

PUBLIC SERVICE COMMISSION OF WISCONSIN

Memorandum

June 21, 2017

FOR COMMISSION AGENDA

TO: The Commission

FROM: Jeffrey J. Ripp, Administrator
Jim Lepinski, Chief Engineer - Electric
Division of Energy Regulation

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RE: Electric Provider Renewable Portfolio Standard Compliance 5-RF-2016
for 2016

Suggested Minute: The Commission (accepted/did not accept) the reports of Wisconsin electric providers and aggregators regarding compliance with the Compliance Year 2016 requirements of Wis. Stat. § 196.378(2)(a)2. The Commission directed the Division of Energy Regulation to inform each electric provider of its compliance with the statute.

2016 Renewable Portfolio Summary Report

Executive Summary

Commission staff has reviewed the 2016 Renewable Portfolio Standard (RPS) reports filed by all the electric providers, and has confirmed that each electric provider is in compliance with its 2016 RPS requirements. Electric providers accomplished compliance by retiring required amounts of Renewable Energy Certificates (REC) within the Midwest Renewable Energy Tracking System (M-RETS). M-RETS verifies that each REC represents one megawatt-hour (MWh) of renewable energy, and once retired for the RPS, the REC cannot be used for any other program. Commission staff confirmed the amount of RECs that each electric provider needed for compliance and verified those REC retirements in M-RETS.

Wisconsin also met its RPS goal of 10.00 percent of retail sales of electricity from renewable resources. Approximately 10.56 percent of 2016 total retail sales of electricity came from renewable resources due to the RPS. If generation for green pricing programs, for which some retail customers voluntarily pay a premium, is added to the total, 11.07 percent of retail sales came from renewable resources in 2016.

Background

2005 Wisconsin Act 141 (Act 141) set a statewide goal of 10.00 percent of total Wisconsin retail sales of electricity from renewable resources by 2015, and also established requirements for all 118 electric distribution utilities, or “electric providers” as they are legally defined. Act 141 set baseline percentages for electric provider requirements, based on their average renewable energy percentages observed over the 2001-2003 period. For the initial compliance years (2006-2009), electric providers had to maintain their baseline percentages. During the 2010-2014 period, they had to increase their renewable percentages to 2.00 percent above baseline. In 2015 and thereafter, they are required to increase their renewable percentages to 6.00 percent above baseline. For more RPS legal and technical information, refer to Appendix A of this memorandum. ([DL: 1549552.](#))

RPS Compliance in 2016

All electric providers responded to Commission staff’s data request on 2016 RPS compliance by filing reports in docket 5-RF-2016. Commission staff used this information to determine REC retirement requirements for compliance year 2016. Electric providers also made REC retirements in M-RETS. Using regulatory access, Commission staff then verified electric provider REC retirement activity within M-RETS and confirmed that each electric provider retired at least the minimum amount of RECs required for 2016 for the sole purpose of meeting

the Wisconsin RPS. Using this verification process, Commission staff determined that all electric providers are in compliance with the RPS. In aggregate, 6,508,839 RECs were retired for compliance year 2016. Additional information on individual electric provider requirements and REC retirements can be found in Appendix C of this memorandum.

10.00 Percent Statewide Goal in 2016

In order to determine the statewide renewable energy percentage, Commission staff asks electric providers to submit statistical information about actual renewable energy, by resource type, generated in the previous year. In 2016, over 7.3 million MWh of RPS renewable energy was generated. This number divided by the total retail sales of Wisconsin electric providers yields a 2016 RPS renewable energy percentage of 10.56, which exceeds the 10.00 percent statewide goal. Wisconsin first met the 10.00 percent statewide renewable energy goal in 2013, and has met it every year since.

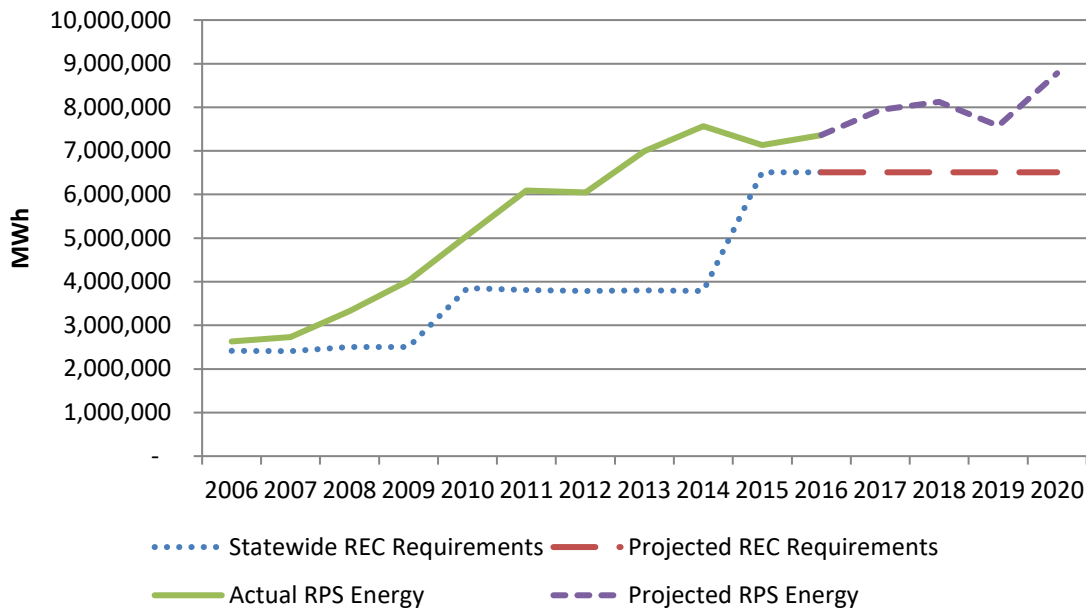
Beyond compliance program requirements, electric providers procure renewable energy for their green pricing programs, for which some of their retail customers voluntarily pay a premium. Over 350,000 MWh were generated for these voluntary programs in 2016. Added together with the RPS energy noted above, the renewable energy percentage was 11.07 percent.

RPS Statewide Outlook through 2020

Wisconsin electric provider may aggregate REC requirements in order to depict the quantity of RECs needed statewide, both for past years as well as projected requirements for the future.¹ These requirements can then be compared to electric provider aggregate actual renewable generation and forecasts, which appear in Figure 1 below.

¹ In order to project RPS requirements, a flat retail sales trend is assumed for Wisconsin's electric providers through 2020. The statewide RPS energy forecast represents an aggregation of electric provider forecasts.

Figure 1 Wisconsin Statewide REC Requirements and Actual RPS Energy



With individual banks of RECs that many electric providers have accumulated, and projected growth of RPS renewable energy that electric providers forecast, both the statewide renewable energy goal and individual requirements should be easily met through 2020. Referencing the aggregated statewide forecast, 8 million MWh of RPS renewable energy may be achieved by 2018, and by 2020 that number may come closer to 9 million MWh. Rather than being driven by future requirements of the Wisconsin RPS, this growth trend is driven by other forces, such as market opportunities, customer demand for additional renewable energy, and multiple processes involved in citing new projects. Therefore, actual production could be lower or higher than these aggregated electric provider estimates.

RPS Progress of Wisconsin’s Largest Electric Providers and Aggregators

Below are figures that, like the statewide figure above, depict REC requirements and RPS energy reported by electric provider. The five largest electric providers are shown, along with the electric provider aggregators, WPPI Energy and Dairyland Power Cooperative. Once again,

all electric providers were in compliance with their 2016 RPS requirements. If electric provider RPS energy levels for 2016 are below their REC requirements for 2016, they have used banked RECs from prior years, and/or purchased RECs from other electric providers that were in excess of their own requirements.

