MANITOBA HYDRO 2010/11 POWER RESOURCE PLAN

Date: Sept. 24, 2010

The purpose of the 2010/11 Power Resource Plan is to provide a recommendation for the long-term power resource development plan which, similar to last year, includes:

- a recommended development plan for use in the 2010 Integrated Financial Forecast and the Capital Expenditure Forecast, and
- an alternative development plan, which recognizes uncertainties in the recommended plan.

2010/11 Recommended Power Resource Development Plan

The recommended power resource development plan includes the major infrastructure and resources to pursue a new interconnection and facilitate the Wisconsin Public Service (WPS) and Minnesota Power (MP) Sales as follows:

- The 500 MW Sale to WPS and the 250 MW Sale to MP as described in the Term Sheets incorporating negotiated terms as at March 31, 2010,
- Keeyask with a 2019/20 In-Service Date (ISD),
- Conawapa with a 2023/24 ISD,
- A new interconnection capable of 1000 MW export and 750 MW import with a 2019/20 ISD,
- Additional north-south transmission beyond a 2000 MW Bipole III, as required for the combined Conawapa and Keeyask generation with a 2024/25 ISD.

2010/11 Alternative Power Resource Development Plan

The alternative power resource development plan for major infrastructure and resources to meet Manitoba requirements without a new interconnection and without the MP or WPS Sales is as follows:

- Conawapa with a 2022/23 ISD,
- Combined Cycle Gas Turbine with a 2033/34 ISD.

Inherent in these plans are the base resource assumptions, which can be found in Section 3. SUPPLY OF POWER.

The Supply and Demand Tables for Dependable Energy and Capacity can be found in Appendix A. Supply and Demand Tables for Average Energy can be found in Appendix B.

EXECUTIVE SUMMARY

The 2010/11 plan for power resources is the most recent corporately approved update of energy supply and demand for the Manitoba Hydro system and is based on information available prior to August 2010.

Under dependable energy conditions, new generation is required to meet Manitoba load requirements in 2021/22. The recommended development plan includes a new interconnection, Keeyask Generating Station and Conawapa Generating Station as well as the Wisconsin Public Service and Minnesota Power sales (the Sales Package).

Major supply assumptions to meet the new sales include:

- Keeyask in 2019/20
- Conawapa in 2023/24
- Additional north-south transmission beyond 2000 MW Bipole III by 2024/25
- New interconnection by 2019/20

This resource plan also includes several projects that are required to ensure continued operation and reliability of the existing system and to recognize climate change legislation in Manitoba such as:

- Kelsey upgrade of 77 MW completed by 2012/13
- 138 MW of new wind power at St. Joseph by 2010/11
- Pointe du Bois powerhouse rebuild by 2030/31
- Bipole III - 2000 MW completed by 2017/18
- Restricted operation of Brandon Unit 5 (coal)

For the purposes of the 2010/11 Power Resource Plan, Pointe du Bois is assumed to be rebuilt for a 2030/31 in-service date, at which time it will provide an increase of 43 MW and 150 GW.h/year of dependable energy. This is a change from the 2009/10 Power Resource Plan which assumed a Pointe du Bois rebuild by 2016/17. This change reflects the decision to move forward with a Spillway Replacement Project and defer the powerhouse rebuild.

The 2010/11 Power Resource Plan restricts the operation of Brandon Unit 5 to comply with *The Climate Change and Emissions Reductions Act* passed in 2008. Under the Act, Brandon Generating Station Unit 5 is restricted to the support of emergency operations which is considered to be the mitigation of adverse water conditions commonly referred to as "drought", and to provide system reliability support.

In May, 2010, agreements were executed with Northern States Power which extend Manitoba Hydro's export commitment with Northern States Power from 2014/15 to 2024/25. These agreements do not advance the need for new generation.

Manitoba Hydro signed a 27-year power purchase agreement in 2010 with San Francisco-based Pattern Energy Group LP for the 138 MW St. Joseph wind project in southern Manitoba. Construction is underway, and the project is expected to begin producing power by the end of 2010.

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2010/11 POWER RESOURCE PLAN

1. INTRODUCTION

The 2010/11 Power Resource Plan is the annual update to the long-term resource development plan to ensure that adequate resources are available to meet the needs of the province of Manitoba. This report provides a recommendation on how to meet these needs with a development plan that extends thirty-five years into the future.

The Power Resource Plan is updated annually to support the Integrated Financial Forecast (IFF) and the long-term Capital Expenditure Forecast processes as well as other long-term planning and corporate initiatives.

1.1. Resource Planning Criteria

Power resource planning is an essential activity in fulfillment of Manitoba Hydro's mission which is:

> "To provide for the continuance of a supply of energy to meet the needs of the province and to promote economy and efficiency in the development, generation, transmission, distribution, supply, and end-use of energy."

As multi-year lead times are required to plan, design, obtain approvals, and construct new resources, long-range planning is undertaken and is the responsibility of the Power Planning Division. Resource planning is governed by Manitoba Hydro Policy G195, Generation Planning which provides the following criteria:

> "1. Capacity Criteria
>
> Manitoba Hydro will plan to carry a minimum reserve against breakdown of plant and increase in demand above forecast of 12% of the Manitoba forecast peak demand each year plus the reserve required by any export contract in effect at the time.
>
> 2. Energy Resource Planning
>
> The Corporation will plan to have adequate energy resources to supply the firm energy demand in the event that the lowest recorded coincident river flow conditions are repeated. Planning studies, to meet the firm energy demand, may include up to a maximum of 10% of the energy demand in Manitoba to be supplied from the energy reserves on interconnected utilities, provided an energy purchase contract is or will be in effect during the time being studied."

Capacity Criteria:
Capacity reserves, measured in megawatts (MW), are intended to protect against capacity shortfalls resulting from breakdown of generation equipment, or increases in peak load due to unexpected load growth or extreme weather conditions. Historically, the reserve

margin of 12% has been adequate for Manitoba Hydro's predominately hydro based system because of the relatively low outage rates of hydro generating units combined with the relatively small size of units. For comparison, reserve margins in predominantly thermal-based systems are typically in the 15% to 18% range. The maximum demand for capacity in Manitoba occurs in the winter season, and therefore the winter peak capacity is evaluated in supply-demand tables for capacity.

Energy Resource Planning:
The energy criterion, measured in gigawatt-hours (GW.h), recognizes the limitation of hydraulic generation during drought conditions. This criterion requires that the Manitoba Hydro system be capable of supplying sufficient dependable energy resources to meet firm energy demand in the event of a repeat of the lowest historic system inflow conditions experienced from 1912 to present. The firm energy demand is determined from the base level of forecast Manitoba load and from existing export contracts. Historic system inflows are derived from the available record of river flows (1912 to present) which have been adjusted to represent present use conditions and to account for systemic changes due to expected future water use and withdrawals upstream of Manitoba.

The dependable energy available in the Manitoba Hydro system is the total of energy supplied from

- hydro-electric stations,
- thermal stations,
- contracted wind purchases,
- projected Demand Side Management (DSM) savings not already accounted for in the load forecast, and
- imports from neighbouring utilities.

The energy criterion limits the extent that imports can be relied upon to supply Manitoba demand. Plans for adequate resources may include imports from neighbouring utilities of up to 10% of the forecast Manitoba energy demand.

These planning criteria provide the basis for determining when new resources are required to ensure an adequate supply of capacity and energy for Manitoba. The recommended and alternative development plans in this report meet these planning criteria.

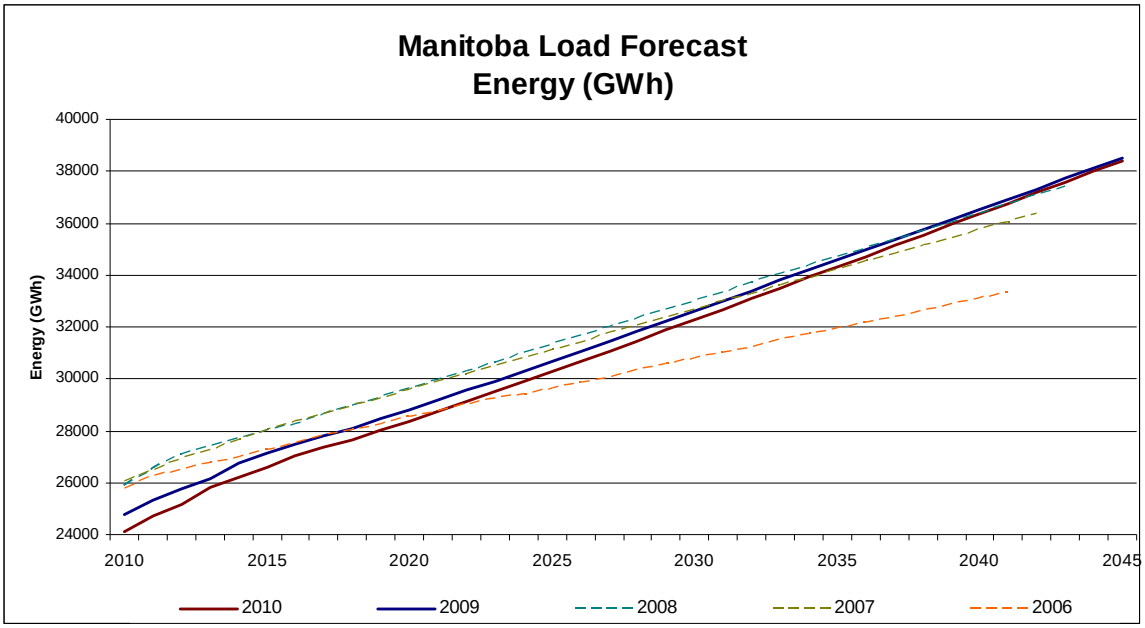
2. DEMAND FOR POWER - MANITOBA LOAD AND EXPORT CONTRACTS

Demand for power consists of Manitoba domestic load, which includes residential, commercial and industrial sectors, and requirements associated with export contracts. The following sections provide a summary of demand from the 2010 energy and capacity forecasts and from export contracts**.**

