THE 2007/08 POWER RESOURCE PLAN

RECOMMENDATION:

The recommendations of the 2007/08 Power Resource Plan are that:

1. Conawapa continues to be included as the next generating plant after Wuskwatim for Manitoba load in 2021/22 for the Integrated Financial Forecast and the Capital Expenditure Forecast,

2. Corporate plans be based on Selkirk GS continuing operation until at least March 2021.

3. The following resource plan be adopted for purposes of the 2007/08 Integrated Financial Forecast and the Capital Expenditure Forecast.

4. The 300 MW wind Request For Proposal be evaluated using the results contained in this report as a guide.

Supply-Side Enhancement Projects (SSE)		
Total Dependable Energy by Mar 2018:	Total:	721 MW/ 3721 GWh
Achieved to Date:	Total:	140 MW/ 732 GWh by Mar 2003
Planned Additional:	Total:	224 MW/ 472 GWh by Mar 2018
Kelsey Rerunnering		77 MW/ 0 GWh by 2011/12
HVDC Bipole III Line (West)		87 MW/ 442 GWh by 2017/18
Winnipeg River Plants		15 MW/ 30 GWh
Northern AC Enhancements		45 MW/undetermined GWh
License Review and Continuation of Operation:	Total:	357 MW/ 2517 GWh
Selkirk #1-2 Licence Review		132 MW/ 1060 GWh 2005/06-2020/21
Brandon #5 Licence Review		105 MW/ 837 GWh 2006/07-2018/19
Pointe du Bois (modernized)		120 MW/ 620 GWh 2015/16 (total plant)

Demand Side Management Program (DSM)	
Planned Additional (by Mar 2018):	221 MW/ 987 GWh
Codes & Standards, Curtailable Loads, etc:	184 MW/ 835 GWh
Achieved to Date (by Mar 2006):	434 MW/ 1030 GWh
Corporate Target (by Mar 2018):	839 MW/ 2852 GWh

New Generation		
Wind Power: (under PPA contract with NUG)		
Phase I	100 MW	2005/06
Phase II	100 MW	2010/11
Phase III	100 MW	2011/12
Phase IV	100 MW	2012/13
Hydro:		
Wuskwatim	200 MW	2012/13
Conawapa	1300 MW	2021/22

Although not all projects included in the plan have received final corporate commitment, these projects are judged to be reasonable and practical based on current status and analysis. Such uncommitted projects in the plan are still subject to corporate approval based on individual project evaluations. The inclusion of 400 MW of wind power is based on the MHEB direction, August 2006 and is still under review.

EXECUTIVE SUMMARY:

Based on updated assumptions, the 2007/08 Power Resource Plan identifies that new energy resources are required to meet the forecasted domestic requirements by 2020/21, one year earlier than last year's IFF (sufficient capacity exists only until 2021/22, six years earlier than last year).

However, this year there are dependable energy shortages in the near-term in the years 2009, 2010 and 2011. These shortages are caused by a higher domestic load forecast and later in-service of 300 MW of wind power compared to last year. Imports or gas-fired generation are the most likely bridging options for these years.

The most economic generation continues to be Conawapa (approximately 1300 MW) to meet domestic requirements. Since Conawapa is not likely available until 2021/22, it is expected that the Selkirk GS can be operated for at least one additional year to March 2021 to alleviate the deficit in 2020/21, reducing the deficit from 977 GWh to 17 GWh. A further study is required to confirm this deficit and whether bridging options would be required for 2020. The next resource requirement after Conawapa occurs in 2032.

The results of the wind RFP analysis are also discussed in this report. The value that an additional 300 MW of wind power brings to the system is about $60/MWh (2007$ @ border). The value of the wind power is largely determined by what the alternatives are and the amount of surplus energy, tie-line space, and market share that exists before the wind power is added. The wind generation being evaluated is coincident with the requirement for new resources to meet domestic load. Therefore, there is no increased market risk associated with the wind power, compared to other options. Accordingly, no risk premium has been applied.

Since the 2006/07 Power Resource Plan (06 PRP), key updates have been included: specifically the Conawapa and Keeyask capital costs, the export price forecast and the domestic load forecast.

- The November 2006 Range Estimating Session resulted in Conawapa's and Keeyask's capital costs increasing.
- The updated export forecast predicted higher prices both on the long-term on-peak dependable and on-peak opportunity market.
- The load forecast is higher than last year (2006/07 PRP) by about 1125 GWh by 2020.

Other major assumptions in this report:

- Bipole III will be required for reliability before it is needed for new northern generation although the time between Bipole III being available for reliability (2017) and the date when new generation is required (2021) has diminished. The Bipole is assumed to follow a route west of the Interlake and this route will require 2000 MW of converters to operate.
- Wuskwatim will be built for an in-service date of 2012/13.
- A total of 400 MW of wind power will be available by 2013/2014.
- Brandon and Selkirk operation will continue until at least 2018/19 and 2020/21 respectively.
- Kelsey will be upgraded by 77 MW by 2011 (previously estimated to be 85 MW).
- Pointe du Bois will be modernized to a capacity of 120 MW with an in-service date of 2015.

