POLICY OBSERVATIONS RELATED TO THE COST/BENEFIT OF PREFERRED PLAN - NFAT REVIEW

TESTIMONY OF DR. ROGER HIGGIN
PRESIDENT, SUSTAINABLE PLANNING ASSOCIATES INC.

SUBMITTED TO THE:
MANITOBA PUBLIC UTILITIES BOARD

AT THE REQUEST OF:
PUBLIC INTEREST LAW CENTRE ON BEHALF OF THE
CONSUMERS' ASSOCIATION OF CANADA MANITOBA

FEBRUARY 4, 2014

POLICY OBSERVATIONS RELATED TO THE COST/BENEFIT OF PREFERRED PLAN - NFAT REVIEW

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report presents a high-level overview of the Strategic Policy Observations of the Author on the Manitoba Hydro NFAT Filing now before the Manitoba Public Utilities Board.

The report is a Policy rather than Technical Document, but is based on referenced Manitoba Hydro evidence, Technical Reports of MPUB Consultants and primarily on Reports of Consultants retained by the Consumers Association of Canada (Manitoba).

The report address 5 Socio-Economic Elements related to the Cost/Benefit of the Proposed Plan and Alternatives. It provides the Author's observations on Demand-Load Forecast; Export Markets; Capital Escalation; Sustainability and Macro-Environment; Affordability; Economic Evaluation and Transfers.

A key element of the report is an assessment of the Affordability of Residential Electricity Rates under the Preferred Plan. This assessment suggests the Ratepayer Impact is not acceptable and suggestions for mitigation are provided.

The interactions of these Socio Economic and Environmental Elements, some of which are monetized and others that are not, such as externalities, is complex. The Strategic Policy considerations are broad and the implications for Manitoba far reaching and long term.

The Strategic Policy Observations are condensed in the attached Table, which may serve as a high level road map of the report.

The second part of the report addresses the context of the NFAT Terms of Reference and associated Process considerations. It provides observations which may assist the Review Panel in its Challenging Task.

The primary observations are that if the Preferred Plan passes threshold questions of whether it should proceed, the Public Interest will be served by a Phasing of the Preferred Plan (or variation of it) as well as the Process for its further development and Review.

Summary of CAC Consultants Strategic Policy Observations			
Element	**Sub- Issues**	**Observations**	**NFAT Considerations**
Demand & Load Forecast	**Price Elasticity**	**Model may be inadequate result Load Forecast too high at 1.6%**	**Need-drives comparison of Plans and timing for Keeyask I/S for domestic load**
	DSM	**DSM Expectations built in Load Forecast too low. Achievable Potential- 1.5X DSM. Higher Target 16-18% Load and 1600 GW by 2023**	**Timing of Keeyask and lower cost DSM not considered as Resource**
	Fuel Switching Electric to Gas	**2012 study needs update for space heating and DHW costs 2025**	**Timing for Keeyask I/S Gas heat as an Economic choice**
Export Markets	**Price Forecast**	**MISO Market Congestion, Carbon Tax. Brattle price OK? Is MH price high? Potomac (redacted)**	**Critical to $9.3 m export revenue forecast and comparison of Plans**
	Intertie	**MH to finance 750 MW line?**	**Critical- Plan 4 vs Plan 14**
	Contracts	**No firm WPS Contract**	**Condition Precedent**
Risk of Capital Escalation	**Capital Cost Estimates and Control**	**PP vulnerable to Capital Escalation. MPUB has no ongoing oversight of MH Capital Investment. MH estimates reviewed by Knight Piesold. Civil contract cost bids may provide confidence. (not filed)**	**Critical Issue-major risk to Preferred Plan MPUB to be given mandate re Capital Cost Reporting & Review**
Affordability of Electricity under PP	**Residential Bill Increases**	**Bill Increase PP 2023 46 % 2010-2013 12% (All Gas 2023 39%)**	**Affordability key issue per CES. Mitigation of Bill impacts required 2015-2025**
	Vulnerable Electric Heat Consumers	**Bill Increase PP 2023 46% -$852/yr (Relative to All Gas 39 %-$730/yr)**	
	Affordable Utility Rate Act Comparison	**Gap to other Provinces maintained in 2023 but narrowed due to higher electricity costs**	
Sustainability & Macro-Environment	**Sustainability/IRP**	**Maximization of cost effective energy efficiency and robust alternatives analysis central to sustainability analysis. Phasing of PP K + 22 could allow for Sustainability and IRP assessment**	**Is current record sufficiently robust to draw macro-economic conclusions? Phasing of Plan would allow detailed IRP and Macro Economic assessments in parallel with development of PP including Conawapa**
	Macro-Environmental Cumulative Impacts	**Uncertainty with respect to key elements. Additional information will provide superior information. MNP suggest more assessment and monitoring**	
Economic Evaluation and Transfers	**Economic Evaluation**	**Uncertainty related to inputs and to alternatives analysis. PP is an economic Option 250 MW intertie keeps a 2031 I/S date for C 750 MW intertie (and WPS + added investment) keeps a 2025+ ISD for C**	**Phasing of PP will allow better information for decisions on next steps. MB-CBA analysis can be made more robust**
	Economic Transfers	**Additional considerations re transfers to Ratepayers and First Nations**	
Overall Cost/Benefit	**Risks**	**PP may be an Economic option if negative social/macro-environmental issues can be/will be mitigated**	**Advancing Keeyask for export "opportunities" consistent with CES**
Conditions Precedent	**Licensing Contracts Intertie**	**CEC Recommendation WPS Contract execution and NEB Approval Financing of Intertie**	**Keeyask for Domestic Load would change timing and open other options**

POLICY OBSERVATIONS RELATED TO THE COST/BENEFIT OF PREFERRED PLAN - NFAT REVIEW

INTRODUCTION

Question

What is the Scope of your evidence?

Answer

I have been asked by CAC to:

I **Provide strategic policy observations, based on the CAC Consultants' views on the elements of the NFAT Review of the Manitoba Hydro Business Case and where appropriate reference to the evidence of MH and MPUB Independent Expert Consultants (IECs)**

II **With Reference to Manitoba's Clean Energy Strategy and other Guiding Documents, address additional policy considerations including affordability and Intergenerational equity.**

II **Offer observations, considerations and suggestions related to the NFAT Terms of Reference and potential outcomes from and next steps for, the NFAT Review**.

Question

Do you have any qualifications or caveats regarding this evidence?

Answer

Attempting to summarize the views from the evidence of the CAC consulting team in order to draw out the policy considerations addressed in this evidence is both difficult and selective. These experts will directly provide their own views and observations in testimony.

The Policy Observations are my ***preliminary views*** based on the evidentiary record as it currently stands. It is important to note that there are several pieces of evidence that still have to come in on the record.

As an example of the incomplete record, the responses to the information requests of the IECs were not available at the time the CAC Consulting Team had to file its evidence and the proposed evidence of the CAC MB socio-economic experts has not been filed.

I have not received all of La Capra Associates Report or all Manitoba Hydro responses to Interrogatories. Finally, receipt of the Clean Environment Commission Report regarding Keeyask may have a major impact on these views.

Prior to the presentation of my oral evidence, I expect to update and consolidate my recommendations after reviewing both written reports to be filed and further information which may become available.

It is implicit that based on a complete record, our client- CAC Manitoba-may adopt, change or modify the observations expressed herein in its final closing submission.

Question

Can you summarize the Key Documents upon which you relied?

Answer

These include the MH Business Case filing and IR responses, MPUB Terms of Reference, MPUB IEC evidence, Reports of CAC Manitoba experts, Provincial Energy Strategy, Legislation including the Affordable Utility Rates Act, Review of Closing Argument of CAC Manitoba in CEC Keeyask EIS.

Question

Do you have any further preliminary observations?

Answer

As a former Energy Policy practitioner and Utility regulator and in addition having participated in the 2003 MPUB/CEC Wuskwatim NFAT Review, I am well aware of the challenges faced by the Review Panel. These challenges include a Government Direction with a compressed timeframe, the enormous amount of sometimes conflicting information, the difficulties to assess the complex interactions between and the weighting to be placed on each element.

It is hoped that this evidence will provide the Review Panel with some useful "big picture" observations.

SUMMARY OF POLICY OBSERVATIONS BASED ON CAC CONSULTANTS' EVIDENCE

Question

What framework will you use to present the observations of CAC Consultants?

Answer

The following Socio-Economic Policy Framework and Elements will be used

Socio-Economic Policy Framework and Elements

The framework for this evidence is based on MH evidence summarized in the MH Business Plan and Interrogatory Responses. These have been used to formulate an overall perspective of the key Economic/Social/Sustainability elements of the Preferred Plan and shortlisted alternatives.

This approach allows me to summarize the CAC Consultant's observations for each Element and the relevant Sub-issues. We also note some of the observations of the MPUB EIC Reports. In most cases, I provide quotes from the record, rather than trying to paraphrase in my own words. While this may lengthen my report somewhat, I believe it provides important context to my observations.

It should be emphasised that this approach is **not** attempting to displace the traditional Need and Alternatives To (NFAT) framework which leads to the Preferred Plan. Rather it is a complementary perspective on the various socio-economic elements of costs and benefits and related trade-offs associated with the Preferred Plan and shortlisted alternatives.[1]

As noted in the Introduction, the second part of this Evidence attempts to place the policy observations in the cost/benefit assessment into the context of the Mandate of the MPUB related to the NFAT Review and considerations and to make suggestions that the MPUB can consider in formulating the

[1] Short listed alternatives as used in this evidence are the 5 Pathways and associated Plans that Manitoba Hydro has listed in the Business Case in several places, including Chapter 14 Table 14.1. All of these other than All Gas, have Keeyask as the first new generation. Manitoba Hydro concludes Plan 14 as Preferred, Plans 4 and 6 are ranked next from MH's Risk an economic benefit evaluations.

outcome of the NFAT Review-its Report and Recommendations.

Question

Can you summarize the key Elements you intend to address in your evidence?

Answer

The central Focus is the Socio-Economic Costs/Benefits of the Preferred Plan and shortlisted Alternatives. The observations and considerations assume that the alternatives are reduced to those that have significant Socio-Economic Cost and Benefit impacts. The Elements are:

1. Demand and Load Forecast-observations related to the evidence on Demand, the sub-issues such as price elasticity and DSM that may affect either the merits, priority or timing of the shortlisted plans and pathways

2. Export Markets is a limited set of observations on the price and accessibility of the US MISO area markets. These observations are based on available non confidential information on the record

3. Capital Escalation-this is not an area of focus for this evidence and there are limited observations mostly of a process nature

4. Sustainability and Macro-Environment-this element and sub-issues are of high priority to CAC and significant expert evidence has been filed. The observations are high level from the perspective of how energy policy and these considerations interact

5. Affordability is important to CAC. The impact of the Preferred Plan on Ratepayers and in particular Vulnerable Energy Consumers, is an area for key observations and considerations

6. Economic Evaluation and Transfers–observations on MH Economic and Risk assessments and the MC-CBA Account analysis impacting on the balancing of Risks and Costs and Benefits.

ELEMENT #1 NEED AND DOMESTIC ELECTRICITY DEMAND (INCLUDING PRICE ELASTICITY)

Question

Please present your evidence on element 1.

ANSWER

The excerpts below present relevant information from the MH Business Case and the Observations of Elenchus.

Manitoba Hydro

The Manitoba load is expected to grow in all sectors, the result of population growth, increased average energy use per residential customer and anticipated industrial and commercial expansion by a number of businesses. (Business Plan Executive Summary Page 10)

As outlined in Chapter 4, Manitoba Hydro's future DSM strategy involves an additional investment of $326 million (2012$) with expected energy savings of 1,552 GWh/year and 490 MW expected to be captured by 2027/28. Combined with energy savings achieved to date, total electrical savings of 3,113 GWh and 846 MW will be realized by 2027/28, with a cumulative investment of $762 million (2012$). The DSM/Power Smart initiatives included within the Preferred Development Plan are outlined in the 2013 – 2016 Power Smart Plan. (Appendix E)[2]

Elenchus MPUB EIC-Load forecast

In summary, it is our view that the NFAT process would be enhanced if Manitoba Hydro prepared a more thorough Electric Load Forecast with alternative economic and weather scenarios. A more thorough description of the forecasting methodology with full documentation of processes and any methodological changes, as well as within sample forecast accuracy would also allow for a more thorough assessment of the forecast reasonableness. A description of potential assumptions around the economic factors affecting Top Consumers and a range of scenarios would also allow stakeholders to more appropriately assess the risks around the forecast for that sector. Ideally, in addition to the five scenarios suggested above (and used until 2009 by Manitoba Hydro), scenarios that demonstrate the impact of selected market transformation scenarios, such as grid parity for small scale generation, would impact on future loads.[3]

Elenchus MPUB EIC - DSM

There is considerable uncertainty regarding how much load reduction from DSM upon which MH may rely at various points in the future. Elenchus concludes that this uncertainty, in isolation from other factors beyond the scope of thus report, is not so great that the proposed Keeyask Generating Station (GS) should be deferred. However, PUB may consider as a precondition to the authorization of Conawapa GS, that MH develop a more rigorous approach to the integration of DSM load reductions with system planning. The return to Integrated Resource Planning (IRP) is advised[4].

Question

Have CAC Consultants examined the MH analysis of Need that is driven by the Domestic Demand for power? What are the components and Issues?