2.1. Electric Load Forecast

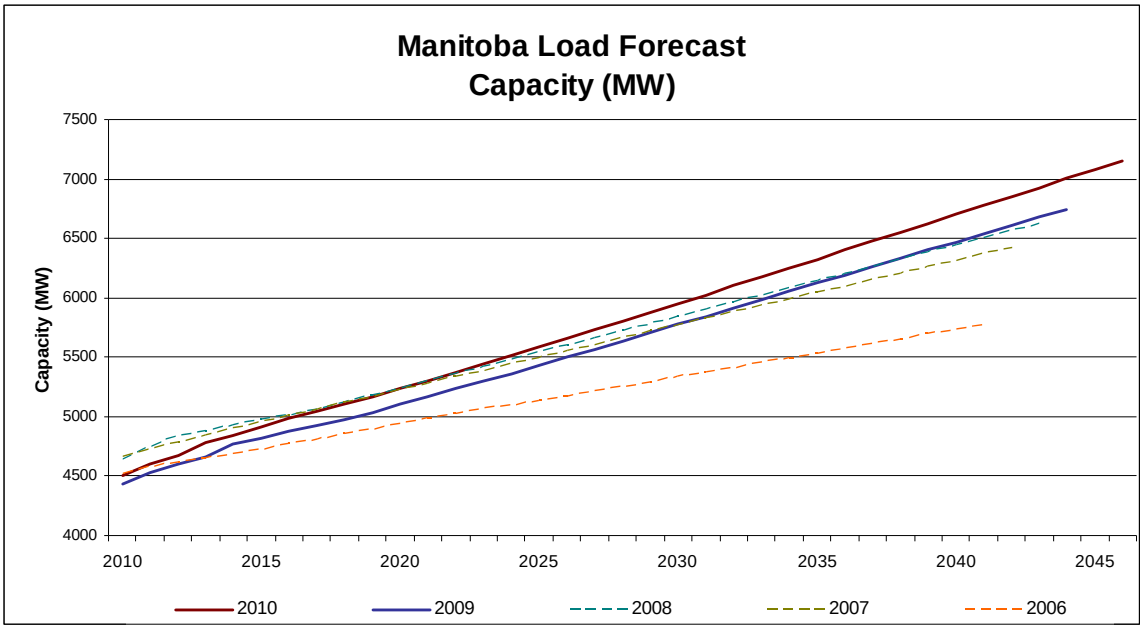
The report entitled *Electric Load Forecast 2010/11 to 2030/31* provides the forecast of the Manitoba domestic load. As shown in Figure 1 below the 2010 load forecast has decreased for the second consecutive year. Although residential load has increased over last year's forecast, lower energy demand is forecast for the industrial sector. This has resulted in a reduction in the 2010 energy forecast of approximately 400 GW.h/year on average over the 2009 energy forecast, reducing from about 640 GW.h in 2010, to 360 GW.h in 2029.

Figure 1
Comparison of Manitoba Load Energy Forecasts for 2006 - 2010



Although the forecast for Manitoba energy consumption has decreased from last year, peak Manitoba demand has increased as shown in Figure 2. This increase is primarily due to a re-evaluation of the peak. The load forecast has increased about 100 MW in 2010, and is about 300 MW greater by 2040.

Figure 2
Comparison of Manitoba Load Winter Peak Capacity Forecasts for 2006 - 2010



2.2. Existing Long-term Export Contracts

Long-term contracts are those which have a duration of greater than six months. Long-term dependable export obligations refer to sales that are sourced from dependable energy resources and must be served under all historic water flow conditions including the lowest flow on record. Long-term export obligations under dependable flow conditions may be less than the obligation under higher flow conditions and is governed by the terms of each individual contract.

New Sale Agreements with Northern States Power (NSP)
This past year, Manitoba Hydro signed definitive sale agreements to extend its export commitment with NSP from 2014/15 to 2024/25. The sale agreements are subject to regulatory approval by the Minnesota Public Utilities Commission (MPUC) and Canada's National Energy Board (NEB). The sale consists of five separate agreements effective May 1, 2015 to April 30, 2025 as follows:

1. **375/325 MW System Power Sale Agreement** - NSP has agreed to purchase 375 MW each winter season and 325 MW each summer season of system participation power. Fixed price energy deliveries under this contract are for the 16 on-peak hours of each weekday during the summer season and the 12 on-peak hours of each weekday during the winter season. During periods of low water Manitoba Hydro has the right to reduce the fixed price energy deliveries by up to 75% during the winter season through a financial settlement provision in the contract. In addition, Manitoba Hydro must offer energy during the 4 on-peak hours of each weekend day

throughout the year. This agreement will preserve 529 MW of existing firm south bound transmission between Manitoba Hydro and NSP. Manitoba has the right to put additional energy to NSP up to the maximum available transmission capacity of 529 MW in all hours.

2. **125 MW System Power Sale Agreement** - NSP has agreed to purchase an additional 125 MW of system participation power under identical terms and conditions as the 375/325 MW System Power Sale Agreement. This agreement is subject to the construction of major new hydraulic generation in Manitoba with a rated capacity of at least 1000 MW.

3. **350 MW Seasonal Diversity Sale Agreement -** Manitoba Hydro has agreed to provide NSP with 350 MW of capacity during the summer season and NSP has agreed to provide Manitoba Hydro with 350 MW of capacity during the winter season. Manitoba Hydro has the right to put energy to NSP during the summer season and call on energy from NSP during the winter season in all hours up to the maximum available transmission capacity. Manitoba Hydro includes 1614 GW.h per year of imports as dependable energy based on 350 MW hours per hour during the winter season. This agreement will preserve 363 MW of existing firm southbound and northbound transmission service between Manitoba Hydro and NSP.

4. **Amendment No. 3 to 200 MW Diversity Exchange Agreement** - The 350 MW Seasonal Diversity Agreement will replace the existing 200 MW Diversity Exchange Agreement between Manitoba Hydro and NSP. An amendment to the existing agreement was necessary to change its termination date from October 31, 2016 to May 1, 2015.

5. **Amendment No. 3 to 150 MW Diversity Exchange Agreement -** The 350 MW Seasonal Diversity Agreement will replace the existing 150 MW Diversity Exchange Agreement between Manitoba Hydro and NSP. An amendment to the existing agreement was necessary to change its termination date from April 30, 2019 to May 1, 2015.

3. SUPPLY OF POWER

This section describes resources that form the base supply available to meet Manitoba load requirements under a No New Generation plan and identifies when new base supply resources are required.

Base supply is common to all development plans and can be from existing resources or from expected resources. Existing resources include generating resources currently available within Manitoba and contracted imports from external markets. Expected resources are those to which Manitoba Hydro has committed or for which there is a reasonable expectation that Manitoba Hydro will commit. Expected resources include those presently under construction, proposed Supply-Side Enhancements (SSE), replacement or upgrading of existing resources, improvements due to transmission upgrades, Demand Side Management (DSM), and non-contracted imports from external markets.

3.1. Existing Resources

Table 2 provides a listing of existing resources and the available energy and capacity from these resources. Significant improvements and additions have been made over the years to maintain or enhance these generating resources. In this study it is assumed that sufficient maintenance and rehabilitation will continue to occur over time such that generating capability is sustained throughout the study period or until retirement where noted.

The supply-demand tables in Appendix A account for an annual decrease in hydraulic energy production of about 15 GW.h to reflect a reduction in system inflow due to anticipated increases in irrigation and other consumptive uses of water in Saskatchewan and Alberta.

Table 1
Existing Resources

Resource	Winter Peak Capacity (MW)	Energy Produced Under Flow Condition (GW.h)		
		Dependable	Average	Maximum
Hydro	4,900	21,090	29,250	35,445
Thermal	515	4,120	145	145
Wind	0	320	375	375
Imports	550	2705	varies	minimal
Total	**5,970**	**28,235**	**29,770**	**35,965**

Notes:

- Dependable energy of hydro is estimated for 2010/11. Supply demand tables show declining values to reflect water withdrawals over time. DSM is quantified in Table 2 Expected Resources.
- Average energy is the average of the annual generation from the full range of historic flows.
- Maximum energy is the generation which would occur for the maximum historic system flow (2005/06).
- Thermal resources are assumed to operate to their full potential for dependable energy, and are assumed to operate at their minimum for average and maximum flow conditions.

The following provides a summary of additional information, notable assumptions and/or current status updates for specific resources identified in Table 2.

Brandon G.S. Unit 5 - *The Climate Change and Emissions Reductions Act*

The 2010/11 Power Resource Plan assumption regarding the Brandon Generating Station Unit 5 operation remains unchanged from the 2009/10 Power Resource Plan which anticipated the introduction of *The Climate Change and Emissions Reductions Act* which received assent on June 12, 2008. Under this Province of Manitoba legislation, starting January 1, 2010, power generation from coal at Brandon Generating Station Unit 5 is restricted to "…support emergency operations".

Operation of Brandon Unit 5 will occur for two main purposes: mitigation of adverse water conditions commonly referred to as "drought", and to provide system reliability support. In order to maintain the effective power generation capability of Unit 5 for either of these purposes, preparation for emergency support will be necessary. Activities to maintain the reliable operation of the unit and system reliability support under emergency condition results in an estimated 125 GW.h /year of generation.

Brandon Unit 5 will remain available as a source of supply during a drought but it will not be considered available as a source of supply for new sales. In drought years, Brandon Unit 5 can continue to operate up to its maximum capability of 811 GW.h/year (northern equivalent). Unit 5 generation is assumed to be available to meet all commitments existing prior to the introduction of the Act. In the future however,

Brandon Unit 5 energy shall not be considered available to supply new sales including future long-term dependable export sales.

Brandon Generating Station Unit 5 - Environment Act Licence Review
As part of an on-going public licence review by Manitoba Conservation, Manitoba Hydro submitted an Environmental Impact Statement in December 2006.

Progress on the licence review was temporarily halted pending passage of the Manitoba's *Climate Change and Emissions Reductions Act* in 2008 and its subsequent regulation, *MR 186/2009, the Coal-Fired Emergency Operations Regulation* in November 2009. The licence review process has resumed following formal adoption of the new regulation.

