardy, March 14, 2014

expanded tie line and transmission capacity between Southern Manitoba and the US.

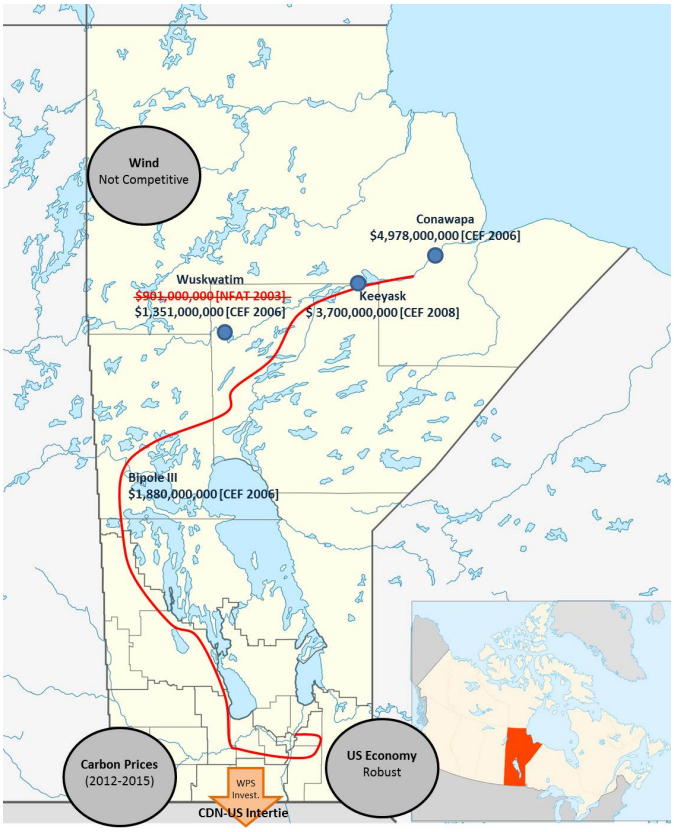
In addition to their role in facilitating US exports, Hydro takes the position that both transmission projects offer significant reliability benefits. Independent observers have suggested that:

> *The 2000 MW spare transmission capacity initially created by adding Bipole III will drop when Keeyask is added and virtually disappear once Conawapa is added.*[12]

What would be the cost of this Northern Vision? Map 1which follows provides a sense of what was known about its anticipated costs in the time frame between 2007 and 2009.[13]

Relatively low capital costs coupled with anticipated handsome returns in the US export market were central elements of the project economics. With robust economics, it was expected that the Northern Vision would be a "Win/Win/Win" for ratepayers, First Nations and the Province.

Hydro's Northern Vision – Capital Expenditures



[12] Whitfield Russell powerpoint slide 33. See also slides 32 and 48.
[13] Board Order 43/13, p. 30

A Bullish Outlook on the American Marketplace

Much of the Northern Vision was premised upon an optimistic outlook upon the US marketplace. In 2004, at the time of the Wuswkatim Need for and Alternatives proceeding, Hydro was expecting a US carbon policy would "very likely" be in place by 2015.[14]

By 2007, a Midwest Regional Greenhouse Gas Accord had been reached between six US states[15] and Manitoba with a commitment to pursue opportunities to reduce greenhouse gases through a regional cap and trade program and other complementary policy measures.[16]

During roughly this same time period, Manitoba Hydro signed term sheets with Wisconsin Public Service, Minnesota Power and NSP. By 2007, the outlook for national US carbon policy was even more optimistic than it had been in 2004.[17] As explained by Dr. Murphy:

> *At that time.it appeared that legislation would likely be passed within a year or two (2), [though] carbon prices might not actually be implemented quite so quickly.*[18]

The "Decade of Development" and the "Decade of Returns"

Hydro's confidence in its Northern Vision is best illustrated by the notorious "decade of returns" scenario which was the centre piece of its 2009/10 and 2010/11 rate applications. The scenario presented a 20 year financial outlook of the implications of pending major investments in Wuskwatim, Keeyask, Conawapa, and Bipole III.[19]

At the heart of the submission was a premise of above inflation rate increases until March of 2020 to be followed by a "decade of returns" with rate increases at roughly the rate of inflation for each of these years.[20] By the end of the decade, retained earnings were forecast to be in excess of $11 Billion dollars with a debt/equity ratio of 51/49.[21]

Risk and the Ratepayer - Merchant Plants[22] and Price Takers

> *Structuring the Preferred Development Plan to be exposed to export price risks and export volume risks is not a traditional or typical way of constructing the economic relationship of a ratepayer to a monopoly utility provider.*[23.]

> *Manitoba Hydro is fundamentally producing a different product. . . but getting prices that are essentially structured to compensate a gas fired developer for the kinds of risks that they take. Manitoba Hydro is simply taking those contracts because those are the contracts that are*

[14] Hydro (EW), NFAT Transcript, p. 2224
[15] Illinois, Iowa, Kansas, Michigan, Minnesota, and Wisconsin
[16] Hydro (BH), NFAT Transcript, p 2189 – 91.
[17] For details please see Hydro (DR), p. 3123-24.
[18] Brattle Group (DM), NFAT Transcript, p. 2248.
[19] Hydro, (DR), NFAT Transcript, p. 3121.
[20] Hydro (DR), NFAT Transcript, p. 3125.
[21] Hydro (DR), NFAT Transcript, p. 3127.
[22] For a discussion of the merchant plant concept, please see the Transcript p. 7375 – 7377.
[23] MPA (DC), NFAT Transcript, p.7392.

available.[24]

Central to an understanding of the risks and rate implications for ratepayers and the province of the Northern Vision and the Preferred Development Plan is recognition that:

> *Hydro is premising much of the success for its plan on sales into the US wholesale power market;*
>
> *Hydro is a price taker in a marketplace where the marginal unit price is set by sources of supply which have fundamentally different cost drivers and risks.*[25]

The importance of these concepts is best explained in a lengthy series of quotes by Mr. Pelino Colaiacova of Morrison Park (emphasis added):

> *And so… you're seeking to get a firm power contract in that kind of a market. The next available unit, other than the one being offered by Manitoba Hydro, would be either a coal or a gas or potentially a wind unit. And so the prices would actually be set by those alternatives, not by the costs that are borne in Manitoba to develop, construct, and operate its hydroelectric plants.*[26]
>
> *So… the prices for these so-called firm long-term contracts, which are ten (10) to fifteen (15) years typically, are not related in any way to the costs that Manitoba Hydro is bearing in producing its power.*[27]
>
> *If… we were talking about a developer of gas plants in the MISO market, that developer of gas plants would be competing fundamentally against other developers of gas plants, and one may be a slightly better manager than another. One may be a slightly more efficient construction developer than another, but they would fundamentally be competing with each other on the same terms.*[28]
>
> *Manitoba Hydro is not competing with them on the same terms. It has fundamentally different cost drivers and different risks. And it's simply accepting the kinds of contracts that would be applicable to a gas fired developer . . . and using those contracts to try and smooth out the volatility of its revenues over ten (10) or fifteen (15) years.*[29]

As Morrison Park explains, a mismatch exists between the duration of excess dependable energy and the duration of contracts in the MISO market.[30] Perhaps more importantly, the "tremendous amount" of

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[24] MPA (DC), NFAT Transcript, p.7380.

[25] Please see the comment at the Minnesota Department of Commerce with regard to the proposed sale by Manitoba Hydro to MP, E015/M-11-938

[26] MPA (DC), NFAT Transcript, p.73878/79. MPA also explains: "[T]he prices that are available for firm power contracts in the MISO market are set by the MISO market. They're… related to alternatives that are available in the MISO market which are not hydroelectric alternatives. The MISO market is principally powered by coal and natural gas and to a much lesser, but growing, extent wind… [I]in any market, the price is set by the marginal available unit.

[27] MPA (DC), NFAT Transcript, p. 7379.

[28] MPA (DC), NFAT Transcript, p. 7379/80.

[29] MPA (DC), NFAT Transcript, p. 7379/80.

[30] MPA (DC), NFAT Transcript, p. 7386.

> But the time horizon in which there's going to be excess dependable energy is quite long. And the contracts that are available on the MISO market are in ten (10) year increments, for example; in some cases, potentially a little

opportunity energy to be sold exposes ratepayers to substantial risks (emphasis added):

> *Moreover, in all cases, regardless of... the contracts for dependable energy, there's a tremendous amount of expected opportunity energy that's going to be sold. And the opportunity energy is largely going to go to export markets over which Manitoba Hydro has no control.*
>
> *So when you look at the total output of the facility, much of it is not destine[d] for ratepayers. Much of it is at prices which are today unknown. So fundamentally, since ratepayers are responsible for their residual costs of all of Manitoba Hydro's facilities, ratepayers are exposed to the risk on all of that portion of the expected output of the facility.*[31]

Recent Challenges to the Northern Vision

Manitoba ratepayers trying to understand the drivers of rate increases under all potential alternatives can look to four specific factors which are driving current and projected rate pressures. These factors include:

> export prices and revenues significantly lower than were forecast to be at the time of the Wuskwatim NFAT or the "decade of returns" GRA;
>
> significant adverse developments in the actual and projected capital costs of generation and transmission associated with the Northern Vision;
>
> projected increased pressure on the day to day costs of maintaining existing infrastructure; and,
>
> the commitment of over $3 Billion to build Bipole III and the pre-spending of roughly $1.6 billion to preserve Keeyask and Conawapa in service dates.

Decline in actual and forecast export prices

Declines in US export prices have contributed substantially to rate pressures experienced and forecast for Hydro ratepayers. In explaining the collapse of the "decade of returns" scenario, Mr. Rainkie explained that:

> *[T]here's lots of things that have happened in the forecast in the last four (4) years, the major one being a reduction in the assumption of export prices.*[32]

As noted in *Board Order 43/13*, spot export market prices declined from about 8 cents/kWh in 2008/09 to 3.5 cents/kWh in the spring of 2013.[33]

> bit longer, fifteen (15) years.
>
> But Manitoba Hydro is not going to be able to sell -- it's not going to be able to contract, at least at this point as of today, when they're, you know, suggesting that they would like permission to pursue the Preferred Development Plan, all of the excess dependable energy.

[31] MPA (DC), NFAT Transcript, p. 7386.

[32] Hydro (DR), NFAT Transcript, p. 3138.

[33] Board Order 43/13, p. 38. The Board cites lower load growth, increased natural gas generation, increased wind generation and increased imports as a number of the factors contributing to the dramatic decline in spot market prices.

In this proceeding, there has been considerable discussion of the effect of the shale gas "game changer" and its transformative effects upon the US marketplace.[34] As Mr. Cormie candidly conceded, "the world changed, like has happened with shale gas."[35]

The adverse effects of shale gas on the price that Hydro can take in the US marketplace have been exacerbated by the reality that expectations in terms of carbon pricing have not been realized. The Midwest Regional Greenhouse Gas Accord announced with such fanfare in 2007 is no longer pursuing a regional cap and trade policy.[36] As explained by Dr. Murphy (emphasis added):

> *There was… a relative broad expectation at that point in time that… some form of federal climate legislation would be passed in the relatively near term. And the leading…candidates for that were cap and trade proposals. As…events have transpired, of course, the…**global recession kind of knocked that train off the rails**.*[37]

To get some sense of the decline of export revenues, it is helpful to look at a comparison between IFF 2013 and the low export price scenario from the Wuskwatim NFAT for the current period.

Year	Wuskwatim Low Price Scenario (NFAT)	IFF 2013
12/13	$577 M	$353 M (A)
13/14	$575 M	$408 M
14/15	$577 M	$383 M
15/16	$588 M	$362 M

The contrast between IFF 2013 and the low price scenario from the Wuskwatim NFAT projections are a salutary illustration of the uncertainties associated with longer term forecasts reliant in part upon political events in Washington.

Capital Expenditure Overruns

Dramatic changes from forecast for Wuskwatim's capital expenditures further illustrate the forecasting risk associated with building complex projects premised on opportunities in other markets. As noted by the Public Utilities Board:

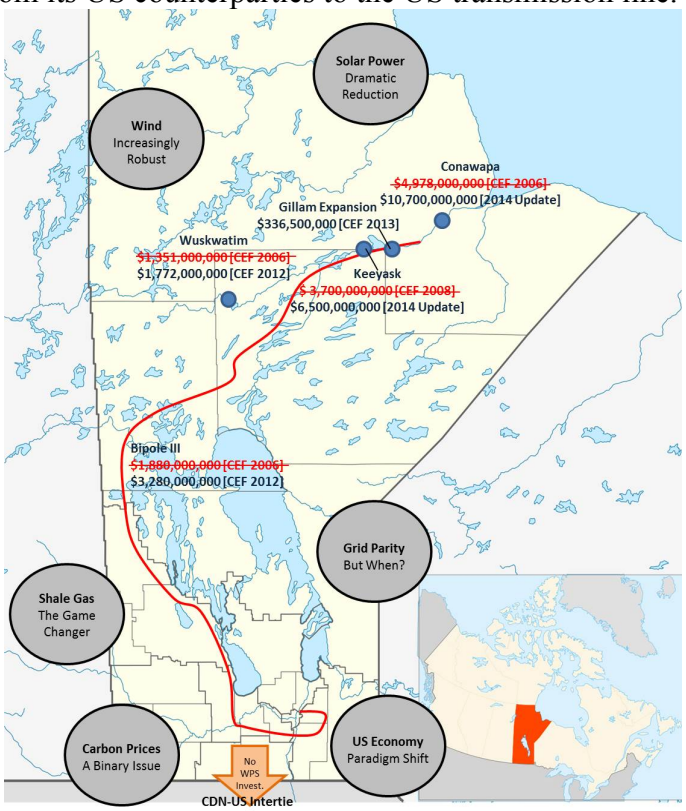
> *The projected cost of the project at the Clean Environment Commission hearing was $901 million for the generating station and transmission facilities. Since then, the capital cost estimate increased on an annual basis, almost doubling to $1.77 million.*[38]

A further indication of the unravelling of cost expectations for Wuskwatim can be found in Hydro's revelation that while it expected roughly 1100 person years to be associated with the project, the final

[34] Dr. Murphy describes it as a "game Changer" Brattle (DM), p. 2209 while Ms Flynn discusses the shale gas revolution and its transformative effects. Hydro (JF), p. 2209.
[35] NFAT Transcript, March 10, 2014, p. 1342
[36] Hydro (BH), NFAT Transcript, p. 2189 – 2191. It has yet to be formally suspended.
[37] Brattle (DM), NFAT Transcript, p. 2247. As late as the Connecticut IRP of 2010, Brattle was not examining zero CO2 pricing scenarios. Brattle (DM), p. 2256.
[38] *Board Order 43/13*, p, 25.

total was 3535.[39]

Wuskwatim is not the only project where adverse developments in projected capital expenditures are likely to put increased pressures on ratepayers. Map 2 documents the material changes in recent years in the forecast capital costs for Conawapa, Keeyask and Bipole III. It also should be noted that in addition to major capital cost overruns, Manitoba Hydro has experienced adverse developments in expected contributions from its US counterparties to the US transmission line.[40]



[39] Hydro (JKH), NFAT Transcript, p. 4149. The NFAT estimate excluded management and supervisory personnel while the final results included them. See also Hydro (JKH), p. 4151/52. So we predicated eleven hundred and nine (1,109) person years, and the project realized thirty-five hundred (3,500) person -- three (3) times the person years. So that's very significant in terms of the number of person years increased over what we had projected.

[40] While the original business case included an investment by WPS in the US transmission line that deal has fallen through. For the 500 kV line, it is now expected that Hydro will be responsible for 49% of the estimated capital cost of $507 Million with MP being responsible for the remaining 51%. In terms of revenue requirement, MP customers will pay 33%. The associated revenue requirement with the additional 18 percent investment of MP will be paid by Manitoba Hydro to MP. Hydro also will be responsible for 49% of the OM&A associated with its current ownership share. Hydro (Jacobsen), p. 2284. Hydro (DC), p. 2285 – 2287.

The Evisceration of the "Decade of Returns"

When the combined effect of projected declining export revenues is coupled with a surge in the costs associated with new generation and transmission and significant increases in day to day capital expenditures,[41] Manitoba ratepayers can begin to understand why the bright promise of the "decade of returns" is unlikely to be realized. The potential downside associated with merchant plant investments also becomes more readily apparent.

As Mr. Rainkie confirmed, projected rate increases for the 2020s are now roughly double what they were projected four (4) years ago.[42]

While the "decade of returns" had forecast 49% equity and $11 Billion dollars in retained earnings by 2029, the sobering results of IFF 2013 project equity of 13% and retained earnings that are roughly $7 billion dollars less (in other words, less than $4 billion).[43]

Focusing solely on the period between 2018 and 2022, there is an adverse swing of more than $1.6 Billion between the forecasts of January 2010 and February 2014.[44]

Why are there no good alternatives?

