

To: Mike Manning, Chief Operating Officer, Ontario Electricity Financial Corporation

From: Todd Williams

Date: March 15, 2017

Re: Final (2011 - 2015) 115-230kV DCR_{new} Calculations reflecting the Global Adjustment Allocation Decision

Introduction

Many of the power purchase agreements between the former Ontario Hydro and Non-Utility Generators (“NUG”) utilized an index based on the former Ontario Hydro’s Direct Customer Rate (“DCR”). Those contracts which had floors or minimum increase provisions are now subject to a new index, referred to as the DCR_{new}. The DCR_{new} is derived from the Total Market Cost (“TMC”) and includes the cost of the commodity, transmission and all other related charges.

This memo will provide the Final 2011-2015 DCR_{new} 115-230kV calculation reflecting the Global Adjustment Allocation Decision as described below.

The calculation of the 115-230kV TMC has been adjusted to reflect changes to rates resulting from the Ontario Uniform Transmission Rate Order, issued by the OEB annually. Additionally, the calculation of the 115-230kV TMC has been adjusted to include settlement amounts to recover certain costs incurred by distribution companies for the connection of new renewable generation to their distribution systems. The costs for 2011-2015 were assessed for the January to December period and were charged to participants based on their proportion of Allocated Quantity of Energy Withdrawn (“AQEW”) for the month¹. The recovery of these costs was enabled by Regulation 330/09², and the monthly amounts are approved by the OEB.

The Renewable Generation Connection – Monthly Compensation Settlement Credit has been added to the Wholesale Market Service Charges (“WMSC”) component of the 115-230kV TMC, and has been broken out for reference in the background section of this memo. Further, the Independent Electricity System Operator (“IESO”) introduced a Daily Uplift Charge as of October 2011, which has been added to the WMSC component of the 115-230kV TMC³.

The Capacity Based Demand Response Recovery (CBDR) charge has been added to the WMSC component of the 115-230kV TMC as of its induction in May 2015. The CBDR charge is allocated using the same method as Global Adjustment charges (see “Global Adjustment Allocation” section below).

¹ IESO – Recovering the Cost of Renewable Energy Connections; July 22, 2010
<http://www.ieso.ca/Pages/News/NewsItem.aspx?newsID=5300>

² Ontario Regulation 330/09
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_090330_e.htm

³ IESO – Guide to Electricity Charges
<http://www.ieso.ca/Pages/Participate/Settlements/Guide-to-Electricity-Charges.aspx>

Global Adjustment Allocation

Beginning in 2011, the way that the Global Adjustment is allocated to consumers was changed. Prior to 2011, the Global Adjustment was allocated to all consumers based on their energy use. Ontario Regulation 398/10 changed this by amending Ontario Regulation 429/04. The amended regulation establishes two classes of consumers: Class A consumers, with average monthly demand greater than 5 MW; and Class B consumers. Under the amended Regulation the Global Adjustment is allocated differently to Class A and Class B consumers.

In this memo, TMC is calculated to include the amount of Global Adjustment payable by all energy consumers allocated on a pro rata energy use basis to reflect the allocation of the Global Adjustment required under the judgment of Justice Wilton-Siegel dated March 12, 2015 in N-R Power and Energy Corporation v. OEFC.

Final (2011) 115-230kV - DCR_{new}

Methodology and Results

The Final (2011) DCR_{new} values for 115-230kV are given in Table 1. Supporting information on the calculations involved is provided in the sections that follow.

Table 1: Final (2011) 115-230kV DCR_{new} Values (cents/kWh)

Voltage	2011 Final
115-230 kV	8.1888

Total Market Cost Calculations

The Final (2011) TMC values for 115-230kV TMC is 8.5980 cents/kWh, as shown in Table 2.

