



**REPORT TO
THE PUBLIC UTILITIES BOARD**

CURTAILABLE RATE PROGRAM

APRIL 1, 2013 – MARCH 31, 2014

September 2014

TABLE OF CONTENTS

	<u>Page No.</u>
SUMMARY	1
BACKGROUND	1
PERFORMANCE FOR 2013/14	3
Curtailment Options:.....	3
Implementation and Size of Curtailments:	4
Reference and Reserve Discounts:.....	5
Adequacy of Terms and Conditions:	7
CONCLUSION.....	8
ATTACHMENT 1- Estimate Of The Value Of Curtailable Load To Manitoba Hydro	9

**REPORT TO PUBLIC UTILITIES BOARD
CURTAILABLE RATE PROGRAM
APRIL 1, 2013 – MARCH 31, 2014**

SUMMARY

This Curtailable Rate Program (“CRP”) annual report covers the period from April 1, 2013 to March 31, 2014. During this period three customers participated in the program and 14 Option R curtailments were successfully initiated.

The Public Utilities Board (“PUB”) Order 42/13 dated April 26, 2013 approved, on an interim basis, the CRP Reference Discount of \$3.28/kW for fiscal 2013/14. Customers received monthly credits on their electrical bill for their participation in the program totaling \$5,965,689 during this time.

Manitoba Hydro’s 2012/13 & 2013/14 General Rate Application (“GRA”) included proposed revisions to the Terms and Conditions of the Curtailable Rate Program. The main revisions included a reduction in the amount of Option A and Option R load available to customers, the elimination of curtailment Options C and CE; and a change to the hours defined as Peak and Off-Peak to correspond to a potential time-of-use rate offering.

In Order 43/13, the PUB accepted, on an interim basis, Manitoba Hydro’s proposed changes to the Terms and Conditions of the CRP. As two of the changes proposed by Manitoba Hydro could not be easily reversed if final approval of the rate setting process was not granted given the proposed changes to the Terms and Conditions, Manitoba Hydro requested to defer implementation of the change in the defined hours for Peak and Off-Peak periods, and the elimination of Curtailment Options C and CE until such time as the PUB grants final approval. Manitoba Hydro also advised that it would implement the other changes to the CRP accepted by Order 43/13, including reducing the global subscription cap on Option A, but only to the extent that Option C load can still be accommodated. By letter dated June 25, 2013, the PUB accepted Manitoba Hydro’s proposal.

BACKGROUND

The CRP Terms and Conditions applicable during the reporting period from April 1, 2013 to March 31, 2014 took effect on April 1, 2013.

The Terms and Conditions allow Manitoba Hydro to reserve the right to limit the amount of total curtailable load used for maintaining operating and contingency reserves¹. Manitoba Hydro's application to revise the CRP Terms and Conditions included a reduction to available Option A and C load from 230 MW to 178 MW and available Option R load from 100 MW to 50 MW. There is no limit for Option E load. The revised caps do not affect current CRP customers. Upon final approval of the changes to the Terms and Conditions, the Option C customer will have one year to decide if they wish to convert their load to Option A or to firm service. The caps have been beneficial to both Manitoba Hydro and curtailable customers by ensuring the value of curtailable load does not depreciate. A decreased value would result in lower discounts paid to customers making the program less attractive to them.

Manitoba Hydro uses curtailable load, among other measures, to maintain operating and contingency reserves as a means of minimizing disruption to firm customers in the event of loss of generation or transmission.

Curtilable load provides value to Manitoba Hydro all year round, as curtailments for system emergencies can occur at any time of the year. However, it has the greatest value during peak times as it is during the peak periods that Manitoba Hydro's capacity surplus is the most vulnerable. Options A and C curtilable load in these hours increases the amount of capacity for sale in the export markets while Option R load can allow Manitoba Hydro to meet its contingency reserve obligations at a lower cost.

Curtilable load provides risk mitigation benefits to the power system. Curtilable load can be used to avoid shedding firm load and/or breach of North American Electric Reliability Council (NERC) standard(s) by Manitoba Hydro or the Midwest Independent System Operator-Manitoba Hydro Contingency Reserve Sharing Group (MISO-MBHydro CRSG)². Option R curtilable load allows Manitoba Hydro to meet reserve obligations thereby freeing

¹ Per North American Electric Reliability Council (NERC) Glossary of Terms, Operating Reserves: The reserves needed to protect Manitoba Hydro and its obligations to the Midwest Independent System Operator power system against Contingencies or Disturbances. These events are typically a result of loss of supply caused by sudden generating or transmission outages. Operating Reserves consist of various types including Contingency Reserves. Contingency Reserves: a component of Operating Reserves which are sufficient in magnitude and response to meet NERC Disturbance Control Standards. Contingency Reserves are comprised of Operating Reserves-Spinning and Operating Reserves-Supplemental. Curtilable load (also referred to as Interruptible Load) can be a source of Operating Reserves-Supplemental.