...[W]hen we're looking at the comparison between All Gas and the Preferred Plan, one (1) of the reasons that there's less of a distinction than we might expect is because in the analysis of All Gas you're . . .including . . . quite a bit of sunk costs?
MR. PELINO COLAIACOVO: That's correct.[45]

…

you note as well that All Gas is. . . bearing a heavy burden when it comes to the substantial amount of debt incurred as a result of system investments, including Bipole III. Would that be fair?
MR. PELINO COLAIACOVO: That's correct.[46]

Accepting for a moment Hydro's forecasts and assuming implementation of DSM Scenario 2, the projected even annual rate increases of Plans 1, 5, 6 and 14 for the period between 2015/16 and 2031/32 are set out in Table 2.[47]

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[41] For an illustration of the impact of day to day capital expenditures, please compare CEF 2006 and IFF2013. CEF-06 (pages 1-5) shows total electric capital spending for 2007-2016 (i.e next 10 years) of $8,744.1 thousand. If we subtract off the projected spending on New Generation and Transmission ($5,115.2 thousand) this leaves $3,628.9 thousand for other capital requirements IFF13 (pages 26-28) shows total electric capital spending for the 2014-2023 period of $20,066.8 thousand. Removing the major G&T spending ($14,769.6 thousand) leaves$5,297.2 thousand for other capital requirements. This is an increase of 46% for a period that has shifted by 7 years. In comparison – seven years of inflation at 2% would yield a 15% increase.

[42] Hydro (DR), NFAT Transcript, p. 3131. Please also see the discussion at pages 3129 and 3130.

[43] Hydro (DR), NFAT Transcript, p. 3133.

[44] Hydro (DR), NFAT Transcript, p. 3137/38. As confirmed in this discussion, the timing of Keeyask has shifted by about a year between the two forecasts.

[45] MPA (DC), NFAT Transcript, p. 7396.

[46] MPA (DC), NFAT Transcript, p. 7398.

[47] Hydro Exhibit, 104-12-2, p. 1.

Projected Even Annual Rate Increases 2015/16 through 20131/32[48]

Plan 1	Plan 5	Plan 6	Plan 14
3.36%	3.74%	3.75%	4.27%

As noted by a number of persons including Mr. Harper, Mr. Bowman, Mr. Rainkie and Mr. Colaiacovo, one of the reasons that there is less of a difference in the rate implications of the plans than one would expect is the fact that even if Hydro's preferred projects of Keeyask and Conawapa do not proceed, the close to $1.6 billion in costs already sunk into these projects will count against all competing plans. As Mr. Rainkie noted "Those costs can't stay indefinitely on our balance sheets forever."[49]

In addition, competing non-hydro plans also carry common capital costs intimately associated with Hydro's Northern Vision including the $3.28 Billion associated with the Bipole III project[50] and the $366.5 M associated with the Gillam Redevelopment and Expansion Program[51]. Given that one key rationale for the Gillam Expansion program is to support corporate initiatives to "develop" the hydroelectric potential of the lower Nelson River[52], it is questionable whether all the costs associated with the program should be treated as common capital for all plans.

Critical Elements of the Northern Vision carried against All Plans

Sunk Costs Keeyask and Conawapa	$1.58 Billion
Bipole III	$3.28 Billion
Gillam Expansion	$366.5 Million

The inclusion of Bipole III as a common capital cost is a clear benefit to the Keeyask plans and one might question the prudence of the Bipole III commitment in these difficult economic times. But as Mr. Colaiacovo noted, the rate impact reality for today's consumers is that Hydro has given the green light to Bipole III as well as to close to $1.6 Billion in expenditures related to Keeyask and Conawapa:

> *Again, it's positional thinking. We are where we are. . . . [T]he Bipole III decision was made, the investment is going ahead, therefore, when you do the numbers it appears that building Keeyask makes sense. Had we had this discussion three (3) years ago before the Bipole decision was made, maybe there would have been a different conclusion. But it's not three (3) years ago; it's -- it's today.*[53]

However, he offered a cautionary note with regard to further expenditures on Conawapa.

> *MR. BYRON WILLIAMS: And that doesn't mean Conawapa is good or bad, but we should understand mathematically that every additional dollar spent on Conawapa has . . . mathematical consequences for the alternatives?*

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[48] MH-104-12-6
[49] Hydro (DR), NFAT Transcript, p. 3154. Mr. Rainkie notes that Hydro's estimate of the sunk costs is in the range of $1.58 billion (p. 3154/3155)
[50] Hydro (DR), NFAT Transcript, p. 3158.
[51] Hydro (LC), NFAT Transcript, p. 3162.
[52] Hydro, NFAT Transcript, p. 3160.
[53] MPA (DC), NFAT Transcript, p. 7399.

MR. PELINO COLAIACOVO:Very much so.[54]

The purpose of this analysis is not to second guess the curious decision to proceed with Bipole III without holding a Need For and Alternatives proceeding. It is not to second guess the timing of the current NFAT proceeding. It is not to question the expenditures upon Keeyask and Conawapa prior to the receipt of regulatory approval. Instead, there are three ready conclusions that flow from the proceeding discussion:

> First, many of the rate pressures felt by today's consumers and likely to be felt by future consumers are intimately connected to Manitoba Hydro's Northern Vision;
>
> Second, it is legitimate to ask whether Hydro's current fidelity to its Preferred Development Plan is linked or biased by its historic commitment to its Northern Vision and by the very significant expenditures that have already been committed.
>
> Third, it is a cautionary tale about how ongoing expenditures related to Hydro's preferred plan may inadvertently poison the well for competing non Hydro alternatives.

Unparalleled Uncertainty

Recently, the future seems even more uncertain than usual.[55]

There is a significant danger in assuming that a view of the future from the perspective of today will be very accurate. All such assumptions should be approached with humility and treated with respect as the best available basis for decision making, but without claiming them to be more than what they are.[56]

Advocates for Hydro's Preferred Development Plan such as Mr. Thompson may argue there are grounds to believe that the worst transformative shocks are behind us. They may suggest that the preferred plan was robust enough to limp through the impacts of capital cost overruns and the shale gas shock. Indeed, it may be the case that over the long run the future of Hydro's Northern Vision is brighter than it appears today.

However, perhaps the most important message of this hearing is that Manitoba Hydro is proposing to build more than $17 Billion worth of infrastructure at a time of perhaps unprecedented uncertainty in the electrical energy industry.

This uncertainty extends both to issues as presumably pedestrian as the Hydro's management of its capital projects to profound questions relating to potential structural change in the industry akin to a "second electrical revolution."

As made clear by the evidence of Knight Piésold there would appear to remain significant systemic

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[54] MPA (DC), NFAT Transcript, p. 7400.
[55] Brattle Group, NFAT Appendix 3.1, Long-Term Price Forecast for Manitoba Hydro's Export Market in MISO, slide 10
[56] Morrison Park Advisors, *Commercial Evaluation of Manitoba Hydro Preferred Development Plan Business Case,* January 2014, p. 16; See also Mr. Rainkie. "You don't have a perfect lens on the future when you're doing projections." (Hydro (DR), NFAT Transcript, p. 3216.

uncertainties with regard to the capital cost estimates associated with Keeyask and Conawapa especially as related to construction project management.[57]

Moreover, it is strongly arguable that the next few decades are likely to be particularly tumultuous with the electrical industry in particular being on the cusp of profound structural change. As noted by Dr. Murphy:

> *And would it be fair to say, sir, that as enormous as the uncertainty seemed in 2008, as unprecedented as it seemed in 2008, the roller-coaster ride was just beginning? DR. DEAN MURPHY: Yes, I'd say that's a fair characterization in some ways.*[58]
>
> *Would it be fair to say, sir, that this is a -- a time of high uncertainty as well? DR. DEAN MURPHY: I think that's a fair characterization.*[59]

In suggesting that "[r]ecently, the future seems even more uncertain than usual[60]", Dr. Murphy identified four major uncertainties:

- uncertainty in terms of long-run environmental policies;
- uncertainty related to the evolution of low-carbon generation technologies including wind and solar power;
- uncertainty associated with the long run price effects of unconventional gas; and,
- uncertainty in the pace and the magnitude of coal plant retirements due to new EPA requirements[61]

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[57] See for example Knight Piésold at page 7834: For example, one (1) of the -- the ones that came to light more recently was for the overall construction project management, would that be . . done . . . in-house, or would that be done externally? To us, if they didn't have enough knowledge about whether it should be done internally before or after, **that's kind of a major flag that says, Well, maybe this whole process of how it would be carried forward is not clearly defined.** (emphasis added). See as well KP at p. 6786 – 6787**:** Boris Fichot: Systemic risks associated with a Manitoba Hydro maturing system, that's again, the fact that they've recently defined a process. That process is in draft form. They. . . haven't fully fleshed out how they're actually going to manage the construction, at least. . . to date. So we've seen that the process is in place. It's evolving a little bit because of the -. . . recent . . . engagement with the civil contractors. So since all that system for the management is not clearly elaborated, there's. . . risks associated with that. . .that it carries through and it has an impact on the cost. MR. MICHAEL ROBERTSON: **So I just add to that, that it's -- it's a new system that has not yet been tested.** (emphasis added) At page 6799: MS. MEGHAN MENZIES: Okay. And what would be the most important **systemic risk** now? MR. MICHAEL ROBERTSON: **Essentially, their new process. (emphasis added)**

Knight Piésold also discussed the P50 versus the P80 standard at p. 6796-98. MS. MARILYN KAPITANY: Sorry to interrupt, but your report does say that a higher contingency, based on the P80, would be recommended for the conservative estimate. So it sounds like you're making a recommendation. MR. MICHAEL ROBERTSON: Well, we are if . . .if you want to go with a conservative estimate. It[s]. . . Manitoba Hydro's choice, you know, and I guess ultimately the people of Manitoba, whether they would be more comfortable with a more conservative estimate. And if they . . . would like that, then we should be using something more like a P80, we believe. . . . MS. MEGHAN MENZIES: I guess what I'm hoping to . . . understand is, can you say . . . in as plain language as possible, why would a decision maker want a P80 as opposed to a P50, or the opposite? MR. MICHAEL ROBERTSON: Because he doesn't want to exceed his budget. MS. MEGHAN MENZIES: Okay. MR. MICHAEL ROBERTSON: **And he doesn't want egg on his face or what -- whatever.** (emphasis added)

[58] Brattle (DM), NFAT Transcript, p. 2207.

[59] Brattle (DM), NFAT Transcript, p. 2208.

[60] Brattle Group, NFAT Appendix 3.1, Long-Term Price Forecast for Manitoba Hydro's Export Market in MISO, slide 10

[61] See Brattle (DM), NFAT Transcript, p. 2211; Brattle Group, NFAT Appendix 3.1, Long-Term Price Forecast for Manitoba Hydro's Export Market in MISO, slide 10

Based upon the insight of experts such as Dr. Gotham, Mr. Todd and Mr. Colaiacovo, CAC MB believe the material risks to ratepayers are even more widespread than suggested by Dr. Murphy. They include:

- uncertainty associated with the very long forecast period;
- uncertainty associated with the paradigm shift in the Midwest US economy;
- uncertainty associated with US regulatory policy; and,
- uncertainty associated with dramatic developments in the marketplace.

Long Term Forecast Uncertainty

An inescapable uncertainty endemic to the planning of long lived Hydro projects is the length of planning horizon. Looking forward over 50 to 75 years, it becomes increasingly difficult to guess at what demand and supply options will be in play at that point in time.[62]

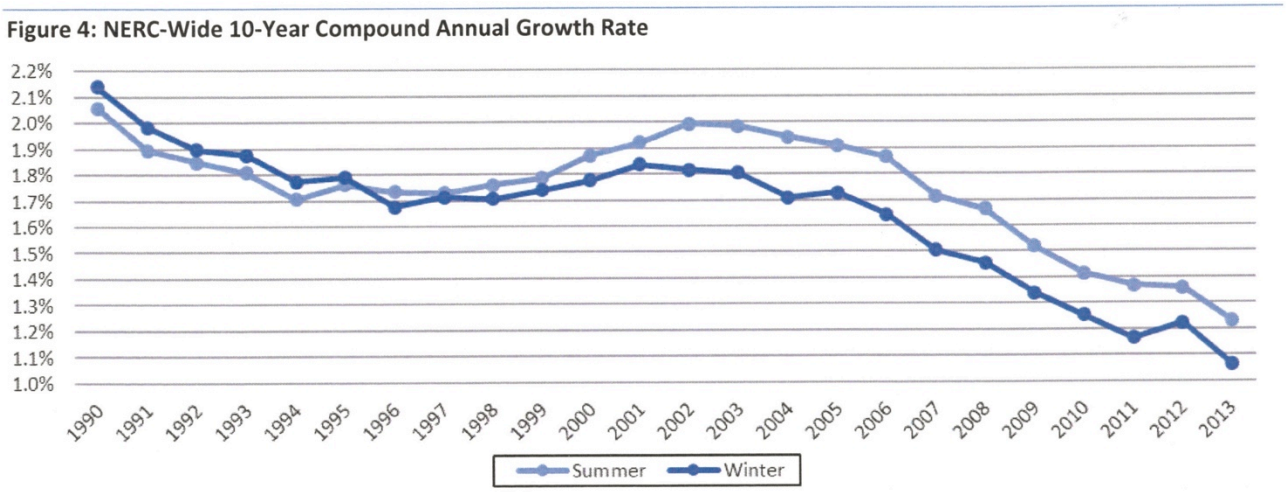
Paradigm Shift in Load Forecast

MR. RICHARD BEL: One (1) last question. Do I take it from your presentation -- or can I assume that in the MISO region as a whole, are we seeing a decrease in the rate that load is increasing?
DR. DOUGLAS GOTHAM: Yes, . . . that is true. That's happening all across the country, that we're. . . seeing the rate of -- of load growth going forward dropping over time.[63]

Of more immediate concern is the near and middle term pace of growth in the American marketplace and in particular in the US Midwest.

As demonstrated by the 2013 NERC Reliability Assessment (NERC wide), the 10 year compound annual growth for on-peak summer demand is expected to fall for the 11th consecutive year to an "all time low of 1.23 percent".[64]

[62] See MPA (DC), NFAT Transcript, p. 7373/74.
[63] Gotham, NFAT Transcript, p.8659.
[64] NERC, 2013 Long-term Reliability Assessment, (Dec 2013), p. 7.



Source: NERC 2013 Long-Term Reliability Assessment, December 2013, p. 7

Mr. Colaiacovo points out the particular concern of the US utilities industry with the risk of low or zero growth.

> *Any review of. . . literature coming out of the American utilities industry . . . will tell you that it's a top-of-mind issue. That, you know, the risk of a zero growth future in a number of jurisdictions is putting enormous pressure on businesses to adapt.*[65]
>
> *[I]n some parts of the United States, there is very little growth. . . . [L]ike in the underlying economy, there's very little growth, and then that's being exacerbated by the growth of distributed generation.*[66]
>
> *MR. PELINO COLAIACOVO: In the Midwest, they are facing some challenges, yes.*
> *MR. BYRON WILLIAMS: And that phenomena, as you've noted, is not restricted to Indiana, it's in a number of jurisdictions in the Midwest. Would that be fair?*
> *MR. PELINO COLAIACOVO: Yes.*[67]

In this proceeding, the panel has had the benefit of the particular expertise of Dr. Doug Gotham who is well recognized for his expertise in load forecasting and who has recently been commissioned by MISO to undertake forecasts for all 15 states within MISO. Dr. Gotham cautions that we are in the midst of paradigm shift in terms of the relationship between growth and electricity demand with significantly unresolved uncertainty (emphasis added).

> *Right now, we are coming out of a period of high energy prices followed by a very significant recession, and I think we're -- we're in the middle of that paradigm shift. So the next question is: Where is the new normal? And we're getting to the point where we're coming out of the recession. We may have some -- a -- a better idea than we would have two (2) years ago, but there's still significant uncertainty in terms of what the new normal is for load growth and that relationship between economic growth and load growth.*[68]

[65] MPA (DC), NFAT Transcript, p. 7326.
[66] MPA (DC), NFAT Transcript, p. 7327.
[67] MPA (DC), NFAT Transcript, p. 7327/28.
[68] Gotham, NFAT Transcript, p. 8429.

Carbon Prices and Regulatory Uncertainty

The issue of regulatory uncertainty related to carbon prices has been well flagged by a number of observers including Mr. Cormie, Dr. Murphy[69], MNP, Potomac and Dr. Gotham. As Mr. Cormie has suggested:

> *We don't know where prices are going to go, we don't know where carbon regulation is going to go.*[70]

MNP has estimated that there is a 50/50 chance there will not be carbon pricing within the forecast period.[71] Potomac also has suggested that there is significant uncertainty related to the introduction of carbon costs.[72]

Dr. Gotham based upon decades of research in the US marketplace has described the issue more succinctly (emphasis added):

> *Well, . . . I would say, from my perspective, the carbon pricing issue is -- is kind of a -- a 'yes' or 'no' question. And so there's almost a step there that you take. It's on or off. It will happen or it doesn't happen. And so there's that to be considered, that it's -- I'm showing my engineering background, but a binary decision: It's either on or it's off. And. . . there's . . . you know, a significant amount of difference between one (1) state and the other.*[73]

As Dr. Gotham notes:

> *The inclusion of CO2 costs in the export price forecast is inherently uncertain and poses a substantial risk. Even if CO2 restrictions are imposed, the level and timing of the costs are critical to the revenue needed by Manitoba Hydro.*[74]

The Risk of Structural Change

> *There's a school of thought which is becoming increasingly strong, I'm certainly a member of it, that says this transformation in the industry will happen. The only uncertainty is -is when* [75]

> *Take these four point together: cheaper solar power, cheaper energy storage, more internet-connected devices, and low voltage DC power-networks offering alternative ways to distribute your home-grown energy sources to devices in your home. Somehow, this is all starting to feel like very fundamental change across our sector.*[76] (Bruce Campbell, CEO Independent Electricity System Operator, Ontario) [emphasis added]

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[69] Dr. Murphy has noted that while he was not examining a zero CO2 scenario as part of Brattle's work with the 2010 Connecticut Integrated Resource Plan, a zero CO2 scenario is currently part of the Brattle analysis for Hydro. (Brattle (DM), p. 2256.