Table 2: Calculation of Final (2011) 115-230kV TMC

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total /
MONTHLY STATISTICS														
days		31	28	31	30	31	30	31	31	30	31	30	31	365
total hours		744	672	744	720	744	720	744	744	720	744	720	744	8760
														Weighted Average
MARKET RATES														
HOEP	c/kWh	3.192	3.329	3.123	2.837	2.442	3.209	3.529	3.262	3.118	2.853	2.797	2.518	3.0152
WMSC	c/kWh	0.507	0.514	0.503	0.527	0.640	0.663	0.535	0.514	0.564	0.520	0.550	0.525	0.5467
Tx network	\$/kW-mth	3.220	3.220	3.220	3.220	3.220	3.220	3.220	3.220	3.220	3.220	3.220	3.220	
Tx line connection	\$/kW-mth	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	0.790	
DRC	c/kWh	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
Global Adjustment	c/kWh	3.534	3.337	3.467	4.053	4.611	3.792	2.982	3.427	3.546	4.159	4.050	4.451	
IESO Operating Surplus Rebate	c/kWh													
TOTAL MARKET COST CALCULATION														
Total market cost per month	c/kW-mth	6,303	5,696	6,199	6,245	6,645	6,423	6,164	6,281	6,109	6,526	6,231	6,497	
Total annual market cost	c/kW-yr													75,319
TMC = total market cost	c/kWh													8.5980

Final (2011) 115-230kV DCR_{new} Calculations

The Final (2011) 115-230kV DCR_{new} is the greater of (i) the average of the 115-230kV TMC for the three calendar-year periods from January 2009 through December 2011 inclusive, based on the number of days in each period and (ii) the Final (2010) 115-230kV DCR_{new}. The Final (2011) 115-230kV DCR_{new} is 8.1888 cents/kWh, as shown in Table 3.

Table 3: Final (2011) 115-230kV DCR_{new}

	2009 Final	2010 Final	2011 Final
Avg annual HOEP	2.9518	3.6255	3.0152
TMC (P) Current, based on actual HOEP WMSC, regulated tariffs, estimated rebate, etc.	7.8553	8.1132	8.5980
DCR _{new}	7.1725	7.6383	
Final DCR _{new} = greater of: i) Average TMC (2009, 2010,2011) ii) DCR _{new} (2010)	8.1888 7.6383		
Final DCR _{new} (2011)			8.1888

Final (2012) 115-230kV - DCR_{new}

Methodology and Results

The Final (2012) DCR_{new} value for 115-230kV is given in Table 4. Supporting information on the calculations involved is provided in the sections that follow.

Table 4: Final (2012) 115-230kV DCR_{new} Values (cents/kWh)

Voltage	2012 Final
115-230kV	8.4654

Total Market Cost Calculations

The Final (2012) TMC values for 115- 230kV is 8.6844 cents/kWh, as shown in Table 5.

Table 5: Calculation of Final (2012) 115-230kV TMC

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total /
MONTHLY STATISTICS														
days		31	29	31	30	31	30	31	31	30	31	30	31	366
total hours		744	696	744	720	744	720	744	744	720	744	720	744	8784
														Weighted Average
MARKET RATES														
HOEP	c/kWh	2.483	2.208	1.433	1.694	1.926	1.996	3.139	2.764	2.489	2.155	2.579	2.483	2.2805
WMSC	c/kWh	0.462	0.512	0.536	0.475	0.481	0.511	0.534	0.580	0.552	0.431	0.490	0.474	0.5030
Tx network	\$/kW-mth	3.570	3.570	3.570	3.570	3.570	3.570	3.570	3.570	3.570	3.570	3.570	3.570	
Tx line connection	\$/kW-mth	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	
DRC	c/kWh	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
Global Adjustment	c/kWh	4.016	4.740	5.774	5.564	5.179	4.956	3.159	3.863	4.357	4.896	4.992	3.807	
TOTAL MARKET COST CALCULATION														
Total market cost per month	c/kW-mth	6,137	6,117	6,719	6,508	6,602	6,314	6,041	6,320	6,268	6,524	6,745	5,990	
Total annual market cost	c/kW-yr													76,284
TMC = total market cost	c/kWh													8.6844

Final (2012) 115-230kV DCR_{new} Calculations

The Final (2012) 115-230kV DCR_{new} is the greater of (i) the average of the 115-230kV TMC for the three calendar-year periods from January 2010 through December 2012 inclusive, based on the number of days in each period and (ii) the Final (2011) 115-230kV DCR_{new}. The Final (2012) 115-230kV DCR_{new} is 8.4654 cents/kWh, as shown in Table 6.

