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This Biennial Review filing of the Lansing Board of Water & Light's (BWL) Renewable Energy Plan (REP) complies with the State of Michigan Public Act 295 of 2008 (the Act) and the related January 27, 2015 Michigan Public Service Commission Order (MPSC Case No. U-16619).

Part (4) of Section 25 of the Act provides that every two years after initial approval of the REP the MPSC shall review the REP after providing an opportunity for public comment (the provider itself can instead provide the opportunity for public comment).

An opportunity to convey public comments on the BWL Renewable Energy Plan Biennial Review was communicated to all BWL customers on its website, [www.lbwl.com](http://www.lbwl.com), and paper copies of the Draft Biennial Plan were available at the BWL Customer Service Center. The BWL will solicit public comments until June 24, 2015 in three ways:

- 1) via the website, [www.lbwl.com](http://www.lbwl.com);
- 2) by mail: Lansing Board of Water & Light, 1201 S Washington Ave, Lansing, MI 48910; and
- 3) in person by appointment with George Stojic, Executive Director of Strategic Planning and Development, prior to June 24, 2015.

All public comments received on the REP Biennial Review will be submitted to the MPSC prior to July 1, 2015.

The BWL filed a 20-year Renewable Energy Plan (U-15868) with the MPSC on April 3, 2009, and on July 1, 2009 the MPSC issued an order finding that the BWL's plan was in compliance with the requirements of the Act. The BWL filed subsequent Biennial REP Reviews on July 1, 2011 and June 28, 2013; on October 4, 2011 and December 19, 2013 the MPSC issued orders finding that the BWL's plans complied with the Act. The BWL does not plan any major amendments to the REP filed on April 3, 2009. This biennial review is intended to provide progress made to date and an updated financial analysis.

***Section 25 (2) (a) Describe how the provider will meet the renewable energy standards.***

The BWL developed a two phase approach to meeting the standards of the Act. Phase I addresses the compliance years 2012 through 2015, and Phase II addresses the years from 2016 through 2028.

**Phase I**

In 2007, prior to enactment of PA 295, the BWL adopted its own Renewable Portfolio Standard (RPS). The BWL's RPS called for acquiring renewable energy beginning in 2009. Compliance with Phase I of the Act is based on the renewable energy the BWL began to secure during 2007 and 2008, to comply with its own RPS. Phase I renewable energy sources include two hydro units, two landfill gas facilities, and a solar energy facility located in Lansing. Renewable Energy Credits (RECs) generated from these renewable energy sources during the years 2009 to 2012 were banked in accordance with Section 39(3)(c) of PA 295. These banked RECs provided the BWL with an inventory sufficient to allow the BWL

to meet PA 295 standards through 2015. See *Attachment A – Renewable Energy Credit Portfolio* for further details.

### Phase I - Update

Table 1 below summarizes the status of the energy and Renewable Energy Credits that the BWL has acquired and/or generated in 2013 and 2014. The BWL will continue banking the RECs which will be used together with RECs from ongoing generation to meet the PA 295 standards through 2028.

**Table 1 - Renewable Energy Generated or Acquired**

Year	Electricity (MWh)	Total RECs
2013	86,496	94,760
2014	93,894	102,827

Compliance reporting for renewable energy continued in 2013 and 2014; the BWL applied 76,749 and 112,023 RECs respectively to meet the requirements under PA 295.

### Phase II

In 2014, the BWL continued to add to its renewable energy sources to ensure compliance with PA 295 REP requirements. To continue diversifying its energy portfolio, the BWL entered into a Power Purchase Agreement with Exelon for 19.2 MW of wind energy. The BWL also pursued further development in solar energy; adding an additional 121 kW of BWL owned solar, as well as releasing a Request for Proposals (RFP) for a utility scale solar project. As a result of the Solar RFP, the BWL is working to finalize both a utility scale solar project and a community solar program for BWL electric customers. These projects are forecasted to generate approximately 85,000 MWh of electricity annually. As part of the BWL's 2015 integrated resource plan, the company continues to explore the possibility of co-firing generation with biomass, as well as incorporating other future renewables projects into the generation portfolio.

***Section 25 (2) (b) Specify whether the number of megawatt hours of electricity used in the calculation of the renewable energy credit portfolio will be weather-normalized or based on the average number of megawatt hours of electricity sold by the electric provider annually during the previous 3 years to retail customers in this state.***

The BWL has calculated its renewable energy credit portfolio requirements based on the average number of MWhs of electricity sold by the BWL annually during the three previous years to its retail customers. This is consistent with the BWL original U-15868 plan filing.