[70] Hydro (DC), NFAT Transcript, p. 2218

[71] MNP (CS), NFAT Transcript, p. 5300

[72] Potomac (RS), NFAT Transcript, p. 4460.

[73] Gotham, NFAT Transcript, p. 8562.

[74] Douglas Gotham, *Review of Manitoba Hydro Export Price Forecast for NFAT,* p. 9

[75] Elenchus (JT), NFAT Transcript, p. 4954. (emphasis added)

[76] Mr. Bruce Campbell, President and CEO of the Independent Electricity System Operator in Ontario), *Notes for Remarks: Ontario Energy Network* Luncheon, p. 11.

A central risk to ratepayers in this proceeding is the very real but inherently unpredictable possibility of a marketplace on the verge of dramatic change.

Whether it is the Brattle Group's talk of a "second revolution"[77] , Morrison Park's discussion of the fundamental and "unpredictable" effects of technology change[78] or Mr. Todd exploration of the potential "double whammy" of export market and domestic market grid parity[79], the issue of potential structural change has been a dominant theme in this proceeding.

As explained by Dr. Gotham in conversations with Board Member Grant, the inherently unpredictable risk in this proceeding is the implications for Manitoba Hydro of a grid parity scenario that causes a significant deterioration in demand:[80]

> *[T]he idea behind the grid parity is that electricity prices increase and the cost of customer-owned generation decreases, it becomes economically competitive. Any further increases in price to the customer will drive customers to generate . . . for themselves. You could see that happening, not only in your domestic load forecast, but you could see that happening in the export region. And it . . .essentially produces a cap on what the price in that region could be, because if the price goes above that, people will generate for themselves. So it's… another level of uncertainty when it comes to that...price forecast.*[81]

Implications of Uncertainty for the Manitoba Hydro Merchant Plant Investments

While the business case for Manitoba Hydro was originally advanced in part as matter of meeting domestic need, there is an emerging consensus in this proceeding that new generation is not required for domestic need for many years in the future.

This has been a consistent theme for leading international experts such as Mr. Philippe Dunsky and La Capra for a considerable period of time.[82] The evidence of Mr. Dunsky suggests that cost effective energy efficiency investments can put of new generation need well in the 2030s. CAC MB accepts Mr. Dunsky's evidence based upon its well documented rationale and Mr. Dunsky's leading expert status in the field of North American energy efficiency analysis.

The reality that cost effective energy efficiency could put off new generation for domestic purposes for a number of years was finally conceded by Manitoba Hydro in its February rebuttal evidence and in the early days of the oral proceeding.[83]

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[77] Peter Fox-Penner, principal and chairman emeritus of the Brattle Group, *Smart Power*, (20100.
[78] MPA (DC), NFAT Transcript, p. 7373.
[79] Elenchus (JT), p. 4928 through 4932. And it leads to one (1) of two (2) consequences. Either the suppliers take lower prices so they can maintain the load, or they sell less, which means they make less money. And if… they're selling less, but at the same costs, and it is a fixed cost industry, then if they're selling less and they seek to raise the rates, you can into the classic death spiral, which I didn't think existed until the recent TransCanada Pipeline hearings, where they're dealing with the -- the -- their pipeline across Canada that is facing issues related to what looks like a death spiral. (Elenchus (JT), p. 4931.
[80] See the discussion of Gotham and Grant at pages 8422 – 8424 as well as the prefiled evidence of Elenchus at page 41-42.
[81] Gotham, NFAT Transcript, p. 8449.
[82] CAC-87, slide 57 and 58; La Capra, NFAT Transcript, p. 5884; Mr. Chernick is another expert who has made this point.
[83] See for example, Hydro Exhibit 95, p. 4 or Hydro Exhibit 129, p. 7.

The recognition that the options of deferral or "a no new build" scenario are true alternatives deserving of rigorous consideration highlights the importance of the merchant plant observations of Morrison Park and Mr. Dunsky. It is one thing to make a massive investment in the face of uncertainty when the justification is the meeting of domestic need. It is quite another when the dominant justification for early investment is a merchant opportunity. Mr. Dunsky highlights some of the leading risks to the merchant plan business case:

> [I]f you're looking at this as… merchant investments, the value is heavily dependent on some really big risk factors. Notably -- I'll throw out three (3) of them that… for me are the biggest: How will natural gas prices evolve; I think it's a very significant wild card. How quickly will solar PV costs continue to decline will significantly impact export prices. And whether, and to what extent, the US will adopt more aggressive carbon reduction requirements is a big one as well.[84]

Sustainable and Robust Resource Planning in the Face of Uncertainty

So what is the role of modern resource planning in the face of modern uncertainty? A seminal article by the Brattle Group describes what it considers to be the importance of robust resource planning in the face of what it described as "enormous"[85] "unprecedented"[86] uncertainty.

Brattle begins by describing what it considers to be the limitations in the traditional analytic approach:

> *The IRP approach of minimizing the present value of revenue requirements in an assumed certain future (augmented with a few sensitivity analyses of what the that future might look like) does not sufficiently address either the uncertainties or the multi-attribute nature of the problem.*[87]

Brattle describes four key aspects of robust integrated resource planning with one of the most critical being:

> *Identify and characterize a wide scope of potential resource solutions including aggressive demand-side programs and renewable generation, in addition to conventional supply options.*

Brattle also speaks to the need to take future flexibility into consideration.[88]

Dr. Robert Gibson is one of the foremost experts on sustainable resource planning in Canada. With his colleague, Dr. Gaudreau, he offers perhaps the most comprehensive description of robust resource planning on the record of this proceeding. In his view, the key steps include:

- A careful definition and estimate of need using both backcasting and forecasting approaches and based upon a recognition that energy production is simply a means to an end;
- Alternatives analysis based upon robust integrated resource planning including:

[84] Dunsky, NFAT Transcript, p. 8083.
[85] The Brattle Group, *Reviving Integrated Resource Planning for Electric Utilities*, CAC 45-3, p. 41, third para.
[86] The Brattle Group, *Reviving Integrated Resource Planning for Electric Utilities*, CAC 45-3, p. 40, first para.
[87] The Brattle Group, *Reviving Integrated Resource Planning for Electric Utilities*, CAC 45-3, p. 41, 1st para.
[88] The Brattle Group, *Reviving Integrated Resource Planning for Electric Utilities*, CAC 45-3, p. 41,

- an understanding of all supply and demand options and power system configurations (and how they relate in a portfolio approach) to determine which package is likely to make the most significant positive contributions to progress towards sustainability while avoiding risks of serious adverse effects;
- the application of a portfolio approach that treats alternatives as part of a larger power system rather than simply on their own individual merits and limitations.
  - this allows for positive synergies;
  - it also ensures viable alternatives are not screened out prematurely.[89]

- Avoidance of undue **locking in** to one particular resource for an extended period of time but instead allowing for flexibility and allowing the various aspects of the portfolio to meet the needs.

It is notable that the Gibson/Gaudreau recommendation for a modern portfolio approach is consistent with the approach recommended by the CEC following the Wuskwatim NFAT:

> *Any future Manitoba Hydro "Need for and Alternatives To" filings for major hydroelectric projects be required to employ a portfolio approach for assessing resource options. The portfolios should include consideration of hydroelectric sequencing as well as coordinated implementation of other initiatives such as DSM programs and SSE projects.*[90]

Dr. Gaudreau notes a material risk to sustainability related to the possibility of overly optimistic forecasting leading to an overstatement of demand. He cites the conclusion of the World Bank that:

> *Overstating future demand has led to a perceived need for. . . a large incremental response to meet rapidly growing needs. In many circumstances, this is militated against a gradual approach of adopting smaller, non-structural options, and has pushed decision makers into adopting large-scale dam projects because they seem to be the only adequate response to the large gap between existing supply and forecast demand.*[91]

As Gibson and Gaudreau explained, premature lock in is of particular concern in the face of uncertainty. They suggest that lock in can be avoided by applying a portfolio approach which promotes a wide variety of options at the beginning and avoids selecting winners too early. The favoring of adaptive and flexibility technologies and plans can also assist in the avoidance of lock in.

> *One important theme worth touching on when considering alternatives is that of lock-in. There is tremendous uncertainty about the future, both regarding our energy systems and more broadly in society. Flexibility is required, and undesirable lock-in must be avoided. And there's several considerations regarding lock-in. It's important to allow for technological development in fertile areas.*

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[89] Gaudreau, NFAT Transcript, p. 9143-44.
[90] CEC, Report on Public Hearings, *Wuskwatim Generation and Transmission Projects*, September 2004 in CAC 45-1, Tab 1.
[91] Gaudreau, NFAT Transcript, p. 9142 citing the World Commission on Dams.

> Conservation and demand-side management, wind, and solar all appear to be areas that have bright options right now, and the future appears even more positive.[92]

Gibson and Gaudreau warn of the risk that large resource plans can lock out other options:

> Large resource projects, such as hydro dams, can lock out other options by diverting resources, altering planning horizons, and excluding options that may be able to deliver benefits more quickly.[93]

This is not Robust Integrated Resource Planning

Senator, I served with Jack Kennedy. I knew Jack Kennedy. Jack Kennedy was a friend of mine.
Senator, you're no Jack Kennedy.[94]

Just as it was an egregious political error to characterize Senator Quayle as a worthy successor to President Kennedy, it would be a misstatement of fact to suggest that the NFAT Resource Plan is consistent with modern resource planning. Hydro's analysis in support of its Preferred Development Plan is not consistent with good integrated resource planning

The central logic of the Brattle Group and of Drs. Gibson and Gaudreau revolves around a number of central integrated resource strategies including:

- the careful assessment of need to avoid the planning perils associated with a material overstatement of demand;
- consideration of a wide scope of potential resource solutions including aggressive demand-side programs and emerging renewable generation, in addition to conventional supply options;
- the application of an optimized portfolio approach that allows for positive synergies and ensures that viable alternatives are not screened out prematurely;
- avoidance of undue lock in by allowing for flexibility and allowing the various aspects of the portfolio to meet the needs.

The analysis underlying the Preferred Development Plan fails to successfully carry out the robust analysis demanded of modern resource planning.

Material overstatement of demand/Flawed Treatment of DSM

A critical flaw in the Hydro resource plan relates to a material overstatement of energy and capacity demand. It was the conclusion of Independent Expert Elenchus that:

> *Manitoba Hydro does not maintain sufficient documentation on the impact of past changes to its load forecasting processes to support an adequate assessment of the reasonableness of its forecasting methodology in the context of the NFAT.*[95]

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[92] Gaudreau, NFAT Transcript, p. 9145/46.
[93] Gaudreau, NFAT Transcript, p. 9145/46.
[94] Senator Bentsen to Senator Quayle, 1988 US vice-presidential debates (emphasis added).
[95] Elenchus, (JT), NFAT Transcript, p. 4972.

More fundamentally, as the evidence on independent experts such as La Capra, Bill Harper, Philippe Dunsky, Doug Gotham and Wayne Simpson made clear, a central oversight in the original Hydro filing was the adoption of what La Capra characterized as "very conservative" need date.[96]

While Dr. Gotham and Dr. Simpson correctly characterized the 2012 and 2013 Hydro Load forecast as both simplistic[97] and upwardly biased[98], the most critical error was in the treatment of DSM.[99]

As recommended by Brattle and Dr. Gibson and as confirmed by La Capra, it is common in robust integrated resource planning to see a number of DSM scenarios in combination with other resources to get an understanding of "what levels of DSM could provide the most value."[100] For example, this type of analysis was done in the 2010 Connecticut Integrated Resource Plan by Brattle.[101]

[96] La Capra, NFAT Transcript, p. 5844.

[97] Dr. Gotham at page 8380, notes that both end use analysis and econometric model should be used as an ongoing check on each approach. In both their written and oral evidence, Simpson and Gotham note that Hydro's forecasting methodology has significant limitations including the adoption of some approaches that are not acceptable under the MISO standard. They observe that Hydro relies on non-standard methods for some components and overly simplistic assumptions for others. See for example, their written evidence at page 6. For a discussion of the more simplistic approaches of Manitoba Hydro, see for example Elenchus (Mr. Todd), p. 4967 through 4969.

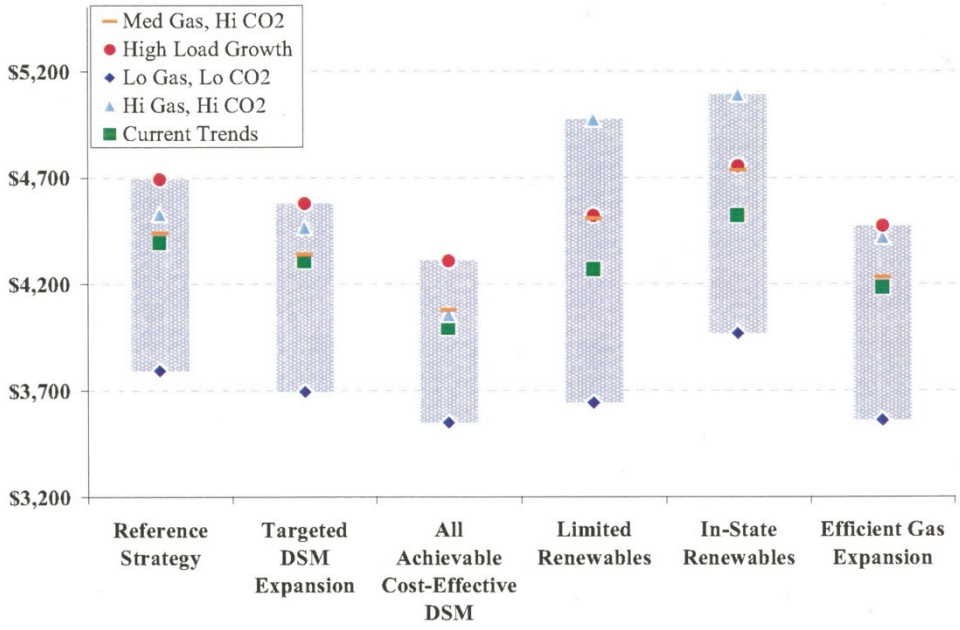
[98] For example see the comments of Dr. Simpson at p. 8384, 8396, 8398, 8400, 8404. In particular, see Dr. Simpson's suggestions that it could exaggerate the need for new electricity by a a number of years. See as well Dr. Gotham at p. 8410, 8413/8414. In particular, see Dr. Gotham at p. 8418: I think it's entirely appropriate to try to produce a forecast that has a 50 percent chance that growth will be higher and 50 percent that it'll be lower, but it is our opinion that they have failed to -- to produce such a forecast here, specifically with respect to the price elasticity. Please also see page 10 of the written evidence of Gotham/Simpson on Load Forecasting: The most disturbing omission from the Hydro forecasting methodology must be the impact of rising electricity prices because all the evidence implies that the bias introduced by this omission is upward; that is, the omission of price effects leads to inflated load forecasts and requirements for new system capacity." It is noteworthy that Hydro consultants EnerNoc (IR), p. 800 and Brattle (Hydro (LM), p. 880/881) use price elasticity in their load forecasting. See also the discussion of Hydro (LM) at p. 879/880/881 and Hydro Exhibit 87, p. 12. See also Elenchus (JT) p. 4964/65.

[99] It should be noted that both La Capra and Mr. Harper (p. 8470) identified shortcomings in Hydro's treatment of imports

[100] La Capra (DP), NFAT Transcript, p. 5872/73.

[101] CAC Exhibit 45-3, Tab 11, p. 58. See also CAC 45-1, p. 129 for an example of the robust DSM scenarios conducted by EnerNoc for its client Ameren Illinois. This type of portfolio analysis was not done for Manitoba Hydro. (EnerNoc (IR), p. 788. Similarly, EnerNoc was not asked by Manitoba Hydro to conduct an examination of demand response potential (EnerNoc, (IR), p. 792.