² The MISO-MBHydro CRSG is a NERC registered Contingency Reserve Sharing Group that has operated since January 1, 2010. The CRSG was established under the terms of the Amended MISO-Manitoba Hydro Coordination Agreement and executed on October 9, 2009.

up hydro generation for market transactions in the short-term opportunity energy market³. In this circumstance the benefits of having Option R available are dependent on Manitoba Hydro's water supply conditions as follows:

- High Water Supply - the generating capacity freed up for commercial use allows for increased hydraulic generation for export as idle generating units can be run to capture additional sales. Without Option R capacity in place energy would be spilled. With Option R load, the additional energy generated can be sold at on-peak prices.
- Average Water Supply - allows for additional hydraulic generation during on-peak hours that would otherwise be produced during off-peak hours (due to limited on-peak generating capability). In this case Manitoba Hydro captures the benefit of the price differential between on and off-peak periods.
- Low Water Supply - does not provide any significant benefits because Manitoba Hydro has sufficient shut down generating units that could be run temporarily for operating reserves purposes without relying on Option R load reductions.

Manitoba Hydro will not initiate load curtailments in order to facilitate an opportunity spot market sale⁴.

PERFORMANCE FOR 2013/14

Curtailment Options:

The Curtailable Rate Program consists of four base curtailment options and three combinations. Options vary dependent on: minimum notice to curtail, maximum duration per curtailment, maximum daily hours of curtailment, maximum number of curtailments per year, and maximum annual hours of curtailment.

³ Opportunity export sales are sales of capacity and/or energy that are not backed by dependable energy and are incremental exports that arise from time to time as a result of water conditions that are better than the lowest historic levels.

⁴ Spot market sales are sales that occur on a day ahead or real time basis. They are not considered to be a capacity sale.

The three customers that participated in the Curtailable Rate Program during the April 1, 2013 to March 31, 2014 period designated a total of 228 MW to Manitoba Hydro's reserves, allocated as 80 MW Option AE, 67 MW Option A, 31 MW Option C and 50 MW Option R. The amount each customer designated as curtailable load in relation to their total load varies, and therefore, impacts their curtailable credit, as shown on the following table:

Summary of Curtailment Credit Data April 1, 2013 to March 31, 2014					
Customer	Option(s)	CRP Load as % of Total Load	Average On-Peak MW	Average On-Peak LF	Average Monthly Cr.
1	A, R, E	87%	194.0	94.3%	\$447,671
2	A	94%	24.5	93.6%	\$49,469
3	C	0%	7.1	60.2%	\$0

Customer 1: 87% of total load represents 41% Option AE, 26% Option R and 20% Option A for 2013/14.

Customer 3: this customer was operating below their protected firm load and therefore had no load available for curtailment.

Load designated under Option R must be nominated as a Guaranteed Curtailment. That is, the customer must agree to shed a specified number of MW in order to be compliant with the curtailment request. Under all the other curtailment options, customers can nominate curtailable load as Guaranteed Curtailment or Curtail to Protected Firm Load.

Dependent on the curtailment option selected, Manitoba Hydro will curtail customers to meet reliability obligations only. Options A, C and R curtailments assist in securing operating and contingency reserves whereas Option E curtailments are initiated to meet firm energy requirements in the event that Manitoba Hydro expects to be short of firm energy supplies.

Implementation and Size of Curtailments:

There were 14 Option R curtailments during the April 1, 2013 to March 31, 2014 period, all of which were initiated in response to a contingency or disturbance event requiring deployment of Manitoba Hydro's supplemental reserves. The following table summarizes the duration and load in MW of each curtailment.

April 2013 to March 2014	Option 'R'	
	Hrs	MW
April 18, 2013	0.63	50
April 19, 2013	0.25	50
April 25, 2013	0.77	50
May 27, 2013	1.77	50
June 6, 2013	0.70	50
June 21, 2013	1.37	50
July 3, 2013	0.93	50
July 3, 2013	1.55	50
July 7, 2013	1.43	50
July 17, 2013	0.73	50
August 19, 2013	1.72	50
September 3, 2013	0.23	50
February 5, 2014	3.05	50
March 27, 2014	0.75	50
Total	15.88	N/A
Average	1.13	50

All curtailments occurred during peak hours. The customer did not use an alternative power source to supply their load during the curtailments.