This plan represents a balance between energy reliability (defined as the degree of certainty in Manitoba Hydro's ability to meet energy commitments) and cost. The major risks associated with this plan are:

- A greater reliance on wind energy at contracted prices above $ 60/MWh would increase cost.
- An increasing reliance on imports instead of wind energy would decrease energy reliability.
- Significant load growth associated with the base load forecast, combined with delayed ISD's for wind have created planning energy deficits for the years 2009/10 to 2011/12 inclusive. These energy deficits have about a 4% hydrologic probability of occurrence in each of these years assuming the base load forecast. If no resources are secured, these energy deficits are relatively small and can be managed by non-contracted imports on the opportunity market should drought occur. However, this approach would be an exception to Manitoba Hydro's planning criteria.
- If wind energy purchases are ultimately foregone because, for example wind energy is too costly, and if the NSP sale extension is undertaken, the resulting deficits could be up to about 1100 GWh. by 2020. Early retirement of Brandon #5 before 2019 would have an earlier impact resulting in a 1600 GWh deficit by 2011.
- With no new wind energy, a one year delay of Conawapa from 2021 to 2022, would result in deficits of about 2260 GWh and 2675 GWh in 2021/ 22 respectively with and without the NSP sale extension.
- Load increases beyond those in the existing base forecast would exacerbate deficits.
- There is a high degree of confidence that energy deficits up to 3000 GWh/year could be managed through imports. However this approach would increase the financial impact of drought.

THE 2007/08 POWER RESOURCE PLAN

OBJECTIVE:

The objectives of the 2007/08 Power Resource Plan are as follows:

- Evaluate the economics of up to 300 MW of additional wind power.
- Determine the long-term resource plan for the 2007 Integrated Financial Forecast and the Capital Expenditure Forecast.

BACKGROUND:

I. ASSUMPTIONS FOR NEW/UPGRADED GENERATION:

Wuskwatim:
The infrastructure portion of the Wuskwatim project is under way and scheduled to be completed by spring 2008 and on schedule. First power for the project continues to be June 2012. Cursory economic evaluations indicate that there would be value in advancing the plant in-service date ten months, to August 2011 based on current cost estimates. The current project schedule allows for up to a ten month advancement. General civil contract bids are expected in by mid-July and a more detailed evaluation on in-service date advancement will be conducted at that time.

Kelsey:
The 2007/08 Power Resource Plan continues to include Kelsey Rerunnering projected to provide 77 MW of incremental capacity (previously estimated to be 85 MW), up to 315 MW plant capability. There will be an increase in average energy but there will not be an increase in dependable energy. The first unit to be rerunnered was taken out of service in the fall of 2006 and is expected to be back in service in July, 2007. The plan will have all seven units rerunnered by November, 2011.

Pointe du Bois:
The 2007/08 Power Resource Plan includes the rebuilding of Pointe du Bois, which assumes a rating of 120 MW and 621 GWh of dependable energy with an in-service date of 2015/16. This is an increase of 43 MW and 150 GWh relative to the existing plant. Subsequent to initial studies, various environmental processes and community consultation, the Manitoba Hydro is now formally commencing the regulatory process for the work during the summer of 2007.

Pointe du Bois is the oldest operating generating station in Manitoba, with much of the original equipment still in service. When Manitoba Hydro purchased Winnipeg Hydro, plans to upgrade Pointe du Bois were in place. Manitoba Hydro has subsequently re-evaluated the options available at Pointe du Bois. Manitoba Hydro's evaluation of the options has indicated that the rebuild option is the most attractive in overall comparison of the various studied options for the site, when viewed from various perspectives: economic, technical, environmental and socio-economic. More detailed engineering studies of the rebuild option have commenced and will further define the recommended actions for the Corporation. A delay of the in-service date would not have a significant impact on the conclusions of this report unless that delay was beyond 2021.

Current estimates for completion of the EIS would not likely be before 2009. Allowing for a five to six year construction schedule, this would mean that the earliest in-service date for an upgraded Pointe du Bois would be 2015/16. The resource plan has therefore included a "rebuilt" Pointe du Bois with a 2015/16 ISD.

Other Rerunnering:
Evaluations are ongoing on Pine Falls, Great Falls and Slave Falls for supply-side improvements. It is expected that the Great Falls Unit 4 rerunnering project will proceed with about 10 MW added in 2010. For Pine Falls, the Corporation is currently evaluating the economics of rerunnering Units 1 and 2, with a possibility of also rerunnering Units 3 and 4. Rerunnering of units 1&2 is expected to take place in 2010 & 2011 and add a total of about 11 MW.

Existing Thermal Resources:
No changes to the supply assumptions for existing thermal generation resources (Brandon gas turbines #6 & 7, Brandon #5 and Selkirk #1 & 2 steam plants) have been made for the 2007/08 Power Resource Plan.

For Selkirk GS, Manitoba Conservation has provided a draft revised environment act license for Manitoba Hydro's review and final terms are expected by fall of 2007. For the 2007/08 PRP, the Selkirk 1&2 environmental act license was assumed to expire in 2019/20. However, the draft revised license does not stipulate a license expiry date. In addition, due to the good physical condition of the units and the low anticipated levels of operation, Units 1&2 are expected to be serviceable well beyond 2019/20. Therefore, new assumptions for Unit 1&2 operational life will be developed when the license is finalized and these will be included in the 2008/09 PRP.

For Brandon GS, the license review process is in progress and a revised environment act license is tentatively anticipated in 2008. The assumed environment act license expiry date for Brandon 5 is assumed to be 2018/19 in the PRP. Studies are currently planned to determine the remaining operational life of the unit and the PRP will be updated when those studies are completed and the results of the license review process are known.

Wind Generation:
In March 2007, a Request for Proposal (RFP) was issued by Manitoba Hydro for up to a maximum of 300 MW of additional wind energy. The closing date for the RFP is July 18th, 2007.