Figure 29
Connecticut Customers' Annual Power Supply-Related Costs in 2020 (2010 $Mill)



Source: The Brattle Group, *Integrated Resource Plan for Connecticut,* January 1, 2010, p. II-31

However, as pointed out both by Mr. Dunsky and La Capra and as conceded by Manitoba Hydro[102], MB Hydro did not develop assumptions and parameters for additional DSM in its original business case and did not incorporate additional DSM into any of the alternative DSM development plans.[103]

Mr. Harper identifies two adverse consequences flowing from this fundamental planning error. As he explained, the flawed treatment of DSM led to a material misstatement of the need date while the early construction of large scale resources was likely to "crowd out" other resources.

> *not only could increased levels of DSM postpone the need date for new generation resources, they can also create an opportunity for other options or . . . plans to be brought into consideration.*[104]
>
> *by increased levels of DSM and delaying the need date, it would increase Manitoba Hydro's flexibility to consider such alternatives in the future, whereas early construction of large-scale*

[102] See for example Hydro (JF) at p. 2325 and 2321.
[103] La Capra (DP), NFAT Transcript, p. 5884. As pointed out by La Capra, all the plans had the same level of DSM (p. 5877) and DSM Scenarios 1, 2 and 3 were not considered in the original business analysis. (p. 5878)
[104] Harper, NFAT Transcript, p. 8471/72. In his written evidence at page 11, Mr. Harper noted that the inclusion of alternative levels of DSM would have allowed for the consideration of Conawapa as the first hydro generation source.

resources could well crowd out… consideration of such options [wind and solar] as we move into the future.[105]

Mr. Harper pointed out that a later need date might also have allowed for consideration of Conawapa as the first Hydro option in the resource plan.

La Capra characterized the error by Hydro as significant:

MR. BYRON WILLIAMS:… In the initial business plan, would it be fair to describe . . . the failure to contemplate… alternative DSM scenarios as having a material impact, both on the need determination and the alternative analysis?
MR. DANIEL PEACO: Yes, I think. . . the -- the change in the year of need by implementing this level of DSM effectively moving it the better part of a decade is… a significant timing change. And given that some of the plans are moving relative to one another by $300 million when we're looking at plans with benefits of, you know, in . . . in the range of, you know, several hundred million dollars to a little over a billion dollars, . . . that's a fairly significant ratio of those overall benefit values. So it…[in]…some cases it changes the rank, depending on how you look at the DSM.[106]

While Manitoba Hydro has made frantic efforts to correct this flaw over the past three months, the significance of this error cannot be overstated. An important analytical issue that has not been examined in any detail is whether construction of Keeyask can be deferred to the latter part of the 2020s or beyond.[107]

As candidly acknowledged by Manitoba Hydro:

What this doesn't do . . . and I - I want to be careful. We didn't have something where we -- we could look at a higher DSM level and push things back five (5) years, and start analyzing those things. That was not analyzed in the . . . original submission context . . . .[108]

To this date, the PUB and hearing participants have not been presented with a Manitoba Hydro analysis which looks at moving the need for domestic capacity and dependable energy out to the 2028 to 2030 time frame or beyond. To the knowledge of CAC MB, there has been no analysis undertaken which addresses the economic and financial impacts of new hydro generation[109] or alternative resources such as a wind/solar portfolio[110] the 2028 to 2030 time frame or beyond.

Similarly, there is no analysis on the record of this proceeding in terms of how the Hydro plans including wind would look with an optimized DSM Scenario or how the La Capra wind plan would

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[105] Harper, NFAT Transcript, p. 8472 and 8473. As explained on page 8472, Harper's point was not that he was endorsing wind and solar but that he was concerned that they would be crowded out by the combination of a misstated early need date and the deployment of large scale resources. n his written evidence at page 11, Mr. Harper noted the possibility of solar (utility and customer scale) becoming increasingly cost competitive over time. See also Harper, p. 8469.
[106] La Capra (DP), NFAT Transcript, p. 5884.
[107] La Capra (DP), NFAT Transcript, p. 5879/80.
[108] Hydro (EW), NFAT Transcript, p. 2303.
[109] CAC Manitoba understands that La Capra pathway 3 contemplated but did not examine timing Keeyask being built for domestic need in that time period. La Capra (DP), NFAT Transcript, p. 5880.
[110] Harper, NFAT Transcript, p. 8472.

look with an optimized wind portfolio and DSM Scenario 2.[111]

Hydro's Resource Plan - Disadvantaged Competing Alternatives

As explained by La Capra, the alternatives considered by Manitoba Hydro were narrow and not fully optimized.[112] In particular, analysts such as La Capra have pointed to:

- the failure to optimize the All Gas portfolio[113];
- the failure to take into account current and prospective costs for wind; and,
- the premature screening out of solar.

Similar to other independent analysts such as Power Advisory, La Capra shared its perspective that the only cases presented with regard to wind "were conservative".[114] It noted that Hydro did not look at "any current or prospective expectations of cost for wind solar" with the result that those types of scenario "were not tested" in the NFAT submission.[115]

To illustrate the shortcomings in the Hydro analytic approach, La Capra demonstrated that a less "conservative" approach to the wind alternative could lead to an economically competitive wind plan. As explained by Mr. Peaco:

> *[W]e illustrated with a[n] alternative set of assumptions that we produced, that those assumptions were sufficient to take the wind case from being dead last in their list to something that was better than the Gas Plan, and… particularly with the change in… the cost in the… hydro plans economically competitive with the others. And so… what we felt is that by testing that… alternative set… of assumptions that we postulated showed enough improvement in the plan to make it in some sort of parity with the other plans that [were] being considered.*[116]

Like Mr. Harper and Mr. Dunsky, La Capra also pointed out the flaws in excluding from analysis a technology such as solar that "could undercut" the projected benefits from the Preferred Development Plan. In their view, this was particularly the case given the capital intensive nature of the preferred plan and the reality that its benefits, as compared to other plans, would not accrue until many years in the future.

> *But if you're -- if you're making a plan where the benefits largely accrue in forty (40), fifty (50), sixty (60) years from now, you'd have to say is there . . . something, you know, in the category of emerging technologies that could undercut that benefit package. And that's . . . the.*

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[111] La Capra (DP), NFAT Transcript, p. 5886. MR. BYRON WILLIAMS: And to your knowledge, on the record there is no . . . analysis of Level 2 DSM coupled with the wind plan? MR. DANIEL PEACO: Not to my knowledge, no. (LC 5886). Mr. Peaco went on to confirm that it was conceivable that the portfolios including wind may have been disadvantaged by the absence of DSM 2.

[112] This statement appeared in La Capra's original written report and was confirmed in cross examination at p. 5845 as well as p. 5858.

[113] Like the analysts for MIPUG, La Capra noted that Hydro's All Gas plan was not fully optimized, p. 5844-45

[114] La Capra (DP), NFAT Transcript, p. 5858.

[115] La Capra (DP), NFAT Transcript, p. 5858. La Capra's views would appear consistent with those of other independent witnesses on the record including Knight Piésold and Power Advisory.

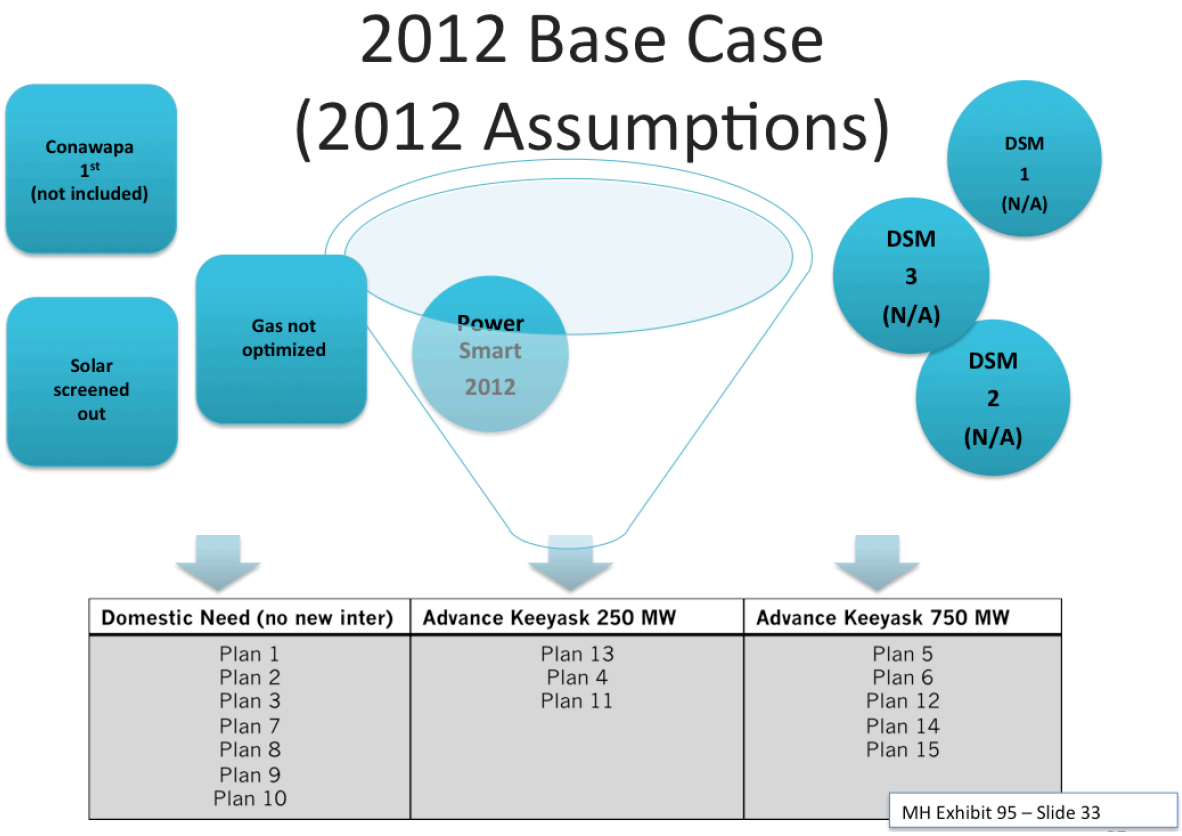
[116] La Capra (DP), NFAT Transcript, p. 5892.

. . concept that we're driving at here.[117]

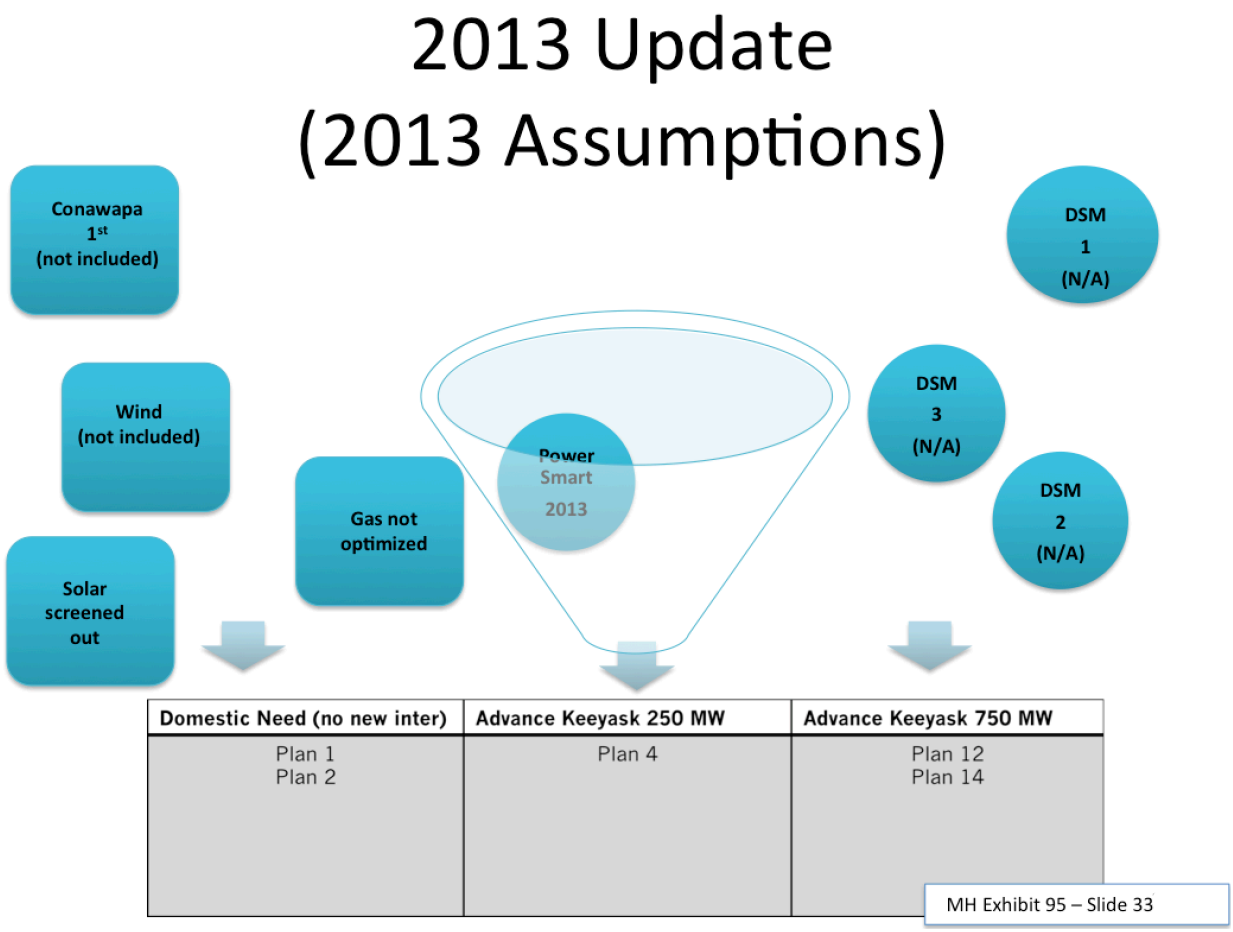
As noted by analysts such as Mr. Hendricks and confirmed in cross examination by CAC Manitoba,[118] only the Hydro dominated plans were optimized in terms of social and economic benefits for Northern and Aboriginal communities.

Some of the limitations in the Hydro Planning approach are given pictorial expression in the Funnel Charts which appear below. These limitations include:

- Hydro's failure to optimize the All Gas plan, which has denied the PUB the opportunity to robustly test a plan that is already highly economic as compared to the Preferred Development Plan while having relatively smaller rate implications over the next decade to 15 years.
- Hydro's screening out of solar and its excessively conservative treatment of wind costs, which have led to falsely truncated analysis of renewable options that are potentially both cost competitive and macro-environmentally competitive with the hydro dominated plans.[119]
- Hydro's failure to optimize the non-hydro plans in terms of socio-economic benefits for Northern and Aboriginal communities, which has further aggravated the disadvantage of competing plans.



[117] La Capra (DP), NFAT Transcript, p. 5889.
[118] See Schaffer, NFAT Transcript, p. 4206-4208
[119] See for example the discussion with La Capra at p. 5891.



While the CEO of Manitoba Hydro sees himself as an advocated for the Preferred Development Plan, Manitoba consumers deserve an analysis that robustly identifies and tests alternatives. Sadly, that analysis was not undertaken in the original NFAT case. The shortcomings of that flawed approach continue to haunt these proceedings.

The "Mad Scramble" - Resource Planning "on the Fly"

The most distressing aspect of the Hydro's flawed resource planning is the damage done to the credibility of the proceeding. The best description of resource planning in the NFAT proceeding is that was conducted "on the fly".

All participants have been forced to engage in a "mad scramble" to try to understand the implications of material changes in assumptions within the Preferred Plan, Hydro's selected alternatives and perhaps most importantly, alternatives that were not canvassed in either Hydro's original business case or the business case updates.

Over the past few months, hearing participants have been privy to a number of revelations including:

- the collapse in the relative economic value of the preferred plan under the weight of new

planning assumptions[120];

- the designation of the most economically attractive alternative Plan 4 as hypothetical and not viable[121];
- the demotion and exclusion of other leading plans such as plans 2, 6 and 12 from the updated Manitoba Hydro economic analysis of March 10, 2014 ;[122]
- the sudden adoption of a hybrid plan 5 as a leading alternative despite the fact that plan 5 was not analyzed in the 2013 business case update undertaken by Hydro[123];
- the initial exclusion of plan 5 from the updated MABCA analysis despite its inclusion as a leading contender in Hydro's economic analysis[124];
- the restriction of the initial updated financial analysis of Manitoba Hydro to plans 1, 5 and 14[125];
- the suggestion by Manitoba Hydro that it did not intend to produce updated financial evaluations for plans 2, 4 and 6[126];
- the necessity of the PUB directing updated analysis of a series of plans including plans 2, 4, 6 and 12; and,
- the exclusion of plans with wind components from updated DSM Scenario 2 analysis[127];
- a significant shift in the need date identified by Hydro[128] along with the suggestion that Hydro was not equipped to analyze a deferral option because that was not analyzed in the original submission[129].

One of the consequences of the "mad scramble" is that hearing participants were denied a complete analysis of leading experts such as La Capra and Morisson Park in terms of the economic and commercial implications of the updated planning assumptions. Indeed, it appears that additional material from La Capra, Morisson Park and MNP is being prepared for the hearing process. Unfortunately, intervenors will not be in a position to receive that material prior to the presentation of their final positions.[130]

While one would normally expect a credible hearing process to result in the elimination of many areas

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[120] La Capra, NFAT Transcript, p. 5895.