Figure 2 Wisconsin Electric Power Company REC Requirements and Actual RPS Energy

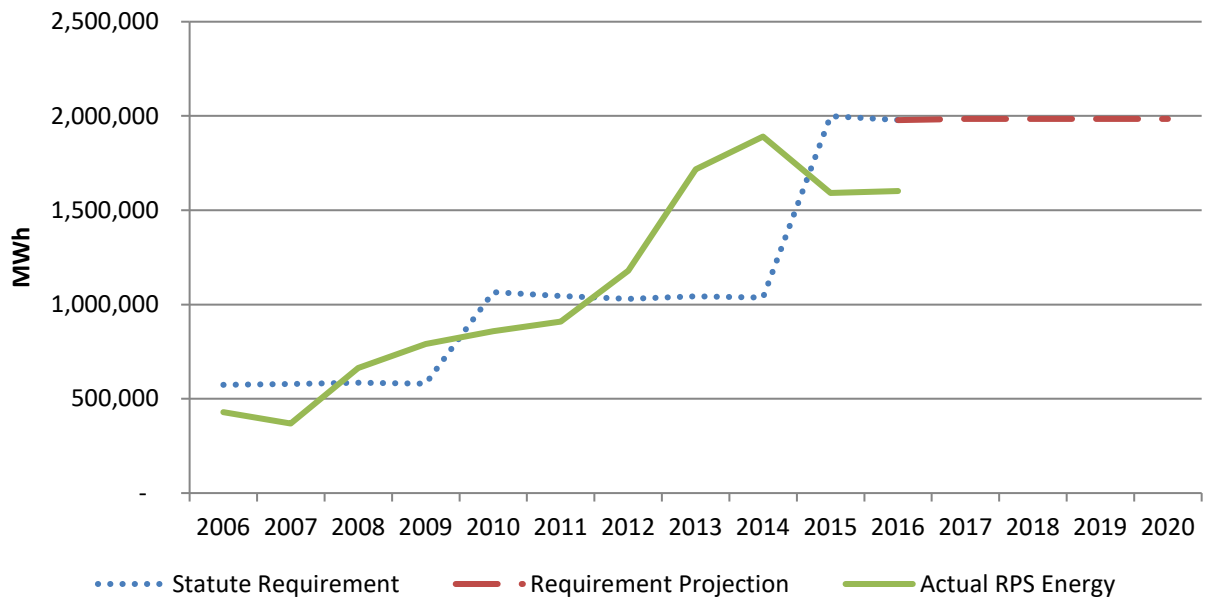


Figure 3 Wisconsin Public Service Corporation REC Requirements and Actual RPS Energy

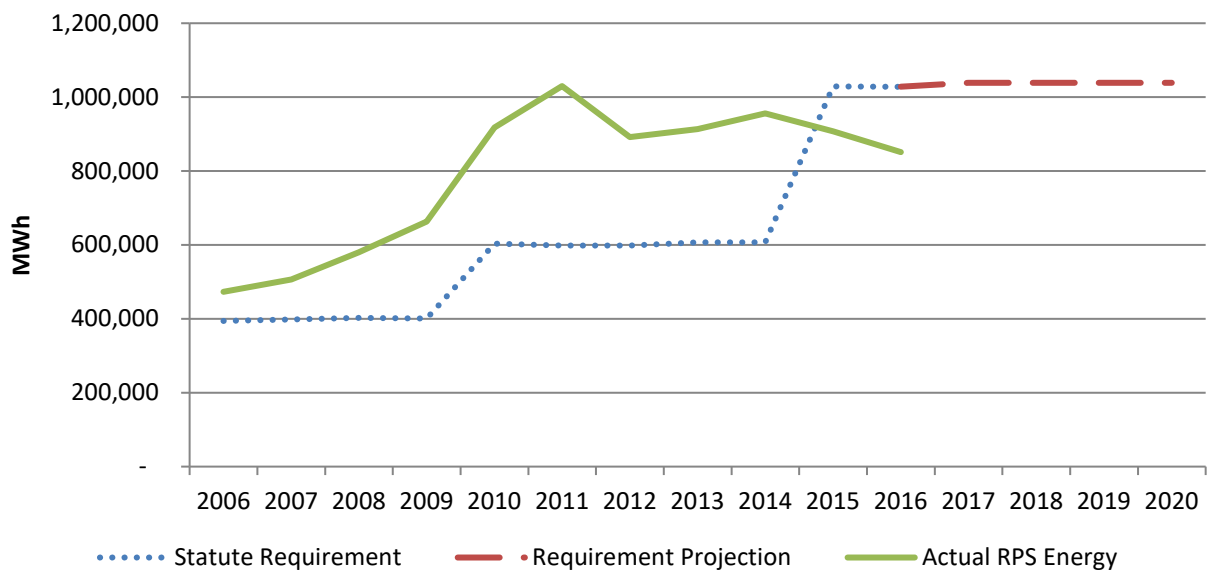


Figure 4 Wisconsin Power and Light Company REC Requirements and Actual RPS Energy

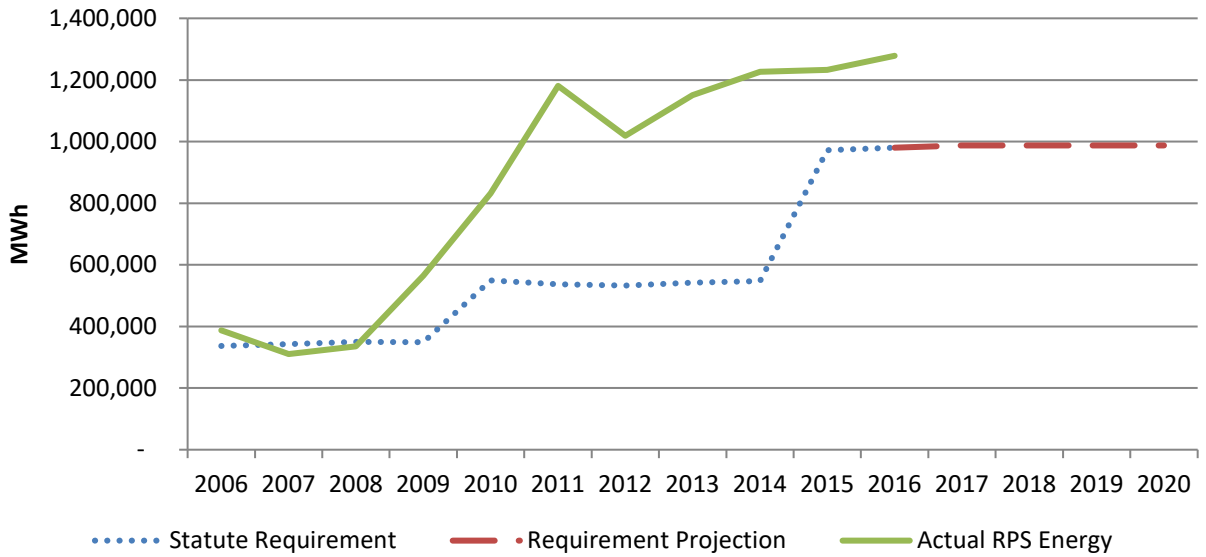


Figure 5 Northern States Power Company-Wisconsin REC Requirements and Actual RPS Energy