Brandon Generating Station Units 6-7 Simple Cycle Combustion Turbines (SCCT)
The annual, firm energy assumption of 2354 GW.h for Brandon Generating Station Units 6-7 remains unchanged from the 2009/10 Power Resource Plan. However the firm capacity (Winter Peak) assumption has been updated from 298 MW to 280 MW to reflect the results of recent, annual, Uniform Rating of Generating Equipment (URGE) testing.

Brandon Units 6-7 are assumed to remain in operation to the end of the planning horizon assuming routine capital investment.

Selkirk Generating Station
The 2010/11 Power Resource Plan assumption regarding the Selkirk Generating Station operation remains unchanged from the 2009/10 Power Resource Plan in which the estimate of dependable energy from Selkirk was revised from 1060 GW.h/year to 953 GW.h/year (northern equivalent) due to cooling water restrictions.

The Selkirk Generating Station is assumed to remain in operation to the end of the planning horizon assuming routine capital investment.

St. Leon Wind Power Purchase Agreement (PPA)
For planning purposes, contracted purchases of power (100 MW; 320 GW.h dependable energy and 375 GW.h of average energy, based on equivalent northern generation) from St. Leon are expected to be renewed after the expiration of the current contract and extend through 2045/46, to the end of the study period.

Only 85% of the expected annual generation from wind resources is relied upon as dependable energy. Because the wind generation is not assured to be available during system peak loads, and in fact is likely to be off due to cold weather limitations, wind is not assigned any capacity for the purposes of meeting peak loads.

Energy and Capacity Imports
Manitoba Hydro has long-term seasonal diversity contracts which provide winter capacity and dependable energy imports during the winter season in exchange for exports of capacity and energy during the summer season. In addition, Manitoba Hydro has an energy services agreement which provides firm US northbound transmission for the pupose of importing non capacity backed energy.

Manitoba Hydro does not have firm import transmission with either Ontario or Saskatchewan and as such does not plan on firm imports from these markets.

Manitoba Hydro imports energy during low cost periods, to facilitate sales opportunities during high value periods when it is possible to do so. Such imports are used to maximize the revenue opportunities available to Manitoba Hydro.

3.2. Expected Resource Assumptions

Beyond existing resources there are resources to which Manitoba Hydro has committed or for which there is a reasonable expectation that Manitoba Hydro will commit. These resources contribute to the overall ability to meet energy and capacity requirements over the study period. Table 2 provides a listing of expected resources and the available energy and capacity from these resources.

Table 2
Expected Resource Assumptions

Project	Winter Peak Capacity (MW)	Energy Produced Under Flow Condition (GW.h)		
		Dependable	Average	Maximum
Wuskwatim 2011/12 ISD	200	1250	1520	TBD
Pointe du Bois rebuilt (incremental) 2030/31 ISD	43	150	250	TBD
138 MW St. Joseph Wind PPA 2010/11 ISD	0	463	544	544
SSE-Kelsey Rerunnering (incremental from all 7 units) by 2012/13	77	0	350	TBD
Bipole III Loss Reductions 2017/18 ISD	89	243	N/A	N/A
DSM by 2024/25 (incremental)	275	1112	1112	1112
Non-contracted Imports	700	1100 to 1575	varies	minimal

Notes:

- TBD - to be determined.
- N/A - not available.
- The winter peak capacity is an estimate of the contribution of an individual plant to the system for typical winter conditions, and is not necessarily the same as the URGE testing values.
- Average energy is the average of the annual generation from the full range of historic flows.
- Maximum energy is the generation which would occur for the maximum historic flow (2005/06)
- Resources other than hydro are converted to northern equivalent

The following provides additional information, notable assumptions and/or current status updates for specific resources listed in Table 2.

Wuskwatim Generating Station

Wuskwatim Generating Station is a 200 MW hydro-electric generating station currently under construction on the Burntwood River in northern Manitoba. It is on schedule and expected to be in-service in 2011/12. Construction commenced in August 2006.

Pointe du Bois Generating Station
The 2009/10 Power Resource Plan assumed that the Pointe du Bois Generating Station would be redeveloped at a higher capability than the existing facility with first power in 2016/17. Due to increased capital cost a decision was made to reduce the scope of the Pointe du Bois Modernization Project and it will now take the form of a new spillway and new concrete and earth dams (Spillway Replacement Project). For the 2010/11 Power Resource Plan the Pointe du Bois powerhouse is assumed to be rebuilt with an increase of 43 MW and 150 GW.h, similar to the 2009/10 Power Resource Plan, but with first power in 2030/31 instead of 2016/17. Until Pointe du Bois is rebuilt, it is assumed to continue to operate with ongoing maintenance.

St. Joseph Wind Power Purchase Agreement (PPA)
Manitoba Hydro signed a 27-year PPA this year with San Francisco-based Pattern Energy Group LP for the 138 MW St. Joseph wind project in southern Manitoba. Construction has begun, and the project is expected to begin producing power by the end of the year. When finished in the spring of 2011, there will be 60 wind turbines each producing up to 2.3 MW and covering an area of 125 square kilometres in the rural municipalities of Montcalm and Rhineland. The wind farm is assumed to operate at a 40.9% capacity factor consistent with the terms of the PPA.

For planning purposes, contracted purchases of power from St. Joseph are expected to be renewed after the expiration of the current contract and extend through to the end of the study period.

Supply-Side Enhancement (SSE)
The Manitoba Hydro system is continuously reviewed for opportunities to upgrade infrastructure to enhance the supply of power. SSE projects go beyond routine or major maintenance required to maintain supply, but SSE opportunities often come about due to required maintenance. SSE projects are subject to economic evaluations, similar to other major resource projects. The two main current SSE initiatives are the Kelsey Rerunnering Project and Winnipeg River Rerunnering project .

Kelsey Rerunnering
The 2010/11 plan for power resources continues to include a major upgrade of the Kelsey Generating Station which consists of the replacement of all seven turbine runner blades resulting in increased plant capacity and greater utilization of water flow. This upgrade is expected to be completed in 2012/13 and has the potential to increase the plant rating by 77 MW. The project is proceeding on a unit by unit basis, with a review being conducted before undertaking each additional unit replacement.

Upgraded turbines have approximately 30% greater discharge capability than existing units and will capture roughly 30% more of the energy during higher flow periods through reduced spill. While the rerunnering project will not increase dependable energy at Kelsey, there will be an increase in average energy of about 350 GW.h/year when the project is complete. In addition, each of the seven units at Kelsey Generating Station is expected to gain about 11 MW of capacity for an overall gain of roughly 77 MW. To date, three units have been replaced resulting in a 33 MW increase in capacity.

For the purpose of this Power Resource Plan, a cumulative capacity increase of 11 MW has been included in 2010/11. This increase grows to 34 MW in 2011/12 and 77 MW by 2012/13.

Winnipeg River Rerunnering

There are rerunnering opportunities on the Winnipeg River due to dated technology and aging infrastructure. When the generating units require a major outage to repair generator windings or major turbine repairs, there are opportunities to upgrade the equipment. Many of these upgrades are required to bring the plants back up to the performance levels that are already included in the plan.

Evaluations of supply-side efficiency improvements are ongoing on Pine Falls, Great Falls and Slave Falls. It is expected that the work on the remaining three Great Falls units (units 2, 4 and 6) and Pine Falls Units 1 through 4 will proceed.

The Winnipeg River plants will need to be studied in more detail to determine what portion of the upgrades simply restores previous capability, and what portion provides new opportunity. Consistent with previous resource plans, the potential increased plant capability is not included as an incremental addition due to the uncertainty in the increase relative to overall existing Winnipeg River capability.

Loss Reduction due to Bipole III

Bipole III continues to be needed to satisfy reliability requirements within Manitoba. Bipole III, routed on the west side of the Interlake, continues to be planned for a 2017/18 in-service date. This is the earliest date that it could be available, based on anticipated planning and regulatory requirements. Concept engineering for the Bipole is being finalized including selection of the overall capacity.

Bipole III does not provide any new generation, but is expected to reduce the transmission losses on the HVDC system. By using all three bipoles to transmit the lower Nelson River generation, rather than just the existing two, the losses are reduced, resulting in 89 MW and 243 GW.h/year of reduced losses under drought conditions (same as the 2009/10 Power Resource Plan). This benefit has been included and is adjusted as new northern generation is added to the system.

Demand Side Management (DSM)

DSM included in the 2010/11 Power Resource Plan is 275 MW and 1112 GW.h to be achieved by 2024/25, as compared to 269 MW and 1158 GW.h in the 2009/10 Power Resource Plan. DSM included in the Power Resource Plan excludes savings already achieved to date and savings achieved through codes and standards which are included in the Load Forecast. It also excludes portions of savings from customer self generation and curtailable rates programs that do not qualify as winter peak capacity or dependable energy.

4. NEED FOR NEW RESOURCES TO MEET EXISTING OBLIGATIONS

The need for new resources to meet the expected or base Manitoba load requirements is assessed using the "No New Generation" plan based on supply assumptions as discussed in the SUPPLY OF POWER section and the base load forecast and export sales requirements as discussed in the DEMAND FOR POWER section. Using the planning criteria, the supply-demand surplus or deficit is determined for each year of the 35 year planning horizon. The year that deficits begin for either dependable energy or peak capacity is the latest year that new resources are required.

Table 3 shows the changes over the last three years in the dates that new resources were needed for both energy and capacity. The variation in the date that new resources are needed is due to changes in the load forecast, Demand Side Management, and base resource assumptions such as wind and Pointe du Bois and contract obligations.

Table 3

Changes to Supply-Demand Balances in the Last Three Years 2008/09, 2009/10 & 2010/11

	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
	Dependable Energy (GWh)														
2008	-224	-469	330	603	367	2473	2036	1646	1144	-25	-347	-663	-980	-1313	-1658
2009	1099	1686	2155	1823	1231	3175	2596	2350	1935	785	452	120	-227	-562	-938
2010	975	1353	1888	1350	1252	2213	1910	1897	1637	470	125	-218	-570	-925	-1302
	Winter Peak Capacity (MW)														
2008	382	307	500	392	359	1052	823	868	563	152	92	33	-26	-89	-153
2009	622	777	793	668	558	1227	966	1016	728	314	252	190	125	61	-8
2010	464	617	642	493	457	420	356	398	345	175	110	45	-21	-89	-160

5. RESOURCE OPTIONS

As part of the resource planning process Resource Planning & Market Analysis maintains information on resource options including hydro-electric, thermal, biomass, nuclear, solar, wind, and imports that are potentially available to meet Manitoba requirements. A listing of these resource options is provided in Appendix C.