The timing for the in-service of this additional wind power will likely be later than previously thought. For the purposes of this resource plan, it has been assumed that the first 100 MW will come on-line no earlier than 2010 and the subsequent 100 MW installations will be in 2011 and 2012 respectively. Recent studies also indicate that the capacity factors of the additional 300 MW of wind power will not be as high as the St. Leon site. The table below summarizes the current wind power assumptions for the Sequence recommended to the 2007 IFF.

Table 1
Wind Power Assumptions for the 2007 IFF

Site	Status	Capacity Factor
St Leon - 100 MW	Operational in 2006	39%
Proposed - 100 MW	On-line 2010	38%
Proposed - 100 MW	On-line 2011	37%
Proposed - 100 MW	On-line 2012	36%

An evaluation was conducted to determine the incremental value of 100 MW blocks of wind power to the system. A summary of the results is contained in the "Evaluation of an Additional 300 MW of Wind Power" section of this document.

Status of Bipole III:
This fall, Manitoba Hydro is developing plans to proceed, with introductory consultations with regulatory authorities, aboriginal communities, and rural towns and municipalities with regard to the development of Bipole III running from the Nelson River via the area west of Lake Winnipegosis and on to the Riel Station site on the east side of Winnipeg.

For the purposes of this resource plan and the Corporate Integrated Financial Forecast it has been assumed that the west route for the Bipole III HVDC line is the route that will be developed and that the earliest in-service date continues to be October 2017. The October 2017 ISD allows for four years Site Selection and Environmental Assessment Studies (SSEA), one year for licensing, six months to initiate property acquisition, and five winter construction seasons for both the line and converters. A final route will be determined through the application of Manitoba Hydro's site selection and environmental assessment processes, including input from a comprehensive public involvement program.

The loss reduction available from the Bipole III HVDC line remains unchanged and, with a western routed line, continues to require the installation of both north and south converters to be functional.

II. ASSUMPTIONS FOR DEMAND:

DEMAND SIDE MANAGEMENT:

The 2007/08 Power Resource Plan includes incremental DSM savings from the preliminary 2007 POWER SMART Plan. The report outlines a detailed plan to achieve the Corporate target of electricity savings of 839 MW / 2852 GWh by 2017/18. The Corporate target includes the savings to date of 434 MW / 1030 GWh already achieved by March 31, 2006.

This year, a levelized cost evaluation was conducted on Option 2 and Option 3 which is contained in Table 2 below.

Table 2
Levelized DSM Costs
2007 $/MWh

	@ 10% Discount Rate		@ 6.1% Discount Rate	
	Option 2 (1128 GWH in 2021)	**Option 3** (90 GWH in 2021)	**Option 2** (1128 GWH in 2021)	**Option 3** (90 GWH in 2021)
Total Resource Cost	**36.2**	**130.9**	**29.3**	**111.1**
Utility Cost	**22.4**	**127.1**	**16.4**	**103.6**

Option 2 consists of all the individual DSM programs that have a Total Resource Cost (TRC) ratio of 1.0 or better. In search of more DSM savings, Option 2 programs were pushed to the limit to determine if any additional saving could be achieved to bring their TRC ratio closer to 1.0. Option 3 represents the incremental savings & costs that were achieved over Option 2. The effect of this analysis shows that the incremental savings achieved are not cost effective, thus having a TRC ratio less than 1.0. Furthermore this analysis demonstrates that savings beyond Option 2 are providing diminishing returns. Also, on a levelized cost basis for TRC and Utility Cost, Option 3 is clearly not economic and should not be pursued.

LOAD FORECAST:

Base Load Forecast: In last year's resource plan, it was stated that "the 2006 Base Load Forecast would be higher by an amount in the range of 1000 GWh to 2000 GWh by 2019 if the energy intensive rate structure were not modified". It is expected that Manitoba Hydro's current rate structure for energy intensive customers will continue to attract large base-load electricity customers in the long-term.

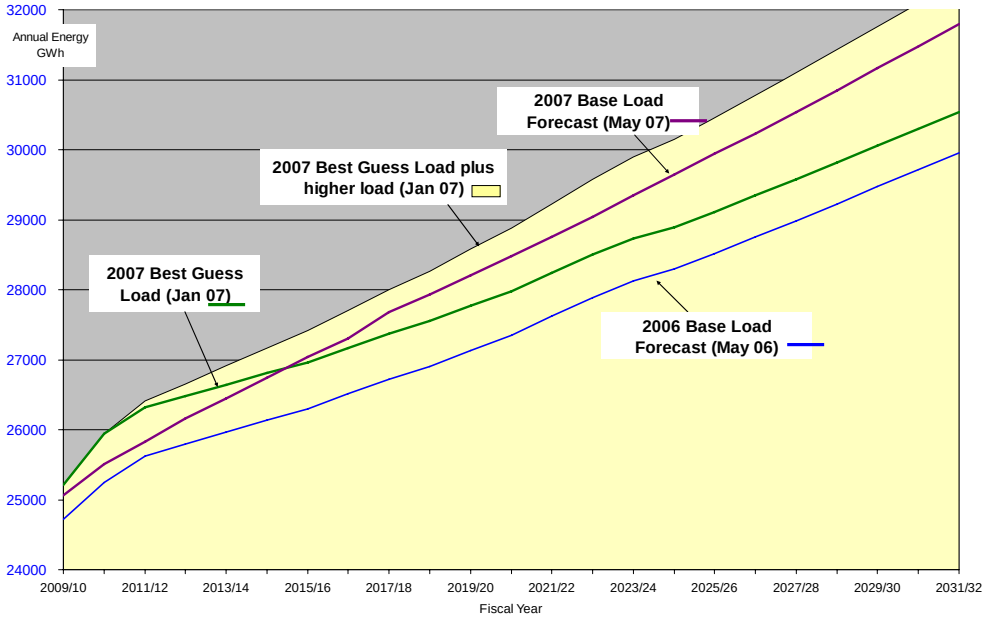
Two interim load forecasts were provided in January 2007 to better estimate the Manitoba load. These forecasts were used in the wind RFP analysis. The two interim forecasts include the following scenarios:

- Future implementation of an energy intensive rate - identified as the 2007 Best Guess load forecast.
- No future implementation of an energy intensive rate - simply identified as 2007 Higher Load

The results of the wind RFP analysis are contained in this resource plan in Table 5.