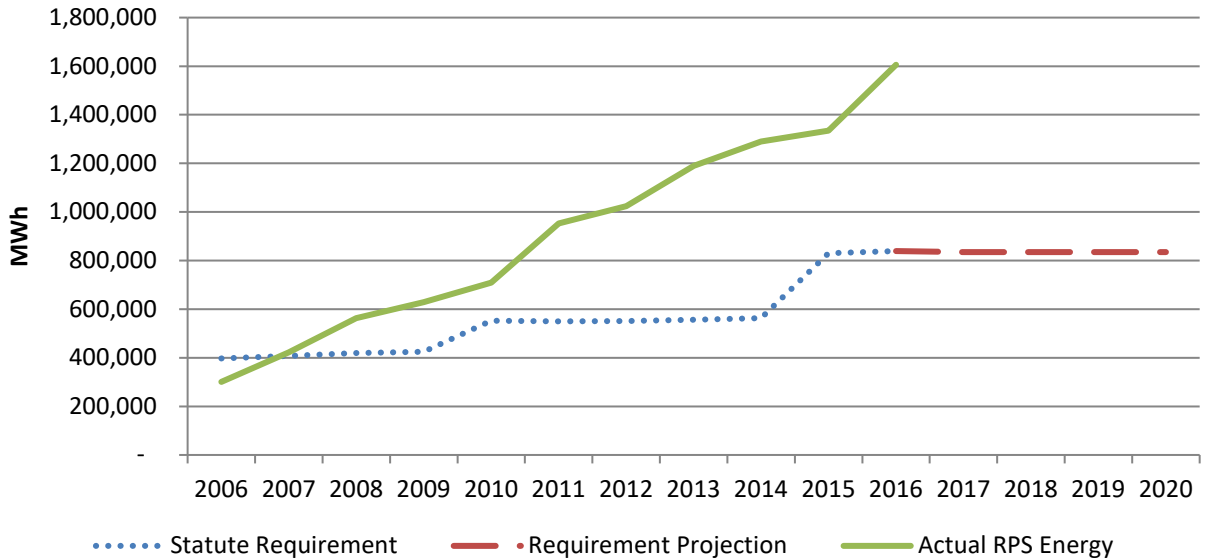


Figure 6 WPPI Energy REC Requirements and Actual RPS Energy

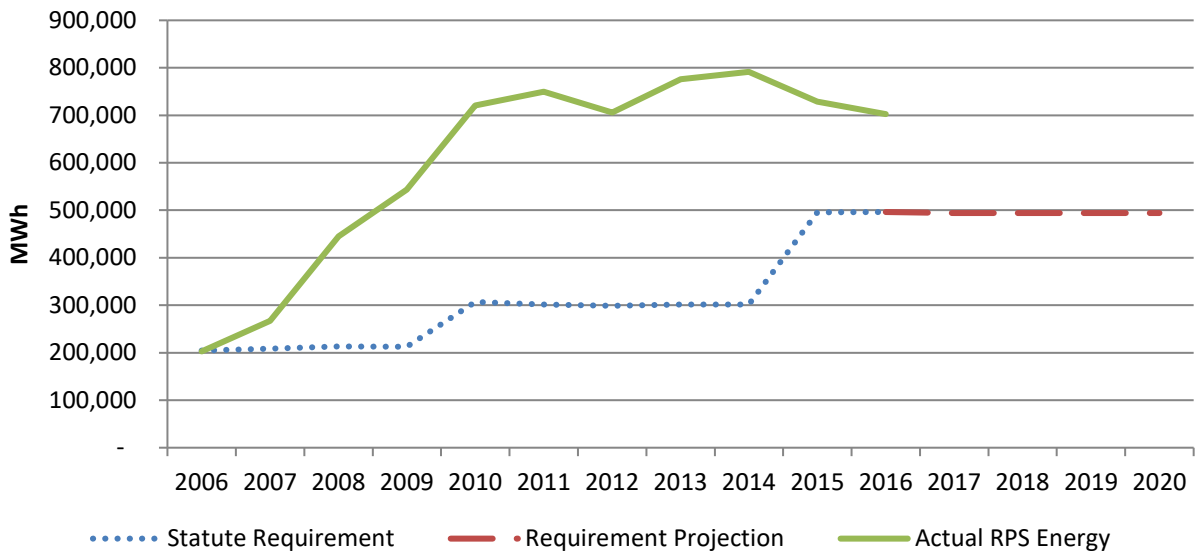


Figure 7 Dairyland Power Cooperative REC Requirements and Actual RPS Energy

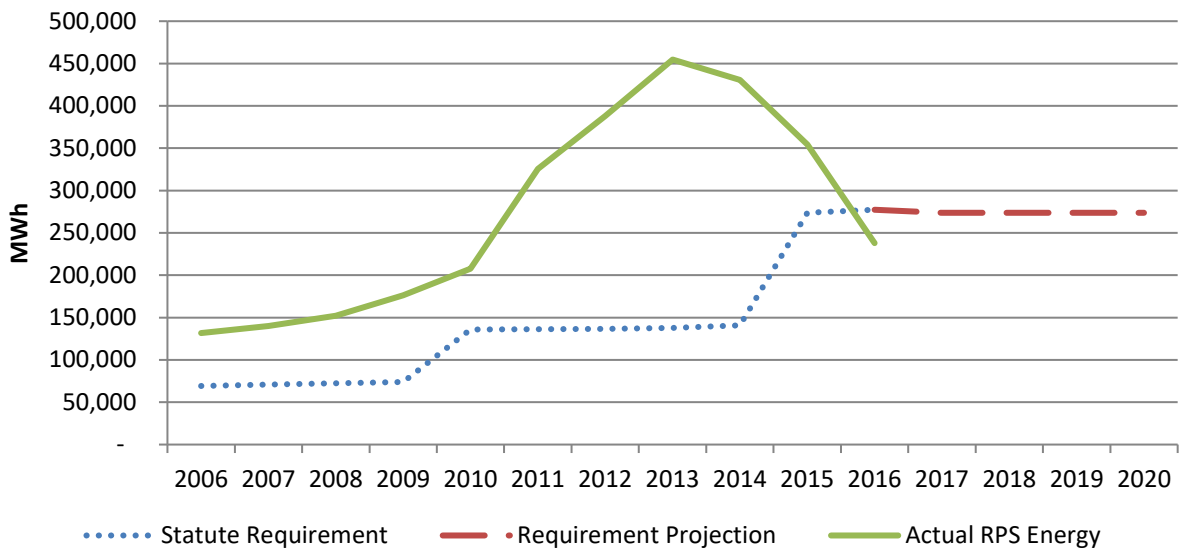
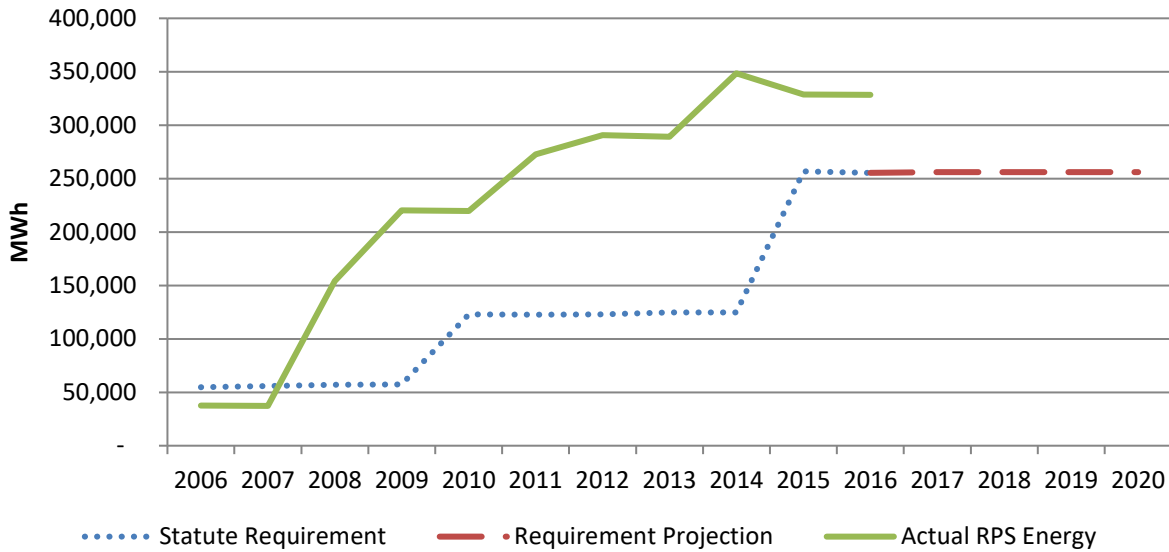