[121] Although the chronology remains confused, it appears the conclusion that plan 4 was hypothetical was reached in late February or early March 2014. See Hydro (DC), p. 2369 – 2372. See in particular, p. 2372 MR. DAVE CORMIE: Yes, when we – when I saw the updated economic analysis that's the point where we moved it from not just being risky, but now purely hypothetical. Please also see p. 2372 "I think having all the information in the public domain killed our ability to negotiate." Manitoba Hydro also indicated that the assessment of the additional import capability of the 250 MW line was done to late for the MISO Wind Synergy Study. (Hydro, (DJ), p. 2375.

[122] See the Funnel at CAC 45-4, p. 4. See also Hydro (Flynn), p. 2354/55.

[123] MR. PELINO COLAIACOVO: Yes, and the -- originally last August Manitoba Hydro provided financial data for seven (7) plans. Those were 1, 2, 4, 6, 12, 13, and 14. Now, they have provided update financial information for 1 and 14, but have focussed on 5 instead of 2, 4, or 6. (MPA),7351. See also Hydro (Flynn), p. 2354/55.

[124] Schafer, NFAT Transcript, p. 4229.

[125] See Hydro Exhibit 104-12-2

[126] Hydro (LC), NFAT Transcript, p. 3185. For parties wishing to evaluate the financial implications of Hydro's Preferred Plan against what they consider to be comparative alternatives, the Corporation does not intend to produce financial evaluations of 2, 4, and 6, correct? MS. LIZ CARRIERE: That's correct.

[127] La Capra, NFAT Transcript, p. 5886. See also Hydro (Flynn), p. 2324/25.

[128] MH-95, p. 4, Hydro Exhibit 129, p. 7.

[129] Hydro (EW), NFAT Transcript, p. 2303.

[130] CAC Manitoba reserves the right to file additional commentary on this material when it becomes available.

of uncertainty, it is striking that the closing evidence of Dr. Higgin saw fit to highlight what he identified as:

> Increased Uncertainties and [Incomplete Information at this time].[131]

As the Board is well aware, Dr. Higgin is an experienced public servant with two terms on the Ontario Energy Board and a leading role in the Ontario Resource Planning deliberations of the early 1990s. He is well aware of the need for regulators to make decisions in the face of uncertainty.

Yet, Dr. Higgin felt compelled to flag for the Board's attention what he considered to be "increased uncertainties" as well "incomplete information at this time". This is an extraordinary warning and a distressing testament to the existing state of the record.

What we don't know – Major Uncertainties

At the time that Dr. Higgin provided his advice to the panel, he was of the view that there were three potential options reasonably in play:

1. Proceed with Economic DSM; No Build till Domestic Need date;
2. Proceed with Economic DSM and MH Return with updated Information on Export Opportunities (and presumably the Regional CEA); and,
3. Proceed with Economic DSM and Keeyask and 750 MW intertie with Conditions.

There is sufficient evidence on the record to conclude that Hydro's Preferred Development Plan involves too much risk and is not economically viable as compared to other alternatives at this point in time.[132]

However, CAC Manitoba is concerned that there are significant existing information gaps that throw into question the credibility of a final analysis of alternatives to the Preferred Plan. From the perspective of CAC Manitoba, there are ten major gaps or uncertainties in the record that continue to impair its assessment of the merits of the alternatives:

- Is the 250MW intertie truly not viable?
- The highly uncertain[133] carbon pricing issue which is heavily dependent upon guesswork about the US political system[134] and which is facing resistance from many quarters[135];

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[131] CAC-76, slide 14.

[132] Please see the oral evidence of Mr. Harper on economics or the evidence of Dr. Simpson on risk. A summary of the economic issues presented in this hearing can be found in Appendix B to this written argument.

[133] La Capra has suggested there is significant uncertainty. (LC), p. 5854. MNP has described the prospects of a carbon tax as being a 50/50 probability (Potomac, p. 4389). Potomac has suggested there is significant uncertainty. (Potomac) (Dr. Sinclair), p.4459-4460. Dr. Gotham has described as a binary question to the effect that the more important and more uncertain question is yes or no not the magnitude of the pricing impact. He has suggested that: There is considerable uncertainty as to if, when, and to what degree some form of carbon restriction will be imposed on the Midwest. And if they don't materialize, export prices and revenues will be significantly reduced. Gotham, p. 8433.

[134] See Brattle (DM), p. 2250. in terms of predicting, it's highly dependent about guesswork, about the US political system, agreed? DR. DEAN MURPHY: Yes, and – and certainly the form that climate policy might take. Even -- even someone who has high confidence that climate policy of some form will be implemented will probably still have some uncertainty about what that form will be, how it will be manifest.

- The analysis of the implications of a no carbon scenario upon plans 5 and 6 given the significant adverse results of no carbon scenarios upon plan 14[136];
- The absence of expected values based upon 2013 planning assumptions taking into account the updated capital cost and economic DSM[137];
- The lack of transparency in terms of the Manitoba Hydro export revenue forecasts[138] leaving the generally lower assumptions of Potomac as the only transparent and publicly reliable source of export price information[139];
- The failure to analyze the macro-economic impacts of rate increases upon the Manitoba economy[140] especially in light of the growing gap between Plan 14 and other plans over

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[135] Brattle (DM), p. 2244. "There is resistance from many quarters to . . . certainly, federal legislation that would put a price on carbon." Dr. Gotham observes: I think that the likelihood of the Midwest region imposing their own carbon restrictions is very small. Much of the Midwest is -- relies on an industrial-based economy that needs competitive electricity prices in order to be economically competitive. If we lose those prices, … we're going to put ourselves in a -- a competitive disadvantage. (Gotham, p. 8436). Dr. Gotham goes on to note that: "Furthermore, the Obama administration is on the record as saying that they're not proposing a carbon tax." (Gotham, p. 8438)

[136] La Capra, p. 5854/55. To test the impact of a change in reference scenario pricing as a result of there being no cost for carbon emissions, La Capra undertook an exercise to determine the percent reduction in opportunity export prices and non-committed firm sales and adjusted its economic analysis. The results were significant, dropping the . . relative Preferred Development Plan benefits by about $340 million as compared to All Gas. Brattle (DM), p. 2238. Dr. Murphy notes about a $20 dollar per megawatt difference between the low and high carbon scenarios of Brattle in 2018. By 2034, the difference is about $30 per megawatt. To similar effect, Ms. Flynn looking at the financials for the 2030 year, notes a difference between the high and low price scenarios in terms of extra provincial revenues in that particular year of about $650 Million. (Hydro, JF), p. 2213/2214.

[137] It is generally accepted by experts such as Mr. Harper, Dr. Simpson and others that expected values which more fully reflect risk are a better indicator than reference values. As explained by Mr. Harper in his oral evidence as well as Appendix A to this submission, when we look at the 2012 results, there are material differences between the expected values and the reference values. Moreover, this difference varies across plans, In hearing that is already struggling with dated information, it would be inappropriate to rely upon the expected values based upon 2012 assumptions.

[138] As stated by Potomac, p, 4437 "One of the reasons we conducted our own detailed analysis was that there was a lack of transparency in. . . most of the forecasts, that we were not able to determine the underlying mechanisms which produced them." Please also see Potomac. p. 4443-4444. [W]ould it be fair to say that, in terms of energy prices and capacity prices, Potomac was unable to disentangle countervailing effects, and that caused you some concerns, in terms of the Brattle estimates? DR. ROBERT SINCLAIR: That's correct. See also Potomac, p. 4447 MR. BYRON WILLIAMS: Sir, going back to the -- our very early discussion of the Public Utilities Board's mandate to report on the reasonableness, thoroughness, and soundness of all critical inputs, including export expectations, would it be fair to say that -- that Potomac's efforts to . . report on these inputs were, in essence, frustrated by limited access to consultants' models, outputs, and assumptions? DR. ROBERT SINCLAIR: Yes, I think that's the . . . point we make, is that because we couldn't get to the bottom of some of the calculations,. . . we couldn't make definitive conclusions.

[139] Potomac (RS), p. 4481/82. Dr. Sinclair concluded at the aggregate level, Potomac's results were generally lower than the Hydro consultants. He suggested that Potomac relied upon lower natural gas prices, lower forecast demand and a lower pace of coal plant retirements.

[140] As noted by MPA (DC), The question about the macroeconomic impacts of rate increases don't actually believe were covered by anybody. (p. 7338) One (1) of the points that we do raise in the report, and. . . I mean, we raised it in the context that we thought it needed additional study at some point, is the . . . question of competitiveness. The government does care very much about the competitiveness of the province, . . . the attractiveness of the province to investment. I think the presentation that was here earlier today was very much on that point. From an industrial company that has facilities across North America, around the world, when they're making investment decisions, they care about current rates, but also the direction of future rates. And so to the extent that different plans have an impact on rates, then competitiveness is a legitimate concern. What we found in our own analysis was that there is relatively little impact --the choice of plan has relatively little impact on near term rates. Near term rates appear to be rising amongst all of the different plans. However, after a certain number of years, there's a divergence between the plans, and the. . . cost pressures that the plans are putting on the system. (MPA 7340) And so, it would be legitimate to consider the competitiveness aspect of the plans. rates go in a certain direction, what does that mean for the broader economy? (MPA 7340) So it's -- it's not a simple thing, but there is

the short and medium term[141] as well as some evidence on the record suggesting a positive economic effect from lower energy bills[142];

- The absence of an economic and financial analysis of new generation deferral scenario or a "no build" scenario[143];
- The absence of an updated analysis of an economic DSM/other renewable portfolio taking into account current planning assumptions[144];
- The outcome of the Regional Cumulative Effects Assessment recommended by the Clean Environment Commission in both its Bipole III recommendations and its Keeyask Report[145];
- Will the construction of Keeyask effectively "crowd out" the opportunity for other renewables including wind?
- Is the construction of Keeyask a true condition precedent to the Minnesota Power Sale?

What we do know?

Recognizing that other parties will be devoting substantial argument to the various conclusions they wish the panel to draw, CAC Manitoba will begin this section by highlighting its major conclusions. It will then provide additional detail on a number of sections. For further details about the information relied upon by CAC Manitoba, the PUB may wish to turn to:

Appendix A, Economic Evaluation Backgrounder.

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potentially some useful analysis that could be done there, and we just didn't see it anywhere on the record.

[141] See for example, 104-12-2; 104-12-6

[142] See for example, the response of Mr. Dunsky to Undertaking 120 in which the positive macroeconomic effects of lower energy bills on the province of Quebec were discussed. See also reports of the CIBC and Scotia Bank which were cited by Typlan Consultants and which can be found at CAC Exhibit 45-14. The CIBC notes that "No matter how you look at it, higher energy costs bite significantly into Canadian households' pockets. . . This can influence not only the speed and consumption of growth in personal consumption but also the health of Canada's retail sector. (CAC 45-14, p. 1. The Scotiabank Group suggests "High energy costs have dampened spending on other "less discretionary" purchases." "there is an ongoing urgency to reduce household energy consumption because of the discernible upward trend in the price of energy. . . .From the perspective of households, reducing energy consumption, or at least slowing its rise, could generate significant long-term cost savings. (CAC 45-1, p. 35/36.

[143] See La Capra (DP), NFAT Transcript, p. 5899 MR. BYRON WILLIAMS: How important would it be to look more deeply into the pathway where Keeyask is deferred out to 2028? MR. DANIEL PEACO: I guess that's more for the panel to judge than for me as to how important it is to them. But the . . .information -- you know, . . ., we did that analysis because we received interrogatory questions along those lines, and . . .we realized that, particularly with the introduction of DSM Plan 2, that that was something that was -- it's a logical question to ask: What. . .does that do with respect to the timing of Keeyask? And if . . . you're contemplating as -- one of Hydro's paths. . . Keeyask alone, then the question is what timing. See also MPA at p. 7347.

[144] See La Capra, NFAT Transcript, p. 5892.

[145] Clean Environment Commission, *Report on Public Hearing: Bipole III Transmission Project,* June 2013, p. 126; Report on Public Hearing: *Keeyask Generation Project*, April 2014, p. 160

Key Conclusions Related to Risk and the Economic and Financial Perspective

CAC Manitoba concludes that:

- Ratepayers are the primary risk bearers with regard to Hydro's merchant plant ventures[146];
- DSM is an essential, economic and reliable element of modern resource planning;
- The economic and risk analysis strongly suggest the preferred plan should be expressly rejected;
- There is some economic support for plans with Keeyask and interconnections but little support for the WPS sale; and,
- Over the foreseeable future, there is evidence to suggest that Manitoba ratepayer impacts will be minimized under Plan 1.

Key Conclusions Relating to Macro-Environmental and Socio - Economic Considerations

CAC Manitoba concludes that:

- From a sustainability perspective, DSM is likely to be the preferred choice[147];
- In terms of generation sources, there is a general preference for renewables followed by transition fuels[148];
- There is mixed evidence on the relative ranking of the renewables[149] with rapid cost improvements in wind and solar suggesting a need to revisit these technologies;
- There is ongoing uncertainty about the Regional Cumulative Effects of Hydro-Electric

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[146] As noted by MPA (DC), NFAT Transcript, p. 7392, In a traditional regulated rate environment where a utility is . . . spending money and providing power to its ratepayers and all of its costs are being imposed on the ratepayer, the justification for those costs is that they're needed by the ratepayer, the ratepayer's going to use them, and, therefore, you know, those costs are allocated to the ratepayers over time. And while it's not voluntary, in the sense . . you know, the ratepayers are not choosing and the decisions are made by a public utilities board or regulator of some other kind, it is a requirement for those ratepayers.

It's a public need. In the case of the Preferred Development Plan where a substantial portion of the output of the new facilities is for export and exposed to export price risks, and export market risks, it's not a need. It's not a public need for the domestic ratepayers of Manitoba. The public need of the domestic ratepayers in Manitoba is power for them, right? Structuring the Preferred Development Plan to be exposed to export price risks and export volume risks is not a traditional or typical way of constructing the economic relationship of a ratepayer to a monopoly utility provider.

At p. 7394, Morrison Park draws a contrast between this approach and the approach taken in Newfoundland "where the ratepayer is insulated from export risks."

147 Gaudreau, p. 9145/46. In the context of energy strategy in Manitoba, a sustainability assessment approach to alternatives would focus more specifically upon, first, a general preference for demand reduction and load growth avoidance. In other words, conservation and demand- side management options should be prioritized. Both the work of La Capra and Dunsky support this viewpoint.

148See Gaudreau/Gibson, Written evidence, p. 29.

149 See Gunn written evidence, p. 36. These criteria include: price, CO2 emissions, availability and limitations, efficiency, land use, water consumption, and social impacts. Evans et al. (2009) demonstrated these criteria by applying them to four electric power generating sources (see Table 4.5) and found that "electricity production from wind is the most sustainable followed by hydropower" (p. 1086) but that the high cost of production, fluctuation in availability, and low efficiency are major drawbacks to investments in wind energy production. Gunn notes in her evidence that given pricing changes in wind and solar, it may be time to revisit these options.

Development on the Nelson River[150];

- Like any other generation options, hydro-electricity has significant environmental consequences[151];
- In terms of potentially significant adverse effects flowing from the Keeyask Hydro-electric Generating Station, the Clean Environment Commission has identified potentially adverse effects upon sturgeon and boreal woodland caribou[152];
- From a social economic perspective, Manitoba Hydro chose to optimize only hydro plans;
- Like any major resource project, hydro-electric development on the Nelson River System offers both socio-economic opportunities and risks[153];
- One of the potential consequences of Hydro's preferred plan and its alternatives is a "perfect storm with regard to the lack of affordability of . . . hydroelectricity" with a region which is relatively colder, has relatively poorly insulated housing and has a higher rate of poverty[154];
- There are many unexplored opportunities to utilize energy resource planning in ways that could benefit Northern and aboriginal communities[155];
- Analytic restrictions have limited the otherwise valuable insight of MABCA;
- Sustainability Analysis used in conjunction with MABCA is a useful analytic approach;

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150 In its Keeyask Decision, the Clean Environment Commission found that "The Keeyask hearing reinforces the conclusion that a regional CEA needs to be carried out." (p. 140) The Panel recommended a regional CEA in in the Bipole III proceeding.

151As noted by Gunn, All of the power supply options will have profound potential impacts on the environment, and that tradeoffs among them are complex. What are the likely macro or cumulative environmental impacts of the Plan and each alternative and how well does each perform with respect to the broad vision, values and performance indicators that have been identified?

152It held that "there is the potential for the combination of past, present and future projects to have a significant cumulative effect. This is especially the case if the mitigation measures for sturgeon are not successful. For caribou,, until the "summer resident" herd and its range can be better defined, the degree of uncertainty about effects or mitigation will be great. (page 138)

153 As noted in the Keeyask EIS report of the CEC, the Project has the potential to be an economic benefit to the KCNs, although the magnitude of the benefit is not entirely clear. (P. 103, CEC, Keeyask Report) Drs. Buckland and O'Gorman identified evidence both of support and dissent within the KCN for the projects.