***Section 25 (2) (c) Provide the expected incremental cost of compliance with the RPS Requirement.***

Following the *Filing Requirements and Instructions for Renewable Energy Plans for Municipally-Owned Electric Utilities* provided in Attachment C of the MPSC Order to implement PA 295, the BWL has provided *Attachment B – Renewable Energy Plan Surcharge Summary*. In summary, the incremental cost of compliance is estimated to be less than the Section 45 (2) caps of \$3.00 per month for each residential meter, \$16.58 per month for each commercial meter, and \$187.50 for each industrial meter. The actual incremental costs, levelized pursuant to Section 45 (4), shall be detailed on customer's bills per Section 45 (5) beginning when the Renewable Energy Plan is approved by the Commission.

The incremental costs were calculated in the following manner:

- (1) Total renewable costs are calculated from the terms of power purchase agreements, and forecast costs of future solar, wind, and hydro installations. Where appropriate, these costs are escalated over time.
- (2) Incremental renewable costs are offset by either a long-term forecast of market energy and capacity prices, or the all-in cost of generation from the BWL's own generating units and capacity values. The forecast market prices are based upon estimated MISO wholesale market. These estimates span the period of time beginning with 2015 and running to 2028 and begin at approximately \$76/MWh in 2015 and escalate to \$125/MWh in 2028. Capacity costs are now factored in the value of energy calculation, and are set at the MISO price of \$1,270/MW-year in 2015. The forecast market prices are used to determine the incremental cost of renewable energy resources outside the Lansing footprint. The incremental cost of power for renewables within the footprint are the all-in, capacity and energy costs of energy displaced from the BWL's own generating units. Renewable energy within the BWL's service territory serves the same role as BWL generation in offsetting transmission requirements and reducing day-ahead load forecasts.
- (3) The difference between the renewable energy cost and the offsetting market value of energy and capacity is the estimated incremental cost of renewable energy.
- (4) Incremental costs are summed for all the renewable energy sources for each year. The present values of the annual net sums are used to calculate a levelized monthly charge for each customer class over a twenty year period.

***Section 25 (2) (d) Describe the manner in which the provider will allocate costs.***

The BWL began levying REP surcharges in March of 2010. In fall 2014, the BWL re-evaluated these surcharges, and implemented new lower surcharges on November 1, 2014. The updated surcharges are as follows:

Residential

Rate 1 Residential	\$0.75/customer
Rate 21 Senior Citizen Residential	\$0.50/customer

Secondary Commercial and Industrial

Rates 3,4,7,and 12	\$0.0024/kWh
Minimum Monthly Charge	\$2.80/customer
Maximum Monthly Charge	\$12.00/customer

Primary Commercial and Industrial

Rates 5 and 8	\$160.00/delivery point
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Traffic Light Service

Rate 11	
Less than 914 Active Watts	\$3.00/Intersection
914-3650 Active Watts	\$9.00/Intersection
Greater than 3650 Active Watts	\$15.00/Intersection

Street Lighting Service

Rates 31 and 32	
Less than 100W Luminaire	\$0.20/Luminaire
100W or greater Luminaire	\$0.50/Luminaire

Except for its secondary commercial and industrial customers, the BWL allocates costs on a per meter, per month basis. The BWL's secondary rates 3, 4, and rate 12 contain commercial customers with a very wide variation of monthly energy consumption amounts. A flat fee could cause monthly increases of 80% or more for some of these customers. In order to mitigate potential rate impacts, customers on these rates will be charged a two part rate. First, a flat monthly amount of \$2.80 will be charged to these customers and, second, a per kWh charge of \$0.0024 will be levied until the cap of \$12.00 is reached.

Residential customers will be charged a flat rate of \$0.75, except for senior customers on the BWL's senior rate. Senior customers on rate 21 will be charged \$0.50 per month. The remaining customers will be charged the rates shown above. These surcharges are consistent with the Renewable Energy Plan (U-15868) filed by the BWL which the MPSC found to be in compliance with PA 295.