Figure 8 Madison Gas and Electric Company REC Requirements and Actual RPS Energy



Commission Alternatives

Alternative One: Accept the reports of Wisconsin electric providers and aggregators regarding compliance with the requirements of Wis. Stat. § 196.378(2)(a)2. The Division of Energy Regulation is directed to inform each electric provider of its compliance with the statute.

Alternative Two: Do not accept the reports of Wisconsin electric providers and aggregators regarding compliance with the requirements of Wis. Stat. § 196.378(2)(a)2. and provide further instruction to Commission staff or the providers and aggregators.

JJR:JAL:AMK;jlt:DL: 01543388

- Attachments: Appendix A: Wisconsin RPS Legal and Technical Information, [DL: 1549552](#)
- Appendix B: Electric Provider List
- Appendix C: 2016 Total Retail Energy Sales and Renewable Energy by Wisconsin Electric Provider
- Appendix D: 2016 Renewable Energy by State and Resource (MWh)
- Appendix E: 2016 Statistics Generated from Electric Provider Data
- Appendix F: 2016 Figures of Statistics Generated from Electric Provider Data, (Appendices B-F combined: [DL: 1549564](#))

Appendix A: Wisconsin RPS Legal and Technical Information

Wisconsin Stat. § 196.378 establishes the Wisconsin Renewable Portfolio Standard (RPS) and applies to all 118 electric providers that serve retail customers in Wisconsin. These electric providers are local electric distribution companies, and include all investor-owned utilities, municipal utilities, and electric cooperatives that serve residential and business customers in the state.

The RPS Goal

The RPS has two components: (1) a statewide goal of 10 percent of total retail electric sales from renewable resources by 2015, and (2) individual electric provider requirements. The 10 percent statewide goal is not, in and of itself, a mandate. However, individual electric provider requirements drive the procurement of renewable resources to serve Wisconsin customers, either in the form of electric provider-owned generation, or purchase power agreements. This leads to renewable resource generation, the quantity of which can be measured and used to establish an annual statewide renewable energy percentage.

2013 was the first year that the 10 percent goal was achieved, two years ahead of schedule. The statewide goal has been met every year since 2013 as well. Individual electric provider RPS requirements will continue indefinitely, and based on electric provider planning information, it is likely that the 10 percent goal will be met each year in the foreseeable future.

Electric Provider RPS Requirements

Wisconsin electric providers must provide a minimum percentage of the electricity they supply at retail from renewable resources, and annually report renewable energy generation and planning activities to the Commission. For each calendar year from 2006 through 2009, electric providers were required to meet a baseline percentage equal to the average of the electric provider's renewable energy percentage for the years 2001 through 2003. An electric

provider's requirements were determined during the 2006-2009 period by multiplying the electric provider's baseline percentage by the electric provider's total retail sales average. The sales average is taken from the previous three years, as established in the statute, so that electric providers know what their requirements will be in the upcoming year.

All Wisconsin electric providers met their baseline percentage requirements through 2009. Beginning in 2010, electric providers were required to achieve a renewable energy percentage at 2 percent above their respective baselines. In order to comply with the RPS in 2015 and thereafter, electric providers will need to meet and sustain a level that is 6 percent above their respective baselines. 2013 Wisconsin Act 290 exempts certain electric providers, with baseline renewable energy percentages that were above 12 percent, from meeting the 2015 elevated level of 6 percent above baseline. This will allow four electric providers (Centuria Municipal Electric Utility, Consolidated Water Power Company, North Central Power Company, Inc., and Northwestern Wisconsin Electric Cooperative) to sustain renewable percentage levels that are 2 percent above baseline in 2015 and thereafter.

Renewable Facility Certification

Electric providers achieve compliance with their RPS requirements by generating or purchasing electricity from renewable resources to serve the load of their retail customers. An electric provider must register a renewable facility that it uses to serve its retail customers with the Commission. If the facility meets criteria in Wis. Admin. Code §§ PSC 118.03(1) and 118.05, the Commission will certify the facility as eligible for the RPS. For purposes of verification, and tracking generation from these certified facilities, electric providers are allowed to create one Renewable Energy Certificate (REC) for each megawatt-hour of renewable

energy. The RECs associated with the renewable energy generated from these certified facilities are then deemed eligible for the RPS.

According to Wis. Stat. § 196.378(3)(a)2., if a Wisconsin RPS-certified renewable facility was placed in service on or after January 1, 2004, or is owned by a retail customer of an electric provider regardless of age, the facility is eligible to create RECs that qualify as Renewable Resource Credits (RRCs). Incremental additions to capacity of facilities with in-service dates before 2004 also create RECs that qualify as RRCs. A Wisconsin RRC carries with it the value of being bankable for a four-year period for purposes of the Wisconsin RPS. A renewable facility put in service after 2003, and used by a Wisconsin electric provider, would thus likely be eligible for the Wisconsin RPS and create RECs that qualify as RRCs. One REC may have multiple program eligibilities, as a facility may also seek certification with other state RPS compliance and/or voluntary programs. The Commission only has the authority to certify renewable facilities for the Wisconsin RPS and certify RECs as RRCs.

Tracking Renewable Energy and Demonstrating RPS Compliance

Electric providers are required to use the Midwest Renewable Energy Tracking System (M-RETS), an electronic renewable energy tracking database, to track their RPS renewable energy and to demonstrate RPS compliance. Besides Wisconsin, other states that participate in M-RETS include Illinois, Iowa, Minnesota, North Dakota, South Dakota, Montana, as well as the Canadian province of Manitoba. M-RETS uses a stakeholder approved set of Operating Procedures to gather, verify, and track generation data from renewable facilities and award RECs to the account holder of the facility within M-RETS. Each M-RETS REC carries with it one or more program eligibilities based on certifications it has received. However, a REC may only be used, or “retired,” once for one program, and then is no longer eligible for any other program.

Wisconsin electric providers demonstrate RPS compliance within M-RETS by retiring RECs that are eligible for the Wisconsin RPS. If a REC does not qualify as an RRC, it must be retired for the Wisconsin RPS in the compliance year associated with the calendar year generation vintage. For example, an older RPS-eligible hydroelectric facility that generates RECs in calendar year 2013 must have its RECs retired in compliance-year 2013, or its Wisconsin RPS eligibility will expire. Since April 15 is the statutory deadline for electric providers to make retirements for the previous year's RPS requirements, the compliance year for 2013 runs from April 16, 2013, through April 15, 2014. As a result, a REC from the older hydro facility discussed above with a generation vintage of January 2013 will have its Wisconsin RPS eligibility expire on April 16, 2014. If the facility has other program eligibilities, the REC may still be eligible for a different program, such as another state RPS.