Below, Figure 1 compares the two interim forecasts with the 2006 Base Load Forecast and the 2007 Base Load Forecast.

Figure 1
Comparison of 2007 and 2006 Load Forecasts
(Net of DSM)



The 2007 Base Load Forecast is lower in the near-term and higher in the long-term than the 2007 Best Guess load, crossing over around 2014. Compared to the 2006 Base load forecast, this year's Manitoba load forecast is about 120 GWh higher by 2008 but about 1125 GWh higher by 2020.

Significant increases in the 2007 Base Load Forecast compared to the 2006 forecast are primarily relating to the General Service sector:

- Brighter outlook in the Primary Metals sector
- Revised estimates of pipeline expansions in the Petroleum sector
- Chemical sector has increased due to potential sodium chloride plans

In addition, the 2007/08 Electric Load Forecast contains a new classification in General Service category called Potential Large Industrial Loads.

To a much lesser extent, the following areas resulted in changes as well:

- Residential housing forecast was increased by 200 homes per year.
- Forecasted higher saturation of residential electric water heating.
- Change in weather normalization methodology.

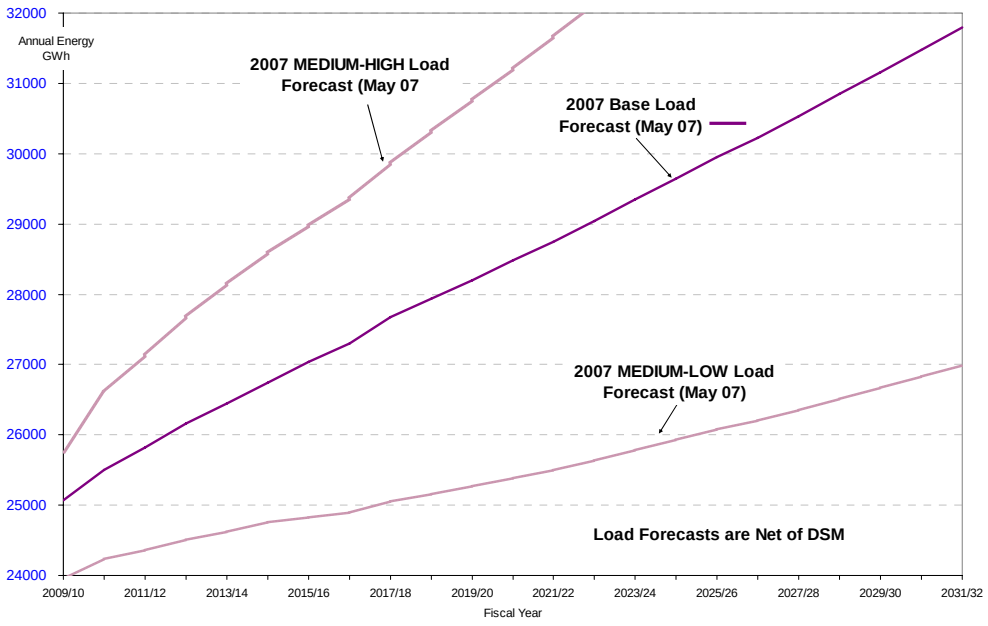
Impact of Medium-High and Medium-Low Load Forecasts on Timing of New Resources:

Alternative load growth scenarios provided in the 2007/08 Electric Load Forecast were substituted to determine resource requirements under those higher and lower load scenarios

- A load growth corresponding to medium-high load growth scenario would result in every year from 2008 and on to be critical under a repeat of the lowest flow on record (dependable energy conditions) in those years. The exception to that would be years 2015 and 2016 which is coincident with the expiration of the current NSP 500 Sale contract.
- 2007 Medium-low load forecast: under dependable energy conditions, new resources would not be required until 2034.

The 2007 Base, Medium-High, Medium-Low Electric Load Forecasts (net of DSM) are compared below in Figure 2.

Figure 2
2007 Base, Medium High & Medium Low Load Forecasts
(Net of DSM)