[2] CAC/MH I-222.
[3] Elenchus, NFAT Review: A Review of Manitoba Hydro's Load Forecast, January 2014, pg iv.
[4] Elenchus, NFAT Review: A Review of Manitoba Hydro's Demand Side Management Plan, January 2014, pg1.

Answer

The evidence on Residential load forecasts includes population growth[5], economic growth, price elasticity/ demand[6]; fuel switching and DSM impacts[7].

In assessing the record with regard to load forecasting I noted the Report of Dr. Doug Gotham and Dr. Wayne Simpson and provide an excerpt relevant to my observations.

> Residential Basic Forecast
>
> Manitoba Hydro assumes the number of customers will change proportionately with population. This relies on the assumption that the number of people per household will not change. This has not been true in the past and is extremely unlikely to hold true in the future. The number of occupants per household will be affected by not only the number of people, but the relative ages of the population. For instance, if the fastest growing segment of the population is over 50, there will usually be fewer people per household in the future. Another factor affecting the number of occupants per household is personal income. As income increases, the number of occupants per household decreases. In our housing model, we project headship rates (the inverse of occupants per household) using a logit model that is a function of age, income, marital status, and the prior year's headship rate.
>
> Manitoba Hydro projects the number of dwellings that use electricity for heating from a five-year average and then uses that as an exogenous assumption to the end use model. This nullifies one of the major benefits of end-use modeling, which is the ability to simulate the economic trade-off of different technologies and fuel sources based on the capital and fuel costs of the different options. Ideally the number of new dwellings would be an exogenous input and the fuel choice decision would be handled endogenously by the model.[8]

Population & Economic Growth and Price Elasticity of Demand

Question

Please provide more observations on these issues, with specific reference to price and demand.

---

[5] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 14, pg 11. See also CAC/MH 1-028 and PUB/MH 1-002,

[6] CAC/MH 1-039; CAC/MH 1-170 and CAC/MH 1-171.

[7] CAC/MH 1-047b.

[8] Wayne Simpson & Doug Gotham, Standard Approaches to Load Forecasting and Review of Manitoba Hydro Load Forecast for Needs For and Alternatives To (NFAT), February 2014, Page 5.

Answer

MH forecasts robust load growth of 1.6% over the next 20 years[9] despite:

- almost no load growth in recent years (2007-12),
- projected real rate increases of 1.5-2% for the next 20 years[10], and
- forecast load growth of only 0.9% in the U.S. despite higher GDP growth forecasts for the U.S.

Specifically with regard to price and demand MH's response to IRs [11] indicates that for the Basic Residential Class with a price elasticity effect of 0.05, the demand relative to 2012/13 will be -6 GWh in 2013/14; -87 GWh in 2023/24; and -180 GWh in 2032/33. These forecast effects are relatively, small but when combined with other factors (see below) could change the domestic demand outlook materially

As observed by Dr. Gotham and Dr. Simpson

> The major missing factor in the load forecast is prices. The NFAT[12] admits that energy prices matter but makes no attempt to incorporate what amount to fairly substantial projected rate increases into its load forecast. Moreover, Hydro indicates that it does not pay attention to what is a fairly robust literature on the impact of prices on electricity demand from other jurisdictions. In response to the interrogatories[13], Manitoba Hydro did produce some correlations of prices with customer usage, but the results are based on a small number of points and a simple regression analysis that ignores the other important factors in the determination of customer demand. A more detailed analysis, or the application of results from better analyses elsewhere, is needed.[14]

Fuel Switching

Question

Do you have any observations related to Fuel Switching?

Answer

With regard to gas to electricity Fuel Switching, MH is forecasting continuation of increasing adoption of Electric Heat and Domestic Hot Water Heat in South gas served areas. This results in Load Growth 2012/13-2032/33 from 4255 GWh to 5518 GWh for Space Heating and from 7219 GWh to 9454 GWh for

[9] CAC/MH I-168a & b.
[10] CAC/MH I-169a.
[11] GAC-CAC/MH II-001b.
[12] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Executive Summary, pg 9.
[13] GAC-CAC/MH II-001a and b.
[14] Wayne Simpson & Doug Gotham, Standard Approaches to Load Forecasting and Review of Manitoba Hydro Load Forecast for Needs For and Alternatives To (NFAT), February 2014, Page 8.

Domestic Hot Water.

I am concerned there is no updated evidence on the relative economics of gas and electricity heating other than the 2012 Fuel Switching Report[15]. The main reason for concern is the need for a forecast of relative heating costs out to 2025 to support this increased amount of forecast fuel switching[16].

Demand Side Management (DSM)

Question

What observations do you draw from your review of evidence relating to DSM?

Answer

In response to Interrogatories[17] [18] MH has provided estimates for load and energy savings for 1.5x and 4x DSM . This data indicates that by 2022/23 the Winter Peak Demand could be reduced by 11% or 577MW and Dependable Energy Demand by 9.3 % or 2667 MWh.

I have reviewed the Report of Mr. Phillipe Dunsky providing evidence on behalf of the Green Action Centre and CAC MB. Dunsky Consultants propose a higher Load Reduction target based on increased DSM:

> We assessed, during the 2012/13 & 2013/14 General Rate Application, what DSM savings could be achieved if Manitoba Hydro was to ramp-up its DSM efforts. At that time, we suggested that Manitoba Hydro could at a minimum ramp-up its DSM savings to 1.0% by 2015, and sustain this level of savings in the long run. We also presented two more aggressive scenarios, and concluded that while we believed they would be achievable, it was more prudent to wait for the results of a potential study before committing.
>
> As we saw previously, the potential study has since been released. This study points to a "market potential" of approximately 1.1% per year on average, which is on the low end of results from similar studies elsewhere. More importantly, the study suffers significant limitations, both in scope and methodology, which systematically understate the cost-effective, achievable potential.
>
> Given these considerations, I am now more comfortable in suggesting that, under certain conditions, Manitoba Hydro could commit to somewhat more aggressive scenarios, assuming:

[15] Manitoba Hydro, 2012/2013 & 2013/2014 General Rate Application, Appendix 26: Economic, Load, and Environmental Impacts of Fuel Switching in Manitoba, August 2012.

[16] CAC/MH I-222. See also Manitoba Hydro, Needs For and Alternatives To: Corporate Documents, August 2013, Appendix C, Table 14.

[17] PUB/MH I-210a.

[18] PUB/MH II-392b.

- a reasonable ramp-up period,
- extra time to allow for time lost in the past year, and a strong commitment by both the PUB and Manitoba Hydro to tracking, evaluating, and reporting on performance.

The two revised scenarios are as follows:

Scenario A: The more aggressive scenario would achieve an average of 1.3% savings/year from utility programs alone (1.5% including C&S). This includes a 6-year ramp-up period.

Scenario B: The more cautious scenario would achieve 1.1% savings/year on average from utility programs alone (1.3% including C&S). This includes a 5-year ramp-up period. [19]

The more aggressive scenario (Scenario A) would exceed the "market" potential identified by Manitoba Hydro. This reflects the numerous additional savings opportunities not accounted for by that study, as well as the other limitations I noted previously (see Figure 8). It would require strong commitment and innovative approaches from Manitoba Hydro, but is achievable, and still far lower than what some other leaders are targeting and achieving. I note that this scenario effectively means that Manitoba would achieve neighbouring Minnesota's current performance in 5 years' time.[20]

The less aggressive scenario (Scenario B) would include a somewhat longer ramp-up time and top off at a somewhat lower rate than Scenario A. From a programs perspective, after the 5- year ramp-up, Manitoba Hydro's savings would still fall short of Nova Scotia's latest annual performance results.[21] When accounting for all savings opportunities, this scenario is similar to BC Hydro's latest 10-year target.

…

As the reader can see, Manitoba Hydro's 1.5x scenario only slightly increases the savings achieved by the Power Smart Plans, achieving an average savings of 0.6% over the period – including savings from codes and standards – due in part to the current plan's rapid decline. The 4x scenario is more aggressive, especially during the first years, but the current plan's decline once again leads to a dramatic drop over time, producing average annual savings of only 1.1%/yr (again, including savings from C&S).

…

...our two scenarios begin at current Power Smart Plan levels, proceed to ramp up over 5-6 years to levels currently achieved in such places as Minnesota or Nova Scotia, and hold constant thereafter. I believe this is a more realistic path for Manitoba Hydro than its current "4x" scenario, both in allowing for initial ramp-up, and in accounting for future opportunities.[22]

---

[19] See Philippe Dunsky, The Role and Value of Demand-Side Management in Manitoba Hydro's Resource Planning Process, February 3, 2014, Figure 11.

20 Minnesota utilities currently achieve 1.4% from programs alone, and at least 1.5% when including codes and standards.

21 In its most recent, fully-evaluated year (2012), Efficiency Nova Scotia achieved 1.4% savings/load from energy efficiency programs, and 1.5% when including the codes and standards it could have influenced.

22 Philippe Dunsky, The Role and Value of Demand-Side Management in Manitoba Hydro's Resource Planning Process, February 3, 2014, pgs 29 – 32.

Mr. Dunsky goes on to comment:

> "As I stated last year, the cost of achieving DSM savings has remained fairly constant over the past couple of decades, and evidence strongly suggests that while achieving additional savings may require higher incentives and efforts, added costs are commonly offset, at least in part, by economies of scale.
>
> In my testimony last year, I examined the actual savings (energy saved/energy sold ratio) and costs ($/first-year kWh) from a broad range of states and provinces. My conclusion was that there is only a very weak relationship between unit costs and depth of savings, and that relationship was negative, meaning that, if anything, increasing savings may lead to a decrease in the unit cost of savings. This is largely consistent with my experience across a broad array of program administrators: average costs needn't materially increase to achieve greater savings, because the move to some higher-cost opportunities can be offset by increased efficiencies and market intelligence.
>
> I have now updated that analysis, using the latest results from DSM programs across the continent. This new analysis largely confirms the previous findings: there is essentially no relationship between depth of savings and unit costs (although the negligible relation that is observed is positive this time). Manitoba Hydro's most recent costs are slightly above average; this is not surprising in that Canadian regions commonly face somewhat higher costs.
>
> The plot suggests that most aggressive DSM savings, including the two Canadian cohorts, are being secured at costs in the range of 30 to 40 cents/first-year kWh. Assuming a real discount rate of 5.05% and an average useful life of 15 years, this implies unit costs in the range of 3¢/kWh to 4¢/kWh. "[23]

Question

If the Load forecast was underestimating price effects, DSM, and fuel switching, or is otherwise in error, what are the implications?

Answer

Based on the MH 2013 Load Forecast Update, the need dates have changed to:

- For capacity – 2026/27 [24]
- For energy – 2023/24 [25]

[23] Philippe Dunsky, The Role and Value of Demand-Side Management in Manitoba Hydro's Resource Planning Process, February 3, 2014, pgs 33-34.

[24] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 12, pg 5; Manitoba Hydro, Needs For and Alternatives To: Supporting Documents – Volume 1, August 2013, Appendix 4.2, pg 120.

[25] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 12, pg 5; Manitoba Hydro, Needs For and Alternatives To: Supporting Documents – Volume 1, August 2013, Appendix 4.2, pg 122.

For illustrative purposes only, Dr. Gotham and Dr. Simpson provide a "back of the envelope" discussion of the potential implications of a different approach to estimating price effects:

> Hydro projects total load growth of about 7,899 Gwh, from 24,367 Gwh in 2011/12 to 32,266 Gwh in 2031/32 (NFAT, ch.12, 2-3). It appears that residential load growth is more rapid than other growth, but assume that only one-third of this growth is residential, or 2,633 Gwh. If actual growth is only one-third of that figure because of reduced household usage due to rising electricity prices, as suggested above, then load growth would be reduced by more than 1,755 Gwh. The NFAT (ch.12, p.2) suggests that one year of load growth constitutes 420 Gwh, so this amounts to a reduction in load growth of 4.2 years. By comparison, the revisions to the load forecast for 2013 amount to a reduction in load growth of 3 years by 2031/32, which defers the need for new resources by one year. This suggests that electricity conservation in the residential customer base alone, arising from the rate increases projected by Hydro, would defer the need for new resources by at least another year. Since the commercial sector would also be sensitive to increases in the price of electricity, reductions in load growth in the General Service Mass Market and Top Customer sectors might be expected to defer load growth correspondingly by as much as three years. While this is only illustrative, these are quite significant numbers that would substantially affect planning.[26]

It is suggested that critical load forecast outcomes could include both much later In-Service dates and potentially changes to the priority of Plan 14 vs Plan 4. They also significantly underestimate the potential of DSM both for load reduction and as a critical resource.

ELEMENT #2 EXPORT MARKETS

Question

Please discuss the information you considered related to export markets?

Answer

Two Important Sub-issues are Export Price Forecasts and the Transmission Intertie.

<u>Export Price Forecasts</u>

Manitoba Hydro

[26] Wayne Simpson & Doug Gotham, Standard Approaches to Load Forecasting and Review of Manitoba Hydro Load Forecast for Needs For and Alternatives To (NFAT), February 2014, Page 5.

Under the MPUB Confidentiality Guidelines, the MH gas and electricity data and assumptions are not disclosed on the public record. The Brattle Group forecast is the one exception.
Manitoba Hydro has also selected Natural gas/electricity export prices as a factor for its Probability Assessment. (The other factors are the discount rate and capital costs.)

The main independent Expert Report on this subject is the Potomac Economics Report (redacted)**.**

Potomac Economics EIC Report
Our forecast is based on MISO supply and demand characteristics and recent market outcomes. Changes in these characteristics and outcomes are forecasted for future years based on assumptions regarding the evolution of key drivers noted above.