Councillor Neepin noted the revolutionary aspect of the partnership (Buckland, p. 8819). Robert Spence, pgs. 8271 – 8275, had a different perspective: "whatever . . .Manitoba Hydro touches, they kill. They're like a cancer on the land, on the river, on the people, and the environment. That's what I meant by this. Your clean, renewable energy posters don't fly with our people, with the grassroots people. That's advertising. Window dressing. That's what that is. We see what is really going on. We're part of it. We're the water. We're the land. We're the air. We're everything that the environment is. You can't lie to us."

As noted by Ms. Orenstein, potential health risks exist from the Project. Potential health opportunities also exist – but are less certain in terms of their realization. As she noted at pages 8972 – 8974, so overall the magnitude of health effects will largely depend on how the projects contribute to income disparity. Generally projects of this size increase income disparity in communities, and increase social divisiveness between those who benefit economically and those who don't. In addition, the research on income disparities suggests that the potential positive health benefits of increased economic activity can be impaired by a lack of equity. And this impairment is not just felt by those people who don't gain employment, but actually across the entire community.

154 O'Gorman, p. 8790/91.

155 See the presentation of MKO. See also the evidence of Dr. Buckland and Dr. O'Gorman. They suggest that there needs to be a vision and long term development plan developed for Northern Manitoba. Monetary benefit sharing should be extended to all dam-affected communities in the North. Hydro should enhance the non-monetary benefit sharing in the PDP particularly as it relates to education and housing. Rate mitigation and demand side management should include a focus on Manitoba's North.

and,

- Based on current planning assumptions, the Provincial Government would receive by far the largest share of benefits under the Preferred Development Plan.

The Human Element – Affordability and Barriers to Energy Efficiency

CAC Manitoba concludes that:

- There is significant evidence to conclude that rate increases at double the rate of inflation are likely to adversely affect many consumers; and,
- Low income consumers and persons living in remote communities face many barriers in accessing low income energy efficiency programming.

What we do know?

DSM is economic, reliable and integral to modern resource planning

During the course of this proceeding, the PUB had the benefit of the advice of Mr. Philippe Dunsky. Mr. Dunsky is a leading North American expert in areas related to energy efficiency. His extensive list of clients is comprised of many of the leading jurisdictions in North America including the State of Vermont as well as regulatory bodies from the State of California. He has extensive experience in Canada working with utilities as well as government organizations in provinces such as Nova Scotia, Manitoba, British Columbia, Quebec and Saskatchewan.

In his written and oral evidence as well as in his response to undertakings, Mr. Dunsky provided a number of key conclusions for the Board. Above all, he highlighted the relative advantages of DSM as compared to generation due to dependability, cost, risk[156] and lower CO2 emissions.

Based on the insight from a national study that he has conducted, Mr. Dunsky made a compelling case for the positive economic benefits associated with DSM including job creation, an increase in household disposable income and the freeing of business capital for other productive use.[157]

A central message of Mr. Dunsky was the inherent flexibility of DSM as well as its ongoing capacity for innovation. Looking beyond DSM Scenario Two, Mr. Dunsky highlighted the unparalleled level of innovation currently ongoing in the marketplace. He concluded that ongoing innovation will ensure that savings can be sustained over time. Mr. Dunsky also noted that leading jurisdictions such as the New England and California ISO consider DSM an inherently reliable resource with the Pacific Northwest and Vermont actually providing a risk premium to DSM.[158]

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[156] Please see Dunsky, NFAT Transcript, p. 8076. System planners who've been tasked with shining like on DSM have concluded that rather than seeing its potential depleted, it renews itself quite systematically through continued innovation. They also conclude that it a dependable and low risk resource. As a result, they've concluded that it would be imprudent to not assume continued DSM improvements for planning purposes over time. See also Dunsky, NFAT Transcript, p. 7973: So it is systematically the cheapest resource. It also tends to be a much lower risk resource. See also Dunsky, p. 8074 as well as Elenchus (JT), p. 4990-92 regarding California (p. 4994) regarding Nova Scotia.

[157] See for example CAC Exhibit 79 in which Mr. Dunsky highlights the economic development contribution of DSM expenditures.

[158] See the oral evidence of Mr. Dunsky and CAC-62.

Mr. Dunsky's evidence provided examples of five key resources that suggested DSM Scenario 2 could be extended for many years beyond the precipitous drop envisioned by Manitoba Hydro in latter part of this decade. These resources included:

1. New efficiency standards[159]
    - We're at a period of sudden and very significant increases in the adoption of standards in the US that lead directly to very strong energy savings. The trend has been for Canada to follow closely
2. LED lighting[160]
    - Over the next 10 years we can expect to see a cost reduction on the order of 80 percent and efficiency increases up to 3 times what it is today
3. Heat pumps
    - An excellent opportunity for certain homes and they didn't exist 10 years ago but are present in the market today and are going very strong.
4. Data-driven analytics[161]
5. Solar PV[162]
    - Moving from niche to scale
        - Becoming a lot cheaper
    - Game changer[163]
    - Grid parity on its way in some jurisdictions and already here in others (Saskatoon in 2017, North Dakota in 2021, Minnesota already hit grid parity).[164]

It is important to acknowledge the ample support for Mr. Dunsky's submission in the course of the hearing. Both Mr. Klassen[165] and Mr. Robson confirmed the intense interest in the industry with regard to cold climate air source heat pumps.[166]

It is notable that in the May 1, 2014 cross examination of the Manitoba Hydro DSM panel, there were a

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[159] Dunsky, NFAT Transcript, p. 8006.

[160] See also Klassen at NFAT Transcript, p. 7935 – 7937.

[161] See also Klassen, NFAT Transcript at p. 7942/43.

[162] Exhibit CAC-80. See Dunsky, p. 8027/28. In all cases what we're looking at is extremely rapid cost reductions that are allowing solar to move from what once was a niche to scale. And to scale in residential rooftops, commercial rooftops, and utility scale solar farms. And that is extraordinarily big right now. . . . I think what you have here is . . . practical, real world solar costs on the chart on slide 35. And what you see is in the past four (4) years alone, the cost has come down from about $8 a watt to under $3 a watt. Last year alone in the US, solar PV had . . . 29 percent of market share. It was he number 2 installed electric power resource last year, which is remarkable for those of us who have been looking at solar for a long time now. It was just behind gas power plants and well ahead of wind power biomass plants and coal plants. . . .When we look at the solar radiation available in southern Manitoba, we combine it with the current forecast of electricity prices and a couple of forecasts of declining PV prices what we find is, essentially, two (2) scenarios of what we call grid parity. Grid parity is the point at which, for a customer who finances their system, the annual cost of financing is going to be equal to or cheaper than the electricity that they don't have to buy from Manitoba Hydro as a result . .. ut in the long-run, there's no doubt that this is a game changer.

[163] See also Klassen at 7938. But I will talk about PV. PV, photovoltaic, generated electricity is exploding. We've seen globally massive increases. Again, you know, when I go to China, I see plants turning out PV panels that are the size of Polo Park. And PV, if you monitor what's going on in the utility industry, there's a lot of very nervous utility executives all around the world. They realize that this is a disruptive technology.

[164] See Exhibit CAC-80

[165] Klassen, NFAT Transcript, p. 7935-7937.

[166] Robson, NFAT Transcript, p. 7747 - 7749

number of admissions regarding the potential for new or expanded DSM resources which are not included in the DSM 2 outlook.

In terms of Manitoba Hydro's approach to Integrated Resource Planning, Mr. Dunsky flagged the initial flaw of failing to treat DSM as an equal resource to generation. He suggested a number of key conclusions including:

- There is a need for Manitoba Hydro to adopt modern Integrated Resource Planning:
  - Many new technologies are essentially missing in Hydro's planning (including heat pumps, accurate solar, smart thermostats and power)
  - PUB needs to apply a more prudent forecast assuming sustainable DSM;
  - Hydro's DSM planning is too short term. After aggressive DSM it quickly resorts back to previous assumptions.
- DSM needs to be applied in a way that is flexible, constantly monitored. Persons need to be able/willing to adjust where necessary
- Monitoring agency is important to ensure that goals are met
- Must be aggressive DSM. Cannot be a "wait for them to come" scenario – persons must be on the ground selling it
- Recognize barriers of certain categories of people - Designed with vulnerable ratepayers in mind/needs to account for specific characteristics of certain ratepayers.
  - Low Income
    - The more deep DSM goes, the more likely it is to reach low income
    - You essentially need to cover entire cost, full cost of device and installation
  - First Nations
    - specific characteristics of First Nation should be considered
    - Have seen higher level of success if persons from community are part of implementing the program

Mr. Dunsky's conclusions regarding DSM were ably reinforced by Dr. Higgin who brings a practiced regulatory eye to the proceedings. Dr. Higgin made it clear that he considered DSM 2 or higher to be a reliable resource. He concluded that[167]:

- Aggressive DSM should be applied to reduce electricity bills
- Need to pay particular attention to ensure that it reaches low-income / vulnerable consumers
  - Needs to be pushed
  - Need to have appropriate eligibility criteria
- DSM needs to be pushed and promoted. You cannot wait for people to come to you.
- There needs to be an oversight mechanism to ensure DSM targets are met
- Incentives have been helpful in pushing DSM.

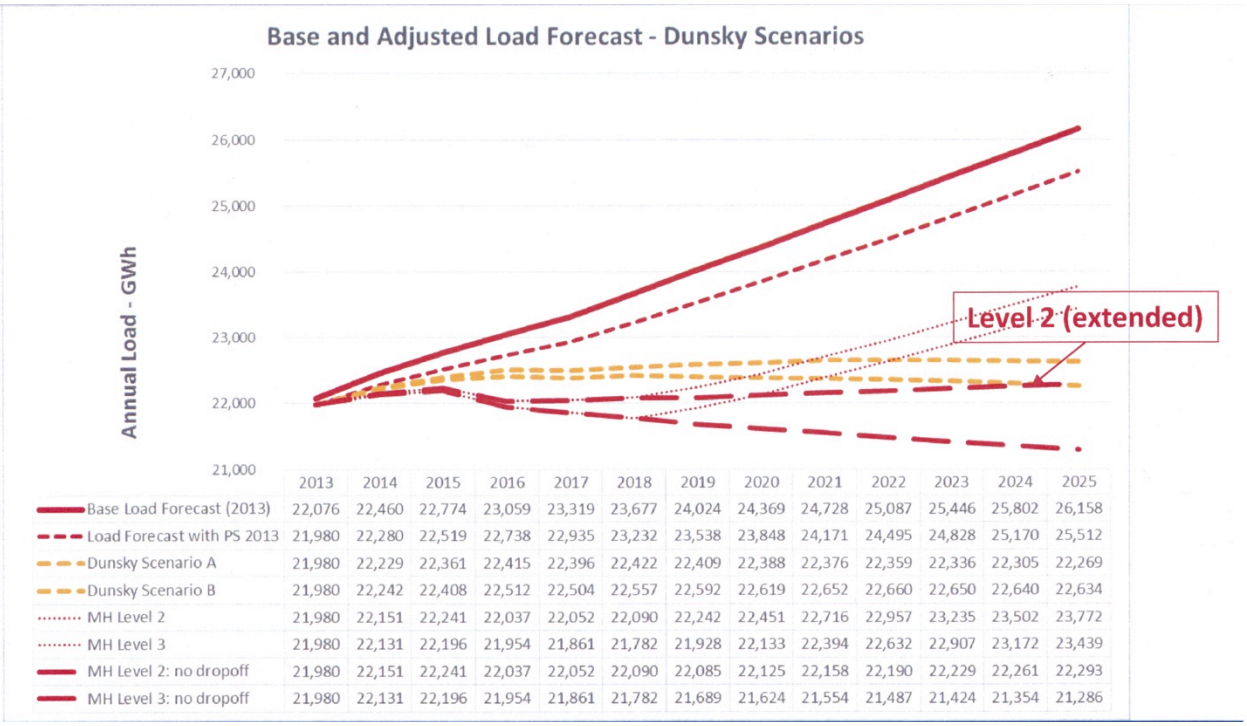
In Exhibit CAC-90, Dr. Higgin provided ample support from both the US and Ontario experience of how DSM is reliable resource from the planning perspective.

[167] See in particular, NFAT Transcript, p. 9410 – 9417 as well as p. 9437 – 9438.

Mr. Dunsky also identified the fundamental reality that neither Keeyask or Conawapa are needed for domestic purposes over the foreseeable future. He suggested that they should be analyzed as merchant plants rather than projects needed to meet domestic need.

During the most recent General Rate Application and again in this proceeding, Mr. Dunsky has provided expert evidence suggesting that there were significant unrealized opportunities for energy efficiency in Manitoba. In its rebuttal evidence and in Hydro Exhibit 87, Manitoba Hydro implicitly accepted many of the core submissions of Mr. Dunsky and concluded that DSM Scenario 2 is economic and could provide a significant deferral of generation. However, at the core of Mr. Dunsky's message was an assertion that Scenario 2 DSM was sustainable over the long term. His analysis is well represented in the figures from slide 57 and 58 of his April 24 Presentation set out below. CAC Manitoba accepts this submission.

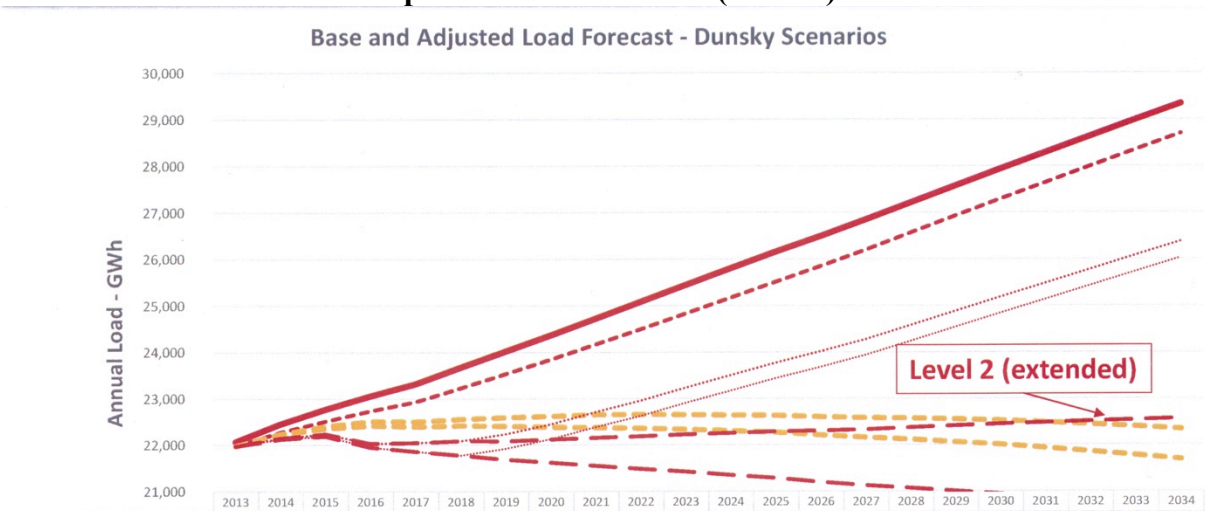
Impact on Load Forecast (to 2025)



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Base Load Forecast (2013)	22,076	22,460	22,774	23,059	23,319	23,677	24,024	24,369	24,728	25,087	25,446	25,802	26,158
Load Forecast with PS 2013	21,980	22,280	22,519	22,738	22,935	23,232	23,538	23,848	24,171	24,495	24,828	25,170	25,512
Dunsky Scenario A	21,980	22,229	22,361	22,415	22,396	22,422	22,409	22,388	22,376	22,359	22,336	22,305	22,269
Dunsky Scenario B	21,980	22,242	22,408	22,512	22,504	22,557	22,592	22,619	22,652	22,660	22,650	22,640	22,634
MH Level 2	21,980	22,151	22,241	22,037	22,052	22,090	22,242	22,451	22,716	22,957	23,235	23,502	23,772
MH Level 3	21,980	22,131	22,196	21,954	21,861	21,782	21,928	22,133	22,394	22,632	22,907	23,172	23,439
MH Level 2: no dropoff	21,980	22,151	22,241	22,037	22,052	22,090	22,085	22,125	22,158	22,190	22,229	22,261	22,293
MH Level 3: no dropoff	21,980	22,131	22,196	21,954	21,861	21,782	21,689	21,624	21,554	21,487	21,424	21,354	21,286

Source: Philippe Dunsky, Direct Testimony of Philippe Dunsky, April 24, 2014, slide 57

Impact on Load Forecast (to 2034)



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Base Load Forecast (2013)	22,076	22,460	22,774	23,059	23,319	23,677	24,024	24,369	24,728	25,087	25,446	25,802	26,158	26,495	26,846	27,210	27,571	27,931	28,283	28,636	28,988	29,340
Load Forecast with PS 2013	21,980	22,280	22,519	22,738	22,935	23,232	23,538	23,848	24,171	24,495	24,828	25,170	25,512	25,849	26,200	26,564	26,925	27,285	27,637	27,990	28,342	28,694
Dunsky Scenario A	21,980	22,229	22,361	22,415	22,396	22,422	22,409	22,388	22,376	22,359	22,336	22,305	22,269	22,208	22,156	22,113	22,061	22,001	21,929	21,852	21,770	21,682
Dunsky Scenario B	21,980	22,242	22,408	22,512	22,504	22,557	22,592	22,619	22,652	22,660	22,650	22,640	22,634	22,604	22,583	22,570	22,550	22,522	22,483	22,438	22,389	22,335
MH Level 2	21,980	22,151	22,241	22,037	22,052	22,090	22,242	22,451	22,716	22,957	23,235	23,502	23,772	24,015	24,276	24,578	24,880	25,181	25,477	25,775	26,075	26,375
MH Level 3	21,980	22,131	22,196	21,954	21,861	21,782	21,928	22,133	22,394	22,632	22,907	23,172	23,439	23,679	23,937	24,237	24,538	24,837	25,132	25,428	25,726	26,024
MH Level 2: no dropoff	21,980	22,151	22,241	22,037	22,052	22,090	22,085	22,125	22,158	22,190	22,229	22,261	22,293	22,307	22,334	22,376	22,414	22,450	22,479	22,508	22,538	22,567
MH Level 3: no dropoff	21,980	22,131	22,196	21,954	21,861	21,782	21,689	21,624	21,554	21,487	21,424	21,354	21,286	21,199	21,125	21,065	21,002	20,937	20,866	20,794	20,722	20,650

Source: Philippe Dunsky, Direct Testimony of Philippe Dunsky, April 24, 2014, slide 58

What do we know about the economics of the Preferred Development Plan as compared to plans 1, 5 and 6?