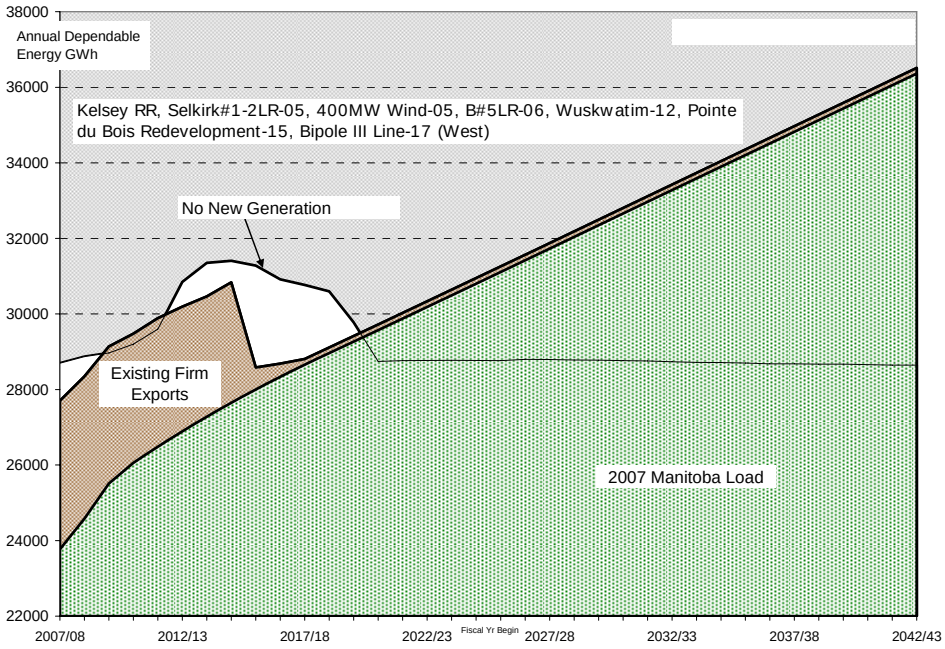


TIMING of NEW RESOURCE REQUIREMENTS for FIRM LOAD

Figure 3 below depicts the system dependable energy supply-demand balance with no new committed resources. Under dependable energy conditions, new generation is required to meet Manitoba load and firm committed exports in 2020. Last year, new resources were required in 2021. This year Conawapa continues to be the plant chosen as the next resource to be developed for the purposes of the sequence for the IFF.

Conawapa is unlikely to be available until 2021/22, due to difficulty in obtaining approvals and completing construction. However it is expected that the operation of Selkirk GS could be extended for at least one year to March 2021 to alleviate the deficit in 2020/21. This would reduce the deficit from 977 GWh to 17 GWh in 2020. A future study will be required to determine if a best bridging option is required for 2020.

Figure 3
System Dependable Energy Supply-Demand Balance
2007 Power Resource Plan - No New Generation



The combination of a higher load forecast and delayed wind generation in-service dates compared to last year, results in deficits in the 2009 - 2011 time frame. Those deficits are addressed below in the two sections on “Near-Term Shortages” and “Bridging / Contingency Options”.

I. NEAR-TERM SHORTAGES:

Utilizing the 2007 Base Load Forecast and 2007 Option 2 DSM in the dependable energy supply-demand tables, near-term deficits appear in years: 2009, 2010 and 2011 due to the following factors.

- Resources:
    - Wind energy that was committed to in last year's resource plan is not likely to be available until mid 2010 at the earliest. Last year, it was assumed that at least 150 MW would be coming on line in 2009.
    - Information now indicates that the energy expected from the wind resource may have been slightly optimistic and therefore the capacity factors of future wind resources have been adjusted. See preceding Table 1 and section on "Wind Power Assumptions for the 2007 IFF".
- Load
    - The Manitoba load forecast is up (net of DSM) in the years 2009, 2010, and 2011 by 200-350 GWh's.
    - Imports/Exports: small changes to firm export contracts which are generally insignificant.

These factors combine to produce the near-term deficits. Table 3 below summarizes the impact of these changes in supply and demand for these three years compared to last year.

Table 3
Summary of Changes in Dependable Energy Supply-Demand Balance
Dependable GWh

	2009	2010	2011
Surplus GWh (from 2006 PRP)	**535**	**460**	**336**
Decreased Resources (timing /quantity of wind power)	**-367**	**-470**	**-408**
Increased MB Load (net of DSM, w/ PduB const power)	**-338**	**-266**	**-215**
2007 Surplus GWh (current: 2007 PRP)	**-169**	**-276**	**-287**

II. BRIDGING / CONTINGENCY OPTIONS:

A limited number of bridging or contingency options may be available to cover the near-term shortages described in the preceding section. However, since detailed evaluations of these options have not yet been undertaken, they should be considered theoretical until such evaluations are completed.

At this time, none of these options is sufficiently advanced to enable the detailed study and sequence costing necessary to support a commitment decision. Furthermore, commitment to certain options requires commitment beyond the potential deficit period, for periods of 20 years or more. For this reason, these options are more appropriately considered new resources for Manitoba load and their commitment could impact the sequence and timing requirements for resources that are already committed to in the Power Resource Plan or as hedges against the ISD risks associated with those

resources. Proper study of bridging options would include study of sequence impacts, including deferral costs or benefits for previously committed resources.

Furthermore, the only option available for 2009 is imported power, while other options have ISDs of 2010 or later. Should the need arise to commit to a bridging option, consideration should be given to the use of a portfolio of options, depending on the amount of energy required, to hedge against the risks and uncertainties associated with each option. For example, one potential portfolio may be imported power combined with the Mankato CCGT winter season contract. Using a portfolio approach allows for flexibility in the near term and may reduce capital expenditures associated with bridging. Potential bridging options are described below.

Imported Power

To meet energy requirements in the 2009 to 2011 time frame, imported power from the MISO market is one contingency option. Imported power could be procured on a day-ahead, as-required basis to meet system requirements or through the establishment of firm bi-lateral contracts for fixed time periods to ensure availability. This option is expected to have the lowest cost and risk of the available bridging options.

Advancement of Wuskwatim

Currently, the anticipated ISD for Wuskwatim is June 2012 but the project schedule potentially allows for up to a ten-month advancement to August 2011. If available, this option would alleviate the energy deficit in 2011. Further evaluation is required.