Our results generally forecast lower prices than Manitoba Hydro's consultants due to assumptions on key inputs. In particular, our models generally rely on lower natural gas price forecasts, lower growth rates of demand, and lower quantities of coal plant retirements. As explained herein, our point-of-view on these key assumptions is based on the reference case used by the US Energy Information Agency (ETA) in its 2013 Annual Energy Outlook.

La Capra Associates Report

Because of the Confidentiality Order, as noted above, we cannot comment on the Manitoba Hydro natural gas and electricity price forecasts, We note the redacted public report of La Capra Associates Technical Appendix 6.

Question

Do CAC consultants have any observations on treatment of forecast Export prices and revenues?

Answer

Based on analysis of responses to interrogatories, we suggest confidence in the forecast is critical to the economics of the Preferred Plan.

Dr. Doug Gotham observes:

- Based on the market valuation, export sales revenue represents a very significant part of the plan to meet expenditures (over $9.3 billion in present value from exports). Thus, if export prices are even slightly lower than the projected price, there will be significantly reduced revenue.
- Alternative plans have reduced (but still significant) revenue from export sales.
  Manitoba Hydro uses an export price forecast that is an average of six forecasts provided by various consultants. With the exception of one of these forecasts, prepared by The Brattle Group, these forecasts are not available due to the proprietary nature of the models and the competitively sensitive nature of the information. Furthermore, the assumptions behind

these forecasts are not available. Thus, it is not possible to speak definitively about the reasonability of the export price forecast and assumptions.

Manitoba Hydro did include supporting information in its Business Case that raises concerns about the assumptions behind its export price forecast and thus, about the export price forecast itself.

- This document looks at three general areas: the applicability of the supporting information provided by Manitoba Hydro, the implication of the inclusion of carbon costs in the export price forecast, and the reasonability of the export price forecast from The Brattle Group.
- While Manitoba Hydro does not acknowledge it, there is substantial evidence from multiple sources that significant congestion exists between Minnesota and Wisconsin and the rest of the MISO market. This congestion has the potential to reduce market prices in the region into which Manitoba Hydro would be exporting. In turn, this would reduce the revenue from sales.
- The actual export price forecast and the assumptions behind it are not known due to confidentiality concerns. Supplemental evidence provided by Manitoba Hydro was in the range of reasonable expectations, but likely on the high end of the range. The reasons for this include using load forecasts that were not representative of the export region and that did not include the impact of higher prices that would be consistent with the CO2 costs assumed by Manitoba Hydro.
- Of the six proprietary forecasts used to develop Manitoba Hydro's export price forecast, information was only available for the forecast from The Brattle Group. The load growth and resultant price projections were reasonable (similar to the MISO MTEP12 and higher than Potomac Economics). The Brattle Group's forecast included a price reduction due to transmission losses and congestion similar to what was seen elsewhere, used a load forecast that was similar to others for that region, and included a reduction in load when prices increase.
- If the electricity price projections from The Brattle Group are indicative of Manitoba Hydro's forecast from the average of the vendor forecasts, it is reasonable. If the Manitoba Hydro forecast is higher than the Brattle forecast, there is cause for concern.
- 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.[27]

As noted above, one of the critical issues for Export prices and revenues is the MH forecasts of US Carbon Pricing and Renewable Portfolio Standards. The Potomac, MNP and La Capra Associates work (Redacted Reports) for the MPUB on these issues is noted.

Transmission Intertie

Question

Please provide any observations relating to the transmission intertie?

[27] Doug Gotham, Review of Manitoba Hydro Export Price Forecast for Needs For and Alternatives To (NFAT), February 2014, pgs 1, 9.

Answer

Relevant excerpts from Manitoba Hydro and Power Engineering are provided below.

Manitoba Hydro

The evaluations of Pathways 4 and 5 assume that Manitoba Hydro will be investing in and owning a portion of the U.S. segment of the 750 MW, 500 kV interconnection and that the percentage amount owned stays constant for the life of the interconnection asset. It will be Manitoba Hydro's intent to arrange for some or all of the Manitoba Hydro ownership to be transferred to another owner for the economic benefit of Manitoba Hydro as soon as an appropriate opportunity can be developed. Manitoba Hydro notes that recent more detailed cost estimates are indicating that the costs of the U.S. portion of the 750 MW interconnection will be less than originally estimated. This would improve the economics of the interconnection in Pathways 4 and 5.[28]

Power Engineering EIC Report

The MCON filing Section 3, further elaborates on project ownership and contractual arrangements between MH and MP. Information from the filing is included below to highlight the contractual sharing arrangements, as interpreted by POWER, for the project:

- Minnesota Power will have majority ownership (51%) of the Project.
- The balance of the Project (49%) will be owned by a subsidiary of Manitoba Hydro.
- While Minnesota Power will own 51% of the Project, Minnesota Power's customers will be financially responsible for only 33.3% of the Project's revenue requirements.
- Minnesota Power will receive an amount equal to the balance of the revenue requirements associated with its ownership percentage (17.7%) from Manitoba Hydro by way of a scheduling fee arrangement included in the proposed 133 MW Renewable Optimization Agreements.
- While the Project will have a transfer capability of approximately 750 MW, Minnesota Power and its customers will be responsible for the revenue requirements associated with 250 MW of that total capability.
- An Operation and Maintenance agreement will invoice MH monthly for its 49% pro rata share of Operation and Maintenance expenses associated with the Project.
- Facilities on the Canadian side of the border will be owned and operated by Manitoba Hydro
- Minnesota Power has signed the Commission-approved 250 MW Agreements and the 133 MW Renewable Optimization Agreements.

POWER's analysis associated with this scope item focused on technical aspects of proposed facilities, and did not include assessment of project economics. However, it should be clear that there will be an economic benefit to Manitoba resulting from marketing portions of the proposed Keeyask and Conawapa generation. Sales revenue will offset a portion of the financing and operating costs associated with planned hydro facilities and MH-US transmission. MH appears to be uniquely positioned at this time to develop generating capacity beyond that required for Manitoba power supply at the scheduled energization dates for the proposed facilities. Additional economic assessment can identify benefits of MH transactions.

In conclusion, POWER believes that MH has demonstrated a technical need for US transmission,

[28] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Executive Summary, pgs 32 – 33.

namely the new 500 kV line and network upgrades in support of incrementing the existing 2175MW interconnection to 2925MW. Pending contract negotiations and the ongoing activity to finalize transmission studies to determine final network upgrades will ultimately determine project financing and cost sharing. ***In the interim***, capital and O&M cost sharing is based primarily on terms of the latest Power Purchase Agreement between Minnesota Power and Manitoba Hydro.[29]

Question

Has the CAC Consulting Team examined the evidence on this Sub-Issue?

Answer

This cost/benefit sub-element has a major impact on both the costs of accessing the MP and WPS markets as well as upon the net benefits from export revenues. In addition, it is important for Manitoba to access US power imports at certain critical periods.

Question

What are the high level sub-issues and the CAC Consultants' observations on these?

Answer

CAC Consultants are concerned with the need for and cost of transmission, particularly to connect to the WPS market.

A preliminary analysis of Mr. William Harper which primarily relied on MH data inputs suggests that:

- The analysis in this Report also indicates that, if there is flexibility for the Development Plan to adapt to changing circumstances (i.e., no firm commitment at this point to type or timing of new generation following Keeyask), a 750 MW intertie is more beneficial from an economic perspective than a 250 MW intertie, provided a firm power contract similar to that under negotiation with WPS is in place and additional investors can be found for the US portion of the intertie. Otherwise the 250 MW intertie is likely to be more beneficial, although only marginally.
- With respect to protecting an in-service date for Conawapa, the analysis indicates that there is benefit to protecting an in-service date in the early 2030's regardless of whether a 230 kV or 750 kV intertie is build and, in the latter case, regardless of whether or not there is WPS contract. The analysis also suggests that, with a 750 kV intertie, there is economic benefit to protecting a mid 2020's in-service date ***but only if there is a contract with WPS***.[30] [*emphasis added*]

[29] Power Engineers, Manitoba Hydro NFAT IEC Transmission Line Construction and Management Report, January 2014, pages 30 –31.

[30] Econalysis Consulting Services, Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan: Report Prepared for The Consumers Association of Canada (Manitoba) Inc., February 4, 2014, Part 2, pg 26.

It is also important to observe that the Provincial Clean Energy Strategy references the potential export opportunity:

> • New export contracts worth over $4 billion are already on offer, with the potential to be added to, if desired. The proceeds will help pay down the cost of the projects, *while helping sustain Manitoba's low rates for decades*.[31]

It is noted that the MH evidence and Interrogatory Responses on the intertie and export contracts appear to confirm that for WPS, currently only a term sheet has been signed. Accordingly there is a reasonable chance that there will be no **firm** WPS Contract prior to the MPUB NFAT Report. The PUB may need to place conditions/caveats in its Report to the effect that this issue needs to considered more fully beyond the constraints of the time frame for the NFAT Review.

We suggest another major export contract issue is the costs of the US portion of the 750MW transmission intertie. It is suggested that the exposure of MH relates to both the US regulatory process and if MH has to finance the intertie, to the Impact on the Costs and Benefits of the Preferred Plan, including potentially Plan 14 vs Plan 15.

ELEMENT #3 RISKS OF CAPITAL ESCALATION

Question

Please summarize your observations relating to the issue of Capital Escalation?

Answer

I have reviewed the Knight Piesold EIC Report and provide relevant excerpt below:

Knight Piesold EIC Report: High Level Assessment of the Construction Planning and Management of Construction Costs of Preferred Development Plan

At a high level, KP believes that the construction planning and management of the construction costs associated with Hydro's preferred development plan have been done in an appropriately detailed and professional manner. It is clear that much effort has been expended and continues to be expended by Hydro in an effort to ensure the successful development of the projects. KP does have reservations about some of the details, in particular some parts of the cost estimate process and the final results, but these should largely be reconciled ***once the civil tender costs are known*** and the extra scope that has been assigned to KP is fulfilled.[32]

Question

Have CAC consultants considered the implications of material Capital Cost Escalation?

Answer

[31] Manitoba Innovation, Energy and Mines, Focused on What Matters Most: Manitoba's Clean Energy Strategy, December 2012, pg 14.

[32] Knight Piésold Consulting, Manitoba Public Utilities Board NFAT Review of Keeyask and Conawapa GS: Knight Piésold Independent Expert Consultant Report, January 23, 2014, pg iv.

This has not been an area of focus, except to review responses to Interrogatories and the Reports by MPUB EICs.

The direct management of the Capital Program Costs is the responsibility of Manitoba Hydro. We note that the MPUB has no ongoing role in reviewing MH's Capital plans.

CAC consultants note that the Capital Costs for both Keeyask and Conawapa are the P50 values (except for sensitivity analysis). There is a concern that rather than P50 values, expected values be used.

As part of the Economic Assessment and Risk Analysis, the related implications regarding the Financial and other (for example electricity rates) impacts of capital escalation on the costs and benefits of the Project(s) were reviewed.

Question

Given the considerable exposure and financial risks to be managed that would affect the Economic outcomes of the Preferred Plan, do you have any suggestions for the MPUB to consider in this regard?

Answer

The Financial and other consequences of Capital Escalation are so large it is suggested that the MPUB Panel consider recommending that MH be required to provide the Government and MPUB with comprehensive Public Domain annual Cost/Financial reports. If significant cost escalation begins to be evident, then since the MPUB does not have Statutory authority to review MH Capital Plans, we suggest the Government should authorize the MPUB to hold an inquiry on the Report in the public interest.

In terms of ongoing accountability for major projects I also note the CAC recommendations to the CEC regarding Adaptive Environmental Management and the Role of the Monitoring Advisory Committee (MAC) in the development of Keeyask.[33]

This proposed Financial Reporting would be complementary and in combination with the MAC and Environmental Audits would go some way to protect the Public Interest (including First Nations)

Element #4 Sustainability and Macro-Environment

Question

Please provide an overview of your observations relating to sustainability and macro-environmental matters?

[33] Consumers' Association of Canada (Manitoba Branch), Keeyask – A Watershed Decision: Closing Arguments, Submitted to the Manitoba CEC, January 14, 2014, pgs 115 – 116.

Answer

This is addressed this in four inter-related sub-components.

- Provincial Policy including the Sustainability Act
- The MH Planning Process
- Macro-Environmental Considerations related to Preferred Plan
- Alternatives that may affect development of Preferred Plan or timing

The Sustainability Act

Question:

What are the main considerations?

Answer:

With regard to the Provincial Sustainability Legislation[34] and based upon advice from legal counsel, CAC Consultants understand that it would apply to Manitoba Hydro operations in general and specifically to the Planning and Decision process related to development and implementation of the Preferred Plan.[35] CAC MB Consultants are aware that during the course of the Keeyask EIS, CAC MB did not take a position on whether the Keeyask project made a net positive contribution to sustainability but that it did conclude that:

> the imposition of Keeyask upon a profoundly disturbed ecosystem would have significant adverse environmental effects;

With regard to the Government/MH Partnership with KCN the recommendation in CAC's closing argument to CEC is noted:[36]

> •the historic and ongoing effects of hydro-electric development have been to profoundly disrupt the relationship of the Cree Nations within their communities and with their traditional lands;

34 The *Sustainable Development Act*, CCSM c S270; key sections of *The Environment Act,* CCSM c E125; and the *Canadian Environmental Assessment Act,* SC 2012, c 19, s 52.