## **Attachment A – Renewable Energy Credit Portfolio**

### BWL Moores Park Hydro, South Unit

A hydro-electric unit, owned by the BWL, was rehabilitated and brought back into service in March 2008. The unit is capable of approximately 0.5 MW gross generating capacity. This unit typically generates approximately 1,100 MWh annually. The unit stopped operating in 2013; the BWL is working on repairing the hydro plant.

### Granger Landfill Energy, Wood Road

This landfill gas plant, under a long term Power Purchase Agreement (PPA) between Granger and the BWL, was interconnected directly to the BWL distribution system and began commercial operation in November 2008. The facility has a capacity of 7.8 MW, in 2015 there are plans to expand the facility to 9.4 MW total. The current annual electricity production from Wood Road is approximately 60,000 MWh.

### Granger Landfill Energy, Grand River

This landfill gas plant, also under a long term PPA with the BWL, has a capacity of 3 MW. The facility provides approximately 20,000 MWh of renewable energy annually to the BWL system.

### Tower/Kleber Hydro

This northern Michigan hydro-electric unit (near Cheboygan) with a gross generating capacity of 1.7 MW is under a PPA with the BWL. This facility will provide approximately 5,700 MWh annually.

### BWL Cedar Street Solar Array and Expansion

The downtown Lansing solar array, brought online in December 2008, consists of 432 solar panels with 54 kW of gross generating capacity. In July 2014 an expansion of the solar array was completed; adding on an additional 104 kW of capacity, totaling 158 kW. Estimated annual output of the entire facility is approximately 180 MWh. The solar panels are expected to remain operational over the entire 20 year period included in PA 295.

### BWL REO Town Solar Facility

A 13 kW solar array situated on the roof of the BWL REO Town Headquarters and Co-generation plant. This array began producing energy in June 2014, with an estimated annual output of 14 MWh.

### Exelon Energy Beebe 1B Wind Farm

The BWL entered into a power purchase agreement with an affiliate of Exelon for the wind energy produced by eight 2.4 MW Nordex wind turbines. The turbines are located at the Beebe 1B wind farm in Gratiot County, MI, and have a total capacity of 19.2 MW. The wind farm began commercial production in December 2014, and estimates an annual production of 60,000 MWh.

As seen in Table 2, Existing Renewable Energy Sources, the sources listed above provided approximately 103,000 RECs in 2014. The BWL forecasts that 165,000 RECs will be produced in 2015, with the Beebe 1B wind farm operating for its first full year.

**Table 2 - Existing Renewable Energy Sources**

Source	Capacity (MW)	2013 Electricity Generated (MWh)	2013 RECs	2014 Electricity Generated (MWh)	2014 RECs
Moores Park Hydro	0.5	324	355	0	0
Granger Wood Road	3.0	57,873	63,261	63,330	69,221
Granger Grand River	7.8	22,378	24,479	20,474	22,386
Tower Kleber	1.7	5,908	6,625	7,180	8,055
All BWL Solar	0.171	13	40	118	375
Beebe 1B Wind	19.2	NA	NA	2,790	2,790
<b>TOTAL</b>	<b>32.37</b>	<b>86,496</b>	<b>94,760</b>	<b>93,892</b>	<b>102,827</b>