If a facility creates RECs that qualify as RRCs, four additional years of Wisconsin RPS eligibility are allowed before the REC expires for purposes of the Wisconsin RPS. For example, a REC with a January 2013 vintage that qualifies as an RRC will not expire for the Wisconsin RPS until April 16, 2018 (through the 2017 compliance-year period). During this time, the electric provider may bank the RRC qualifying REC for future retirement, or trade it to another entity. All the eligibilities, expiration dates, and associated program rules and limitations will be tied to the REC within M-RETS regardless of who owns it. M-RETS also has agreements with other tracking systems, and RECs may be imported or exported if agreements are established between the two systems. Regardless, according to Wis. Stat. § 196.378(1)(o)1. and 2., only renewable energy used to serve Wisconsin load may be eligible for the Wisconsin RPS.

Appendix B: Electric Provider List
in Order of 2016 RPS Renewable Energy as a Percent of 2016 RPS Requirements

Electric Provider or Aggregator*	2016 RPS Renewable Energy as Percent of 2016 Total Retail Energy Sales	2016 RPS Percent Requirement	Percent of 2016 RPS Requirement Achieved in 2016
Northern States Power Co WI	24.69%	12.89%	192%
Rice Lake Mun Wtr & Elec Util	20.65%	12.53%	165%
Barron Light & Water Utility	20.65%	12.85%	161%
Pioneer Power & Light Co	13.62%	8.71%	156%
Westfield Milling & Elec Co	13.65%	8.81%	155%
Northwestern WI Elec Co	22.21%	14.48%	153%
Princeton Mun Wtr & Elec Util	12.33%	8.21%	150%
Wonewoc Electric & Water Util	12.58%	8.69%	145%
Pardeeville (Village of) Elec Util	12.07%	8.44%	143%
WPPI Energy*	14.62%	10.24%	143%
Adams-Columbia Electric Coop	12.71%	8.92%	142%
Benton Mun Elec & Water Util	12.40%	8.86%	140%
Mazomanie Electric Utility	11.72%	8.45%	139%
Central Wisconsin Elec Coop	12.30%	8.94%	138%
Hazel Green Municipal Utility	12.18%	8.87%	137%
Shullsburg Electric Utility	12.08%	8.82%	137%
Cornell Mun Water & Elec Util	17.30%	12.65%	137%
Belmont Mun Water & Elect Util	11.94%	8.76%	136%
Bangor Municipal Utility	17.06%	12.62%	135%
Wisconsin Dells Mun Elec Util	11.99%	8.89%	135%
Oconto Electric Coop	14.42%	10.71%	135%
Sheboygan Falls Utilities	11.78%	8.77%	134%
Sauk City Mun Wtr & Light Util	11.82%	8.82%	134%
Black Earth Electric Utility	12.29%	9.23%	133%
North Central Power Co Inc	46.04%	35.11%	131%
Spooner Municipal Utilities	16.40%	12.55%	131%
Rock Energy Coop	11.63%	8.93%	130%
Madison Gas & Electric Co	9.87%	7.73%	128%
Medford Electric Utility	15.76%	12.41%	127%
Wisconsin Power & Light	11.76%	9.28%	127%
Cadott Light & Water Mun Util	15.96%	12.72%	125%
Elkhorn Light & Water	11.80%	9.43%	125%
Trempealeau Mun Elc & Wtr Util	15.69%	12.78%	123%
Gresham Mun Light & Pwr Util	10.03%	8.43%	119%
Shawano Municipal Utilities	8.55%	7.34%	117%
Bloomer Electric Utility	14.52%	12.47%	116%
Clintonville Water & Electric Utility	8.55%	7.44%	115%
Consolidated Water Power Company	20.30%	18.47%	110%
East Central Energy	7.01%	6.64%	106%
Wisconsin Rapids WW & Light	8.55%	8.73%	98%
Manitowoc Public Utilities	8.77%	9.19%	95%
Kiel (City of) Utilities	8.55%	9.07%	94%
Washington Island Cooperative	8.78%	9.35%	94%
Superior Wtr Light & Pwr Co	7.78%	8.53%	91%
Dairyland Power Cooperative*	7.36%	8.44%	87%
Stratford Mun Wtr & Elec Utility	7.82%	9.31%	84%
Wisconsin Public Service Corp	7.84%	9.74%	81%
Wisconsin Electric Power Co	6.63%	8.27%	80%
Marshfield Elec & Water Dept	6.69%	8.91%	75%
Dahlberg Light & Power Co	2.58%	7.37%	35%
Centuria Municipal Electric Util	0.00%	14.37%	0%
WISCONSIN TOTAL	10.56%	N/A	N/A

Note: Largest electric providers described in the narrative of this memorandum are in bold. "WISCONSIN TOTAL" represents aggregated RPS renewable energy of all Wisconsin electric providers.
All electric providers are in compliance. If an electric provider has a percentage below its RPS requirement, it has used banked RECs and/or purchased RECs from another provider.

Appendix C: 2016 Total Retail Energy Sales & Renewable Energy by Wisconsin Electric Provider

COLUMN KEY FOR TABLE BELOW

Columns 7-9, 13, 14, and 16 highlight 2016 RPS and Green Pricing renewable energy and percentages. Other columns show compliance activity and information used in calculations. See below for description of each column.

1. List of Wisconsin electric providers or aggregators that must meet RPS requirements. These entities represent all electric providers of retail electric services in the state of Wisconsin (investor-owned, municipal, and cooperative).
2. 2016 total retail sales per electric provider (from all generators) as reported to the Commission.
3. 2013-2015 average annual total retail energy sales, as reported to the Commission. Each year's RPS requirement % is applied to the average of the previous three years of annual retail sales.
4. 2013-2015 average total retail energy sales (Col. 3) multiplied by utility's 2016 RPS percent requirement (Col. 11) equals "Renewable Energy Certificates" (RECs) needed.
5. Electric provider REC retirements, as reported to PSCW and verified by Commission staff through M-RETS database.
6. Assessment of electric provider's compliance activity for CY 2016. If Col. 5 is greater or equal to Co. 4 then "YES" in compliance, otherwise "NO".
7. Electric sales to Wisconsin retail customers in 2016, which were generated by a renewable resource and eligible for RPS activity, as reported by electric provider. This column does not include green pricing program energy; see Col. 13-15 for green pricing information.
8. Col. 7. divided by Col. 3 (if Col. 8 > Col. 11 the utility essentially banks excess credits, if Col. 8 < Col. 11 the utility must use other credits to comply in 2016).
9. Col. 7 divided by Col.2 (for informational purposes only; this percentage is not applicable to compliance).
10. Percentage required for years 2006-2009, equal to mean percentage renewables from years 2001-2003; per Wis. Stat. § 196.378(2)(a)2. Wisconsin aggregate baseline percentage has been updated based on current information.
11. Percentage required for years 2010-2014, equal to baseline % +2% per Wis. Stat. § 196.378(2)(a)2. Wisconsin total percentage is based on current information and is not a statewide requirement; it is an aggregation of electric provider-specific requirements.
12. Percentage required for years 2015 and beyond, equal to baseline % +6% per Wis. Stat. § 196.378(2)(a)2. There are 4 electric providers that are an exception this due to 2013 Wisconsin Act 290: requirements for Centuria Municipal Electric Utility, Consolidated Water Power Company, North Central Power Company, Inc, and Northwestern Wisconsin Electric Cooperative are set at baseline% +2% for 2015 and beyond. Wisconsin total percentage is based on current information and is not a statewide requirement; it is an aggregation of electric provider-specific requirements.
13. 2016 Electric sales to Wisconsin retail customers, which were generated by a renewable resource and part of a utility's voluntary green pricing program, as reported to the Commission.
14. 2016 Total renewable energy that include RPS eligible and green pricing programs (Col. 7 plus Col. 13).
15. 2016 Green pricing program energy as a percent of total 2016 RPS eligible and green pricing renewable energy (Col. 14 divided by Col. 13).
16. All renewable energy (Green Pricing and RPS Energy) divided by 2016 total retail energy sales (Col. 14 divided by Col. 2).