35 Consumers' Association of Canada (Manitoba Branch), Keeyask – A Watershed Decision: Closing Arguments, Submitted to the Manitoba CEC, January 14, 2014, pg 55: "During the CEC Hearing, CAC Manitoba relied upon the Principles of Sustainable Development to propose the following criteria: Has the Proponent demonstrated that the project will not have significant adverse environmental, economic, human health and social effects? Has the Proponent demonstrated that the Project will make a net positive contribution to sustainability?"

36 Consumers' Association of Canada (Manitoba Branch), Keeyask – A Watershed Decision: Closing Arguments, Submitted to the Manitoba CEC, January 14, 2014, pg 89.

- the outcome of the choice to enter into the Keeyask Partnership with its resultant impacts upon traditional waters and land is uncertain, with the potential to exacerbate existing damage to the relationship or to renew it.

MH Planning Process

Question:

Are there other key considerations?

Answer

It is **suggested** that the key crossover planning issue (relative to an EIS) for the MPUB NFAT Review is the Sustainability of the Preferred Plan when assessed in an Integrated Resource Planning framework. The reason for suggesting more attention to this attribute is that in my view, the total value of the Hydro Energy Resource cannot be monetized. The sustainability considerations of proceeding with the Preferred Plan are much larger in scope.

•

It is observed that the MH Planning process may not adequately address all of the alternatives to provide the most cost effective, environmentally appropriate energy services for Manitobans[37], specifically DSM, fuel switching in concert with new local and traditional generation in an integrated manner. We suggest MH Stress Tests on DSM may not adequately address this or whether a change in-service date could provide opportunities for integration of other resources, both demand side resources such as Demand Reduction Programs and supply side options such as proceeding with Conawapa.

Economic Evaluations provided by MH are based on discrete bundles of resources rather than an integrated package of demand side and supply side resources. It is suggested that as a result there is not an optimum a mix of viable cost-effective options to meet the electricity needs of Manitoba in the planning period

It is observed that MH's mandate could be interpreted to include *Providing reliable and economical electricity services to*

- ensure system capacity for reliable provision of affordable energy to meet current and emerging needs and opportunities for lasting benefits, without impairing future opportunities or undermining larger socio-ecological system integrity

- design for maximum net benefits over the long term, recognizing both conventionally accounted factors and important benefits and costs that are not included in conventional pricing

[37] Kyrke Gaudreau & Robert Gibson, Framework for Sustainability-based Assessment for Manitoba Hydro's Needs For and Alternatives To (NFAT) Assessment of Manitoba Hydro's Preferred Development Plan and Alternatives, February 3, 2014.

It is observed the above observed shortfall in approach is not simply a timing issue, but rather as noted by CAC Consultants and Elenchus is a result of the MH analysis not being a complete IRP evaluation.

The observation of Dr. Gaudreau and Dr. Gibson in the context of the NFAT assessment is worthy of note:

> Sustainability-based decision-making is necessary to ensure long-term improvement in human and natural welfare. The decisions to be made concerning options for future electrical power system initiatives in Manitoba – including Manitoba Hydro's preferred power system plan – informed by the NFAT assessment will inevitable affect and be influenced by many critical local, regional and global issues of the 21st century. Furthermore, the significance of the near term and legacy effects of the proposed generating projects and other options makes it imperative to fairly share impacts and benefits both within and between generations. This is best accomplished through an assessment of the full suite of alternatives against a comprehensive set of sustainability criteria.[38]

Macro-Environmental Aspects of the NFAT Review

Question

Can you provide your observations on the macro-environmental aspects of the NFAT Review?

Answer

An excerpt from the commentary of MNP is provided

MNP EIC Report
Executive Summary
MNP is of the opinion that the supporting analysis of macro environmental impacts included in Manitoba Hydro's NFAT filing is satisfactory for the purposes of this hearing, with several notable limitations and potential opportunities for further consideration and/or improvement. Generally, the net environmental benefits of Manitoba Hydro's (MH) preferred plan are found to outweigh its overall environmental costs in a regional and global context. Although measurement and prioritization of the full macro environmental costs and benefits are inherently challenging to evaluate against each other, it is our opinion that the expected costs and risks are acceptable elements of projects of this nature.

By and large, the preferred plan's consideration for resource conservation, sustainable energy development and avoidance of contribution to ongoing human-driven climate change increases the

[38] Kyrke Gaudreau & Robert Gibson, Framework for Sustainability-based Assessment for Manitoba Hydro's Needs For and Alternatives To (NFAT) Assessment of Manitoba Hydro's Preferred Development Plan and Alternatives, February 3, 2014, pgs 33 – 34.

attractiveness of the projects in comparison to most of the alternative plans studied as part of the NFAT. The preferred plan also provides the most upside value in a policy scenario that explicitly merits the avoidance of carbon emissions and provides mid-continent regional benefits that support reduction of the continued reliance on more intensely emitting forms of generation.
Conversely, some local environmental risks, specifically related to the alteration of land and aquatic ecosystems, are of concern and should be carefully weighed and mitigated.
MH's analysis provides an acceptable narrative of the macro environmental risks and concerns. That said, the conclusions of MH's filing do not always provide the Public Utilities Board Review Panel with a full set of assessment results and scenarios for consideration. Limitations of the filing include some lack of transparency around key assumptions; limited estimation of mitigation costs due in part to unique environmental impacts and reliance on concurrent studies (e.g. CEC's EIS) yet to be concluded. This report is intended to identify and in some cases offer further analysis related to these limitations.

It is acknowledged that the Clean Environment Commission is conducting and will be conducting direct project-specific environmental assessments of each preferred plan project. These hearings provide a more fulsome analysis and decision-making process as it relates to environmental issues. The purpose of the NFAT hearing is not to duplicate an already rigorous review of environmental issues and impacts. In our view, there is insufficient examination of some key issues in the NFAT filing to provide the Review Panel with enough information upon which to base robust and informed commentary regarding the environmental externalities and related direct costs associated with development plan projects.

The findings of this report offer incremental analysis, augmented sensitivities and further review of analysis captured from other regulatory processes of the Keeyask and/or Conawapa projects, or general research on similar projects and experiences.

MNP provides an extensive List of Observations and Further Considerations related to Climate Change, Greenhouse Gas Emissions and Macro-Environmental consequences related to Water Regime, Caribou Lake Sturgeon and other at risk Fauna.

Question

Please provide observations on the evidence of the CAC MB consultants on this issue

Answer

The report of Dr. Jill Gunn seeks to assist to the NFAT review panel by posing four critical themes for review:

(1) While hydro-electric power has been the power generation source of choice in the past in Manitoba, it may not be preferred in the future. **What is the preferred future direction for long-term energy infrastructure investment in Manitoba?**

(2) The Nelson sub-watershed has already been substantially altered by hydroelectric development, and it is agreed past alterations have been cumulatively significant (Noble and Gunn 2013). **What is the vision for this region, and can or should it sustain further development?**

(3) The NFAT review represents a strategic policy decision. **What are the values and/or performance indicators against which the Plan and its alternatives are being assessed?**

(4) All of the power supply options will have profound potential impacts on the environment, and that trade-offs 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?

The primary observation with regard to Macro Environmental aspects of the Preferred Plan is there are significant areas of uncertainty and gaps in the Hydro Resource Assessment still to be addressed including the Keeyask EIS report and the Provincial commitment to a Regional Cumulative Effects Assessment of the Nelson River Watershed.

This suggests that caution should be exercised in evaluating claims regarding macro-economic effects until more information is available.

Alternatives that could affect development of Preferred Plan or timing

Question

Please provide your observations regarding alternatives that could affect the development of the Preferred Plan or its timing?

Answer

As part of applying Integrated Resources Planning to further development of the Preferred Plan, it is suggested that MH consider inclusion of the following:

- The new 2014 PowerSmart Plan is expected to mirror a 1.5X DSM scenario, the DSM Target but should be based upon a ramp up to an annual reduction of 1.3-1.5% in energy demand (GWh), and a similar target for winter peak reductions (MW)[39] to the extent they are needed to meet peak projections. Critically, incremental savings should be *maintained* thereafter and for the foreseeable future.
- Assessment of Solar Power Grid Parity i.e. the timeframe for Solar to meet comparable conventional generation costs based on Levelized Unit Costs[40].

[39] See scenarios in Philippe Dunsky, The Role and Value of Demand-Side Management in Manitoba Hydro's Resource Planning Process, February 3, 2014.

[40] See scenarios in Philippe Dunsky, The Role and Value of Demand-Side Management in Manitoba Hydro's

- Although Wind/C26 did not rank in the shortlisted pathways and plans, an assessment of Increasing Grid-Connected Wind Resources.

ELEMENT #5 AFFORDABILITY OF PREFERRED PLAN

Question

Has the important issue of the "Affordability" of the Preferred Plan been considered?

Answer

We have considered "Affordability" purely from a MH customer perspective in three ways:

- Rates and customer bills in context of the future cost of power for average Manitobans
- Vulnerable Consumers impact - the future cost of power as a percentage of income for Seniors & Low Income Manitobans[41]
- AURA-the relative cost of power as part of the Government **Affordable Utility Rate Act** comparison.

Specifically with regard to Vulnerable Consumers, an assessment by Mr. Harvey Stevens and Dr. Wayne Simpson suggest that:

> Over the ten year period between 2000 and 2009, real electricity rates showed a fluctuation of – 5 per cent to + 6 percent –first falling between 2000 and 2003, then eventually rising by 6 per cent in 2009 to a cost of $7.08 per 100 kWh. The proposed real rate increases of 2 per cent per year between 2015 and 2032 will result in a rise in the cost of electricity to $10.12 in 2009$.
>
> This analysis has shown that the historical fluctuations in the price of electricity affected how households allocated their spending as well as the overall balance they achieved between their available income and expenditures. The rising cost of electricity resulted in lower consumption of necessities like food, shelter, clothing and transportation by the low income household and a worsening of their already deficit position. Among the near low income household, there was an even more pronounced drop in spending on food and an even larger negative impact on their household balance. By comparison, for the non low income household, their overall household balance will improve.

Resource Planning Process, February 3, 2014, pg 37.

[41] Vulnerable Consumers are defined here as Families (1-7 persons) with an income that meets 125% of the Statistics Canada After Tax LICO (2011 data) that own their dwelling. It is noted 63,000 and are Electric Heat customers (CAC/MH I-189b).

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.[42]

Question

What are the high level observations from your own assessment?

Answer

A key part of the Government Clean Energy Strategy is the Affordable Utility Rate Act (Bill 18) as described below:

> **Keeping Rates Low**
> • Place Bill 18 – *The Affordable Utility Rate Accountability Act* – into law to ensure the lowest cost in Canada for a bundle of utility services– that is, the combined rates for electricity for home use, natural gas for home heating and automobile insurance.
> • Within the context of *The Affordable Utility Rate Accountability Act*, support predictable, moderate rate increases for Manitoba Hydro over the coming years. The rates should be sufficient to fund the renewal of existing infrastructure; develop new generation, transmission and distribution capacity to serve growing demand; and assure continued reliable service to Manitobans.[43]

Question

What analysis have you done on affordability?

Answer

In Appendix A[44] and B[45] of my evidence, I analyze whether the objective of moderate increases is achieved for average customers and for more vulnerable customers.

The base rate/bill analyses use Manitoba Hydro assumptions regarding the impact of the Preferred Plan

[42] Harvey Stevens & Wayne Simpson, Impact of Increases in Electricity Rates on Low and Non Low Income Households in Manitoba, February 2014, pg 11.

[43] Manitoba Innovation, Energy and Mines, Focused on What Matters Most: Manitoba's Clean Energy Strategy, December 2012, pg 3.

44 The base rate/bill analyses use Manitoba Hydro Assumptions regarding the impact of the Preferred Plan on rates and annual electricity bills for average Manitoba Hydro Customers.

45The Vulnerable Consumer Bill analysis uses Low Income Cut Off (LICO) data to compare the status quo costs to future costs for vulnerable consumers.

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.

It could be argued that absolute comparisons to today's rates and Electricity Bills are not appropriate and under the MH Load Growth Scenario, the relative future rate and bill impacts on ratepayers should be compared to rates resulting from the All Gas Base Plan. Under the All Gas Plan, even with the phase out of Brandon Coal, construction of new gas generation plant may not be required in the period to 2023+. This is especially true if load growth is lower and material reductions in demand can be realized due to DSM and Fuel Switching.

While noting this All Gas comparison is a useful benchmark for relative economic and risk analysis, it is not an appropriate point of reference for future Rates and Bill increases. A more realistic reference point is the most recent rate and bill increases approved by the MPUB, which are an average of 3% a year from 2010-2013 (Appendix A Table C).

MH projections are that based on the Preferred Plan, average Residential Rates will increase at twice of the rate of inflation-an annual increase of 3.95% and a cumulative 108% over the long term outlook time period. However, the impacts in the early years particularly on Vulnerable Consumers are more material and in our view require greater mitigation. The Preferred Plan has about the highest average rate increase to 2031/32 – but the lowest annual rate increase over the long term (50 years).

However, the analysis of rate impacts in the period 2013-2025 (Appendices A and B) shows the materiality of these impacts, particularly in the first 10 years of the Preferred Plan. For a *typical* Residential customer with an *average* consumption of 1319 kwh/month the increase to 2023 is 46.5%. The All Gas Plan could result in a 39.8% increase (major caveat re comparability as above).