Following are descriptions of the resource options included in the recommended and alternative development plans.

5.1. Keeyask Generating Station

The Keeyask Generating Station is planned to be a seven unit plant located upstream of Kettle generating station on the Nelson River. The design rating for Keeyask is 695 MW, which reflects the maximum generation potential when Stephens Lake is drawn down. The nominal winter peak rating for Keeyask is 630 MW. Keeyask will not impact the capacity of any other plants and is not significantly affected by ice conditions, therefore, the nominal capacity and net system addition are both 630 MW. The earliest in-service date assumed for the Keeyask Generating Station is 2019/20.

Keeyask is expected to take six years to construct to first unit in service and an additional two years to complete construction. Keeyask could be brought into service approximately three years earlier than Conawapa due to a shorter construction schedule and advanced environmental assessment work being undertaken jointly with the Keeyask Cree Nations (Tataskweyak Cree Nation and War Lake First Nation operating as the Cree Nation Partners, York Factory First Nation, and Fox Lake Cree Nation). The environmental field work for the Keeyask Generation Project, which includes the generating station and related works, is essentially completed

In 2009, each of the Keeyask Cree Nations voted, through a referendum of members, to become limited partners in the project and to accept individual adverse effects agreements. The Keeyask Cree Nations have been intensively involved in project planning and environmental assessment since the early 2000's. On May 29, 2009 Manitoba Hydro and the Keeyask Cree Nations signed the Joint Keeyask Development Agreement setting out the terms of the First Nations participation in the remainder of project planning, the environmental assessment process and in construction and operation of the project. Each of the Keeyask Cree Nations has also signed individual Adverse Effects Agreements to address the environmental and socio-economic effects of the project on their membership.

5.2. Conawapa Generating Station

Conawapa is planned to be a ten unit plant located downstream of the Limestone Generating Station on the Nelson River. The current design rating for Conawapa is 1485 MW during open water conditions. Initial impoundment of the forebay will reduce Limestone output by 90 MW, resulting in a net increase in system summer capacity of 1395 MW. Downstream ice conditions will reduce Conawapa output by about 55 MW

and similarly ice conditions will further reduce Limestone by 35 MW during winter peak conditions resulting in a nominal net system addition of 1300 MW. The earliest in-service dated assumed for the Conawapa Generating Station is 2022/23. A schedule review determined that a 2021/22 in-service date is no longer practically feasible.

The earliest in-service date assumed for Conawapa, if it is constructed in conjunction with Keeyask, is 2023/24. In order to reduce overlap on internal and external skilled labour and other resources, there must be at least four years between the in-service dates of these two plants.

The Conawapa project will be located within the Fox Lake Resource Management Area. The provincial government and Manitoba Hydro have signed a Memorandum of Understanding with Fox Lake First Nations related to the Conawapa project. The corporation has entered into Process Agreements with First Nations in the vicinity of Conawapa, including:

- Fox Lake Cree Nation
- York Factory First Nation
- Tataskweyak Cree Nation and War Lake First Nation (working together as the Cree Nation Partners)

In addition, Manitoba Hydro has signed a Letter of Agreement with Shamattawa First Nation. These agreements provide the current funding framework for First Nations' participation in planning and development activities related to the Conawapa project.

Environmental field work for the generating station and related works has been underway for several years, building upon the environmental assessment work conducted in the late 1980s and early 1990s. The access road to the site is in place as it was built before the original Conawapa project was put on hold in 1992.

5.3. Natural Gas-Fired Generation

Natural gas-fired simple cycle and combined cycle gas turbines are supply options that are available with relatively short lead times from the date of project commitment and are flexible due to the variety of available configurations. SCGTs are available in capacities ranging from 30 MW to 200 MW with lead times to approve, procure and install of 3 to 5 years. CCGTs are available in capacities ranging from 150 MW to 800 MW with lead times to procure and install of 3 to 5 years.

Consistent with the 2009/10 Power Resource Plan, representative natural gas-fired generation options considered were an LM6000 which is an aero-derivative simple cycle gas turbine (SCGT), and an S107H which is a combined cycle gas turbine (CCGT), both manufactured by General Electric.

6. OPPORTUNITIES

Opportunities may prompt a new resource or group of new resources to be selected or advanced for consideration in a development plan. These opportunities have enabled Manitoba Hydro to promote economy and efficiency in the supply of power.

The recommended development plan of the 2010/11 Power Resource Plan pursues a new interconnection to the US, which is made possible by large sales to Minnesota Power and Wisconsin Public Service. These sales require a resource plan with large hydro resources. These resources are capable of serving the sales as well as Manitoba load requirements. As a virtually non-emitting resource, hydro has appeal to both domestic and export customers. The sales will facilitate a new US interconnection which will provide an outlet for the surplus capacity from building large plants and for surplus energy which results from favorable water conditions.

This new interconnection will improve energy security and reliability within Manitoba by providing greater access to the large pool of generation in MISO. The increased market access provided by the interconnection will facilitate additional higher valued export sales which increase net revenues and consequently subsidize customer rates. In addition, by facilitating the sale of a greater quantity of hydroelectric generated electricity to the MISO region, the interconnection will play a role in displacing generation and associated emissions from thermal units.

6.1. WPS and MP Term Sheets

The WPS and MP term sheets set out the key business terms of potential long-term sales. Both term sheets are contingent on a new interconnection and 1800 MW of new hydro generation in Manitoba. Definitive agreements are under negotiation and are expected to be completed late in 2010.

The duration of the WPS Sale has been amended delaying the start of the sale from June 1, 2018 to June 1, 2019. The end date of the sale remains as May 31, 2032. The capacity of the sale ramps up from 150 MW in 2019, to 300 MW in 2020, to 500 MW in 2021, then ramps down to 250 MW in 2030, and terminates in 2032.

The duration of the firm portion of the MP Sale has also been delayed one year to May 1, 2023 through April 30, 2035. Non-firm energy is to be sold, as it is available, beginning May 1, 2008. The Term Sheet, signed December 2007, is a 250 MW System Power Sale.

The fulfillment of the WPS and MP Term Sheets requires the construction of specific infrastructure, including Keeyask, Conawapa, north-south transmission and a new Manitoba - Minnesota - Wisconsin interconnection. Collectively, this infrastructure is referred to as the “Sales Package”.

Both Term Sheets are subject to:

- approval by the appropriate corporate, federal, provincial, and state authorities,
- approvals, permits and licenses for the required facilities,
- the WPS Term Sheet is conditional upon changing Wisconsin's Renewable Portfolio Standard (RPS) definition to recognize large hydro,
- the construction of a new interconnection (discussed below),
- negotiation of definitive agreements.

6.2. New Interconnection Details

The WPS and MP Sales are contingent on having a new transmission interconnection with transfer capability of at least 750 MW north and 650 MW south, in addition to the existing capability of 100 MW south. Detailed design of the line, including route location, voltage, and line capability has not yet begun. The in-service date of 2019/20 for a new interconnection is coincident with Keeyask in-service date and the start of the WPS and MP Sales.

6.3. Increased Import Capability

The WPS and MP Term Sheets require the development of definitive agreements for imports to Manitoba Hydro. Imports will be made available during the lower cost off-peak hours. Increased import capability would improve the security and reliability of supply in Manitoba under both low flow and system contingency conditions.

7. RESOURCE DEVELOPMENT PLANS

The following provides a description of the recommended and alternative development plans. These resource development plans are driven by the need for additional capacity and dependable energy resources. As shown in Section 4, resources are needed in 2021/22 to meet dependable energy requirements and in 2022/23 to meet peak capacity requirements. These development plans were prepared such that energy and capacity demand is met over the entire 35 year planning period. Keeyask or gas-fired resources could be in-service in time to meet this need, while an import is required in 2021/22, before Conawapa can be put in service in 2022/23.

7.1. Description and Rationale of Development Plans

With the significant opportunity associated with the Wisconsin Public Service (WPS) and Minnesota Power (MP) Sales, a development plan which incorporates these Sales and the required new infrastructure (the Sales Package) is a key focus. Since the sales agreements with WPS and MP are not final, an alternative development plan which can be implemented if the Sales Package is not realized is also essential.

Recommended Plan: The Sales Package - Keeyask in 2019/20 followed by Conawapa in 2023/24 and SCGT's after 2040 when required.
This plan incorporates the signed WPS and MP Term Sheets and the new interconnection. It also includes increased north-south transmission within the province to provide sufficient transmission for both Keeyask and Conawapa.