* Indicates Aggregator.

1	Total Retail Energy Sales Information		CY 2016 Compliance Activity			2016 RPS Renewable Energy Information			Provider RPS Requirements			Green Pricing Program (GPP) Energy Information			RPS + GPP
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Electric Provider or Aggregator*	2016 Retail Sales (MWh)	2013-2015 Ave. Retail Sales (MWh)	2016 RECs Required	2016 RECs Retired	In Compliance?	Actual 2016 RPS Energy (MWh)	Actual 2016 RPS Energy as % of Ave. Sales	2016 RPS Energy as % of 2016 Retail Sales	Baseline RPS (%)	2010-2014 RPS (%)	2015 and beyond RPS (%)	2016 GPP Energy (MWh)	2016 GPP + RPS Energy (MWh)	GPP as % of Total Renewable Energy	Total Renewable Energy as % of 2016 Retail Sales
Adams-Columbia Electric Coop	468,959	503,480	44,910	44,911	YES	59,604	11.84%	12.71%	2.92%	4.92%	8.92%	439	60,043	0.73%	12.80%
Bangor Municipal Utility	25,675	26,789	3,381	3,381	YES	4,381	16.35%	17.06%	6.62%	8.62%	12.62%	-	4,381	0.00%	17.06%
Barron Light & Water Utility	80,621	81,763	10,507	10,507	YES	16,650	20.36%	20.65%	6.85%	8.85%	12.85%	-	16,650	0.00%	20.65%
Belmont Mun Water & Elect Util	24,297	22,658	1,985	1,986	YES	2,900	12.80%	11.94%	2.76%	4.76%	8.76%	-	2,900	0.00%	11.94%
Benton Mun Elec & Water Util	5,145	5,134	455	455	YES	638	12.43%	12.40%	2.86%	4.86%	8.86%	-	638	0.00%	12.40%
Black Earth Electric Utility	16,070	16,075	1,484	1,485	YES	1,975	12.29%	12.29%	3.23%	5.23%	9.23%	-	1,975	0.00%	12.29%
Bloomer Electric Utility	53,104	53,844	6,714	6,714	YES	7,712	14.32%	14.52%	6.47%	8.47%	12.47%	-	7,712	0.00%	14.52%
Cadott Light & Water Mun Util	13,178	13,189	1,678	1,678	YES	2,103	15.95%	15.96%	6.72%	8.72%	12.72%	-	2,103	0.00%	15.96%
Central Wisconsin Elec Coop	94,840	97,276	8,696	8,697	YES	11,664	11.99%	12.30%	2.94%	4.94%	8.94%	-	11,664	0.00%	12.30%
Centuria Municipal Electric Util	5,770	5,804	834	834	YES	0	0.00%	0.00%	12.37%	14.37%	14.37%	-	-	0.00%	0.00%
Clintonville Water & Electric Utility	109,087	117,785	8,763	8,763	YES	9,330	7.92%	8.55%	1.44%	3.44%	7.44%	-	9,330	0.00%	8.55%
Consolidated Water Power Company	1,048,854	1,033,119	190,817	190,819	YES	212,878	20.61%	20.30%	16.47%	18.47%	18.47%	-	212,878	0.00%	20.30%
Cornell Mun Water & Elec Util	12,158	12,682	1,604	1,604	YES	2,103	16.58%	17.30%	6.65%	8.65%	12.65%	-	2,103	0.00%	17.30%
Dahlberg Light & Power Co	101,056	104,822	7,725	7,725	YES	2,605	2.49%	2.58%	1.37%	3.37%	7.37%	-	2,605	0.00%	2.58%
Dairyland Power Cooperative*	3,230,320	3,285,668	277,310	277,325	YES	237,791	7.24%	7.36%	2.44%	4.44%	8.44%	4,347	242,138	1.80%	7.50%
East Central Energy	49,423	52,176	3,464	3,464	YES	3,464	6.64%	7.01%	0.64%	2.64%	6.64%	304	3,768	8.06%	7.62%
Elkhorn Light & Water	118,770	112,189	10,579	10,580	YES	14,017	12.49%	11.80%	3.43%	5.43%	9.43%	-	14,017	0.00%	11.80%
Gresham Mun Light & Pwr Util	23,009	23,521	1,983	1,983	YES	2,307	9.81%	10.03%	2.43%	4.43%	8.43%	-	2,307	0.00%	10.03%
Hazel Green Municipal Utility	8,076	8,333	739	739	YES	984	11.81%	12.18%	2.87%	4.87%	8.87%	-	984	0.00%	12.18%

1	Total Retail Energy Sales Information		CY 2016 Compliance Activity			2016 RPS Renewable Energy Information			Provider RPS Requirements			Green Pricing Program (GPP) Energy Information			RPS + GPP
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Electric Provider or Aggregator*	2016 Retail Sales (MWh)	2013-2015 Ave. Retail Sales (MWh)	2016 RECs Required	2016 RECs Retired	In Compliance?	Actual 2016 RPS Energy (MWh)	Actual 2016 RPS Energy as % of Ave. Sales	2016 RPS Energy as % of 2016 Retail Sales	Baseline RPS (%)	2010-2014 RPS (%)	2015 and beyond RPS (%)	2016 GPP Energy (MWh)	2016 GPP + RPS Energy (MWh)	GPP as % of Total Renewable Energy	Total Renewable Energy as % of 2016 Retail Sales
Kiel (City of) Utilities	87,537	81,366	7,380	7,380	YES	7,486	9.20%	8.55%	3.07%	5.07%	9.07%	-	7,486	0.00%	8.55%
Madison Gas & Electric Co	3,327,047	3,303,788	255,383	255,383	YES	328,299	9.94%	9.87%	1.73%	3.73%	7.73%	102,192	430,491	23.74%	12.94%
Manitowoc Public Utilities	535,882	523,783	48,136	48,136	YES	46,989	8.97%	8.77%	3.19%	5.19%	9.19%	174	47,163	0.37%	8.80%
Marshfield Elec & Water Dept	365,767	374,471	33,365	33,365	YES	24,477	6.54%	6.69%	2.91%	4.91%	8.91%	-	24,477	0.00%	6.69%
Mazomanie Electric Utility	39,040	32,004	2,704	2,705	YES	4,577	14.30%	11.72%	2.45%	4.45%	8.45%	-	4,577	0.00%	11.72%
Medford Electric Utility	125,690	128,522	15,950	15,950	YES	19,808	15.41%	15.76%	6.41%	8.41%	12.41%	-	19,808	0.00%	15.76%
North Central Power Co Inc	33,738	33,843	11,882	11,882	YES	15,532	45.89%	46.04%	33.11%	35.11%	35.11%	-	15,532	0.00%	46.04%
Northern States Power Co WI	6,502,717	6,509,973	839,128	839,129	YES	1,605,796	24.67%	24.69%	6.89%	8.89%	12.89%	13,697	1,619,493	0.85%	24.90%
Northwestern WI Elec Co	167,635	170,848	24,739	24,739	YES	37,240	21.80%	22.21%	12.48%	14.48%	14.48%	-	37,240	0.00%	22.21%
Oconto Electric Coop	109,500	111,666	11,959	11,960	YES	15,786	14.14%	14.42%	4.71%	6.71%	10.71%	-	15,786	0.00%	14.42%
Pardeeville (Village of) Elec Util	19,036	19,411	1,638	1,639	YES	2,298	11.84%	12.07%	2.44%	4.44%	8.44%	-	2,298	0.00%	12.07%
Pioneer Power & Light Co	16,258	16,612	1,447	1,448	YES	2,215	13.33%	13.62%	2.71%	4.71%	8.71%	-	2,215	0.00%	13.62%
Princeton Mun Wtr & Elec Util	10,710	10,090	828	829	YES	1,321	13.09%	12.33%	2.21%	4.21%	8.21%	-	1,321	0.00%	12.33%
Rice Lake Mun Wtr & Elec Util	160,381	160,358	20,093	20,093	YES	33,125	20.66%	20.65%	6.53%	8.53%	12.53%	-	33,125	0.00%	20.65%