With regard to Vulnerable Consumers Mr. Stevens and Dr. Simpson indicate:

> "Low Income families and households have different consumption patterns than higher income households. They spend more on the basic necessities of life than higher income households and less on discretionary items, with a few exceptions, as Table 7 below reveals. Table 7 is based on ten years of data from the Statistics Canada Survey of Household Spending for Manitoba from 2000 to 2009. Low income is defined as having income below the after-tax Low Income Measure (LIM) cutoffs which are established for households.
> Table 7 shows that,as household income rises from low income to near low income to higher income, households spend proportionately less on food, shelter, electricity, household operations, health and personal care and tobacco and alcohol. Conversely, as household income rises, households spend proportionately more on clothing, household equipment and furnishings, transportation, recreation and miscellaneous expenditures. Reading and education expenditures are either constant, as household income rises or show a non-linear trend.
>
> The elasticity estimates are consistent with these expenditure patterns: Those items, whose

share of total consumption declines with rising incomes, have elasticities less than one, indicating that demand for these products is inelastic. By comparison, those items, whose share of total consumption increases with rising incomes, have elasticities greater than one, indicating an elastic demand for these products.

Education is the one item whose elasticity is very high but whose consumption pattern is non-linear. Of particular importance in this profile is the very low elasticity associated with electricity consumption. This means that the share of electricity in total consumption costs rises sharply as household income (total household consumption) declines. It also suggests that low income households will be most affected by rising electricity costs, since it is a larger share of their consumption budget than it is for households with higher incomes. "[46]

A preliminary analysis of the impact of the PP on Vulnerable Consumers (Appendix B) indicates that from 2015-2025 Low Income Families in detached single family homes with Electric Heat will see a $850 increase in bills (47.3% increase) to $2900/yr. Under the All Gas Plan (major caveats regarding comparability as above) the Bill increase would be $730.

In addition, the AURA comparison analysis (Appendix C) shows that with assumptions used by Manitoba Hydro regarding short term Rate increases in BC, Saskatchewan and Quebec[47], the Affordable Utility Rate package advantage that Manitoba consumers have now, relative to other provinces in 2013 still remains in 2025, relative to the above compared other three Provinces. However, for Electricity prices under the Preferred Plan, the gap to Quebec is likely to be increased.

Question

What potential Mitigation measures do you suggest to address affordability concerns?

Answer

A threshold question is whether the Preferred Plan or a variation of the Preferred Plan such as Plan 4 or Plan 6 should proceed. That determination will be discussed later.

The matter of phasing[48] of the development of the Preferred Plan could be an important strategic policy decision with several major implications, including the potential impact on rate increases in the short term depending on what costs are deferred. This positive effect may be offset by higher long term costs and reduced net benefits.

46 Harvey Stevens & Wayne Simpson, Impact of Increases in Electricity Rates on Low and Non Low Income Households in Manitoba, February 2014, pgs 21 – 22.

47 Response to CAC/MH II-134b.

48 Phasing development of the plan, is proceeding with a Phase I of the Preferred Plan (or modified PP) along with other critical short-term Plan components (DSM etc.). In parallel, Manitoba Hydro would develop updated evidence on a Second Phase Assessment that may include the same PP elements as present, or may be an updated and modified Preferred Plan. As will be discussed later in this evidence, in addition to Macro-Environmental Impact Studies, greater attention would be paid to Sustainability and Integrated Resource Planning.

Second, aggressive DSM to reduce electricity bills; particularly targeted at Vulnerable Consumers. Expansion of the Affordable Energy Fund could be one tool to facilitate this.

Third, we suggest that if the main elements of the Preferred Plan were endorsed, the Review Panel could recommend that the Manitoba Government authorize a *Manitoba Clean Energy Benefit* related to the incremental move away from fossil fuel generation by the Province to increased renewable electricity generation via the Preferred Plan. (This assumes a version of Plan 14 , Plan 4 based on hydraulic generation is endorsed for further development.

Question

Please provide your suggestions and observations regarding the financing and other features of a potential Manitoba Clean Energy Benefit.

Answer

The underlying policy principle is based on the principle that at the Provincial level, as set out in the Manitoba Clean Energy Strategy,[49] a move away from fossil generation to increased renewable generation is in the long term beneficial to the Province.

The result of the MH MC-MBA Economic Benefit Analysis shows that economic transfers to the Province are substantial enough to return a portion to the account of the MH customers that will pay increased real electricity rate increases for several years due to the collateral costs to ratepayers of the CES movement to more Hydro Projects.

The timing of a CEB program would be coincident with the Governments green light to proceed with a version of Phase1 of the "Preferred Plan", or as soon after as is practical as rate increases occur. We suggest that universality is important so that all MH residential customers receive the CEB, including those living in off-grid communities.

Question

Have you considered a scenario that outlines the costs and benefits of a Manitoba Clean Energy Benefit?

Answer

A preliminary scenario for discussion, based on the model of the current Ontario Clean Energy Credit, is provided in In Appendix D[50] and includes a Scenario with a potential Manitoba CEB with potential 5% and 10% bill reductions.

The Ontario Clean Energy Benefit as updated (December 2012) is a five year commitment to provide

[49] Manitoba Innovation, Energy and Mines, Focused on What Matters Most: Manitoba's Clean Energy Strategy, December 2012, Message from the Minister, pg 1.

50 The AURA comparison analysis uses the MH data on future power costs within the Affordable Unit Cost comparison framework developed by Deloitte for the Manitoba Treasury.

relief to small volume customers consuming less than 3000 kWh of electricity per month. The credit is 10% of the bill and is applied directly to each customer's bill.[51]

Our estimates (Appendix D) indicate that the cost of a 5% CEB could be about $28 million/year and a 10% CEB about $56 million/year, assuming the current residential customer base and consumption levels. These estimates are for on-grid customers and would be higher when off-grid customers are included. As a point of comparison, the All Gas Plan (same major caveats noted above and in Appendices) results in a 2023 Bill increase of $730 a year for Vulnerable Electric Heat consumer compared to $852 for the Preferred Plan (Appendix B).

While there are several other viable alternatives for a CEB, these are too numerous to examine in detail and therefore for illustrative purposes we have simply mirrored the Ontario model.

Question

Do you have any observations regarding Off-Grid Communities?

Answer

The CES addresses this to a limited degree:

> Working closely with the off-grid communities, and the Canadian government and other partners, Manitoba Hydro will reduce dependency on diesel fuel by implementing renewable alternatives to diesel generation and improving energy efficiency. Manitoba will also show national leadership on this complex issue, working with our counterparts in other territories and provinces that have off-grid communities to share best practices and seek solutions.[52]

It is suggested that in addition to receiving the CEB, providing expanded DSM and local renewable options for these communities becomes an expanded component in development of the next phase of the Plan.

Question

Do you have any comments on inter-generational equity?

Answer

This is a perennial, intractable, problem for policy makers, particularly in the case of major new energy projects, including hydro generation projects.

Dr. J. Gunn has addressed this issue:

> Regarding intra-generation equity, Winfield et al. (2011) propose six criteria that should

[51] Ontario Ministry of Energy, online: http://www.energy.gov.on.ca/en/clean-energy-benefit/#.Uu1S59GYY5s
[52] Manitoba Innovation, Energy and Mines, Focused on What Matters Most: Manitoba's Clean Energy Strategy, December 2012, pg 17.

influence the decision which include how the alternative will improve:

(i) consumption, wealth and resource access gaps between upper and lower income segments of the population;
(ii) the equitable (re)distribution of risks, costs, benefits and opportunities among income groups, genders, age groups, regions, indigenous/non-indigenous people, areas of growth and decline;
(iii) key quality of life considerations (e.g. health, valued employment, respected knowledge, community security, access to opportunity, influence in decision making, durable economic development opportunities);
(iv) allocations of costs and risks to those who benefit little or not at all from the electricity system;
(v) the externalization or internalization of risks, costs and benefits among investors, suppliers, consumers and governments (i.e. taxpayers); and
(vi) social and economic impacts of electricity costs and pricing among suppliers, consumer groups (who wins, who loses).[53]

Other than short term financial mitigation measures, such as those outlined above, aggressive universal DSM programs are advocated to reduce customer energy consumption and lower electricity bills (and where applicable, gas bills).

ELEMENT #6 ECONOMIC EVALUATION AND TRANSFERS

Economic Evaluation

Question

Please provide your comments on Economic Evaluation and Transfers?

ANSWER

Manitoba Hydro's NFAT analysis was undertaken using its 2012 planning assumptions. However, the economic evaluation results for selected Plans were updated for the 2013 planning assumptions. Key aspects of the update were:

- Revised (downwards) load forecast
- Deferred next generation in-service date requirement based on need
- New/revised export contracts
- New (higher) electricity export prices
- Revised (later) possible in-service date for Conawapa and
- Revised real discount rate of 5.40% (as compared to 5.05%)

Based on these updates the incremental NPV values for the Plans changed[54].

[53] Dr. Jill Gunn, Manitoba Hydro's Needs For and Alternatives To (NFAT) Review of Keeyask and Conawapa Generating Stations: Macro Environmental Impact Assessment Guidance, February 4, 2014.

[54] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 12, Table 12.5.

However, Manitoba Hydro concludes[55] that the economic ranking of the alternative Development Plans remains the same as the ranking under the 2012 planning assumptions.

La Capra Associates EIC Report

It is observed that La Capra Associates has a different perspective:

Summary[56]

Our review of the NFAT Application's Economic Analysis included consideration of MH's economic and planning models and methods as they have been used in the Economic Model, its Economic Uncertainty analysis and MH's assessment of the Development Plan economics from the Province of Manitoba Perspective. While there are many observations as shown below, there are four high level observations that should be considered in the NF AT review.

1) Alternatives metrics such as IRR and Break-Even Year do not show the Preferred Development Plan to *be the best development plan.*
2) The use of NPV metrics for different points in time, other than the end of 78 years, show that many other development plans, including the All Gas Plan, are lower cost than the Preferred Development Plan for at least the next 40 *years.*
3) The conclusion that Plan 14, *which includes Keeyask, Conawapa, a 750* MW *Transmission Line, and the* WPS *Contract and Investment, should be the Preferred Development Plan based upon MH's analysis and observations* is *not robust* to *withstand simple sensitivities* to *changing assumptions, such as capital costs, discount rates and energy prices.*
4) While a Provincial Perspective in this study shows improved economics for all the development plans with either or both Keeyask and Conawapa, there are other plans with metrics superior to *the Preferred Development Plan even when taking the Provincial Perspective.*

Question

Do you have observations on the Economic Evaluation?

Answer

Here is an extract of Mr. W. Harper's observations based on MH planning assumptions:

Economic Evaluation - Approach

[55] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 12, pg 14.
[56] La Capra Associates, Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Proposal for the Keeyask and Conawapa Generating Stations, Appendix 9A: Economic Analysis Part 1, Jan 30 2014, pg 9A-150.

• Manitoba Hydro's approach to economic evaluation is generally consistent with accepted practice.

• Economic evaluations are performed from a specific perspective which will impact both the costs and benefits included in the analysis as well as the discount rate used in the evaluation of alternatives. Manitoba Hydro's economic evaluation is carried out from its perspective as the entity undertaking the proposed plan. This is a valid perspective but differs from that of either its rate payers or the Provincial government.

• A true Manitoba Hydro perspective would have separated out the costs/benefits accruing to KCN which Manitoba Hydro did not. However, the impacts on the results are likely minimal.

• In reporting the results of its economic evaluation Manitoba Hydro has inappropriately combined the benefits attributable to itself and the Provincial government. In the case of ratepayers, Manitoba Hydro did not include in its NFAT Application an economic evaluation based on this perspective.

• Manitoba Hydro's uses its Weighted Average Cost of Capital as the discount rate in its evaluations. This discount rate includes a "cost of equity" rate for the portion of spending deemed to be financed through customer rates (i.e. net income/retained earnings) which Manitoba Hydro has based on what utilities regulated on a cost of capital basis are allowed. However, the 300 basis points (over Manitoba Hydro's debt costs) used to calculate this rate understates the return on equity as recently approved by Canadian regulators. Taking into account these recent regulatory decisions would increase the WACC from 5.05% to 5.20%.

• Furthermore, since Manitoba Hydro is not regulated on a cost of capital basis, the use of allowed returns on equity to determine the appropriate time value for funds raised through customers' rates is, at best, an approximation of customers' views as to the time value of money.

• Finally, given the long study period used (78 years) considerations of intergenerational equity become important. However, this is an issue that Manitoba Hydro did not explore in its economic evaluation analysis.

Economic Evaluation – Reference Case Results

• Utilizing a discount rate of 5.2% (as opposed to 5.05%) does not change the Manitoba Hydro's conclusion that, based on Reference case costs for each alternative Plan:

  - o Plan #2 (K22/Gas) yields the highest economic benefit for Manitoba Hydro from amongst all the no-intertie plans considered.
  - o Advancing the in-service date for Keeyask and building an intertie yields economic benefits relative to the no intertie alternatives.

• However, with the higher 5.2% discount rate, the decision between a 250 MW and a 750 MW intertie is more nuanced:

  - o All of the 750 MW intertie Plans with Conawapa following Keeyask are no longer more economic than the 250 MW intertie Plans. Indeed only the Preferred Plan which includes both the WPS 300 MW contract and additional outside investment in US transmission is more economic than Plan #4 (K19/Gas 24/250 MW).