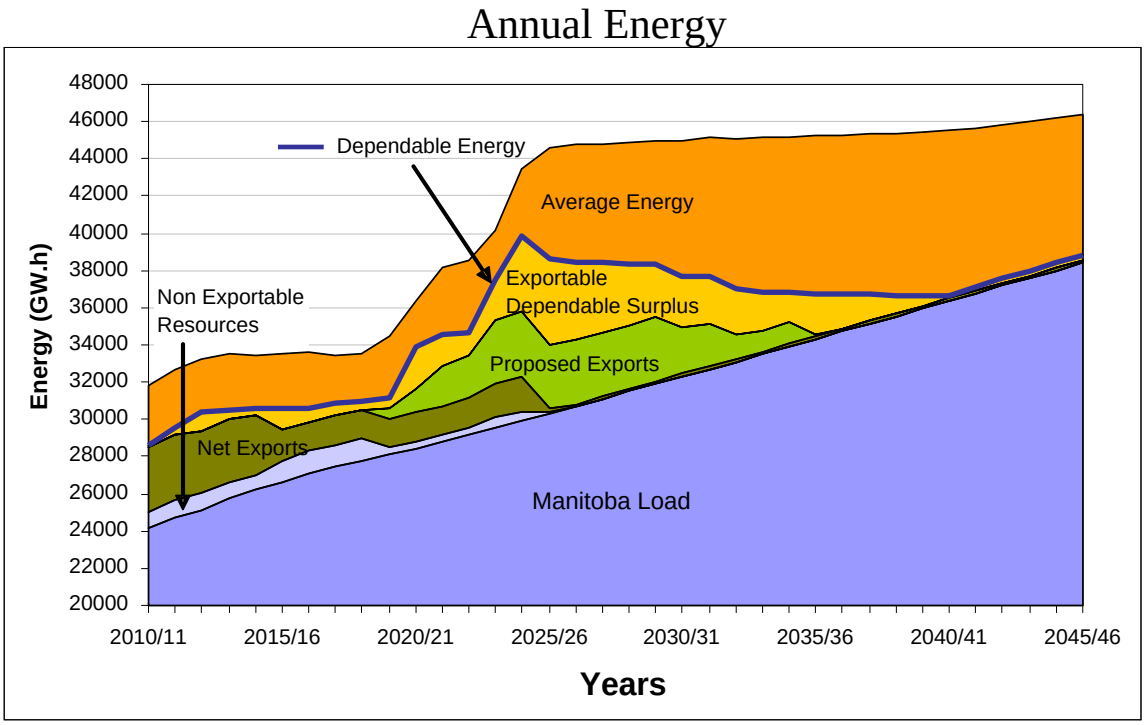
Alternative Plan: Conawapa in 2022/23 followed by CCGT 2033/34 and SCGT's after 2040 when required
The 2010/11 Power Resource Plan has the earliest Conawapa in-service date as 2022/23 which is one year later than required to meet the dependable energy obligations. The shortfall in 2021/22 is relatively small and in the event of a severe drought, is planned to be met through additional imports.

Figures 3 and 4 show the dependable and average energy and winter peak capacity supply-demand balances for each of the development plans.

Figure 3

Recommended Plan - the WPS and MP Sales Package

The Sales Package - Keeyask in 2019 followed by Conawapa advanced to 2023 for export over a new interconnection to WPS and MP.



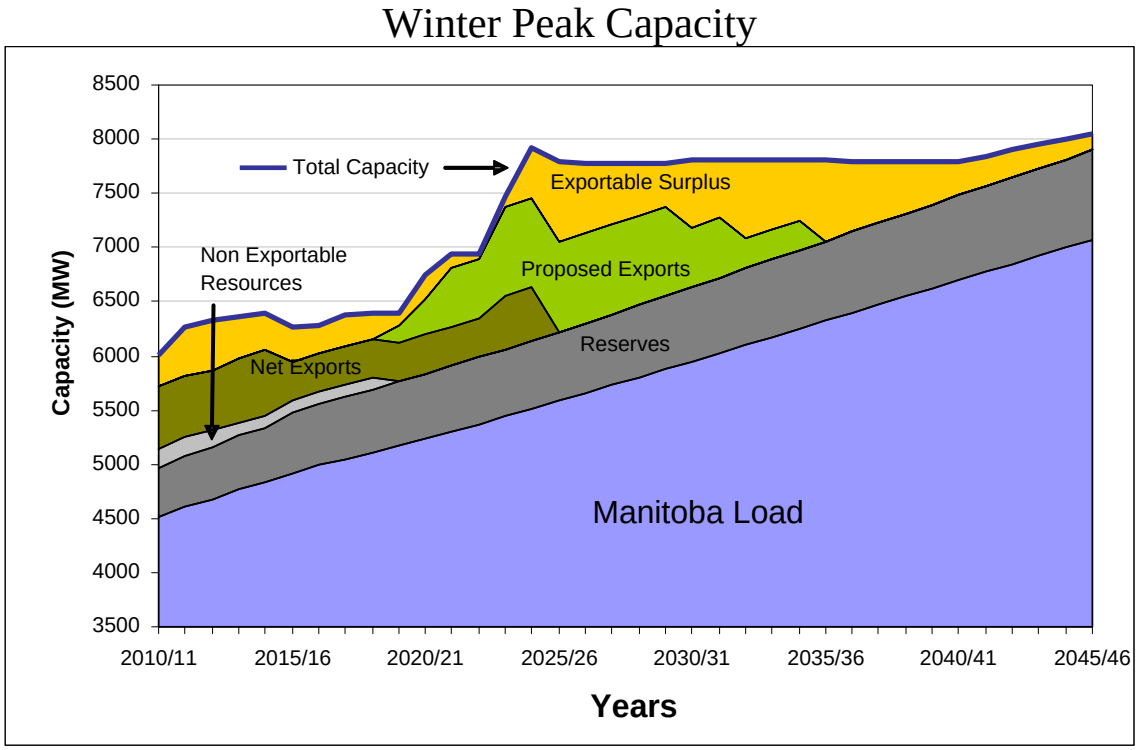
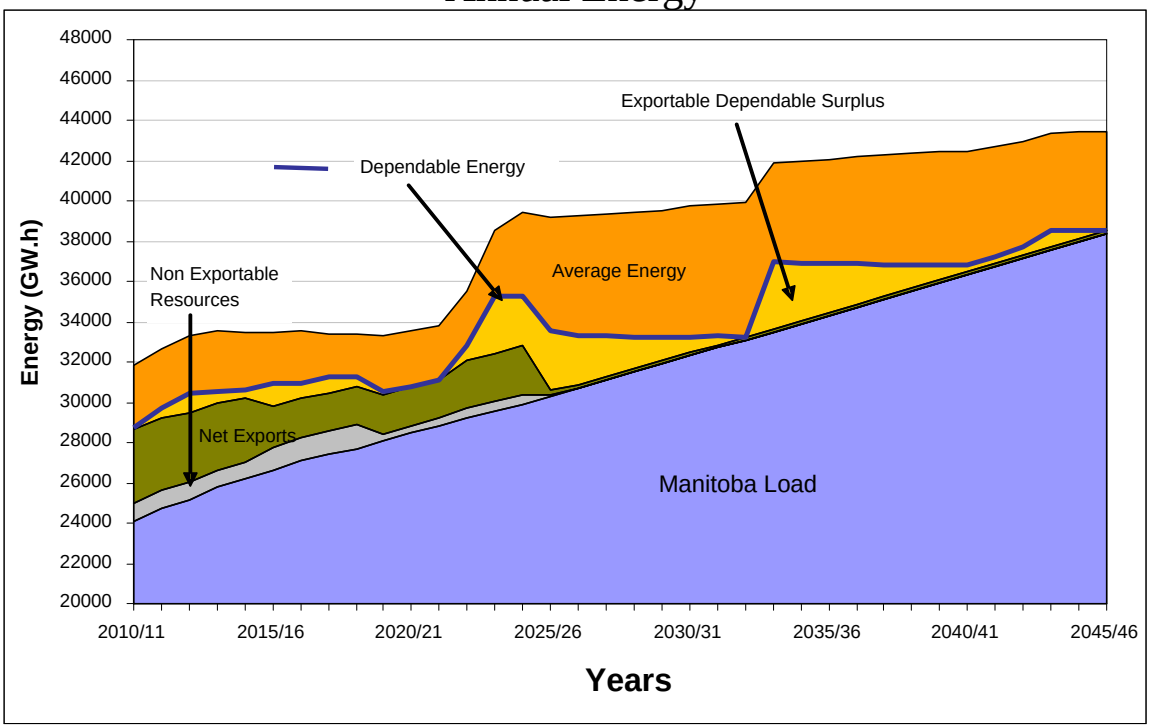
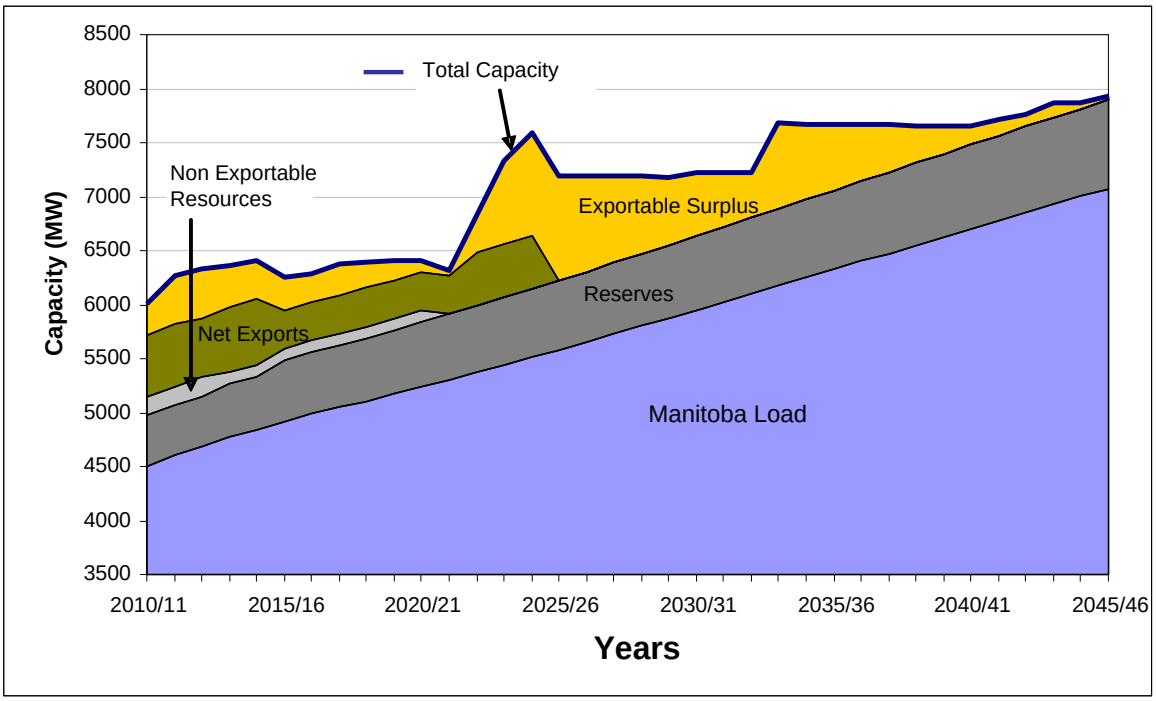


Figure 4
Alternative Plan - Conawapa followed by Gas
Conawapa in 2022/23 followed by CCGT 2033/34 and SCGT's 2041/42, 2045/46

Annual Energy



Winter Peak Capacity



8. CONCLUSIONS

Under dependable energy conditions, new generation is required to meet Manitoba load requirements in 2021/22.