Aeroderivative Simple Cycle Gas Turbines

Modular simple cycle gas turbine generators in the 50 MW size range are available from manufacturers such as GE and Rolls Royce. These units are derived from gas turbines originally designed for flight applications and can be purchased as complete, factory tested power plant packages mounted on base plates for fast installation compared to larger industrial frame gas turbine generators which must be built in-situ.

A potential bridging option is to install three of these units at Brandon Generating Station in the spaces currently occupied by retired Units 1 to 4. Preliminary in-house estimates indicate that there may be potential to install two 49 MW GE LM6000 gas turbine generators by May 2010 and one additional unit by October 2010 if a commitment decision is made by September 2007 and a dedicated project team is created. These ISDs assume that the environmental assessment, licensing, and equipment procurement processes occur in parallel. This option is expected to have the highest capital cost of the available bridging options.

III. EXPORT MARKET:

The Electricity Export Price Forecast was updated in 2007 and was utilized in the wind RFP analysis.

- The high, expected and low forecasts of both on-peak long-term dependable and opportunity export prices have increased since last year. Compared to last year, the 2007 expected on-peak estimates of dependable and opportunity export prices have increased by up to 15% in the long term.

Increases are attributed to higher projected natural gas prices. Natural gas is the fuel at the margin used to generate power during most of the on-peak hours. Also, CO2 allowance prices have an increased recognition compared to the 2006 forecast.

EVALUATION of an ADDITIONAL 300 MW of WIND POWER:

In March 2007, a Request for Proposal (RFP) was issued by the Corporation for up to a maximum of 300 MW of additional wind energy. The closing date for the RFP is July 18th, 2007.

In May 2007, an analysis was conducted to explore the benefits that the energy associated with an additional 300 MW of wind power would add to the Manitoba Hydro System and therefore determine the value that those benefits represent on a $/MWh basis.

In this analysis, the planned 300 MW wind power added to the system in 100 MW increments starting in 2010. Currently, it is not considered feasible that additional wind energy could be available any earlier than 2010. The incremental value of each 100 MW block of wind energy was determined in this evaluation and levelized utilizing the incremental average energy (converted to value per MWh over the entire analysis period).

At the time that this analysis was initiated, the 2007 Base Load Forecast had not yet been received by RPMA, therefore the evaluation was conducted on the interim 2007 Best Guess load forecast that was developed by the Market Forecast Department in January 2007. Comparison of the 2007 load forecast to the 2007 Best Guess is in Figure 1, earlier in this report.

The wind RFP study estimates the value of 100 MW incremental blocks of wind power add to the system. The study results indicate that each incremental 100 MW of wind generation adds less value than the wind power installed before it, as expected. The levelized benefit of each incremental 100 MW block of wind power compared to meeting the same loads with imports ranges from $57 to $59/MWh.

Wind Integration Costs and Market Risk Premiums

Wind generation is not dispatchable, it is somewhat erratic, and difficult to forecast. These features need to be accounted for in the evaluation of the value of wind power.

The proposed wind generation in this report is being evaluated when it is required to meet domestic load under dependable conditions. This causes the purchase cost of wind to be directly comparable to capital carrying costs of other options (evaluated at WACC). Therefore, there is no incremental market and exchange risk, and it has been estimated as $0/MWh.

Estimates of the Integration Cost and the Market Risk premium that might apply to the proposed 300 MW of new wind generation are &5.5 to $6.0/MWh.

Renewable Energy Credits

It is not clear that Renewable Portfolio Standards in the U.S. would result in Renewable Energy Credits being available for Manitoba wind; hence none have been included.

SUMMARY:

WIND RFP CONCLUSION:

Overall, in the analysis, the first 100 MW of wind power is worth the most and each increment decreases in value. It is judged that the analysis using the Best Guess load forecast where wind power derives its value from the market, is considered most representative.

LONG-TERM RESOURCE PLAN for the 2007 INTEGRATED FINANCIAL FORECAST and the 2007 CAPITAL EXPENDITURE FORECAST:

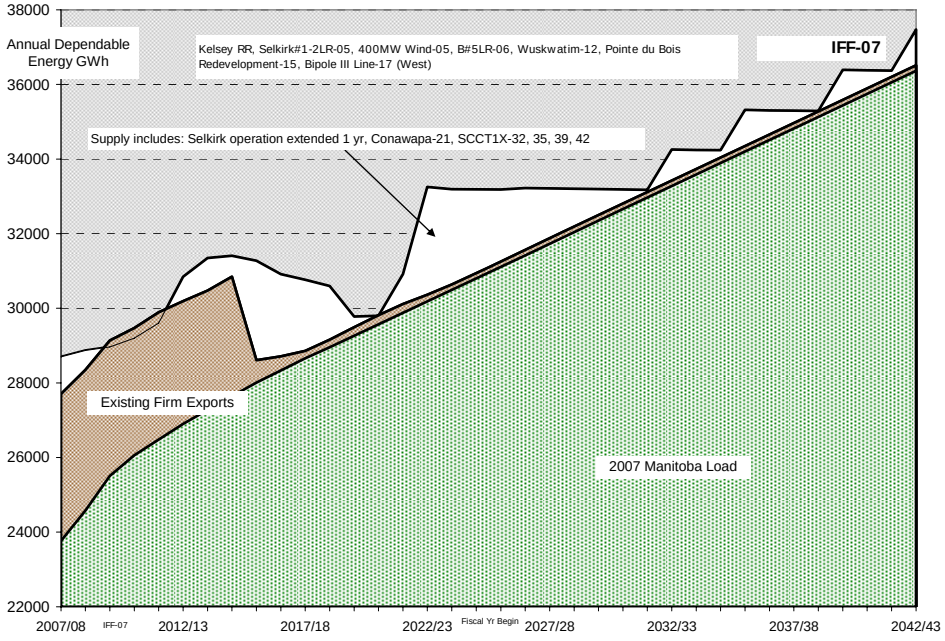
An evaluation to select the sequence recommended for the 2007 IFF was not conducted this year. Previous studies continue to indicate that Conawapa is the preferred next option for development to meet Manitoba Load.