Manitoba Hydro continues to use telephone to communicate curtailment requirements to customers on the program. This procedure is manageable and provides the additional security that curtailment(s) will be initiated by confirmation from an agent of the customer. Manitoba Hydro experienced no difficulties in communicating the 14 curtailments during this reporting period.

Reference and Reserve Discounts:

The maximum discount available to a participating customer is called the “Reference Discount.” The Reference Discount is related to the marginal value of capacity, and is adjusted on April 1 of each year by the inflation factor. The Reference Discount in effect for the reporting period April 1, 2013 to March 31, 2014 was \$3.28 per kW/month, as approved by the PUB, on an interim basis, in Order 42/13 dated April 26, 2013. Option AE customers receive 100% of the discount, while Option A and R customers receive 70% of the discount or \$2.30 per kW/month. Option C customers receive 40% of the discount or \$1.31 per kW/month.

For curtailable load nominated as ‘Protect to Firm Load’ the Reference Discount is calculated and credited to customers’ bill each month as $(A - B) \times C \times D$ where:

- A = On-Peak Period Demand (kW)
- B = Protected Firm Load (kW)
- C = On-Peak Period Load Factor
- D = Discount Amount

For curtailable load designated as a ‘Guaranteed Curtailment’ the Reference Discount is calculated and credited to customers’ bill each month as $GC \times D$ where,

- GC = the customer’s guaranteed curtailable load
- D = Discount Amount

Customers selecting Curtailment Option R receive, in addition to the Reference Discount, a Reserve Discount for each curtailment initiated and successfully completed. The Reserve Discount represents the value of carrying contingency reserves and is calculated and credited to customers’ bill for each successful curtailment as $LR \times Du \times FD$ where,

- LR = amount of load reduction (in kW) requested by Manitoba Hydro’s System Control to the customer at the time of an Option R curtailment
- Du = duration of the curtailment (in hours)
- FD⁵ = fixed discount amount, currently set at \$0.04 per kWh

The table below illustrates the amount of the monthly Reference Discount Credit that each customer received from April 1, 2013 to March 31, 2014, as well as their monthly On-Peak Demand and On-Peak Load Factor.

Monthly Reference Discount Credit									
2013 to 2014	Customer 1 Options AE, R, A			Customer 2 Option A			Customer 3 Option C		
	On Peak MW	LF %	Discount Paid \$	On Peak MW	LF %	Discount Paid \$	On Peak MW	LF %	Discount Paid \$
Apr	208.8	92.6%	\$439,020	24.6	97.6%	\$51,875	31.7	59.4%	\$0
May	207.8	83.9%	\$408,342	24.9	93.7%	\$50,388	28.6	39.5%	\$0
June	175.5	93.8%	\$443,042	24.6	92.5%	\$49,159	19.0	6.1%	\$0
Jul	175.5	97.7%	\$456,860	24.6	94.7%	\$50,350	0.7	70.1%	\$0

⁵ The Fixed Discount amount is based on the value of carrying contingency reserves on Manitoba Hydro units.

Monthly Reference Discount Credit									
2013 to 2014	Customer 1 Options AE, R, A			Customer 2 Option A			Customer 3 Option C		
	On Peak MW	LF %	Discount Paid \$	On Peak MW	LF %	Discount Paid \$	On Peak MW	LF %	Discount Paid \$
Aug	175.5	97.4%	\$455,635	24.8	98.1%	\$52,438	0.7	69.9%	\$0
Sep	175.5	95.7%	\$449,584	24.7	67.8%	\$36,131	0.7	74.4%	\$0
Oct	175.5	95.7%	\$449,654	24.3	95.8%	\$50,310	0.8	56.5%	\$0
Nov	209.3	93.9%	\$443,462	24.1	99.5%	\$51,754	0.8	68.1%	\$0
Dec	205.9	92.8%	\$439,684	24.4	97.7%	\$51,475	0.9	76.7%	\$0
Jan	207.0	97.6%	\$456,335	24.3	95.6%	\$50,168	0.9	46.0%	\$0
Feb	205.9	96.4%	\$452,137	24.1	96.1%	\$50,011	0.4	78.2%	\$0
Mar	205.9	94.8%	\$446,540	24.3	94.4%	\$49,575	0.4	78.1%	\$0
Total	2,328.0	94.3%	\$5,340,296	293.8	93.6%	\$593,633	85.5	60.2%	\$0

The discounts shown for Customer 1 do not include the \$31,760 credited in respect of the Option R Reserve Discount.