1	Total Retail Energy Sales Information		CY 2016 Compliance Activity			2016 RPS Renewable Energy Information			Provider RPS Requirements			Green Pricing Program (GPP) Energy Information			RPS + GPP
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Electric Provider or Aggregator*	2016 Retail Sales (MWh)	2013-2015 Ave. Retail Sales (MWh)	2016 RECs Required	2016 RECs Retired	In Compliance?	Actual 2016 RPS Energy (MWh)	Actual 2016 RPS Energy as % of Ave. Sales	2016 RPS Energy as % of 2016 Retail Sales	Baseline RPS (%)	2010-2014 RPS (%)	2015 and beyond RPS (%)	2016 GPP Energy (MWh)	2016 GPP + RPS Energy (MWh)	GPP as % of Total Renewable Energy	Total Renewable Energy as % of 2016 Retail Sales
Rock Energy Coop	286,415	279,659	24,974	24,974	YES	33,320	11.91%	11.63%	2.93%	4.93%	8.93%	-	33,320	0.00%	11.63%
Sauk City Mun Wtr & Light Util	32,470	33,337	2,940	2,941	YES	3,839	11.52%	11.82%	2.82%	4.82%	8.82%	-	3,839	0.00%	11.82%
Shawano Municipal Utilities	265,910	272,025	19,967	19,967	YES	22,741	8.36%	8.55%	1.34%	3.34%	7.34%	-	22,741	0.00%	8.55%
Sheboygan Falls Utilities	187,779	185,456	16,264	16,265	YES	22,113	11.92%	11.78%	2.77%	4.77%	8.77%	-	22,113	0.00%	11.78%
Shullsburg Electric Utility	11,164	10,888	960	961	YES	1,349	12.39%	12.08%	2.82%	4.82%	8.82%	-	1,349	0.00%	12.08%
Spooner Municipal Utilities	30,979	30,871	3,874	3,874	YES	5,082	16.46%	16.40%	6.55%	8.55%	12.55%	-	5,082	0.00%	16.40%
Stratford Mun Wtr & Elec Utility	18,023	17,755	1,653	1,653	YES	1,410	7.94%	7.82%	3.31%	5.31%	9.31%	-	1,410	0.00%	7.82%
Superior Wtr Light & Pwr Co	820,880	748,659	63,861	63,861	YES	63,861	8.53%	7.78%	2.53%	4.53%	8.53%	-	63,861	0.00%	7.78%
Trempealeau Mun Elc & Wtr Util	14,518	14,492	1,852	1,852	YES	2,278	15.72%	15.69%	6.78%	8.78%	12.78%	-	2,278	0.00%	15.69%
Washington Island Cooperative	8,621	9,188	859	860	YES	757	8.24%	8.78%	3.35%	5.35%	9.35%	-	757	0.00%	8.78%
Westfield Milling & Elec Co	12,961	13,084	1,153	1,153	YES	1,769	13.52%	13.65%	2.81%	4.81%	8.81%	-	1,769	0.00%	13.65%
Wisconsin Dells Mun Elec Util	69,355	60,675	5,394	5,395	YES	8,318	13.71%	11.99%	2.89%	4.89%	8.89%	-	8,318	0.00%	11.99%
Wisconsin Rapids WW & Light	264,376	269,731	23,548	23,549	YES	22,607	8.38%	8.55%	2.73%	4.73%	8.73%	116	22,723	0.51%	8.59%
Wisconsin Electric Power Co	24,172,449	23,918,550	1,978,064	1,978,065	YES	1,602,195	6.70%	6.63%	2.27%	4.27%	8.27%	128,945	1,731,140	7.45%	7.16%
Wisconsin Power & Light	10,874,507	10,562,635	980,212	980,213	YES	1,278,416	12.10%	11.76%	3.28%	5.28%	9.28%	29,554	1,307,970	2.26%	12.03%
WPPI Energy*	4,803,956	4,846,613	496,293	496,293	YES	702,475	14.49%	14.62%	4.24%	6.24%	10.24%	68,693	771,168	8.91%	16.05%
Wisconsin Public Service Corp	10,856,634	10,557,062	1,028,258	1,028,259	YES	851,426	8.06%	7.84%	3.74%	5.74%	9.74%	8,317	859,743	0.97%	7.92%
Wonevoc Electric & Water Util	4,570	4,800	417	418	YES	575	11.98%	12.58%	2.69%	4.69%	8.69%	-	575	0.00%	12.58%
WISCONSIN TOTAL	69,724,917	68,888,518	6,508,805	6,508,839	N/A	7,362,586	10.69%	10.56%	N/A	N/A	N/A	356,777	7,719,363	4.62%	11.07%

Appendix D: 2016 Renewable Energy by State and Resource (MWh)

Includes both Wisconsin Renewable Portfolio Standard and Green Pricing Program Renewable Energy

Electric Provider/Aggregator*	WI Hydro	WI Wind	Landfill Gas	WI Biomass - Biogas	WI Biomass - Refuse-derived fuel	WI Biomass - & Wood Waste	WI Biomass - Wood	Biomass - Other	WI Solar	WI - Other	WI Subtotal	Non WI Hydro	Non WI Wind	Landfill Gas	Non WI Biomass - Biogas	Non WI Biomass - Refuse-derived fuel	Non WI Biomass - Waste	Non WI Biomass - Wood & Wood	Other	Non-WI Biomass - Other	Non WI - Solar	Non WI - Other	Subtotal	Non WI - Subtotal	Grand Total
Adams-Columbia Electric Coop	12,993	9,432	1,002	419	-	-	-	-	368	-	24,215	-	-	35,828	-	-	-	-	-	-	-	-	-	35,828	60,043
Bangor Municipal Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	4,381	-	-	-	-	-	-	-	-	-	4,381	4,381
Barron Light & Water Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	16,650	-	-	-	-	-	-	-	-	-	16,650	16,650
Belmont Mun Water & Elect Util	632	456	49	20	-	-	-	-	-	-	1,157	-	-	1,743	-	-	-	-	-	-	-	-	-	1,743	2,900
Benton Mun Elec & Water Util	139	102	11	4	-	-	-	-	-	-	256	-	-	382	-	-	-	-	-	-	-	-	-	382	638
Black Earth Electric Utility	430	311	33	14	-	-	-	-	-	-	788	-	-	1,187	-	-	-	-	-	-	-	-	-	1,187	1,975
Bloomer Electric Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	7,712	-	-	-	-	-	-	-	-	-	7,712	7,712
Cadott Light & Water Mun Util	-	-	-	-	-	-	-	-	-	-	-	-	-	2,103	-	-	-	-	-	-	-	-	-	2,103	2,103
Central Wisconsin Elec Coop	2,542	1,832	196	82	-	-	-	-	-	-	4,652	-	-	7,012	-	-	-	-	-	-	-	-	-	7,012	11,664
Centuria Municipal Electric Util	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clintonville	717	842	161	38	91	-	-	-	3,219	-	5,068	229	-	4,033	-	-	-	-	-	-	-	-	-	4,262	9,330
Consolidated Water Power Co	212,878	-	-	-	-	-	-	-	-	-	212,878	-	-	-	-	-	-	-	-	-	-	-	-	-	212,878
Cornell Mun Water & Elec Util	-	-	-	-	-	-	-	-	-	-	-	-	-	2,103	-	-	-	-	-	-	-	-	-	2,103	2,103
Dahlberg Light & Power Co	2,605	-	-	-	-	-	-	-	-	-	2,605	-	-	-	-	-	-	-	-	-	-	-	-	-	2,605
Dairyland Power Cooperative	61,860	4,414	17,788	7,061	-	-	-	-	57	-	91,180	27,604	-	102,959	18,303	2,092	-	-	-	-	-	-	-	150,958	242,138
East Central Energy	-	-	-	-	-	-	-	-	-	-	-	-	-	3,768	-	-	-	-	-	-	-	-	-	3,768	3,768