- o Without the additional investment in US transmission the overall economic benefits from both Plans are roughly the same and without the WPS 300 MW contract or the additional investment the economic benefits of Plan #4 are higher.

Economic Uncertainty Analysis – Approach

• Manitoba Hydro's approach of accounting for risk through probability analysis is preferable to the use of hurdle (discount) rates. However, the probability-based risk analysis in the NFAT Application is relatively unsophisticated as it considers the risk associated with only three factors and considers only three possible outcome for each. On the other hand, limited number of factors and outcomes makes the outcomes more transparent.

• Manitoba Hydro's inclusion of the "discount rate" as a factor subjected to uncertainty and therefore variation in the analysis distorts the comparisons of the results of the various scenarios as it means there is no longer a common discount rate applied to all the possible outcomes of all the Plans analyzed. A preferable approach would be to use a common discount rate across all Plans and underlying scenarios. Concern about the appropriateness of the discount rate used should be addressed through sensitivity analysis.

• The economic uncertainty analysis produces "expected" NPV values for each Plan that differ from the Reference case NPV values for each Plan. The expected NPV values are the appropriate ones to use for comparative and decision making purposes.

Economic Uncertainty Analysis – Results

• Utilizing a common discount rate of 5.2% for all scenarios does not change Manitoba Hydro's conclusions that:

- o Plan #2 (K22/Gas) is the preferred no-intertie Plan from an economic benefit perspective.
- o It is more beneficial to advance Keeyask and invest in small intertie than to proceed with any of the no intertie plans.
- o It is more beneficial to invest in a smaller intertie when Keeyask is followed by natural gas-fired generation.

• However, with the use of a higher (5.2%) common discount rate the expected NPV value for the Preferred Plan no longer exceed that of Plan #4 with the 250 MW intertie, instead the two value are now virtually equivalent. As a result, the risk/reward trade-off between the two plans identified in the NFAT Application no longer exists. At the 5.2% discount rate, the preferred plan offers, at best, the same expected reward but with greater risk. Furthermore, the Preferred Plan is premised on completion of a WPS 300 MW contract and additional outside investment in US transmission. If Manitoba Hydro is not successful in achieving either of these two elements then the expected value of the plan will decrease.

• The analysis in this Report also indicates that, if there is flexibility for the Development Plan to adapt to changing circumstances (i.e., no firm commitment at this point to type or timing of new generation following Keeyask), a 750 MW intertie is more beneficial from an economic perspective than a 250 MW intertie, provided a firm power contract similar to that under

negotiation with WPS is in place and additional investors can be found for the US portion of the intertie. Otherwise the 250 MW intertie is likely to be more beneficial, although only marginally.

• With respect to protecting an in-service date for Conawapa, the analysis indicates that there is benefit to protecting an in-service date in the early 2030's regardless of whether a 230 kV or 750 kV intertie is build and, in the latter case, regardless of whether or not there is WPS contract. The analysis also suggests that, with a 750 kV intertie, there is economic benefit to protecting a mid 2020's in-service date but only if there is a contract with WPS.[57]

MA-CBA Analysis

Question

Are there any observations you would like to add relating to the MA-CBA analysis employed by Hydro?

Answer

Manitoba Hydro Evidence: Executive Summary re Chapter 13 Pages 33- 36 of 42

MH Suggests

MA-BCA is a variant of traditional cost-benefit analysis. It extends Manitoba Hydro's Economic Evaluation of the different plans to take into account consequences and net benefits or costs for customers, taxpayers, workers and the economy, the environment, affected communities and Manitobans generally. These net benefits and costs are not reflected in the NPV of the different plans from the perspective of Manitoba Hydro and its project partners. The MA-BCA is intended to assist the NFAT panel address the **Question** of the overall socio-economic benefit of the preferred and alternative plans, and more specifically the relative advantages and trade-offs they entail.

MA-BCA recognizes that not all consequences can be monetized in order to calculate a 'bottom line' ; as well there are important distributional consequences that need to be considered in the assessment of the relative advantages or disadvantages and trade-offs that the different plans entail. The results of the MA-BCA are presented under a disaggregated set of evaluation accounts:

- Market Valuation
- Customers
- Government
- Manitoba economy
- Environment
- Social
- Risk.[58]

[57] Econalysis Consulting Services, Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan: Report Prepared for The Consumers Association of Canada (Manitoba) Inc., February 4, 2014, Part 2, pgs 22 – 26.

[58] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Executive Summary, pg 34.

Overall, MH's main conclusions of the MA-BCA are as follows:

- Developing Keeyask G.S. to meet domestic load offers significant net benefits relative to the All Gas plan not only for Manitoba Hydro but also more broadly to society as a whole; it offers significant tax, employment, GHG and social benefits that go beyond the benefits to Manitoba Hydro.
- Plans that include a new interconnection offer significant net benefits to those that don't. They significantly enhance the net benefits for Manitoba Hydro and its partners.
- The alternative with the 250 MW interconnection and the development of Keeyask G.S. but not Conawapa G.S. offers the same expected net benefit to Manitoba Hydro and its partners as the Preferred Development Plan, without the short- to medium-term rate trade-off that the Preferred Development Plan gives rise to. At the same time it doesn't offer the same long-term legacy value or upside potential as the Preferred Development Plan. Nor does it offer the long-term rate, tax, employment, GHG and social benefits as the Preferred Development Plan.

The Preferred Development Plan offers the lowest rate impacts for the long-term and significantly greater benefits to Manitoba society as a whole than the smaller tie alternative. It does, however, require higher rate increases in the short- to medium term than the other plans. The more weight one places on the broader public interest consequences and the longer term effects, the more one would favour this plan.

Question

Did you consider the IEC Consultant Report on socio-economic matters?

Answer

The Typlan Report indicates Manitoba could have higher socio-economic benefits than Reference case.

TYPLAN IEC Report

From a socio-economic perspective, the approach assumptions and findings MH has presented are reasonable. Overall the PDP exhibits the greatest socio-economic benefits to the people of Manitoba, northern communities and First Nations compared to other plans based on the reference plans evaluated.

Use of the Statistics Canada Interprovincial IOM in this review suggests that, based on MH assumptions that the Manitoba related economic impact benefits may have been understated while the rest of Canada benefits overstated, making the PDP more attractive to Manitobans as greater benefits are derived. The Statistics Canada Interprovincial model confirms the overall benefits derived from the PDP are reasonable.

Planned investments are significant over the next decade (as outlined in the proposed PDP), placing increased pressure on the provincial debt and rates, in the short and medium term. The PDP is intended to contribute to the growth of the Manitoba economy, strengthen relationships with First Nations and create a lasting legacy for future generations. By doing so the PDP supports Manitoba Hydro's Corporate

Strategic Plan (MCSP) 2012-13 and goals of the corporation, with two corporate goals in the MCSP being highlighted, supporting Aboriginal people and Provincial economic development.
Throughout the short/medium term the Keeyask Generating Project would generate significant socio-economic benefits for the people of Manitoba, First Nations and northern communities and if not pursued such benefits would be forgone, inclusive of the sunk costs already allocated to the Keeyask Generating Project.

Over the longer term considerable uncertainty and risk remains and the introduction of pathways in the decision making process enables such risk and uncertainty to be studied prior to a decision being made on Conawapa.

Both Keeyask and Conawapa are capital intensive projects, creating significant employment throughout construction, and on-going operational benefits. Monitoring issues related to access, health, education and the cultural implications of project development, while identified, should be monitored aggressively, and lessons learned implemented on an annual basis to ensure sustainable capacity building within First Nations and northern communities. [TYPLAN EIC Report Page vii]

Question

What are observations of CAC MB Consultants on the MH Economic Transfers to and from the Accounts under the Preferred Plan compared to the other options reviewed in the Economic Evaluation and MA-CBA?

Answer

Chapter 13 of the MH NFAT Business Plan includes the MH Multi-Account Cost Benefit Analysis (MA-CBA) of the Costs/Benefits of the Preferred Plan. There are 7 accounts that have been established for the MA CBA framework. There are many elements of cost/benefit analyses, some of which have been monetized and some of which have not. There are also important trade-offs between the elements, some of which MH has identified and some of which MH may not have fully addressed.

Within the framework of the Economic Evaluation and MA-CBA used by MH, we have examined the Economic Evaluation and proposed MA-CBA major accounts and proposed Transfers. However, as acknowledged by MH, the accounts do not appropriately fully delineate the appropriate balance of monetized costs and benefits, nor take into account other non-monetized transfers.

Question

What are observations regarding the analyses or additional considerations?

Answer

The observations of Mr. W. Harper include:

Multiple Account Analysis

• For the Market Valuation account an economic evaluation is done of the cash flows to Manitoba Hydro but using a 6% discount rate in order to reflect a broader societal perspective as to the social opportunity cost of capital. However, it appears that 6% was not used consistently throughout the study period and, as a result, the net benefit calculations must be viewed with caution.

• Customer rate impacts would have been better expressed in term of the NPV value of forecast customer revenues, as was done for the Wuskwatim Project NFAT.

Key Decisions

• The economic evaluation analyses compared various development plans each of which had specific and different assumptions about the types of resources that would be used to meet Manitoba's future electricity requirements and when they would come into service through to the early 2030's. However, neither Manitoba Hydro nor the Provincial Government need to choose a particular "plan" at this point in time. Rather the key decisions that need to be made are:

  - o Should Keeyask be advanced to 2019 and a new intertie with the US constructed to facilitate new export contracts? If not, then what should Manitoba Hydro's plan be for meeting domestic load requirements and existing export contracts?
  - o If Keeyask is advanced to 2019 to facilitate new export contracts, should the required new intertie be 230 kV (250 MW capability) or 500 kV (750 MW capability).
  - o Should Manitoba Hydro continue to spend funds to support a possible in-service date for Conawapa in the mid-2020's, by the early 2030's or not at all?

• Both Manitoba Hydro's and this Report's economic evaluation analysis support advancing Keeyask to 2019 and the construction of new intertie facilities. However, it will be important for the PUB to revisit these conclusions taking into account the advice it receives from its Independent Consultants regarding the input assumptions used in the analysis.[59]

As noted above, there are concerns about some aspects of the MH application of the MB-CBA approach, for example the rationale of including the benefits associated with cash transfers to the Province (Government Account) but omitting the cash transfers from Ratepayers (Customer account).

In terms of the Manitoba Government Account, it is suggested that the transfers in should be balanced by specific transfers out to other stakeholders that are paying the costs either in higher electricity rates or in the case of First Nations, loss of the value (including Bequest Value) of the fundamental interest in the traditional lands and waters of the Nelson River.

We have previously discussed a potential Clean Energy Benefit relative to the Ratepayer Account.

[59] Econalysis Consulting Services, Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan: Report Prepared for The Consumers Association of Canada (Manitoba) Inc., February 4, 2014, Part 2, pg 64.

In its final closing argument to the CEC, CAC MB recommended that regardless of the KCN sharing Agreement:

> The Province of Manitoba should take steps towards the equitable sharing of the resources flowing from Hydro development by dedicating a designated percentage of the water rental fees associated with hydro-electric activity to those communities who share the resources and whose treaty and aboriginal rights may be affected by the use of the Nelson River for hydro-electric development[60].

CAC also noted that sharing of the water rental fee, may be seen as a way to provide some recompense to Cree Nations who choose not to purchase a higher risk investment interest in the project. It also may provide opportunities to Cree Nations who have been excluded from the opportunity to participate in resource development agreements due to luck of the geographical draw.

OVERALL COST/BENEFIT OF PREFERRED PLAN

In order to implement the Plan, Manitoba Hydro requires the following commitments by June 2014[61]:

- Start construction of the Keeyask generating station for a 2019 in-service date,
- Proceed with a (signed) 250 MW export agreement with Minnesota Power,
- Proceed with a (signed) 100 MW export agreement with Wisconsin Public Service,
- Proceed with a 300 MW export agreement with Wisconsin Public Service, subject to satisfactory conclusions of negotiations, and
- Proceed with a 750 MW US interconnection.

Question

Have you any "bottom line" observations regarding the Preferred Plan?

Answer

A threshold question is whether the Preferred Plan or a variation of the Preferred Plan such as Plan 4 or Plan 6 should proceed. That determination will involve consideration of whether the PUB Review Panel is satisfied that Need has been adequately defined including load growth, export revenues and capital costs and also whether a robust assessment of Alternatives is possible, given the limitations in the Hydro Assessment identified earlier. In the event these hurdles are addressed, the Board may determine that the Preferred Plan or a variation of the Preferred Plan such as Plan 4 or Plan 6 should proceed.

The preliminary "bottom lines" are based on examination of the evidence on the record to date.

[60] Consumers' Association of Canada (Manitoba Branch), Keeyask – A Watershed Decision: Closing Arguments, Submitted to the Manitoba CEC, January 14, 2014, pg 107.

[61] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Executive Summary, pg 1.