**Attachment A - Renewable Energy Credit Portfolio**

Line	(a) Year	(b) REC Portfolio Standard	(c) Total REC Compliance Obligation	(d) RECs from Current Year	(e) RECs Used from Current Year	(f) RECs Used from Bank	(g) = (e) + (f) Total RECs Used for Compliance	(h) Total RECs Sold (or lost)	(i) = (d) - (g) - (h) + Prior Yr (i) Cumulative RECs Banked and Carried Over to Next Year	Renewable Energy Sources									
										Granger	Tower Kleber	BWL Solar	Solar PPA	BWL Hydro	MP Hydro PPA	Wind PPA	Other	Total	
1	2009	0.00%	0	90,819	0	0	0	0	90,819	82,066	7,273	197	0	1,283	0	0	0	90,819	
2	2010	0.00%	0	95,367	0	0	0	0	186,186	87,939	6,086	187	0	1,155	0	0	0	95,367	
3	2011	0.00%	0	98,514	0	0	0	0	284,700	91,891	6,199	184	0	240	0	0	0	98,514	
4	2012	2.25%	48,319	92,831	0	48,319	48,319	42,503	286,709	86,284	6,342	205	0	0	0	0	0	92,831	
5	2013	3.50%	76,749	94,760	0	76,749	76,749	18,634	286,086	87,739	6,625	42	0	355	0	0	0	94,761	
6	2014	5.15%	112,023	102,827	0	112,023	112,023	0	276,890	91,607	8,055	375	0	0	0	2,790	0	102,827	
7	2015	10.00%	214,461	165,626	0	214,461	214,461	0	228,055	92,579	6,859	608	0	0	0	65,580	0	165,626	
8	2016	10.00%	214,461	249,824	0	214,461	214,461	0	263,419	92,579	7,054	608	82,134	0	1,869	65,580	0	249,824	
9	2017	10.00%	214,461	250,023	0	214,461	214,461	0	298,981	92,579	7,253	608	82,134	0	1,869	65,580	0	250,023	
10	2018	10.00%	214,461	244,692	0	214,461	214,461	0	329,213	92,579	7,055	608	77,001	0	1,869	65,580	0	244,692	
11	2019	10.00%	214,461	244,758	0	214,461	214,461	0	359,510	92,579	7,121	608	77,001	0	1,869	65,580	0	244,758	
12	2020	10.00%	214,461	222,403	0	214,461	214,461	0	367,452	92,579	7,144	608	77,001	0	1,869	65,580	0	244,781	
13	2021	10.00%	214,461	244,744	0	214,461	214,461	0	397,735	92,579	7,107	608	77,001	0	1,869	65,580	0	244,744	
14	2022	10.00%	214,461	244,761	0	214,461	214,461	0	428,035	92,579	7,124	608	77,001	0	1,869	65,580	0	244,761	
15	2023	10.00%	214,461	244,761	0	214,461	214,461	0	458,335	92,579	7,124	608	77,001	0	1,869	65,580	0	244,761	
16	2024	10.00%	214,461	244,756	0	214,461	214,461	0	488,630	92,579	7,119	608	77,001	0	1,869	65,580	0	244,756	
17	2025	10.00%	214,461	244,759	0	214,461	214,461	0	518,928	92,579	7,122	608	77,001	0	1,869	65,580	0	244,759	
18	2026	10.00%	214,461	244,759	0	214,461	214,461	0	549,226	92,579	7,122	608	77,001	0	1,869	65,580	0	244,759	
19	2027	10.00%	214,461	244,758	0	214,461	214,461	0	579,524	92,579	7,121	608	77,001	0	1,869	65,580	0	244,758	
20	2028	10.00%	214,461	244,759	0	214,461	214,461	0	609,822	92,579	7,122	608	77,001	0	1,869	65,580	0	244,759	
22	Total		3,239,541	3,910,499		3,239,541	3,239,541	61,137											
										IREC	163,635	12,270	6,676	0	51	2,087	111,600	0	296,318
										REC	1,660,001	127,757	3,026	0	2,982	22,204	1,200,000	0	3,015,970
										Total	1,823,636	140,027	9,702	0	3,033	24,291	1,311,600	0	3,312,288

Data above includes RECs and IRECs.

**Attachment B – Renewable Energy Plan Surcharge Summary**

Please find below a detailed description of the lines in the Attachment B worksheet:

- Line 1 – Actual and forecasted retail Sales.
- Line 4 – Number of renewable energy credits required based on three year average annual sales for preceding three year period (PA 295 section 27 (3)). The annual requirement is phased in between 2012 and 2015 and then remains constant after 2015.
- Line 6 – Renewable energy credits required for compliance. Same number as in Line 4, but expressed in REC's instead of MWhs.
- Line 7 – RECs from existing renewable energy supply (pre-PA 295).
- Line 8 and 11 – Required RECs for compliance each year.
- Line 12 – The number of RECs the BWL estimates to be acquired through renewable energy sources by the end of that year.
- Line 13 – The number of RECs used for compliance that year.
- Line 14 – Percentage of the required RECs the BWL used for compliance for that year.
- Line 15 – The cumulative excess or deficient number of RECs.
- Line 18 – Cost of Renewable Energy Construction, O&M, and Purchased Power
- Line 20 – Market Value of Energy and Capacity.
- Line 21 – Number of excess RECs sold.
- Line 23 – Incremental costs of compliance.
- Line 25 to 40 – Total meters, customers, or installations forecast for each rate class.
- Line 42 to 45 – Calculations using maximum surcharge (all rate classes at caps).
- Line 49 to 65 – Total collected and planned surcharges for each rate class.