A deficit under dependable conditions appears in the year 2020, rather than 2021 last year. This year, Conawapa's earliest achievable in-service date is considered to be 2021. Although a detailed evaluation has not been conducted, an extension of Selkirk's operation by one year would alleviate the deficit of 977 GWh.

JUSTIFICATION

The generation sequence identified for the 2007/08 IFF is: one year additional Selkirk GS operation, Conawapa-21 followed by gas turbines. Figure 5 below depicts that sequence meeting Manitoba load and firm committed exports.

Figure 5
System Dependable Energy Supply-Demand Balance
2007 Power Resource Plan - IFF Sequence



RISKS:

This plan represents a balance between energy reliability (defined as the degree of certainty in Manitoba Hydro's ability to meet energy commitments) and cost. The major risks associated with this plan are:

- A greater reliance on wind energy at contracted prices above $ 60/MWh would increase cost.
- An increasing reliance on imports instead of wind energy would decrease energy reliability.
- Significant load growth associated with the base load forecast, combined with delayed ISD's for wind have created planning energy deficits for the years 2009/10 to 2011/12 inclusive. These energy deficits have about a 4% hydrologic probability of occurrence in each of these years assuming the base load forecast. If no resources are secured, these energy deficits are relatively small and can be managed by non-contracted imports on the opportunity market should drought occur. However, this approach would be an exception to Manitoba Hydro's planning criteria.
- If wind energy purchases are ultimately foregone because, for example wind energy is too costly, and if the NSP sale extension is undertaken, the resulting deficits could be up to about 1100 GWh. by 2020. Early retirement of Brandon #5 before 2019 would have an earlier impact resulting in a 1600 GWh deficit by 2011.
- With no new wind energy, a one year delay of Conawapa from 2021 to 2022, would result in deficits of about 2260 GWh and 2675 GWh in 2021/ 22 respectively with and without the NSP sale extension.
- Load increases beyond those in the existing base forecast would exacerbate deficits.
- There is a high degree of confidence that energy deficits up to 3000 GWh/year could be managed through imports. However this approach would increase the financial impact of drought.

System Firm Energy Demand and Dependable Resources (GW.h)

Table A.1

2007 Base Load Forecast

Fiscal Year	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
POWER RESOURCES																	
Manitoba Hydro Plants																	
Existing	21120	21110	21090	21080	21060	21040	21030	20690	20660	20640	20630	20610	20600	20590	20580	20580	20570
Wuskwatim					878	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Conawapa														2151	4550	4550	4550
Bipole III HVDC LINE										442	442	442	442	442	378	314	314
Manitoba Thermal Plants																	
Brandon Unit 5 License Review	837	837	837	837	837	837	837	837	837	837	837						
Selkirk License Review	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060				
Brandon Units 6-7 SCCT	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
SCCT's																	
Committed Wind Power: 400 MW	320	320	462	770	1069	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229
Demand Side Management	339	443	552	658	745	829	899	965	1034	987	1026	1059	1092	1128	1140	1145	1149
Refurbishment of Hydro Plants																	
Kelsey Rerunnering																	
Pointe du Bois								60	150	150	150	150	150	150	150	150	150
Imports																	
Total Contracted	2796	2796	2796	2796	2796	2705	2705	2784	2293	1769	1575	1575	1575	1575	1575	1575	1575
TOTAL POWER RESOURCES	**28872**	**28966**	**29198**	**29602**	**30845**	**31350**	**31410**	**31276**	**30914**	**30764**	**30599**	**29775**	**29798**	**30916**	**33253**	**33194**	**33188**
DEMAND																	
2006 Base Load Forecast	24577	25509	26069	26503	26932	27318	27693	28058	28373	28712	29014	29344	29670	29968	30216	30495	30795
Exports																	
Total Contract Sales	3768	3626	3404	3385	3259	3156	3156	547	339	145	145	145	145	145	145	145	145
TOTAL DEMAND	**28345**	**29135**	**29473**	**29888**	**30191**	**30474**	**30849**	**28605**	**28712**	**28857**	**29159**	**29489**	**29815**	**30113**	**30361**	**30640**	**30940**
SURPLUS	**527**	**-169**	**-275**	**-287**	**654**	**876**	**561**	**2671**	**2202**	**1907**	**1440**	**287**	**-17**	**803**	**2892**	**2554**	**2248**

System Firm Energy Demand and Dependable Resources (GW.h)