Adequacy of Terms and Conditions:

Manitoba Hydro proposed revisions to the Terms and Conditions of the Curtailable Rate Program as part of its 2012/13 & 2013/14 GRA. The revisions included:

- a reduction in the amount of Option A and Option R load available to customers;
- elimination of curtailment Options C and CE;
- change in hours defined as Peak and Off-Peak to correspond to a potential time-of-use rate offering;
- removal of the monthly variation to nominate curtailable or firm load; and
- exclusion from the program after a customer's 2nd failure to curtail in a 12 month period.

In Order 43/13, dated April 26, 2013, the PUB accepted the proposed revisions as noted above, on an interim basis. Subsequent to the receipt of that Order, Manitoba Hydro, in its letter dated May 15, 2013, informed the PUB of the difficulty in implementing a change in the defined Peak and Off-Peak hours, and elimination of Option C and CE on an interim basis, and proposed that these changes be deferred until such matters can be finalized. The PUB, in its letter dated June 25, 2013, confirmed Manitoba Hydro's proposed approach.

The Terms and Conditions have protected Manitoba Hydro's contingency reserves and provided operating reserves that satisfy the requirements of NERC and the MISO-MB Hydro CRSG.

CONCLUSION

The Curtailable Rate Program facilitates fulfilling Manitoba Hydro's commitment of carrying, deploying, and re-establishing contingency reserves to meet its obligations with the MISO-MBHydro CRSG and to maintain compliance to NERC Standards. The program also assists in minimizing disruption to Manitoba Hydro's firm customers.

CRP continues to fulfill Manitoba Hydro's obligations, and with the above mentioned changes to the Terms and Conditions, will preserve the value of the program to both Manitoba Hydro and its customers.

ATTACHMENT 1

ESTIMATE OF THE VALUE OF CURTAILABLE LOAD TO MANITOBA HYDRO

The value of curtailable load to Manitoba Hydro is related to an estimate of the marginal cost of firm, long-term capacity. Over the long term, a representative value for capacity can be developed by estimating the annual carrying cost (includes finance and depreciation costs but not operating/fuel costs) of the lowest cost resource required to provide capacity to Manitoba Hydro, which is a simple cycle combustion turbine (SCCT). In 2005 the annual carrying cost of a SCCT was estimated to be \$78 per kW per year, or \$6.50 per kW per month, evaluated at load. It was proposed that this cost would escalate at the rate of inflation. This cost was reviewed in 2012 and was found to be appropriate going forward. This approach has the advantage of providing a clear transparent value, which is also stable over time and is consistent with the approach that is utilized to evaluate the benefits of other resource options such as DSM that may have a capacity component.

Curtilable load is less valuable than a generation resource such as a SCCT. The SCCT can provide more flexibility in dispatch and also has the capability to deliver for longer time periods during extended emergency situations. Once in place, a SCCT can be relied upon as a permanent, long-term resource, unlike curtilable load which can be terminated with a notice period of one year. Curtilable load normally has more value in the summer months, when it can assist in supporting seasonal capacity exports, and in the peak winter months, when it may add reliability to the Manitoba Hydro system. Curtilable load will provide more winter reliability benefits in years in which there is little capacity surplus on the system. When there is a significant capacity surplus on the Manitoba Hydro system, curtilable load provides less winter value than it would, for example, in the period around the 2023/24 time period, when the requirement to add generation to serve domestic customers may be expected to occur with 2013 planning assumptions and base demand side management program assumptions. The value of reliability benefits in a single year is not easily determined, which is why longer-term levelized values are used to infer the benefits of curtilable load.

The economic benefits of curtilable load can vary considerably year to year for a number of reasons. In the case of Option R CRP, the economic benefits derived from this option will vary depending on water conditions. Export market conditions can also impact the value of curtilable load to Manitoba Hydro. In the MISO market, current supply and demand conditions for capacity resources can cause variability in the near term value of capacity

resources. Use of a longer-term levelized value maintains stability in CRP pricing, therefore sheltering the CRP customer from these sources of variability.

As described above curtailable load is less valuable than a SCCT because it has limited dispatchability, is not sustainable in reducing load over longer periods, and is not guaranteed to exist in the long term. Therefore in order to reflect these factors, curtailable load is assigned a long-term levelized value that is 42% of the annual carrying cost of a SCCT. After consideration of inflation subsequent to the 2011 base year, this yields an estimate of benefits for the year beginning April 1, 2013 of \$3.28 per kW/month, which is referred to as the “Reference Discount”. This value would apply to the curtailable rate option that provides the most value to Manitoba Hydro, that being Options AE and RE, for which the discount is set to return 100% of the estimated value of curtailable load to the customer. Other options provide less flexibility and are accordingly worth less to Manitoba Hydro. These have been priced to reflect their lesser value to Manitoba Hydro but still to return the full estimated value of that option to the customer.