Table 6: Final (2012) 115-230kV DCR_{new}

	2010 Final	2011 Final	2012 Final
Avg annual HOEP	3.6255	3.0152	2.2805
TMC (P) Current, based on actual HOEP WMSC, regulated tariffs, estimated rebate, etc.	8.1132	8.5980	8.6844
DCR _{new}	7.6383	8.1888	
Final DCR _{new} = greater of: i) Average of TMC (2010, 2011, 2012) ii) Final DCR _{new} (2011)	8.4654	8.1888	
Final DCR _{new} (2012)			8.4654

Final (2013) 115-230kV - DCR_{new}

Methodology and Results

The Final (2013) DCR_{new} for 115-230kV is given in Table 7. Supporting information on the calculations involved is provided in the sections that follow.

Table 7: Final (2013) 115-230kV DCR_{new} (cents/kWh)

Voltage	2013 Final
115-230kV	9.0230

Total Market Cost Calculations

The Final (2013) TMC value for 115- 230kV is 9.7875 cents/kWh, as shown in Table 8.

Table 8: Calculation of Final (2013) 115-230kV TMC

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total /
MONTHLY STATISTICS														
days		31	28	31	30	31	30	31	31	30	31	30	31	365
total hours		744	672	744	720	744	720	744	744	720	744	720	744	8760
														Weighted Average
MARKET RATES														
HOEP	c/kWh	2.971	2.878	2.886	2.802	2.428	2.256	2.888	2.236	1.960	2.155	1.493	3.012	2.4980
WMSC	c/kWh	0.483	0.536	0.458	0.453	0.475	0.510	0.584	0.530	0.482	0.501	0.535	0.564	0.5089
Tx network	\$/kW-mth	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630	3.630
Tx line connection	\$/kW-mth	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Debt Retirement Charge	c/kWh	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Global Adjustment	c/kWh	4.712	4.476	4.588	5.490	6.028	6.500	4.782	5.743	6.015	5.664	7.176	4.601	5.481
TOTAL MARKET COST CALCULATION														
Total market cost per month	c/kW-mth	7,034	6,210	6,860	7,239	7,603	7,614	7,100	7,289	7,031	7,149	7,568	7,042	
Total annual market cost	c/kW-yr													85,739
TMC = total market cost	c/kWh													9.7875

Final (2013) 115-230kV DCR_{new} Calculations

The Final (2013) 115-230kV DCR_{new} is the greater of (i) the average of the 115-230kV TMC for the three calendar-year periods from January 2011 through December 2013 inclusive, based on the number of days in each period and (ii) the Final (2012) 115-230kV DCR_{new}. The Final (2013) 115-230kV DCR_{new} is 9.0230 cents/kWh, as shown in Table 9.

Table 9: Final (2013) 115-230kV DCR_{new}

	2011 Final	2012 Final	2013 Final
Avg annual HOEP	3.0152	2.2805	2.4980
TMC (P) Current, based on actual HOEP WMSC, regulated tariffs, estimated rebate, etc.	8.5980	8.6844	9.7875
DCR _{new}	8.1888	8.4654	
Final DCR _{new} = greater of: i) Average of TMC (2011, 2012, 2013) ii) Final DCR _{new} (2012)	9.0230 8.4654		
Final DCR _{new} (2013)			9.0230

Final (2014) 115-230kV - DCR_{new}

Methodology and Results

The Final (2014) DCR_{new} for 115-230kV is given in Table 10. Supporting information on the calculations involved is provided in the sections that follow.

Table 10: Final (2014) 115-230kV DCR_{new} (cents/kWh)

Voltage	2014 Final
115-230kV	9.5766

Total Market Cost Calculations

The Final (2014) TMC value for 115- 230kV is 10.2604 cents/kWh, as shown in Table 11.