Table A.1

2007 Base Load Forecast

Fiscal Year	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42
POWER RESOURCES																	
Manitoba Hydro Plants																	
Existing	20560	20560	20550	20540	20540	20530	20530	20520	20510	20510	20500	20490	20490	20480	20480	20470	20460
Wuskwatim	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Conawapa	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550	4550
Bipole III HVDC LINE	314	314	314	314	314	314	314	314	314	314	314	314	314	314	314	314	314
Manitoba Thermal Plants																	
Brandon Unit 5 License Review																	
Selkirk License Review																	
Brandon Units 6-7 SCCT	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
SCCT's								1100	1100	1100	2200	2200	2200	2200	3300	3300	3300
Committed Wind Power: 400 MW	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229
Demand Side Management	1157	1192	1197	1193	1189	1184	1177	1167	1162	1158	1152	1143	1142	1141	1141	1141	1141
Refurbishment of Hydro Plants																	
Kelsey Rerunnering																	
Pointe du Bois	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Imports																	
Total Contracted	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
TOTAL POWER RESOURCES	**33186**	**33221**	**33215**	**33201**	**33197**	**33182**	**33176**	**34255**	**34240**	**34236**	**35320**	**35301**	**35301**	**35290**	**36390**	**36380**	**36370**
DEMAND																	
2006 Base Load Forecast	31106	31418	31733	32042	32351	32659	32968	33277	33585	33894	34203	34512	34820	35129	35438	35746	36055
Exports																	
Total Contract Sales	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
TOTAL DEMAND	**31251**	**31563**	**31878**	**32187**	**32496**	**32804**	**33113**	**33422**	**33730**	**34039**	**34348**	**34657**	**34965**	**35274**	**35583**	**35891**	**36200**
SURPLUS	**1935**	**1657**	**1337**	**1014**	**701**	**378**	**63**	**834**	**510**	**197**	**972**	**645**	**335**	**16**	**807**	**488**	**170**

System Firm Capacity (Winter Peak) Demand and Resources (MW)

Table A.2

2007 Base Load Forecast

Fiscal Year	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
POWER RESOURCES																	
Manitoba Hydro Plants																	
Existing	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828
Wuskwatim					200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa														300	990	1230	1230
Bipole III HVDC LINE										87	87	87	87	87	50	50	50
Manitoba Thermal Plants																	
Brandon Unit 5 License Review	105	105	105	105	105	105	105	105	105	105	105						
Selkirk License Review	132	132	132	132	132	132	132	132	132	132	132	132	132				
Brandon Units 6-7 SCCT	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
SCCT's																	
Committed Wind Power: 400 MW																	
Demand Side Management	51	74	97	119	139	156	172	188	205	221	232	241	250	259	265	270	274
Regurbishment of Hydro Plants																	
Kelsey Rerunnering	-11		11	34	75	75	75	75	75	75	75	75	75	75	75	75	75
Pointe du Bois								43	43	43	43	43	43	43	43	43	43
Imports																	
Total Contracted	616	616	616	616	616	550	550	660	440	440	220						
TOTAL POWER RESOURCES	**6019**	**6053**	**6087**	**6132**	**6393**	**6344**	**6360**	**6529**	**6326**	**6429**	**6220**	**5904**	**5913**	**6090**	**6749**	**6994**	**6998**
PEAK DEMAND																	
2006 Base Load Forecast	4417	4569	4658	4725	4786	4844	4900	4956	5005	5063	5115	5169	5223	5278	5332	5386	5440
Exports																	
Total Contract Sales	726	693	638	638	605	605	605										
Total Load	**5143**	**5262**	**5296**	**5363**	**5391**	**5449**	**5505**	**4956**	**5005**	**5063**	**5115**	**5169**	**5223**	**5278**	**5332**	**5386**	**5440**
Reserve	458	473	481	487	492	497	501	493	523	528	560	591	597	602	608	614	620
TOTAL PEAK DEMAND	**5601**	**5735**	**5778**	**5850**	**5883**	**5946**	**6007**	**5449**	**5528**	**5591**	**5675**	**5761**	**5820**	**5880**	**5940**	**6000**	**6060**
SURPLUS	**417**	**318**	**309**	**282**	**510**	**398**	**354**	**1080**	**798**	**838**	**545**	**144**	**93**	**211**	**809**	**995**	**939**

System Firm Capacity (Winter Peak) Demand and Resources (MW)

Table A.2

2007 Base Load Forecast

Fiscal Year	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42
POWER RESOURCES																	
Manitoba Hydro Plants																	
Existing	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828
Wuskwatim	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230	1230
Bipole III HVDC LINE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Manitoba Thermal Plants																	
Brandon Unit 5 License Review																	
Selkirk License Review																	
Brandon Units 6-7 SCCT	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298	298
SCCT's								142	142	142	284	284	284	284	426	426	426
Committed Wind Power: 400 MW																	
Demand Side Management	278	289	292	293	293	293	293	291	289	287	285	281	281	280	280	280	280
Regurbishment of Hydro Plants																	
Kelsey Rerunnering	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Pointe du Bois	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Imports																	
Total Contracted																	
TOTAL POWER RESOURCES	**7002**	**7013**	**7016**	**7017**	**7017**	**7017**	**7017**	**7157**	**7155**	**7153**	**7293**	**7289**	**7289**	**7288**	**7430**	**7430**	**7430**
PEAK DEMAND																	
2006 Base Load Forecast	5495	5550	5605	5660	5714	5769	5824	5878	5933	5987	6042	6096	6151	6205	6260	6314	6369
Exports																	
Total Contract Sales																	
Total Load	**5495**	**5550**	**5605**	**5660**	**5714**	**5769**	**5824**	**5878**	**5933**	**5987**	**6042**	**6096**	**6151**	**6205**	**6260**	**6314**	**6369**
Reserve	626	631	638	644	651	657	664	670	677	684	691	698	704	711	718	724	731
TOTAL PEAK DEMAND	**6121**	**6181**	**6243**	**6304**	**6365**	**6426**	**6487**	**6549**	**6610**	**6671**	**6732**	**6794**	**6855**	**6916**	**6977**	**7038**	**7099**
SURPLUS	**882**	**832**	**773**	**713**	**652**	**591**	**530**	**608**	**545**	**482**	**560**	**495**	**434**	**372**	**453**	**392**	**331**