A detailed economic comparison of the shortlisted plans shows that from an economic and risk profile certain plans appear to be superior, especially plans 4 (K19/Gas24/250MW) and Preferred Plan 14 (K19/C25/750MW). The choice between plans 4 and 14 is really a trade-off between a plan (14) with higher projected returns and a plan (4) with lower risk, so that:

(i) risk analysis matters to the choice of plans,
(ii) plan 4 might be superior to plan 14 if the tolerance for risk is low, and
(iii) the crucial decision at this point would be whether to defer Conawapa, because it is the riskiest venture. (based on MH input assumptions)
(iv) in addition, Plan 4 produces somewhat lower rates than plan 14 for consumers up to 2031[62]

Some of the key factors contributing to the preference for the Preferred Plan (and issues that mean it may not be attractive as suggested) are:

- The assumption that all the negative social/environmental issues can be/will be successfully mitigated and that the cost are captured in the capital costs put forward. This includes satisfactory resolution of any "sturgeon" issues
- The assumption that there will only be a 40% investment in the US TX line and that the WPS contract will proceed.
- The assumption that the real return required by rate payers is only 2% as opposed to something like the 6% used for the social opportunity cost of capital
- The inclusion of government revenues in the evaluation – but NOT the accumulated additional revenues paid by rate payers. Rather issues around customer rates are measured in terms of rate levels at the end of the study period.

Conditions Precedent and other Conditions for Proceeding with the Preferred Plan

Question

Could you observations on the conditions precedent to the Preferred Plan?

Manitoba Hydro
Implementation and Risk Management Plan
MH suggests that:

Manitoba Hydro has a well-developed and comprehensive approach to undertake the plan and manage the risks of the Preferred Development Plan. This approach includes an implementation schedule containing portfolio risks, potential impacts and decision points. This schedule and a full range of risk mitigation measures are discussed throughout the submission

[62] CAC/MH I-181a/b.

and, in particular, in ***Chapter 15 – Implementation and Risk Management Plan for Preferred Development Plan***.[63]

The critical steps proposed by MH are set out in Figures 15.1 and 15.2. MH indicates that Figure 15.2 illustrates Pathways 4 and 5 and shows the development plans that are represented by these pathways. The majority of the development plan analysis throughout this submission utilizes resource in-service dates based on the 2012 load forecast; however, Figure 15.2 is based on the 2013 Load Forecast resource in-service dates[64].

Both Pathways 4 and 5 include Conawapa G.S. and have flexibility as to its ISD. Manitoba Hydro will continue to evaluate the Conawapa Project through the annual Power Resource Plan and otherwise as required. Should conditions not be favourable to constructing Conawapa for a 2026 ISD, a decision could be made as late as 2018 to defer its ISD or displace Conawapa with other resources such as gas. Displacing Conawapa G.S. by an alternate resource would reduce some of the benefits associated with the plan as described in this report, but this would be offset by a corresponding reduction in downside risk.

There is a risk the 750 MW interconnection may not receive regulatory approval; however, this risk can also be mitigated because the Conawapa G.S. construction commitment in 2018 falls one year after the scheduled approval date for the interconnection. Conawapa G.S. could therefore be deferred or cancelled should the interconnection approval be delayed or denied.

With all required approvals in place, construction can begin on the Keeyask Project without having received the final approval for the interconnection. In the event that the interconnection does not proceed and the 250 MW MP Power Sale Agreement (PSA) is cancelled, Keeyask G.S. is still the logical choice for a new resource option to meet Manitoba's growing electricity needs. With sufficient notice, the Keeyask G.S. construction timeline could be adjusted to correspond to a later ISD if conditions so indicate, likely around 2023, and the value of all Keeyask G.S. efforts and expenditures would still be retained[65].

Question

Are there any observations on Conditions Precedent and/or other conditions for proceeding with development and implementation of the Preferred Plan?

Answer

As noted earlier, the execution of the WPS contract and its approval by the National Energy Board is a Condition Precedent related to committing the 750 KW intertie and MH financing this. Another Condition Precedent is the CEC recommending licensing of Keeyask GS.

With regard to the Scenario MH outlines above *" in the event that the interconnection does not proceed and the 250 MW MP Power Sale Agreement (PSA) is cancelled",* we do not agree with MH's position in regard to the timing of Keeyask.

[63] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Executive Summary, pg 42.
[64] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 15, pg 5.
[65] Manitoba Hydro, Needs For and Alternatives To: Business Case, August 2013, Chapter 15, pg 45.

If Keeyask is not to be advanced for Export purposes, then it is suggested that the Review Panel recommend a sober second look at the PP in an IRP framework (including DSM and revised load forecast) regarding the timing of Keeyask and proceeding with rest of the Preferred Plan.

1386

Summary of CAC Consultants Strategic Policy Observations (PRELIMINARY)			
Element	**Sub- Issues**	**Observations**	**NFAT Considerations**
Demand & Load Forecast	**Price Elasticity**	**Model may be inadequate result Load Forecast too high at 1.6%**	**Need-drives comparison of Plans and timing for Keeyask I/S for domestic load**
	DSM	**DSM Expectations built in Load Forecast too low. Achievable Potential- 1.5X DSM. Higher Target 16-18% Load and 1600 GW by 2023**	**Timing of Keeyask and lower cost DSM not considered as Resource**
	Fuel Switching Electric to Gas	**2012 study needs update for space heating and DHW costs 2025**	**Timing for Keeyask I/S Gas heat as an Economic choice**
Export Markets	**Price Forecast**	**MISO Market Congestion, Carbon Tax. Brattle price OK? Is MH price high?- Potomac (redacted)**	**Critical to $9.3 m export revenue forecast and comparison of Plans**
	Intertie	**MH to finance 750 MW line?**	**Critical-Plan 4 vs Plan 14**
	Contracts	**No firm WPS Contract**	**Condition Precedent**
Risk of Capital Escalation	**Capital Cost Estimates and Control**	**PP vulnerable to Capital Escalation. MPUB has no ongoing oversight of MH Capital Investment. MH estimates reviewed by Knight Piesold. Civil contract cost bids may provide confidence. (not filed)**	**Critical Issue-major risk to Preferred Plan MPUB to be given mandate re Capital Cost Reporting & Review**
Affordability of Electricity under PP	**Residential Bill Increases**	**Bill Increase PP 2023 46 % 2010-2013 12% (All Gas 2023 39%)**	**Affordability key issue per CES. Mitigation of Bill impacts required 2015-2025**
	Vulnerable Electric Heat Consumers	**Bill Increase PP 2023 46% -$852/yr (Relative to All Gas 39 %-$730/yr)**	
	Affordable Utility Rate Act Comparison	**Gap to other Provinces maintained in 2023 but narrowed due to higher electricity costs**	
Sustainability & Macro-Environment	**Sustainability/IRP**	**Maximization of cost effective energy efficiency and robust alternatives analysis central to sustainability analysis. Phasing of PP K + 22 could allow for Sustainability and IRP assessment**	**Is current record sufficiently robust to draw macro-economic conclusions? Phasing of Plan would allow detailed IRP and Macro Economic assessments in parallel with development of PP including Conawapa**
	Macro-Environmental Cumulative Impacts	**Uncertainty with respect to key elements. Additional information will provide superior information. MNP suggest more assessment and monitoring**	
Economic Evaluation and Transfers	**Economic Evaluation**	**Uncertainty related to inputs and to alternatives analysis. PP is an economic Option 250 MW intertie keeps a 2031 I/S date for C 750 MW intertie (and WPS + added investment) keeps a 2025+ ISD for C**	**Phasing of PP will allow better information for decisions on next steps. MB-CBA analysis can be made more robust**
	Economic Transfers	**Additional considerations re transfers to Ratepayers and First Nations**	
Overall Cost/Benefit	**Risks**	**PP may be an Economic option if negative social/macro-environmental issues can be/will be mitigated**	**Advancing Keeyask for export "opportunities" consistent with CES**
Conditions Precedent	**Licensing Contracts**	**CEC Recommendation WPS Contract execution and NEB Approval**	**Keeyask for Domestic Load would change timing and open other options**

	Intertie	Financing of Intertie	

1387

CONSIDERATIONS RELATED TO THE NFAT TERMS OF REFERENCE AND MPUB PROCESS AND OUTCOMES

There are two parts to this part of the Evidence. These contain observations, suggestions and considerations related to the NFAT Terms of Reference and Review Process

A. TERMS OF REFERENCE AND SCOPE OF REVIEW

Question

Have you considered how, within the NFAT Terms of Reference, the MPUB may address the important trade-offs between the various Elements of the Preferred Plan?

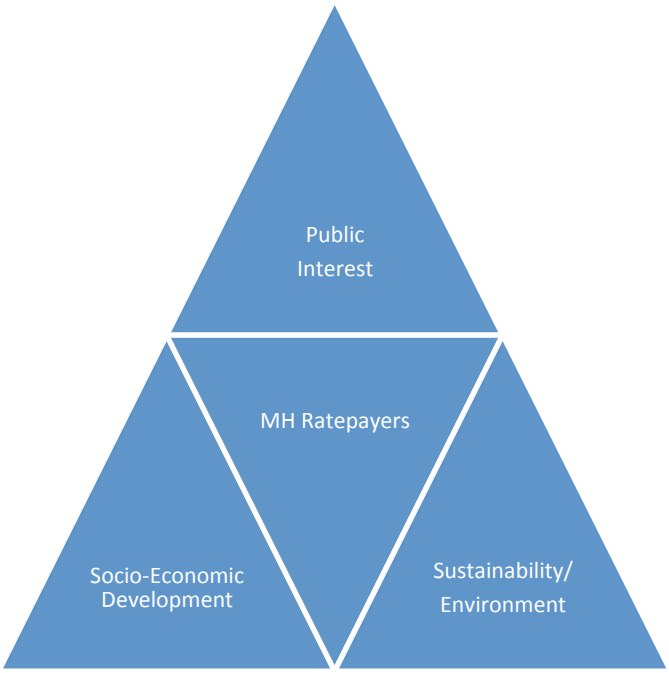
Answer

I offer some observations that may be helpful.

At a high level it is suggested that the NFAT Terms of Reference can be viewed as three major blocks in an energy policy/regulatory framework as this relates to the Mandate of the MPUB Review Panel.

- MH Ratepayers (Including off-grid customers)
- Socio-Economic Development and
- Sustainability/Environment (shared with the CEC)

These policy blocks can be considered together in support of consideration of the overall public Interest as related to the Preferred Plan



Question

Do the NFAT Terms of Reference broaden the regulatory role of MPUB as set out in its legislation?

Answer

The Background to the Order Appointing Members to the Review Panel[66] is informative:

> The Government of Manitoba wishes to have the PUB conduct an NFAT review of Manitoba Hydro's proposed preferred development plan for meeting a growing provincial demand for electricity and for *taking advantage of export opportunities*, which includes the Keeyask and Conawapa Generating Stations, their associated AC transmission facilities, and a new Canada-USA transmission interconnection, in accordance with the attached Terms of Reference.

It is suggested that "taking advantage of export opportunities" broadens the normal role and objectives of the PUB in regard to MH rates, annual Power Resource Plan, PowerSmart Plan etc..

Explicitly in the MPUB Review Panel Terms of Reference, the Scope of Review includes, in addition to MPUB Act, reference to:

a. Manitoba Hydro's mandate, as set out in Section 2 of *The Manitoba Hydro Act*.

b. Manitoba's Clean Energy Strategy and the Principles of Sustainable Development as outlined in *The Sustainable Development Act*.

c. Manitoba's Clean Energy Strategy, *The Climate Change and Emissions Reduction Act*

Question

What are the elements of the NFAT Review in determining if the Preferred Plan is justified as superior to potential alternatives that could fulfill the Domestic Need and take advantage of export opportunities?

Answer

These are listed in the T of R Section 2 paragraphs (c)-(j) and in our view align quite well with the Socio-Economic Elements that we have discussed earlier.

Question

How should the Review Panel bring these elements together and address the complex inter-

[66] Healthy Living, Seniors and Consumer Affairs, Order In Council No. 00128/2013, April 17, 2013.

relationships and trade-offs involved.

This is one of the major challenge that the Review Panel will face, especially where there are differences of view and critically differences of opinion on the weighting to give each element, especially where these are not monetized.

Question

Do you have any comments?

Answer

Within the Scope of the NFAT Review, it is suggested that as noted above, determining the Public Interest is key. This is something that regulatory tribunals including Energy Boards are mandated to address in their regular frame of business. The fact that this Review is not “Regular Business” but a Government Order that has a compressed timeframe and greater scope and complexity makes the challenge much greater.

In addition, the fact that the CEC has a parallel and inter-related mandate provides another challenge in terms of areas of common policy considerations.

Question

Do you have any observations regarding issues of Balance?

Answer

We suggest that since the NFAT Review Mandate is based on Government Reference, the Panel concentrate on addressing the NFAT outcomes in the framework of Provincial Energy Policy and the Legislative Framework set out in the Terms of Reference.

It is important to consider the longer term range and timing of options when reconciling potentially conflicting elements of the energy policy such as DSM, future hydro-electric development versus Solar or wind. Rapidly evolving technologies such as Solar PV, have advanced and the potential may not have been fully understood at the time the Provincial Clean Energy Strategy was developed.

Based on historic precedents such as the Wuskwatim NFAT Review, no Review of this magnitude is likely to result in either an endorsement or rejection of the Applicants Preferred Plan.

It is suggested that the desired outcome is a Report that weighs the risks against the benefits taking into account all relevant public interest considerations and sets a direction forward for the critical planning and investment period. What is required is a high level look at the implications of each scenario and discussion of how to structure choices and decisions about the preferred scenario(s) for further development.

Although the Review Panel may have sufficient (or too much) technical information available on the

options, and operate within a Government Reference, its challenge is to address the implications of the choices at hand and based on its critical analysis. This is a complex strategic Energy/Environmental policy appraisal with significant long term cumulative Socio-economic, Sustainability and Macro-Environmental impact considerations.