Table 11: Calculation of Final (2014) 115-230kV TMC

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total /
MONTHLY STATISTICS														
days		31	28	31	30	31	30	31	31	30	31	30	31	365
total hours		744	672	744	720	744	720	744	744	720	744	720	744	8760
														Weighted Average
MARKET RATES														
HOEP	c/kWh	6.144	7.853	7.659	3.231	1.696	2.728	2.249	2.064	1.406	0.618	1.515	2.019	3.2389
WMSC	c/kWh	0.657	1.003	0.829	0.496	0.609	0.579	0.509	0.462	0.467	0.384	0.488	0.532	0.5819
Tx network	\$/kW-mth	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820	3.820
Tx line connection	\$/kW-mth	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820
Debt Retirement Charge	c/kWh	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
Global Adjustment	c/kWh	1.173	1.231	(0.015)	4.695	6.455	5.459	5.642	6.069	7.095	8.929	7.450	6.828	
TOTAL MARKET COST CALCULATION														
Total market cost per month	c/kW-mth	6,917	7,713	7,289	7,032	7,502	7,279	7,234	7,379	7,425	8,374	7,774	7,963	
Total annual market cost	c/kW-yr													89,881
TMC = total market cost	c/kWh													10.2604

Final (2014) 115-230kV DCR_{new} Calculations

The Final (2014) 115-230kV DCR_{new} is the greater of (i) the average of the 115-230kV TMC for the three calendar-year periods from January 2012 through December 2014 inclusive, based on the number of days in each period and (ii) the Final (2013) 115-230kV DCR_{new}. The Final (2014) 115-230kV DCR_{new} is 9.5766 cents/kWh, as shown in Table 12.

Table 12: Final (2014) 115-230kV DCR_{new}

	2012 Final	2013 Final	2014 Final
Avg annual HOEP	2.2805	2.4980	3.2389
TMC (P) Current, based on actual HOEP WMSC, regulated tariffs, estimated rebate, etc.	8.6844	9.7875	10.2604
DCR _{new}	8.4654	9.0230	
Final DCR _{new} = greater of: i) Average of TMC (2012, 2013, 2014) ii) Final DCR _{new} (2013)	9.5766 9.0230		
Final DCR _{new} (2014)			9.5766

Final (2015) 115-230kV - DCR_{new}

Methodology and Results

The Final (2015) DCR_{new} for 115-230kV is given in Table 13. Supporting information on the calculations involved is provided in the sections that follow.

Table 13: Final (2015) 115-230kV DCR_{new} (cents/kWh)

Voltage	2015 Final
115-230kV	10.3755

Total Market Cost Calculations

The Final (2015) TMC value for 115- 230kV is 11.0786 cents/kWh, as shown in Table 14.

Table 14: Calculation of Final (2015) 115-230kV TMC

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total /
MONTHLY STATISTICS														
days		31	28	31	30	31	30	31	31	30	31	30	31	365
total hours		744	672	744	720	744	720	744	744	720	744	720	744	8760
														Weighted Average
MARKET RATES														
HOEP	c/kWh	2.864	4.965	2.423	1.574	1.422	1.420	2.025	2.187	2.986	2.411	0.929	1.004	2.1663
WMSC	c/kWh	0.538	0.567	0.378	0.283	0.333	0.338	0.363	0.401	0.750	0.502	(0.397)	0.392	0.3705
Tx network	\$/kW-mth	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780
Tx line connection	\$/kW-mth	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860
Debt Retirement Charge	c/kWh	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
Global Adjustment	c/kWh	4.727	3.682	5.746	8.542	8.621	8.571	7.305	7.325	6.120	6.755	10.218	8.670	
TOTAL MARKET COST CALCULATION														
Total market cost per month	c/kW-mth	7,032	7,126	7,344	8,455	8,704	8,405	8,197	8,360	8,065	8,178	8,708	8,473	
Total annual market cost	c/kW-yr													97,049
TMC = total market cost	c/kWh													11.0786

Final (2015) 115-230kV DCR_{new} Calculations

The Final (2015) 115-230kV DCR_{new} is the greater of (i) the average of the 115-230kV TMC for the three calendar-year periods from January 2013 through December 2015 inclusive, based on the number of days in each period and (ii) the Final (2014) 115-230kV DCR_{new}. The Final (2015) 115-230kV DCR_{new} is 10.3755 cents/kWh, as shown in Table 15.