The recommended development plan includes the development of the Keeyask Generating Station and the Conawapa Generating Station, as well as the sales to Wisconsin Public Service (WPS) and Minnesota Power (MP). This recommended development plan will also facilitate the building of a new interconnection to Wisconsin and Minnesota as a result of long-term power sales to WPS and MP. A new transmission interconnection to the US will provide on-going financial, reliability, energy security and environmental benefits for many years, well beyond the term of the sales agreements.

In the event that the Sales Package does not proceed, the alternative development plan is Conawapa followed by a Combined Cycle Gas Turbine.

APPENDICES

A. Dependable Supply and Demand Tables

2010/11 Recommended Plan

System Firm Winter Peak Demand and Resources (MW)

2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Existing Manitoba Hydro Plant	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
Wuskwatim		200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa														520	1040	1300	1300	1300
Keeyask										90	450	630	630	630	630	630	630	630
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering	11	34	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Pointe du Bois																		
Bipole III HVDC LINE								89	89	89	79	79	79	79	10	10	10	10
Manitoba Thermal Plants																		
Brandon Unit 5 Coal	105	105	105	105	105	105	105	105	105									
Selkirk Gas	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCCT	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
New Thermal																		
Simple Cycle Gas Turbines																		
Combined Cycle Gas Turbines																		
Wind																		
Committed 238 MW																		
Demand Side Management	28	63	91	123	156	180	199	216	227	233	242	251	260	268	275	257	255	252
Contracted Imports	550	550	550	550	550	385	385	385	385	385	385	385	385	385	385			
TOTAL POWER RESOURCES	6006	6264	6335	6367	6400	6259	6278	6384	6395	6386	6745	6934	6943	7471	7929	7786	7784	7781
Peak Demand																		
2010 Base Load Forecast	4506	4604	4677	4776	4842	4913	4990	5048	5106	5171	5238	5305	5373	5442	5511	5583	5655	5728
Contracted Exports	638	638	605	605	605	358	358	358	358	358	358	358	358	495	495			
Less: Adverse Water Capacity	-66	-66	-66															
Proposed Exports										165	330	550	550	825	825	825	825	825
Total Peak Demand	5078	5176	5216	5381	5447	5271	5347	5406	5464	5694	5925	6212	6280	6762	6831	6408	6480	6553
Reserves	463	471	476	492	496	568	575	580	586	593	600	606	614	621	628	639	648	657
TOTAL PEAK DEMAND	5541	5647	5692	5874	5943	5839	5922	5986	6049	6287	6525	6819	6894	7382	7460	7047	7128	7211
SYSTEM SUPPLUS	**464**	**617**	**642**	**493**	**457**	**420**	**356**	**398**	**345**	**100**	**220**	**115**	**49**	**89**	**469**	**739**	**655**	**570**
Less: Brandon Unit 5	105	105	105	105	105	105	105	105	105									
Adverse Water	66	66	66															
EXPORTABLE SURPLUS	**293**	**446**	**471**	**388**	**352**	**315**	**251**	**293**	**240**	**100**	**220**	**115**	**49**	**89**	**469**	**739**	**655**	**570**

System Firm Energy Demand and Dependable Resources (MW)

2010 Base Load Forecast

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Existing Manitoba Hydro Plant	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
Wuskwatim	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
Keeyask	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Pointe du Bois			43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Bipole III HVDC LINE	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Manitoba Thermal Plants																		
Brandon Unit 5 Coal																		
Selkirk Gas	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCCT	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
New Thermal																		
Simple Cycle Gas Turbines														53	106	159	212	265
Combined Cycle Gas Turbines																		
Wind																		
Committed 238 MW																		
Demand Side Management	249	246	244	242	240	237	235	231	227	223	221	221	221	221	221	221	221	221
Contracted Imports																		
TOTAL POWER RESOURCES	7778	7775	7816	7814	7812	7809	7807	7803	7799	7795	7793	7793	7793	7846	7899	7952	8005	8058
Peak Demand																		
2010 Base Load Forecast	5802	5877	5952	6027	6102	6177	6252	6327	6402	6477	6552	6627	6702	6777	6852	6927	7002	7077
Contracted Exports																		
Less: Adverse Water Capacity																		
Proposed Exports	825	825	550	550	275	275	275											
Total Peak Demand	6627	6702	6502	6577	6377	6452	6527	6327	6402	6477	6552	6627	6702	6777	6852	6927	7002	7077
Reserves	666	676	685	694	703	713	722	731	741	750	760	769	778	787	796	805	814	823
TOTAL PEAK DEMAND	7294	7377	7186	7271	7080	7164	7249	7058	7143	7227	7311	7395	7479	7563	7647	7731	7815	7899
SYSTEM SUPPLUS	**484**	**398**	**629**	**543**	**732**	**645**	**558**	**745**	**657**	**568**	**481**	**397**	**313**	**282**	**251**	**220**	**189**	**158**
Less: Brandon Unit 5																		
Adverse Water																		
EXPORTABLE SURPLUS	**484**	**398**	**629**	**543**	**732**	**645**	**558**	**745**	**657**	**568**	**481**	**397**	**313**	**282**	**251**	**220**	**189**	**158**

2010/11 Recommended Plan

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

2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Existing Manitoba Hydro Plant	21090	21080	21060	21040	21030	20920	20900	20880	20870	20850	20840	20830	20820	20820	20810	20560	20560	20550
Wuskwatim		550	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Conawapa														2151	4550	4550	4550	4550
Keeyask										677	2898	2903	2903	2903	2903	2903	2903	2903
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering																		
Pointe du Bois																		
Bipole III HVDC LINE								243	243	243	258	258	258	258	162	162	162	162
Manitoba Thermal Plants																		
Brandon Unit 5 Coal	811	811	811	811	811	811	811	811	811									
Selkirk Gas	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCCT	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354
New Thermal Plants																		
SCGTs																		
CCGTs																		
Wind Committed 238 MW	493	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783
Demand Side Management	197	348	479	615	736	837	843	914	958	982	1011	1046	1076	1096	1112	1086	1059	1028
Imports																		
Contracted Energy Imports:	2705	2705	2705	2705	2705	1609	1614	1614	1614	1614	1614	1614	1614	1614	1614	267		
Proposed Contracted Energy Imports										383	843	1431	1534	2238	2301	2301	2301	2301
Non-Contracted Energy Imports						1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1446	1575	1575
TOTAL POWER RESOURCES	**28603**	**29584**	**30395**	**30511**	**30621**	**30617**	**30607**	**30901**	**30936**	**31188**	**33904**	**34522**	**34644**	**37519**	**39891**	**38615**	**38450**	**38409**
Demand																		
2010 Base Load Forecast	24117	24739	25142	25807	26180	26599	27055	27362	27657	28016	28381	28748	29120	29496	29878	30269	30663	31062
Non-Committed Construction Power				10	25	60	65	90	115	100	80	80	100	90	30	15	20	30
Current Exports	3602	3583	3457	3354	3189	2115	2012	2012	2012	2012	2012	2012	2012	2532	2572	289	145	145
Less: Adverse Water Energy	-91	-91	-91			-309	-370	-370	-370	-370	-370	-370	-370	-489	-513	-85		
Proposed Exports										574	1263	2143	2296	3350	3444	3444	3444	3444
TOTAL DEMAND	**27628**	**28231**	**28507**	**29171**	**29394**	**28465**	**28762**	**29094**	**29414**	**30332**	**31365**	**32613**	**33158**	**34979**	**35412**	**33932**	**34272**	**34681**
SYSTEM SURPLUS	**975**	**1353**	**1888**	**1340**	**1227**	**2153**	**1845**	**1807**	**1522**	**857**	**2539**	**1909**	**1486**	**2540**	**4479**	**4683**	**4178**	**3728**
Less: Brandon Unit 5 Coal	811	811	811	811	811	811	811	811	811									
Adverse Water Energy	91	91	91			309	370	370	370	370	370	370	370	489	513	85		
EXPORTABLE SURPLUS	**72**	**451**	**985**	**529**	**416**	**1033**	**664**	**626**	**341**	**487**	**2169**	**1539**	**1116**	**2051**	**3967**	**4598**	**4178**	**3728**

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

2010 Base Load Forecast

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Existing Manitoba Hydro Plant	20540	20540	20530	20530	20520	20510	20510	20500	20490	20490	20480	20480	20470	20460	20460	20450	20440	20440
Wuskwatim	1250	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	4550
Keeyask	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903	2903
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering																		
Pointe du Bois			60	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Bipole III HVDC LINE	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Manitoba Thermal Plants																		
Brandon Unit 5 Coal																		
Selkirk Gas	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCCT	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354
New Thermal Plants																		
SCGTs														443	886	1329	1772	2215
CCGTs																		
Wind Committed 238 MW	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783
Demand Side Management	996	964	937	914	885	855	834	807	790	772	757	757	757	757	757	757	757	757
Imports																		
Contracted Energy Imports:																		
Proposed Contracted Energy Imports	2301	2301	1662	1534	895	767	767	767	767	767	767	767	767	767	767	767	767	767
Non-Contracted Energy Imports	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
TOTAL POWER RESOURCES	**38366**	**38335**	**37719**	**37657**	**36980**	**36812**	**36791**	**36754**	**36726**	**36709**	**36684**	**36684**	**36674**	**37107**	**37550**	**37983**	**38416**	**38859**
Demand																		
2010 Base Load Forecast	31464	31869	32277	32686	33094	33503	33911	34320	34728	35137	35545	35954	36362	36771	37179	37587	37996	38404
Non-Committed Construction Power	30	35	30	10														
Current Exports	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Less: Adverse Water Energy																		
Proposed Exports	3444	3444	2488	2296	1340	1148	1148	94										
TOTAL DEMAND	**35083**	**35493**	**34940**	**35137**	**34579**	**34796**	**35204**	**34559**	**34873**	**35282**	**35690**	**36099**	**36507**	**36916**	**37324**	**37732**	**38141**	**38549**
SYSTEM SURPLUS	**3284**	**2842**	**2779**	**2520**	**2401**	**2016**	**1587**	**2195**	**1853**	**1427**	**994**	**585**	**167**	**191**	**226**	**250**	**275**	**309**
Less: Brandon Unit 5 Coal																		
Adverse Water Energy																		
EXPORTABLE SURPLUS	**3284**	**2842**	**2779**	**2520**	**2401**	**2016**	**1587**	**2195**	**1853**	**1427**	**994**	**585**	**167**	**191**	**226**	**250**	**275**	**309**