The challenges experienced by the Preferred Development Plan in the face of a significantly lowered load forecast due to DSM opportunities and a materially increased capital load are an enduring narrative of this proceeding. As set out elsewhere on the record, there are significant data uncertainties which make the ability to make a determinative selection of the alternatives quite challenging. However, there is ample evidence to suggest that Plan 14 is not currently economically viable and that it is unduly risky.

The following table summarizes results provided by Manitoba Hydro using the 2013 planning assumptions along with the updated capital costs and DSM 2 savings/spending levels for various development plans and contrasts the results with those of earlier analyses[168]. It should be noted that the table below is based upon a Ref/Ref/Ref scenario which does not fully reflect project risks.[169]

[168] CAC Exhibit 68, page 26. Note: The 2013 Update/DSM 2 value for Plan 12 was not available when the CAC exhibit was prepared and the Plan 2 values using the updated capital costs were subsequently revised (MH Exhibit 104-15 – Revision 1) by Manitoba Hydro to those shown in brackets. Also, ECS calculations were possible only where Manitoba Hydro provided the underling cash flow assumptions.

[169] The results suggest that Increased levels of DSM (over the base DSM levels included in the 2013 planning assumptions) are economic regardless of the Plan chosen. They also suggest that Gas-fired generation is more economic than Conawapa as the post-Keeyask resource. Recognizing the material limitations in the data, there is some information to suggest.

- With increased levels of DSM, the All Gas Plan appear to be superior to Plan 2 in terms of the most economic plan with no new intertie.

However, when one explores the prospects of the Preferred Development Plan under both the Hydro and the ECS analysis, there would appear to be strong support for the view that it is unlikely to be economic in comparison with Plan 6, Plan 5 and perhaps Plan 1. Under this analysis, Plans 5 and Plan 6 are the clearly superior. Plan 4 is not presented in this analysis.

PLAN	MILLIONS 2014$ -NPV – RELATIVE TO ALL GAS				
	2013 UPDATE NFAT SUBM BASE DSM (5.40%)	2013 UPDATE BASE DSM NEW CAPITAL (5.40%)	2013 UPDATE BASE DSM NEW CAPITAL (5.55%)	2013 UPDATE DSM 2 NEW CAPITAL (5.40%)	2013 UPDATE DSM 2 NEW CAPITAL (5.55%)
2	$728	$111 ($164)	$26	-$197 (-$38)	?
6	?	?	?	$386	$262
5 – No Inv	?	$377	$256	$410	$285
12	$1,204	?	?	-$18	?
14 – No Inv	$1,245	$374	$123	$45	-$169
Source	NFAT Table 12.4	MH 104-15	ECS Calculation	MH 104-15	ECS Calculation

A review of the Updated ECS Probabilistic Analysis also lends support to the view that the Preferred Development Plan is not the preferred economic choice and that it attracts undue risk. While this analysis lacks the updated DSM scenarios and the 2013 assumptions, it does have value over the 2013 Hydro information in that it includes expected values. It suggests that based upon expected values Plan 4 is the strongest plan, followed by Plan 6 and Plan 5 B (Plans 14 and Plan 5 should be disregarded as they contain the WPS transmission invest which is no longer anticipated).

- With increased levels of DSM advancing Keeyask with a 750 MW intertie is superior to plans with no new intertie, when followed by gas-fired generation. However, the economics of advancing gas-fired generation to support the WPS contract are marginal.

ECS Updated Probabilistic Analysis
2012 NFAT – Updated Capital Costs and 5.25% Common Discount Rate

Development Plan	14	5	4	1	2	8	14B	5B	12	6
	Plan 14 - K19/C25 /750MW (WPS Sale &Inv)	Plan 5 - K19/Gas 25/750M W (WPS Sale & INV)	Plan 4 - K19/Gas 24/250M W	Plan 1 - All Gas	Plan 2 - K22/Gas	Plan 8 - CCGT/C2 6	Plan 14b - K19/C25 /750MW (WPS Sale & no WPS Inv)	Plan 5b - K19/Gas 25/750M W (WPS Sale & no WPS Inv)	Plan 12 - K19/C31/ 750MW	Plan 6 - K19/Gas3 1/750MW
10th Percentile	-2105	-630	-500	-645	-826	-1267	-2290	-845	-2215	-786
25th Percentile	-1596	-316	-415	-436	-725	-1115	-1802	-499	-1644	-684
75th Percentile	1005	658	908	164	499	310	790	503	892	656
90th Percentile	2914	1486	1830	525	1348	1602	2734	1329	2611	1559
Expected Value	56	335	527	-42	140	-32	-127	152	-137	260
Ref-Ref-Ref NPV	524	542	785	0	380	255	343	360	306	531
50th Percentile	499	524	759	3	346	226	315	341	279	499

The analysis presented above tends to support the advancement of Keeyask and the construction of a small intertie as being more economic than any of the no intertie plans. However, in considering these conclusions it is important to bear in mind that these results:

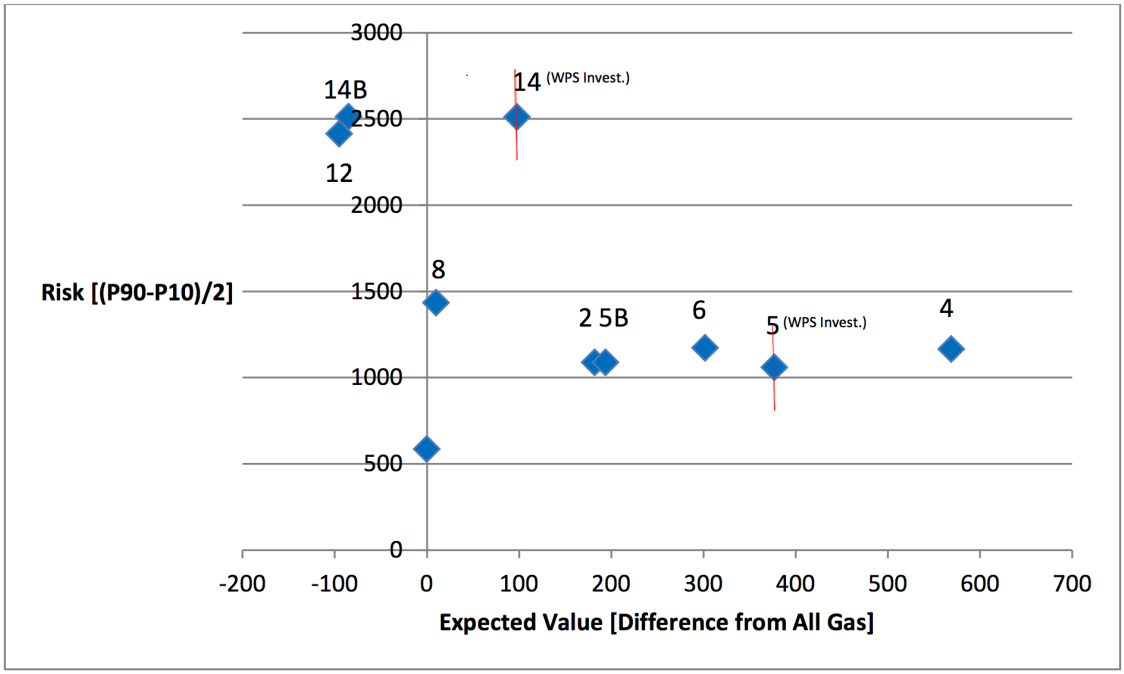
- Do not incorporate the more recent 2013 planning assumptions,
- Do not account for the impact of increased levels of DSM, and
- Do not reflect any of the reservations expressed by the Independent Expert Consultants[170] and others[171] regarding Manitoba Hydro's export price forecasts.

All these results and observations suggest that[172]:

- There is no need for an early (i.e. mid-2020s) in-service date for Conawapa and hence the aggressive spending that would be required to protect such a date.

This conclusion is reinforced by the risk versus expected return analysis presented by Dr. Simpson.[173] The graph suggests based upon risk/reward trade-offs, that Plan 4 is the superior Plan followed by Plan 6, Plan 5B and Plan 2. Again, this analysis is subject to the same data limitations as the updated ECS probability analysis.

[170] For example, Potomac Economics Report, page 5
[171] For example, Doug Gotham, CAC-66
[172] CAC-68, page 51
[173] CAC-78, p. 2.



What do we know about Ratepayer Impacts?

There are numerous challenges in the examination of ratepayer impacts. The repeated message CAC Manitoba has heard from Manitoba consumers including its ratepayer panel suggests that Manitoba consumers are focused on rate impacts over the short and medium term. Persons already struggling to balance their budget on a daily basis seek rates that are affordable, stable and with ample warning of pending increases. They place little if any weight on forecasts beyond 15 or 20 years because they simply do not see them as credible. For this reason, CAC Manitoba sees only limited utility in looking out beyond 10 to 20 years.

The "mad scramble" of this proceeding also has left an unsatisfactory sample of information relating to the financial impacts of sustained Level 2 DSM. The input costs for Level 3 DSM are simply not credible and are given no weight by CAC Manitoba. Based upon the evidence of Mr. Dunsky and others, CAC Manitoba is confident that sustainable Level 2 DSM is likely to be available well out into the 2030s. As well, there is incomplete load forecast information with Manitoba Hydro anxious to incorporate projected Pipeline Impacts but unwilling to incorporate meaningful price elasticity estimates into the 2012 and 2013 assumptions. For this reason, CAC Manitoba has chosen to assess its ratepayer impacts based upon Level 2 DSM.

CAC Manitoba has chosen to look at potential ratepayer impacts from three perspectives:

- Projected Even Annual Rate Increases 2015/16 through 2031/32 based upon a reference capital cost scenario and DSM Scenario 2;
- Consumer Revenue 20 Year NPV based upon DSM Scenario 2; and,
- Consumer Revenue 50 Year NPV based upon DSM Scenario 2.

In terms of projected even annual rate increases out to 2031/32, Plan 1 has the superior result with Plan 14 having a significantly poorer result.

Projected Even Annual Rate Increases 2015/16 through 20131/32

Plan 1	Plan 5	Plan 6	Plan 14
3.36%	3.74%	3.75%	4.27%

In terms of the lowest consumer revenue on a NPV basis out twenty years, again Plan 1 has the best results with Plan 14 trailing.[174]

Consumer Revenues 20 Year NPV (5.05% real)
DSM2/No Pipeline
($ Millions)

Plan	1	5	6	14
Base DSM	$24,544	$25,113	N/A	$26,336
DSM 1	$24,275	$24,855	N/A	$25,767
DSM 2	$23,696	$24,301	$24,323	$25,178

Note: Each level of DSM has a different level of load associated with it.

Looking at only Level 2 DSM for all provided plans (REF-REF-REF) without pipeline load, Plan 14 collects the most from ratepayers on an NPV basis in all years until sometime between Year 45 and Year 50 where it starts to beat Plans 2 and 12.

Leaving aside plan 4, Plan 1 collects the lowest from domestic ratepayers on an NPV basis until the last decade, where Plan 5 becomes the lowest overall cost option to ratepayers.

Main Submission Methodology

Plan	**Plan 14**	**Plan 5**	**Plan 1**	**Plan 2**	**Plan 4**	**Plan 6**	**Plan 12**
DSM	**Level 2**	**Level 2**	**Level 2**	**Level 2**	**Level 2**	**Level 2**	**Level 2**
High C.C.	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Pipeline Load	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Year 5	**$7,286**	$7,265	**$7,249**	$7,257	$7,260	$7,265	$7,265

[174] CAC Manitoba would note that using the No Pipeline/DSM 2 scenario the nominal values over 20 years are Plan 1 - $40,436, Plan 6 - $41,856, Plan 14 - $43,804.

Year 10	**$13,768**	$13,585	**$13,456**	$13,520	$13,543	$13,590	$13,591
Year 15	**$19,710**	$19,234	**$18,901**	$19,065	$19,124	$19,246	$19,249
Year 20	**$25,178**	$24,301	**$23,696**	$23,993	$24,101	$24,323	$24,329
Year 25	**$28,704**	$27,491	**$26,911**	$27,501	$27,273	$27,504	$27,618
Year 30	**$31,416**	$30,106	**$29,635**	$30,355	$29,861	$30,095	$30,458
Year 35	**$33,491**	$32,237	**$31,978**	$32,707	$32,017	$32,236	$32,939
Year 40	**$35,054**	$33,957	**$33,888**	$34,567	$33,758	$33,965	$34,781
Year 45	**$36,189**	**$35,254**	$35,352	$35,975	$35,071	$35,268	$36,089
Year 50	$37,002	**$36,220**	$36,458	**$37,019**	$36,047	$36,235	$37,008

What do we know about the results of Multiple Account Benefit Cost Analysis?

There is no doubt that multiple account benefit analysis has offered some valuable insights in the course of the proceeding. Sadly, however, the information has not been fully updated to reflect the dramatically shifting evidentiary base of this proceeding.

It is important to note that while the Market Value Account has been updated for the revised Keeyask and Conawapa capital costs, it is based on the original NFAT Business Case using the 2012 planning assumptions. The values have not been revised to account for the more current 2013 planning assumptions, It also means the alternative development plans do not incorporate the higher levels of DSM that have been demonstrated to be economic.

The 2013 planning assumptions (excluding the change in discount rate) would appear to improve the economics of the Preferred Plan and other plans where Conawapa follows Keeyask relative to Plan 2 or Plan 4[175]. However, higher levels of DSM improve the economics of plans where natural gas-fired generation follows Keeyask relative to plans where Conawapa follows Keeyask[176].

With these data limitations taken into account, it is worth considering the update based upon new capital assumptions but excluding DSM Scenarios as well as 2013 planning assumptions.[177] In terms of the Monetized Net Benefit, it is noteworthy that Plans 14, 12 and 6 are extremely comparable with Plan 5 trailing badly. One could speculate that taking DSM Scenario 2 into account and incorporating 2013 planning assumptions, one might see Plan 6 continue in a relatively strong position.

[175] Manitoba Hydro, Chapter 12, Page 12
[176] MH Exhibit 104-16
[177] Hydro Exhibit 166 Revised.

Plan #	14	12	6	5	4	2	1
Account	PDP (with WPS sale)	K19/C31/ 750 MW	K19/Gas31/ 750 MW	K19/Gas25/ 750 MW	K19/G24/ 250MW	K22/Gas	All Gas
Market Valuation	0	97	573	313	577	314	251
Government	0	-117	-367	-358	-365	-407	-687
Economy	0	-27	-104	-100	-101	-120	-193
Environment	0	1	-129	-95	-217	-181	-334
Monetized Net Benefit	**0**	**-46**	**-27**	**-240**	**-105**	**-395**	**-963**

It should be noted that in addition to data limitation there are some material analytical restrictions relating to the Multiple Account Benefit Cost Analysis. First, as the evidence of Elder and Traditional Land Users Panel would suggest, the willingness by Keeyask Partners to participate in partnership should not be interpreted to mean that there will be no major residual biophysical or socio-economic effects. This is especially the case given the statement by Ms. Anderson testifying on behalf of Fox Lake that not all the impacts of the Hydro projects have mitigated, compensated or defended.[178] As just one example, the Cree Nation partners expressed significant concern with associated impacts from transmission lines.[179]

The MABCA also might be challenged for its questionable confidence in mitigation adequacy with regard to sturgeon especially given the concerns expressed by the Manitoba Clean Environment Commission that given the uncertainty associated with lake sturgeon habitat remediation that there was a potentially significant adverse effect.[180]

Despite these data and analytic limitations, MA/BCA is a useful tool when used in coordination with the sustainability assessment tool prepared by Dr. Gibson and Dr. Gaudreau.