Table 15: Final (2015) 115-230kV DCR_{new}

	2013 Final	2014 Final	2015 Final
Avg annual HOEP	2.4980	3.2389	2.1663
TMC (P) Current, based on actual HOEP WMSC, regulated tariffs, estimated rebate, etc.	9.7875	10.2604	11.0786
DCR _{new}	9.0230	9.5766	
Final DCR _{new} (2015) = greater of:			
i) Average of TMC (2013, 2014, 2015)	10.3755		
ii) Final DCR _{new} (2014)	9.5766		
Final DCR _{new} (2015)			10.3755

Background on TMC and the DCR

A significant number of Non-Utility Generator (“NUG”) Power Purchase Agreements (“PPAs”) contain provisions that provide for annual contract price adjustment based on the Ontario Hydro Direct Customer Rate (“DCR”). Since the DCR ceased to exist upon market opening it was necessary to establish a replacement index. The Board of Directors of OEFC approved the replacement of the DCR in the PPAs between OEFC and NUG’s on the basis set out in the draft working paper dated June 24, 2002 prepared by the working committee of OEFC representatives and Independent Power Producers Society of Ontario (“IPPSO”) representatives (“*working paper*”). This replacement index is based on the fully loaded cost of 100% load factor power that the typical direct customer would pay going forward in the restructured market, at the voltage provided. Values for $DCR_{new}(P)$ and $TMC(P)$ in this paper are calculated in accordance with the *working paper*, for year P.

It should be noted that Calculation of the WMSC for a given month currently includes the following components:

1. Hourly uplift settlement charges (amount in \$/MWh from IESO data identified as being ‘final’);
2. Daily uplift charges (amount in \$/MWh from IESO data identified as being ‘final’);
3. Monthly uplift charges (amount in \$/MWh from IESO data identified as being ‘final’);
4. IESO Administration Charge (amount in \$/MWh as determined by the OEB);
5. Rural and Remote Electricity Rate Protection (amount in \$/MWh, as determined by the OEB);
6. OPA Administration Charge (amount in \$/MWh, as determined by the OEB); and,
7. Renewable Generation Connection Monthly Compensation Settlement Credit.

At market opening, the Market Power Mitigation Agreement (“MPMA”) rebate framework applied to all Ontario consumers, and as such, was incorporated in DCR_{new} calculations. Bill 210 replaced the MPMA rebate with the more transparent Business Protection Plan Rebate (“BPPR”) insofar as customers are concerned. While the MPMA rebate was used in the TMC calculations for May 1, 2002 to April 30, 2003, the BPPR was used in the TMC calculation for subsequent periods.

Once again the rebate mechanism changed and the calculation of TMC was updated to reflect this change. Under the Electricity Restructuring Act 2004 (Bill 100), a new rebate mechanism was created called the Global Adjustment. The Global Adjustment reflects the difference between total payments made to contracted assets (including NUGs and RFP generators), load reduction contracts and regulated OPG generators (prescribed assets) and any offsetting market revenues. The Global Adjustment is calculated and paid each month and can be either positive or negative.

In addition to the Global Adjustment, the new regulation includes the OPG Non-Prescribed Assets (“OPNA”) rebate, which ended April 30, 2009, but was last paid to market participants for the period ending January 31, 2009.

Additional details on these rebates and their treatment in the calculation of total market cost can be viewed in the updated Navigant Consulting letter to OEFC dated April 27, 2006 and posted on the OEFC website.

Recovering the Cost of Renewable Energy Generation Connections

The recovery of certain connection costs incurred by distribution companies with respect to renewable generation was enabled by Ontario Regulation 330/09. Navigant has included the Renewable Generation Connection Monthly Compensation Settlement Credit amounts in the monthly Wholesale Market Service Charges component of the TMC. These values are published within Section 7 of the IESO monthly reports.