2010/11 Alternative Plan

System Firm Winter Peak Demand and Resources (MW)

2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Existing Manitoba Hydro Plant	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
Wuskwatim		200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa													520	1040	1300	1300	1300	1300
Keeyask																		
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering (Net)	11	34	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Pointe du Bois Rebuild																		
Bipole III HVDC LINE Net								89	89	89	89	89	89	48	48	48	48	48
Manitoba Thermal Plants																		
Brandon Unit 5 Coal	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	132	132	132	132	132
Brandon Units 6-7 SCCT	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
New Thermal Plants																		
Simple Cycle Gas Turbines																		
Combined Cycle Gas Turbines																		
Committed Wind 238 MW																		
Demand Side Management	28	63	91	123	156	180	199	216	227	233	242	251	260	268	275	257	255	252
Contracted Imports	550	550	550	550	550	385	385	385	385	385	385	385	385	385	385			
TOTAL POWER RESOURCES	**6006**	**6264**	**6335**	**6367**	**6400**	**6259**	**6278**	**6384**	**6395**	**6401**	**6410**	**6314**	**6843**	**7330**	**7597**	**7194**	**7192**	**7189**
Peak Demand																		
2010 Base Load Forecast	4506	4604	4677	4776	4842	4913	4990	5048	5106	5171	5238	5305	5373	5442	5511	5583	5655	5728
Current Exports	638	638	605	605	605	358	358	358	358	358	358	358	495	495	495			
Less: Adverse Water Capacity	-66	-66	-66															
Proposed Exports																		
Total Peak Demand	5078	5176	5216	5381	5447	5271	5347	5406	5464	5529	5595	5662	5868	5937	6006	5583	5655	5728
Reserves	463	471	476	492	496	568	575	580	586	593	600	606	614	621	628	639	648	657
TOTAL PEAK DEMAND & RESERVES	**5541**	**5647**	**5692**	**5874**	**5943**	**5839**	**5922**	**5986**	**6049**	**6122**	**6195**	**6269**	**6481**	**6557**	**6635**	**6222**	**6303**	**6386**
SURPLUS RESOURCES	**464**	**617**	**642**	**493**	**457**	**420**	**356**	**398**	**345**	**280**	**215**	**45**	**362**	**773**	**962**	**972**	**888**	**803**
Less: Brandon Unit #5	105	105	105	105	105	105	105	105	105	105	105							
Adverse Water Capactiy	66	66	66															
EXPORTABLE SURPLUS	**293**	**446**	**471**	**388**	**352**	**315**	**251**	**293**	**240**	**175**	**110**	**45**	**362**	**773**	**962**	**972**	**888**	**803**

2010/11 Alternative Plan

System Firm Winter Peak Demand and Resources (MW)

2010 Base Load Forecast

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Existing Manitoba Hydro Plant	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
Wuskwatim	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Conawapa	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
Keeyask																		
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering (Net)	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Pointe du Bois Rebuild			43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Bipole III HVDC LINE Net	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Manitoba Thermal Plants																		
Brandon Unit 5 Coal																		
Selkirk License Review	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCCT	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
New Thermal Plants																		
Simple Cycle Gas Turbines														53	106	212	212	265
Combined Cycle Gas Turbines						460	460	460	460	460	460	460	460	460	460	460	460	460
Committed Wind 238 MW																		
Demand Side Management	249	246	244	242	240	237	235	231	227	223	221	221	221	221	221	221	221	221
Contracted Imports																		
TOTAL POWER RESOURCES	**7186**	**7183**	**7224**	**7222**	**7220**	**7677**	**7675**	**7671**	**7667**	**7663**	**7661**	**7661**	**7661**	**7714**	**7767**	**7873**	**7873**	**7926**
Peak Demand																		
2010 Base Load Forecast	5802	5877	5952	6027	6102	6177	6252	6327	6402	6477	6552	6627	6702	6777	6852	6927	7002	7077
Current Exports																		
Less: Adverse Water Capacity																		
Proposed Exports																		
Total Peak Demand	5802	5877	5952	6027	6102	6177	6252	6327	6402	6477	6552	6627	6702	6777	6852	6927	7002	7077
Reserves	666	676	685	694	703	713	722	731	741	750	760	769	778	787	796	805	814	823
TOTAL PEAK DEMAND & RESERVES	**6469**	**6552**	**6636**	**6721**	**6805**	**6889**	**6974**	**7058**	**7143**	**7227**	**7311**	**7395**	**7479**	**7563**	**7647**	**7731**	**7815**	**7899**
SURPLUS RESOURCES	**717**	**631**	**587**	**501**	**415**	**788**	**701**	**613**	**525**	**436**	**349**	**265**	**181**	**150**	**119**	**141**	**57**	**26**
Less: Brandon Unit #5																		
Adverse Water Capactiy																		
EXPORTABLE SURPLUS	**717**	**631**	**587**	**501**	**415**	**788**	**701**	**613**	**525**	**436**	**349**	**265**	**181**	**150**	**119**	**141**	**57**	**26**

2010/11 Alternative Plan

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

2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Existing Hydro NET	21090	21080	21060	21040	21030	20920	20900	20880	20870	20850	20840	20830	20820	20820	20810	20560	20560	20550
Wuskwatim		550	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Conawapa													2151	4550	4550	4550	4550	4550
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering																		
Pointe du Bois Rebuild																		
Bipole III HVDC LINE Net								243	243	243	243	243	243	229	229	229	229	229
Manitoba Thermal Plants																		
Brandon Unit 5 License Review	811	811	811	811	811	811	811	811	811									
Selkirk License Review	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCCT	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354
New Thermal Plants																		
SCGTs																		
CCGTs																		
Committed Wind	493	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783
Demand Side Management	197	348	479	615	736	837	843	914	958	982	1011	1046	1076	1096	1112	1086	1059	1028
Imports																		
Contracted Energy Imports:	2705	2705	2705	2705	2705	1609	1614	1614	1614	1614	1614	1614	1614	1614	1614	267		
Proposed Contracted Energy Imports:												318						
Non-Contracted Energy Imports						1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1446	1575	1575
TOTAL POWER RESOURCES	**28603**	**29584**	**30395**	**30511**	**30621**	**30617**	**30607**	**30901**	**30936**	**30128**	**30147**	**30490**	**32343**	**34749**	**34754**	**33478**	**33313**	**33272**
Demand																		
2010 Base Load Forecast	24117	24739	25142	25807	26180	26599	27055	27362	27657	28016	28381	28748	29120	29496	29878	30269	30663	31062
Non-Committed Construction Power					10	15	20	30	50	55	80	100	90	30	5	10	20	30
Current Exports	3602	3583	3457	3354	3189	2115	2012	2012	2012	2012	2012	2012	2532	2572	2572	289	145	145
Less: Adverse Water Energy	-91	-91	-91			-309	-370	-370	-370	-370	-370	-370	-489	-513	-513	-85		
Proposed Exports																		
TOTAL DEMAND	**27628**	**28231**	**28507**	**29161**	**29379**	**28420**	**28717**	**29034**	**29349**	**29713**	**30102**	**30490**	**31253**	**31586**	**31943**	**30483**	**30828**	**31237**
SYSTEM SURPLUS	**975**	**1353**	**1888**	**1350**	**1242**	**2198**	**1890**	**1867**	**1587**	**415**	**45**		**1090**	**3163**	**2812**	**2995**	**2485**	**2035**
Less: Brandon Unit 5 License Review	811	811	811	811	811	811	811	811	811									
Adverse Water Energy	91	91	91			309	370	370	370	370	370	370	489	513	513	85		
EXPORTABLE SURPLUS	**72**	**451**	**985**	**539**	**431**	**1078**	**709**	**686**	**406**	**45**			**601**	**2650**	**2299**	**2910**	**2485**	**2035**

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

2010 Base Load Forecast

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Existing Hydro NET	20540	20540	20530	20530	20520	20510	20510	20500	20490	20490	20480	20480	20470	20460	20460	20450	20440	20440
Wuskwatim	1250	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	4550
Supply Side Enhancement Projects (incremental to exisiting)																		
Kelsey Rerunnering																		
Pointe du Bois Rebuild			60	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Bipole III HVDC LINE Net	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229	229
Manitoba Thermal Plants																		
Brandon Unit 5 License Review																		
Selkirk License Review	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCCT	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354	2354
New Thermal Plants																		
SCGTs														443	886	1772	1772	1772
CCGTs						3738	3738	3738	3738	3738	3738	3738	3738	3738	3738	3738	3738	3738
Committed Wind	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783	783
Demand Side Management	996	964	937	914	885	855	834	807	790	772	757	757	757	757	757	757	757	757
Imports																		
Contracted Energy Imports:																		
Proposed Contracted Energy Imports:																		
Non-Contracted Energy Imports	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
TOTAL POWER RESOURCES	**33230**	**33198**	**33221**	**33287**	**33249**	**36947**	**36926**	**36889**	**36861**	**36844**	**36819**	**36819**	**36809**	**37242**	**37685**	**38561**	**38551**	**38551**
Demand																		
2010 Base Load Forecast	31464	31869	32277	32686	33094	33503	33911	34320	34728	35137	35545	35954	36362	36771	37179	37587	37996	38404
Non-Committed Construction Power	30	35	30	10														
Current Exports	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Less: Adverse Water Energy																		
Proposed Exports																		
TOTAL DEMAND	**31639**	**32049**	**32452**	**32841**	**33239**	**33648**	**34056**	**34465**	**34873**	**35282**	**35690**	**36099**	**36507**	**36916**	**37324**	**37732**	**38141**	**38549**
SYSTEM SURPLUS	**1591**	**1149**	**768**	**446**	**9**	**3299**	**2870**	**2424**	**1988**	**1562**	**1129**	**720**	**302**	**326**	**361**	**828**	**410**	**1**
Less: Brandon Unit 5 License Review																		
Adverse Water Energy																		
EXPORTABLE SURPLUS	**1591**	**1149**	**768**	**446**	**9**	**3299**	**2870**	**2424**	**1988**	**1562**	**1129**	**720**	**302**	**326**	**361**	**828**	**410**	**1**