[178] NFAT Transcript, p. 3543-44; 4249-4250
[179] The MA/BCA also might be criticized for its neglect of boom/bust dynamics; Anderson, NFAT Transcript, P. 4250
[180] Clean Environment Commission, *Report on Public Hearing: Keeyask Generation Project*, April 2014, p. 138"For sturgeon and woodland caribou, however, there is the potential for the combination of past present and future projects to have significant cumulative effect. This is especially the case if the mitigation measures for sturgeon are not successful. For caribou, until the "summer resident" herd and its range can be better defined, the degree of uncertainty about effects or mitigation will be great."

What do we know about the rate impacts on vulnerable consumers?

Affordability

> *"The finding is that impact on MH ratepayers in the short term (2015-2025) is* ***not acceptable****, particularly for Vulnerable Consumers. Further, since the benefits are very long term, (78 years) the intergenerational inequity due to high rates in the first 10 years and modest rate increases in later years is very large."*[181]

Much of the evidence presented in these proceedings has dealt with high-level and technical analysis undergone in an effort to provide an accurate portrayal of various energy plans or pathways, on their own and in relation to each other. This is appropriate as these analyses are critical in providing an evidentiary basis for decision making. However, in the Board's final decision making, it will be imperative that it take a step back from the detailed assessments and turn its mind to those who will ultimately bear the burden of shouldering the cost of this decision: Manitoba ratepayers. As stated by Morrison Park:

> *"But when we come right down to it, in our view, domestic ratepayers are responsible over time for all of Manitoba Hydro's costs. ... So they are. . . residually responsible for the costs of Manitoba Hydro.*[182]

Manitoba Hydro is an essential service/basic necessity for Low-income consumers and makes up a larger portion of their total consumption

> *The. . . study that we conducted shows that . . . electricity is a basic necessity for low-income households in Manitoba comprising a larger share of their total consumption than for higher-income households.*[183]

> *To me, I consider Manitoba Hydro an essential service. ... It has to be paid. I cannot afford to live without Hydro.*[184]

> *Currently right now, I am pretty much to a point where every cent of income coming in is going out as fast as it's coming in, so any further increase is definitely a big problem for me.* [185]

In considering that the ultimate costs will be borne by Manitoba's ratepayers, it is important to consider how those costs will be experienced amongst various groups of ratepayers. What has become clear from the evidence is that two distinct groups of ratepayers are likely to experience disproportionate impacts from the proposed rate increases:

- Low-income persons and near low-income persons
- Northern Aboriginal persons

Low-income persons

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[181] CAC-27, p. 29.
[182] NFAT Transcript, Mr. Pelino Colaiacovo, p. 7258 – 7259
[183] NFAT Transcript, Harvey Stevens, p. 7837 - 7838
[184] NFAT Transcript, Mr. Dave Mouland, p. 7672-7673
[185] NFAT Transcript, Mr. Dave Mouland, p. 7674

[W]e've concluded that the proposed 2 percent real increase in electricity rates over the 2015 to '32 period will result in low-income households spending more on electricity and facing even larger operating deficits than they currently do. [186]

Based on an analysis of Statistics Canada Data from 2000 – 2009, the evidence of Dr. Simpson and Mr. Stevens shows the following impacts of increases in the "real" price of electricity for low-income ratepayers:

- As rates increased electricity's share of the low-income household's total consumption increased;[187]
- As rates increased, low-income households shifted their consumption away from shelter, transportation, education, clothing and reading and more to the remaining consumption items.[188]
- As rates increased the low-income household's overall balance became more negative. [189]

Based on these findings, Dr. Simpson and Mr. Stevens concluded that the proposed 2 percent real increase[190] in electricity rates over the 2015 – 2032 period would result in low-income households spending more on electricity and facing even larger operating deficits than they currently do.[191] They also demonstrate adverse effects on near low-income consumers.

An important factor in assessing equitable distribution of rate increase impacts is to consider not only intergenerational equity, but also intragenerational equity. As compared to those who are non-low-income, low-income persons face heightened barriers in numerous aspects of daily living including housing and education. As a result of the inequitable impacts of the proposed rate increases, low-income ratepayers are likely to disproportionately experience increases to debt, decreased access to shelter, transportation, education and clothing and as well, are likely to face a heightened risk of being shut off[192] from electricity, a basic necessity. These academic findings found more eloquent expression in the words of ratepayers.

...But after I calculated the more realistic number, then I realized how much more I'm going to have to tighten my budget and . . . I have to think of things that I can't do. [193]
MS. MEGHAN MENZIES: And so what would be the impact on your spending of these kind of rate increases?
MR. DARRELL SETTEE: Well, we've got to spend less on everything, I guess, all items, necessities, entertainment, et cetera, et cetera.[194]

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[186] NFAT Transcript, Harvey Stevens, p. 7837 – 7838; See also, CAC-31 p. 11: *"The analysis has shown that an annual increase of 2 per cent in the real price of electricity will result in relatively small impacts on household consumption and the overall household balance. However, the cumulative impact of 17 years of annual 2 per cent increases will be substantially greater. Thus, the impacts of continuous real rate increases will negatively affect the low and near low income households of Manitoba."*
[187] NFAT Transcript, Harvey Stevens, p. 7831
[188] NFAT Transcript, Harvey Stevens, p. 7836; See also pages 7872 – 7874
[189] NFAT Transcript, Harvey Stevens, p. 7832
[190] 4% nominal increase.
[191] NFAT Transcript, Harvey Stevens, p. 7837 – 7838; See also, CAC-31 at p. 11.
[192] See Albertine Mason direct testimony April 23, See MKO written submission, February 4, 2014.
[193] Impact of rate increases, NFAT Transcript, p. 7663 – 7664 (Albertine Mason)
[194] Impact of rate increases, NFAT Transcript, p. 7697 (D. Settee)

Northern and Aboriginal Persons

I was paying a Hydro bill one time, and this lady -- I know a lady from Hydro walked in there and she was complaining about her Hydro bill. And I thought, Good, there's somebody complaining. And I saw it, it was eighty-two dollars ($82), and I'm standing there with mine, seven hundred and sixty-eight dollars ($768). That's one (1) month. That wasn't even cold yet. [195]

THE CHAIRPERSON: In terms of . . . rate mitigation, was it a case where people felt that they were paying more than . . . Southern consumers, Southern ratepayers, or was it a case where they felt that because they're living in the shadow of a dam, they should be paying less?
DR. MELANIE O'GORMAN: It was both of what you just said. It was a sense of unfairness that the dams were in their area and they were paying a lot, but it was also a sense of inequity that they -- they believed they pay more than Southerners. [196]

An important theme that has come out within the hearing is the disproportionately high Hydro Bills for Northern and Aboriginal ratepayers.[197] This is especially the case for persons living in remote communities in Northern parts of the province where the effects of lower quality housing and a colder climate are exacerbated by the status of being on fixed or lower incomes. As noted in Ms. Orenstein's evidence, the Burntwood region is currently experiencing health inequities across a broad range of measures that include

- health outcomes such as injury, illness, life expectancy; malnutrition
- key health supports such as housing, infrastructure and access to health services.
- Opportunities for higher education are extremely limited

Given that rate increases on low income persons are likely to have impacts on their spending on housing and education, the added impact of base-level inaccessibility to housing and education in the Burntwood region has the potential to create further inequities.

While it is tempting to look to government transfer or targeted low income energy supports as a panacea for low income persons, caution should be exercised. Judicial notice can be taken of the reality that social benefit programs both federally and provincially have failed to keep pace with inflationary trends.[198]

A simple review of the record leading to Board Order 5/12 also will demonstrate the failure of targeted energy assistance programs to reach even half of their target populations. To similar effect, CAC Exhibit 45-14 contains reference to an American study on the E*nergy Cost Impacts on American*

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[195] NFAT Transcript, Ivan Moose, April 25, p. 8245
[196] NFAT Transcript, O'Gorman, p. 8847.
[197] CAC-48, Jerry Buckland and Melanie O'Gorman, *Re-envisioning the North? A Critical Socio-economic Assessment of Manitoba Hydro's 2012/13 to 2024948 Preferred Development Plan*, p. 53
[198] As just one example, the Provincial Ombudsman's Report on the Provincial EIA System of May 2010. See in particular pages 63 through 66. At page 64 it s noted: he National Council of Welfare (NCW) is an arm's length advisory body to the Federal Minister of Human Resources and Social Development (HRSDC) on matters of concern to low-income Canadians. NCW issues periodic reports on patterns and trends in welfare incomes for four different types of households in the various provinces. For all provinces, reported welfare incomes fall below LICO thresholds. For example, the Summer 2006 report issued by NCW showed that 2005 welfare incomes in Manitoba ranged from 28% of the LICO for a single employable individual to 53% of the LICO for a couple with two children, ages 10 and 15.

Families. The study notes that while many lower-income families qualify for federal and state energy assistance, the programs are hard pressed to key up with the increase in household energy costs.[199]

What do we know about the barriers to energy efficiency faced by low income consumers?

DSM is a way to improve affordability

> *And in that regard, the demand-side management programs that were targeted to low-income households would have the desired effect of -- of making them less -- less vulnerable to price increases of electricity. It would cushion that impact by allowing them to -- to reduce their consumption of electricity, just as an additional measure that could be looked at to. . . address the -- the impact that we've observed of increases in the price of electricity on low income households.* [200]

It is generally accepted that increases in energy prices will have a disproportionate impact on low income persons. A way to soften these impacts is to decrease energy use and lower the overall energy bill. The dilemma is that much evidence has been adduced which points to the fact that there are increased barriers to DSM programs for low income persons.

As explained by Mr. Dunsky in his 2008 evidence to the PUB on behalf of CAC Manitoba, these barriers include[201]:

- Information and search costs: below average language and computation skills (illiteracy, poor math skills, English as a second language) can represent significant hurdles to both participation in DSM programs and adoption of efficiency measures;
- Performance uncertainty: higher than average housing mobility adds to uncertainty regarding the economic value of long-term energy savings measures;
- Transaction costs: greater difficulty in dealing with complex transactions can lead to lower measure uptake and higher dropout rates;
- Financing: lack of access (or access at unreasonable cost) to capital, as well as an aversion to debt, can seriously diminish ability to pay for higher upfront costs;
- Organizational practices: many contractors are unwilling to work for low-income customers, or charge a premium for the perceived risk; and
- Split incentives: the daunting issue of split incentives, which occurs primarily in rental markets, is a significantly greater barrier among low-income households, whose share of renters is considerably higher than average.

It is noteworthy that the ratepayer panel identified another barrier where the housing is so substandard that it is not considered appropriate for a DSM investment.

Based on these barriers, Mr. Dunsky concludes that DSM programs designed to address the barriers for the "average" population will tend to be inaccessible to low-income consumers.

Mr. Dunsky went on to explain four characteristics that the most successful low-income energy

[199] CAC 45-15, p. 23.
[200] DSM for low income consumers, NFAT Transcript, p.7880 – 7881: Harvey Stevens, April 23, 2014.
[201] CAC-82, Response to Undertaking #123, Philippe Dunsky, 2008.

efficiency programs all shared[202]:

1. "Keep it simple: Participation drops precipitously as complexity increases. Program implementers need to take A – Z ownership of the complexity involved in conducting audits, hiring contractors and overseeing work. Complexity must occur on the implementer's side, not the participant's. Similarly, proof of income and other eligibility requirements need to be flexible.
2. Keep it free. While it may be tempting and intuitive to request even symbolic participant contributions, attempts to do so have generally met with failure.
3. Incent "sales" (outreach). The difference between a good theoretical design and good performance is sales. Ideally, the utility, the contractor and a host of other low-income stakeholders will contribute to an active outreach effort, and the latter two will have the capacity, the tools and the incentives to find potential customers and "close the sale".
4. Be comprehensive. As with any sale, the hard part is getting in the door. Once a participant is in the program, it is critical to capture all possible opportunities, recognizing that any measures not installed will likely be lost for years to come and /or their savings will cost significantly more to achieve at a later date. Comprehensive programs typically include education, a suite of "light" measures (CFLs, caulking/weather stripping, low-flow aerators and showerheads, etc), envelope measures (insulation and weatherization) and appliances/equipment replacements (especially old fridges and furnaces)."

Recommendations

In terms of Integrated Resource Planning including demand side management, CAC Manitoba recommends that the Panel find that:

- The resource planning approach adopted by Manitoba Hydro in its initial business case was flawed
- Manitoba Hydro should adopt a modern portfolio analysis approach which gives equal value to demand side measures and which allows for equitable treatment of other renewables including wind and solar
- Manitoba Hydro should be directed to engage in ongoing and early consultation with stakeholders aimed at developing a modern IRP consistent with best practice
- No new major generation or transmission projects should be undertaken without the review of a modern IRP in a public process which makes reasonable provision for public participation
- It is a reasonable and necessary planning assumption to anticipate an extended DSM Scenario 2 beyond 2018 as per the recommendation of Mr. Dunsky
- A mandated multi-year target of economic energy efficiency savings should be given to Manitoba Hydro consistent with North American best practice. That target to be reviewed on an annual basis by the Public Utilities Board
- There is need to remove barriers for access to DSM for low income and vulnerable consumers including those living in remote First Nation and Metis communities. Manitoba Hydro should engage in a stakeholder engagement process to address these barriers and report on its progress within six months to one year;

[202] Exhibit CAC-82, p. 7.

In terms of the Preferred Development Plan and its alternatives, CAC Manitoba recommends that:

- Based upon the existing economic and risk analysis, the Preferred Development Plan as defined in the Terms of Reference is not justified
- The expenditure of additional funds to preserve a 2026 in-service date for Conawapa is not justified
- No further expenditure of significant funds to preserve a later in service date for Conawapa should be undertaken without the express authority of the Public Utilities following an updated consideration of the Conawapa Business Case consistent with modern Integrated Resource Practice
- In the event the decision is made at any point in time to proceed with the Keeyask or Conawapa Generating stations, an enhanced effort should be made to maximize training opportunities for First Nation and Metis people including partner communities
- Expanded tie line and transmission line access to the United States and other marketplaces have the potential for significant economic and reliability benefits
- The evidence of this proceeding has not demonstrated that there will be no further opportunity to enhance tie line and transmission capacity to the US or other marketplaces
- A commitment to Keeyask as a new generation sources has the potential to "crowd out" other sources of renewable generation including wind
- The results of a Regional Cumulative Effects Assessment of the Nelson River Watershed is relevant to the determination of the macro-economic implications of both the Keeyask and Conawapa generating stations
- Consideration can be given to three options for Phase 1:
  1. Proceed with Economic DSM; No Build till Domestic Need date
  2. Proceed with Economic DSM and MH Return with updated Information on outstanding questions relating to the IRP, Export Opportunities and the Regional CEA
  3. Proceed with Economic DSM and Keeyask and 750 MW intertie with Conditions
- Given the many uncertainties and the flaws in the current resource planning exercise, Manitoba Hydro should be directed to proceed with an economic DSM and return with updated information on outstanding questions relating to the IRP, Export Opportunities and the Regional CEA
- A Public Review Process should be initiated to review this new information in a timely manner to preserve existing opportunities related to the sale to Minnesota Power
- It should be open following that Public Review to recommend either the No build until domestic need pathway or a pathway that allows for the sale to Minnesota Power if it is determined to be justified
- Regardless of whether Keeyask proceeds or not, consideration should be given to extended support to Hydro affected aboriginal communities in recognition both of the ongoing benefits that Manitobans derive from Hydro related projects and the ongoing impacts on affected people, lands and waters. These benefits should include consideration of water rental benefit sharing and extended support for energy efficiency initiatives in Metis and First Nation communities.

- In the event that the panel recommends a staged approach of Economic DSM, Keeayask and a 750 MW intertie with Conditions, it is recommended that the following steps be taken:
    - Phase I:
      Path: DSM for Domestic Need and Keeyask for Export Opportunity with 750 MW Intertie with certain conditions to be met in the 2015-2018 Period:
        1. DSM Program (extended savings equivalent to Level 2 but of a longer duration)
        2. Capital Cost Reporting
        3. Rate Impact Mitigation Strategy (MH and Govt)

      Process:
        - Annual Review of Conditions 1 & 2 by PUB (Public Review)
        - Review of Regional Cumulative Effects Study (CEC)
        - Updated Business Case Filed prior to Keeyask ISD, including
        - Appropriate Rate Impact Mitigation Proposal(s)

    - Phase II: Post-Keeyask Plan based on Updated Business Case (Comprehensive IRP Framework)

In terms of the proposed Green Energy Benefit, CAC Manitoba recommends that:

- If Keeyask proceeds a Green Energy Benefit should be provided in recognition of the merchant plant nature of the advancement and the disproportionate share of risk borne by ratepayers. After stakeholder consultation, consideration should be given to whether the benefit is targeted to persons of modest means as defined by Winnipeg Harvest in its public presentation or whether the benefit should be available to a broader spectrum of ratepayers.

In the event any Hydro Generation Project for export purposes proceeds, consideration should be given to a more equitable sharing of benefits between ratepayers and the province.