One suggestion is to consider creating a set of key decision criteria that could be applied to each of the major elements of the Review of the Proposed Plan. (Example Sustainability and Macro-Environmental considerations). Another could be a Scorecard Approach

Question

Do you have any further suggestions/considerations on Process that may assist the Panel?

Answer

The next part of the evidence contains some preliminary observations, suggestions and considerations

B. PROCESS AND OUTCOMES FROM THE NFAT REVIEW.

Question

What are the major considerations and matters to balance in the outcomes of the NFAT Review?

Answer

It is suggested that the evidence offered by MH in the Business Case in the view of the Panel indicates that the Preferred Plan **is an economic option and pathway** to meeting the domestic need for reliable power for Manitoba in the long term. At this point, the economics of this and Plan 4 are close. As noted above "taking advantage of export opportunities" broadens the scope of the Review and drives the timing of the required decisions.

However, it is suggested that due to uncertainties regarding timing and the critical need for additional evidence, the development of the Plan (or a modified version) occur in a ***phased approach.***

Phasing of the NFAT Review would proceed with a Phase I Report in June 2014 that addresses the overall merits/concerns of the Preferred Plan (or a modified version), together with Specific Recommendations related to the licensing Keeyask I/S (20XX) and proceeding with meeting Conditions Precedent such as Contracts, the Intertie and other critical components, such as expanded Demand Side Management.

Phase II would proceed in parallel with the development of Keyaask and the other key short term elements of the Preferred Plan.

Phase II would address the Longer Term in an updated Plan that includes inter-alia significant expansion

of DSM and local generation (including potentially wind and solar) together with the development of required evidence for the conventional Natural Gas and Conawapa generation all in an Integrated Resource Planning framework.

The Second Phase of the Plan should seek to balance the trade-offs between demand and sustainability differently than in the current MH Business Case.

The Terms of Reference for the NFAT also includes consideration of the alignment of the Plan to Manitoba's Clean Energy Strategy.

We have not explicitly examined this Element, but suggest that given the Government Reference and framework of the NFAT, more attention to this alignment would be appropriate in the next Phase(s) of review. We note that there are other components of the CES that fall under MH's areas of planning.

Given its critical importance to the Preferred Plan, the outlook for Export of dependable energy should be updated and be one key issue determining the timing of any new generation beyond Keeyask GS.

Question

How would a NFAT Phase II fit with the current Mandate and NFAT Terms of Reference, with its very tight June 2014 deadline?

Answer

In considering the MPUB Report on "Phase I of the NFAT Review", the Government could indicate to MH that development and assessment of the Preferred Plan would continue and set out the revised parameters and timeframe.

In making a decision as to how to proceed beyond licencing Keeyask, it is suggested that the Government consider providing a combined reference to both the MPUB and the CEC. This could be efficient given the future MH reporting requirements to these Agencies. However we note that assuming Conawapa remains part of the Plan, this would not diminish the need for a CEC EIS Review for Conawapa at an appropriate point.

Question

What would be the timeframe for this?

Answer

That is outside of the scope of this evidence, but once milestones are considered, the possible timeframe could be addressed by the Panel in its June Report.

Question

Does this complete your evidence?

Answer

Yes

Roger Higgin SPA Inc. February 4, 2014

APPENDICES

Appendix A Affordability of Preferred Plan- Residential Customers

Appendix B Electricity Rate increases for Vulnerable Consumers

Appendix C Affordable Utility Rates Act (AURA) Comparison

Appendix D Clean Energy Benefit-Simplified Illustrative Example

Appendix E List of Abbreviations Used in Evidence

Appendix F Biography Roger Higgin Ph.D.; MBA; P. Eng.

Appendix A Affordability of Electricity Preferred Plan- Residential Customers

Simplifying assumptions

- Preferred Plan
- No change in future profile of residential customer average consumption **1318.9 kwh/month**

Table A Residential Customer 2013 Rates and Bills

Basic Residential Customers	456,130	App D Table 14				
Average annual Consumption	15827 kWh	App D Table 14				
Rates	Basic charge $7.09/month	Energy Charge $0.07183/kwh				
Consumption	375kwh	750 kwh	1000 kwh	**1318.9 kwh**	2000 kwh	5000 kwh
Winnipeg typical bill/month	$34.03	$60.96	$78.92	**$101.83**	$150.75	$366.24

Computed from Web Site Bill Comparisons; Appendix C Table 14 and CAC/MH I-140

Table B Projected Bill Impacts

	2013	**2023**	**2033**	**2043**	**2053**	**2063**
Basic charge/month	**$7.09**	$10.41	$11.35	$12.51	$13.88	$14.14
Energy rate/kwh	**$0.07183**	$0.1052	$0.1147	$0.1263	$0.1401	$0.1428
Average bill/month	**$101.83**	149.16	$162.63	$179.09	$198.66	202.48
Increase over 10 years	**0.0%**	**46.5%**	9.3%	10.2%	10.9%	1.9%
All Gas Plan Reference*	***$101.83***	***$142.37***	*$159.09*	$204.63	$242. 78	$282.07
All Gas Increase 10 years	**0.0%**	**39.9%**				

Computed from Appendix C Table 14 and CAC/MH I-140

***Accept MH assumptions (Do not agree new Gas Generation is required until post 2023)**

Table C Comparison Historic and Future (10 yr.) Rates and Bill Increases

2010	**2013**	**2010-2013**	**Average 2010-13**		**2023**	**2013-2023**	**Average 2013-2023**
$6.85	**$7.09**				**$10.41**		
$0.0638	**$0.0718**				**$0.1052**		
$91.00	**$101.83**	**11.9%**	**2.98%**		**$149.16**	**46.5%**	**4.65%**

Calculated from MH web site (2010-13) and CAC/MH I-140 (2013-25)

Appendix B Electricity Rate increases for Vulnerable Consumers

Assumptions

Vulnerable Consumers are defined herein as those that have the following attributes:

- **Families (1-7 persons) with an income that meets the Statistics Canada After Tax LICO (2011 data) .This translates to a 2011 after tax household income from $12,600-$19,300 (single) Rural-Winnipeg up to after tax income of $33000-$50,000 Rural-Winnipeg. [Table 1- Stephens Evidence]**
- **For "Low Income" 125% LICO is used**
- **Total Billed Housing Units 439,096; 380,110 owned [CAC/MH I-189 b]**
- **Electric Heat 133,184 billed units**
- **Families that meet LICO 125% and own their dwelling and are Electric Heat customers 63,093 (CAC/MH I-189b)**
- **Average annual consumption 24,317 kwh**

Table A Bill Impacts for Vulnerable Consumers-LICO 125% Homeowners with Electric Heat

Plan	2013 Base yr.	2023	2013-2023 increase
K19ExpC25 750 MW	$1831	$2683	46.5% ($852)
All Gas*	$1831	$2561	39.9% ($730)

Based on CAC/MH I 189b and 191b and CAC/MH II-134a

*** (Do not agree new gas generation is required until post 2023)**

Appendix C Affordable Utility Rates Act (AURA) Comparison

Assumptions

AURA Bundle includes

- Electricity for home use (non-electric heat)
- Natural Gas for home heating (or heating oil in non-gas areas)
- Automobile Insurance (10 sample basis comparison)

AURA Formula

For comparing the annual cost of **each** utility, the weighting Formula is A x B+C x (1-B)

A is proportion of population residing in largest city/centre.

B is proportion of population living in centres over 30,000 persons. (Stats Can)

C is proportion of population living in town/rural area with fewer than 5,000 persons.

Annual basic utility bundle cost comparison for the year ended March 31, 2013

This annual summary provides a comparison of the cost of a bundle of Manitoba's basic utility services with the cost of that same bundle in other Canadian provinces during the year ended March 31, 2013. The bundle includes electricity, natural gas (home heating) and auto insurance services. The comparative costs were developed based on a methodology developed by Deloitte LLP.

Province	Electricity (non-electric heat)	Natural gas (home heating)	Automobile insurance	Total	Gap from Manitoba
British Columbia	$1,007	$845	$1,472	$3,324	$593
Alberta	1,768	618	2,491	4,877	2,146
Saskatchewan	1,496	744	1,168	3,408	677
Manitoba	844	735	1,152	2,731	-
Ontario	1,494	792	5,380	7,666	4,935
Quebec	756	1,327	1,356	3,439	708
New Brunswick	1,342	2,254	1,882	5,478	2,747
Nova Scotia	1,687	2,372	1,708	5,767	3,036
Prince Edward Island	1,652	2,547	1,828	6,027	3,296
Newfoundland	1,406	2,462	1,707	5,575	2,844
Average	**$1,345**	**$1,470**	**$2,014**	**$4,829**	**$2,098**

Table B AURA Analysis 2025 based on response to CAC/MH II-134b

Province	**Electricity***	Natural Gas	Auto Insurance	Total	Gap
British Columbia	**$1465**	$1055	$1838	$4358	$665
Saskatchewan	**$2057**	$929	$1458	$4444	$751
Manitoba	**$1337**	$918	$1438	$3693	$0
Quebec	**$950**	$1657	$1693	$4300	$607

***Includes MH estimates of near term applied-for Electricity Rates**

Appendix D Clean Energy Benefit-Simplified Illustrative Scenario Example

Simplifying assumptions

- Current Rates -$7.09/month basic charge plus $7.183c/kwh
- Chapter 4 Page 10 -450,748 customers 7114 GWh consumption and **Appendix C Table 14 -456,130 customers 7219 GWh avg. 15827 kwh/customer**
- No change in profile of customer average annual consumption kWh (zero growth)
- CEB rebate at 5% -10% of bill up to 5000 kwh
- MH Residential Customers 456,130 (does not include off grid customers)

Table A Residential Customer Clean Energy Benefit

	375kwh	**750 kwh**	**1000 kwh**	**2000 kwh**	**5000 kwh**
Winnipeg Average monthly bill	$34.03	$60.96	$78.92	$150.75	$366.24
5% rebate	$1.70	$3.05	$3.95	$7.54	$18.31
10% rebate	$3.40	$6.01	$7.90	$15.01	$36.62

Source: MH website Utility Rate comparisons

Table B Estimated Impact of Rebates (2013 rates/bill example)

Customers	456,130	Appendix C Table 14
Average annual Consumption	15827 kwh	Appendix C Table 14
Average Annual Bill (before tax)*	$1221.93	
Average Customer Benefit @5% CEB rebate	$61.10	
Average Customer Benefit @10% CEB rebate	$122.19	
TOTAL Annual Benefits (Avg. 5% rebate/customer)	$27.87 million	(456,130 customers)
TOTAL Annual Benefits (Avg. 10% rebate/customer)	$55.74 million	

*Avg Total Annual Bill estimate 1221.93: $7.09/monthx12 ($85.08/yr) plus 15,827 kwh x 0.07183 ($1136.85)

Table C Comparison with Projected Rates and Average Bills (Preferred Plan)

	2013	**2023**	**2033**	
Monthly Charge	$7.09	$10.41	$11.35	CAC/MH I- 140
Energy Charge c/kwh	$0.7183	$0.1052	$0.1147	CAC/MH I- 140
Average Annual Bill	$1221.93	$1789.92	$1951.56	
Annual bill with CEB rebate (5%)		$1700.42	$1853.98	
Annual bill with CEB rebate (10%)		$1610.93	$1756.40	

Average Total Annual Bill estimate = [(Basic charge/month x12) + (15827 kwh x Energy Charge)].

Appendix E List of Abbreviations Used in Evidence

AURA	Affordable Utility Rate Act
CAC	Consumers Association of Canada Manitoba
CDM	Conservation and Demand Management
CES	Clean Energy Strategy Manitoba
DSM	Demand Side Management
CEB	Clean Energy Benefit
IRP	Integrated Resource Planning
LICO	Low Income Cut Off
MAC	Monitoring Advisory Committee
MH	Manitoba Hydro
MISO	Mid-West Independent System Operator
MP	Minnesota Power
MPUB	Manitoba Public Utility Board
NFAT	Needs For and Alternatives To (Review)
Plan	Referenced plan, or in default Preferred Plan
PP/PDP	Preferred Plan/Preferred Development Plan
Stats Can	Statistics Canada
Sustainability	Approach to planning per Sustainable Development Act
T of R	Terms of Reference
US	United States of America
WPS	Wisconsin Public Service

Appendix F Short Biography Roger Higgin Ph.D.; MBA; P. Eng.

Principal of Sustainable Planning Associates Inc.
Energy Regulatory Services to Public Interest Clients

Dr. Higgin:

- Served as Ontario Energy Board Member for two periods totalling 7 years - retired in 2000
- Senior Public Servant in Energy and Environment Policy and Program areas
- 13 years' experience as consultant to various Canadian Clients on both Gas and Electric Rate and Other Cases, including Incentive Regulation Mechanisms and Conservation and Demand Side Management
- Has testified as Expert on several regulatory matters in Quebec, Alberta, and Manitoba
- Recent Consulting Assignments include Incentive Regulation Plans for Toronto Hydro, Hydro One Distribution and Hydro One Transmission. Earnings Sharing Mechanism cases for Union Gas Limited, Enbridge Gas Distribution Inc. and Hydro Quebec.

More specifically relevant to the NFAT,

Dr. Higgin:

- Was part of the CAC/MSOS team for the 2003 Wuskwatim NFAT

  Testified/provided specific input on DSM, Renewables and Costs arising from First Nations Business Arrangements
- Has extensive expertise in Policy Development and Application including Conservation and Renewable Energy
- Has extensive experience as Energy Regulator- balancing public interest issues with rate setting requirement