B. Average Energy Supply and Demand Tables

System Supply & Demand Balance (GW.h)
Under Average of All Flow Conditions

2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Hydro Generation	29563	29938	30632	30801	30747	30754	30773	30588	30543	30652	32720	34432	34788	36658	40199	41401	41621	41558
Thermal Generation	330	417	447	437	422	411	421	456	470	225	230	467	492	573	414	360	345	331
Committed Wind 238 MW	590	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920
Demand Side Management	197	348	479	615	736	837	843	914	958	982	1011	1046	1076	1096	1112	1086	1059	1028
Imports	1346	1399	1280	1361	1384	1403	1482	1503	1550	2680	2489	2307	2296	1989	1951	1929	1895	1941
TOTAL POWER RESOURCES	**32026**	**33022**	**33759**	**34135**	**34208**	**34326**	**34439**	**34381**	**34442**	**35457**	**37369**	**39172**	**39571**	**41236**	**44595**	**45696**	**45840**	**45777**
Demand																		
2010 Base Load Forecast	24117	24739	25142	25807	26180	26599	27055	27362	27657	28016	28381	28748	29120	29496	29878	30269	30663	31062
Non-Committed Construction Power				10	25	60	65	90	115	100	80	80	100	90	30	15	20	30
Current Exports	3602	3583	3457	3354	3189	2115	2012	2012	2012	2012	2012	2012	2012	2532	2572	289	145	145
Proposed Exports	235	235	235	235	235	235	235	235	235	1062	2026	3266	3449	5073	5201	5201	5201	5201
TOTAL DEMAND	**27954**	**28557**	**28834**	**29406**	**29629**	**29009**	**29367**	**29699**	**30019**	**31190**	**32498**	**34106**	**34681**	**37192**	**37682**	**35774**	**36029**	**36438**
EXPORTABLE SYSTEM SURPLUS	**4072**	**4465**	**4925**	**4729**	**4579**	**5317**	**5071**	**4682**	**4423**	**4268**	**4871**	**5066**	**4890**	**4044**	**6913**	**9922**	**9811**	**9339**

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Hydro Generation	41584	41577	41771	41858	41916	41923	41938	41968	41968	41966	41964	41967	41974	41969	41965	41968	41980	41959
Thermal Generation	345	351	294	293	242	230	232	216	214	213	215	212	211	309	411	516	632	725
Committed Wind 238 MW	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920
Demand Side Management	996	964	937	914	885	855	834	807	790	772	757	757	757	757	757	757	757	757
Imports	2010	2080	2016	2061	2003	2052	2107	2115	2169	2224	2276	2334	2391	2478	2553	2622	2685	2770
TOTAL POWER RESOURCES	**45855**	**45892**	**45937**	**46046**	**45966**	**45980**	**46031**	**46027**	**46060**	**46095**	**46132**	**46190**	**46254**	**46432**	**46606**	**46782**	**46973**	**47131**
Demand																		
2010 Base Load Forecast	31464	31869	32277	32686	33094	33503	33911	34320	34728	35137	35545	35954	36362	36771	37179	37587	37996	38404
Non-Committed Construction Power	30	35	30	10														
Current Exports	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Proposed Exports	5201	5201	3824	3594	2216	1987	1987	128										
TOTAL DEMAND	**36840**	**37250**	**36276**	**36435**	**35456**	**35635**	**36043**	**34593**	**34873**	**35282**	**35690**	**36099**	**36507**	**36916**	**37324**	**37732**	**38141**	**38549**
EXPORTABLE SYSTEM SURPLUS	**9015**	**8642**	**9661**	**9611**	**10510**	**10346**	**9987**	**11434**	**11187**	**10813**	**10442**	**10092**	**9747**	**9516**	**9282**	**9050**	**8832**	**8582**

2010/11 Alternative Plan

System Supply & Demand Balance (GW.h)
Under Average of All Flow Conditions
2010 Base Load Forecast

Fiscal Year	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	2025/26	2026/27	2027/28
Power Resources																		
Hydro Generation	29563	29939	30633	30801	30746	30752	30768	30533	30436	30360	30540	30313	32870	36250	37117	37068	37099	37137
Thermal Generation	330	417	447	437	422	411	421	459	490	364	398	467	388	331	334	308	311	319
Committed Wind 238 MW	590	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920
Demand Side Management	197	348	479	615	736	837	843	914	958	982	1011	1046	1076	1096	1112	1086	1059	1028
Imports	1346	1399	1280	1360	1383	1398	1478	1517	1577	1660	1703	2080	1294	991	1077	925	936	979
TOTAL POWER RESOURCES	**32026**	**33023**	**33760**	**34133**	**34207**	**34318**	**34430**	**34342**	**34380**	**34284**	**34571**	**34825**	**36548**	**39588**	**40559**	**40307**	**40326**	**40384**
Demand																		
2010 Base Load Forecast	24117	24739	25142	25807	26180	26599	27055	27362	27657	28016	28381	28748	29120	29496	29878	30269	30663	31062
Non-Committed Construction Power	0	0	0	10	25	60	65	90	115	100	80	80	100	90	30	15	20	30
Current Exports	3602	3583	3457	3354	3189	2115	2012	2012	2012	2012	2012	2012	2532	2572	2572	289	145	145
Proposed Exports																		
TOTAL DEMAND	**27719**	**28322**	**28599**	**29171**	**29394**	**28774**	**29132**	**29464**	**29784**	**30128**	**30473**	**30840**	**31752**	**32159**	**32480**	**30573**	**30828**	**31237**
EXPORTABLE SYSTEM SURPLUS	**4307**	**4701**	**5161**	**4961**	**4813**	**5544**	**5297**	**4878**	**4596**	**4156**	**4098**	**3985**	**4796**	**7430**	**8079**	**9734**	**9498**	**9147**

Fiscal Year	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	2042/43	2043/44	2044/45	2045/46
Power Resources																		
Hydro Generation	37177	37180	37408	37491	37568	37580	37574	37597	37616	37626	37640	37655	37665	37674	37688	37691	38088	37727
Thermal Generation	322	326	328	333	333	2331	2383	2428	2479	2522	2548	2578	2612	2766	2931	3226	2987	3094
Committed Wind 238 MW	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920	920
Demand Side Management	996	964	937	914	885	855	834	807	790	772	757	757	757	757	757	757	757	757
Imports	1016	1057	1061	1098	1124	1033	1074	1107	1150	1190	1226	1265	1292	1349	1400	1478	1418	1680
TOTAL POWER RESOURCES	**40431**	**40447**	**40654**	**40755**	**40830**	**42720**	**42785**	**42859**	**42954**	**43029**	**43091**	**43175**	**43245**	**43466**	**43696**	**44072**	**44171**	**44178**
Demand																		
2010 Base Load Forecast	31464	31869	32277	32686	33094	33503	33911	34320	34728	35137	35545	35954	36362	36771	37179	37587	37996	38404
Non-Committed Construction Power	30	35	30	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Current Exports	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Proposed Exports																		
TOTAL DEMAND	**31639**	**32049**	**32452**	**32841**	**33239**	**33648**	**34056**	**34465**	**34873**	**35282**	**35690**	**36099**	**36507**	**36916**	**37324**	**37732**	**38141**	**38549**
EXPORTABLE SYSTEM SURPLUS	**8792**	**8398**	**8201**	**7914**	**7591**	**9072**	**8728**	**8394**	**8081**	**7748**	**7401**	**7077**	**6738**	**6550**	**6372**	**6339**	**6030**	**5628**

C. Potential New Resources Table (Available in the Electric Industry)

Potential Resource	Nominal Capacity (MW)	Energy Produced Under Flow Condition (GW.h)	
		Dependable	Average
Hydro			
Notigi GS	100	625	750
Manasan GS	200	1250	1400
First Rapids GS	225	1400	1600
Birthday GS	460	1900	2600
Keeyask GS	695	2900	4430
Conawapa GS	1485	4550	7000
Gillam Island GS	820	3500	5040
Whitemud GS	300	1450	2000
Red Rock GS	250	1700	2250
Bonald GS	120	400	650
Granville GS	125	410	670
Small Hydro			
Small Hydro (Run-of-River) Generation	1 to 50	5 to 230	5 to 230
Small Hydro (Kinetic) Generation	1 to 100	8-790	8-790
Thermal			
GE LM6000 Simple Cycle Gas Turbine	43	355	55 - 95
GE S107H Combined Cycle Gas Turbine	400	3095	1650- 2235
Subcritical Pulverized Coal Generation	400	2980	0[2]
Supercritical Pulverized Coal Generation	600	4470	0[2]
Integrated Gasification Combined Cycle	640	4490	0[2]
IGCC with Carbon Capture	555	3900	0[2]
Nuclear Power Plant	1350	10650	10650
Biomass			
Wood Waste-Fired Generation	20	150	150
Agricultural Crop Residue-Fired Generation	30	225	225
Other			
100 MW Wind Option	100	275 to 290	325 to 340
Solar Photovoltaic	1 to 300	0 to 265	0 to 265
Enhanced Geothermal System (EGS)	10 to 50	85 to 415	85 to 415
DSM - Option 2	275	1110	1110
Imports Contractual Agreements	N/A	N/A	N/A

NOTES:

- Nominal Capacity for hydro stations is the gross plant capacity.
- [1] Lead time as per reported ISD
- [2] Restricted by "The Climate Change and Emissions Reductions Act" (C.C.S.M. c. C135)
- - information to be determined N/A not available