Electric Provider/Aggregator*	WI Hydro	WI Wind	WI Biomass - Landfill gas	WI Biomass - Biogas	WI Biomass - Refuse-derived fuel	WI Biomass - & Wood Waste	WI Biomass - Wood	Biomass - Other	WI Solar	WI - Other	WI Subtotal	Non WI Hydro	Non WI Wind	Non WI Biomass - Landfill gas	Non WI Biomass - Biogas	Non WI Biomass - Refuse-derived fuel	Non WI Biomass - Waste	Non WI Biomass - Wood & Wood	Other	Non-WI Biomass - Other	Non WI - Solar	Non WI - Other	Subtotal	Non WI -	Grand Total
Elkhorn Light & Water	3,055	2,202	236	99							5,592			8,425										8,425	14,017
Gresham Mun Light & Pwr Util	503	363	38	16							920	-		1,387	-	-	-	-	-	-	-	-	-	1,387	2,307
Hazel Green Municipal Utility	215	154	17	7							393	-		591	-	-	-	-	-	-	-	-	-	591	984
Kiel	575	676	129	31	73	-	2,583	-	-	-	4,067	183		3,236	-	-	-	-	-	-	-	-	-	3,419	7,486
Madison Gas & Electric Co	430	63,689	3,357	46,075	87	-	-	1,174	-	-	114,812	3,509		312,170	-	-	-	-	-	-	-	-	-	315,679	430,491
Manitowoc Public Utilities	3,590	4,308	804	192	454	-	16,281	207	-	-	25,836	1,144		20,183	-	-	-	-	-	-	-	-	-	21,327	47,163
Marshfield Elec & Water Dept	8,197	3,476	5,404	-	-	-	-	-	-	-	17,077	852		6,548	-	-	-	-	-	-	-	-	-	7,400	24,477
Mazomanie Electric Utility	997	719	77	33							1,826	-		2,751	-	-	-	-	-	-	-	-	-	2,751	4,577
Medford Electric Utility	-	-	-	-	-	-	-	-	-	-	-	-		19,808	-	-	-	-	-	-	-	-	-	19,808	19,808
North Central Power Co Inc	8,520	-	-	-	-	-	-	-	-	-	8,520	-		7,012	-	-	-	-	-	-	-	-	-	7,012	15,532
Northern States Power Co WI	187,163	-	-	-	7,164	141,276	-	-	-	-	335,603	22,613		1,122,718	12,057	-	-	55,434	71,068	-	-	-	-	1,283,890	1,619,493
Northwestern WI Elec Co	10,948	-	-	-	-	-	-	-	-	-	10,948	-		26,292	-	-	-	-	-	-	-	-	-	26,292	37,240
Oconto Electric Coop	10,290	3,571	-	348	498	1,079	-	-	-	-	15,786	-		-	-	-	-	-	-	-	-	-	-	-	15,786
Pardeeville (Village of) Elec Util	501	361	38	17							917	-		1,381	-	-	-	-	-	-	-	-	-	1,381	2,298
Pioneer Power & Light Co	477	345	37	15							874	-		1,341	-	-	-	-	-	-	-	-	-	1,341	2,215
Princeton Mun Wtr & Elec Util	287	208	24	9							528	-		793	-	-	-	-	-	-	-	-	-	793	1,321
Rice Lake Mun Wtr & Elec Util	-	-	-	-	-	-	-	-	-	-	-	-		33,125	-	-	-	-	-	-	-	-	-	33,125	33,125
Rock Energy Coop	7,264	5,233	560	234							13,291	-		20,029	-	-	-	-	-	-	-	-	-	20,029	33,320

Electric Provider/Aggregator*	WI Hydro	WI Wind	WI Biomass - Landfill gas	WI Biomass - Biogas	WI Biomass - Refuse-derived fuel	WI Biomass - & Wood Waste	WI Biomass - Wood	Biomass - Other	WI Solar	WI - Other	WI Subtotal	Non WI Hydro	Non WI Wind	Non WI Biomass - Landfill gas	Non WI Biomass - Biogas	Non WI Biomass - Refuse-derived fuel	Non WI Biomass - Waste	Non WI Biomass - Wood & Wood	Other Non-WI Biomass	Non-WI Biomass	Non WI - Solar	Non WI - Other	Subtotal	Non WI -	Grand Total
Sauk City Mun Wtr & Light Util		837	603	64	27							1,531	-	2,308	-	-	-	-	-	-	-	-	-	2,308	3,839
Shawano		1,748	2,053	392	93	221	-	7,846	-	-	12,353	557	9,831	-	-	-	-	-	-	-	-	-	-	10,388	22,741
Sheboygan Falls Utilities		4,822	3,473	372	156						8,823	-	13,290	-	-	-	-	-	-	-	-	-	-	13,290	22,113
Shullsburg Electric Utility		295	212	22	9						538	-	811	-	-	-	-	-	-	-	-	-	-	811	1,349
Spooner Municipal Utilities		-	-	-	-	-	-	-	-	-	-	-	5,082	-	-	-	-	-	-	-	-	-	-	5,082	5,082
Stratford Mun Wtr & Elec Utility		474	201	39	142	17	111	-	-	-	984	49	377	-	-	-	-	-	-	-	-	-	-	426	1,410
Superior Wtr Light & Pwr Co		-	-	-	-	-	-	-	-	-	-	-	33,593	-	-	-	-	-	30,268	-	-	-	-	63,861	63,861
Trempealeau Mun Elc & Wtr Util		-	-	-	-	-	-	-	-	-	-	-	2,278	-	-	-	-	-	-	-	-	-	-	2,278	2,278
Washington Island Cooperative		254	107	21	77	9	60	-	-	-	528	27	202	-	-	-	-	-	-	-	-	-	-	229	757
Westfield Milling & Elec Co		391	282	30	13						716	-	1,053	-	-	-	-	-	-	-	-	-	-	1,053	1,769
Wisconsin Dells Mun Elec Util		1,814	1,304	140	59						3,317	-	5,001	-	-	-	-	-	-	-	-	-	-	5,001	8,318
Wisconsin Rapids		1,737	2,040	388	93	219	-	7,916	-	-	12,393	554	9,776	-	-	-	-	-	-	-	-	-	-	10,330	22,723
Wisconsin Electric Power Co		41,996	643,541	212,071	10,188	9,858	111,820	-	987	-	1,030,461	308,526	392,152	-	-	-	-	-	-	-	-	-	-	700,678	1,731,140
Wisconsin Power & Light		278,950	201,275	25,789	9,061	-	-	-	910	-	515,986	-	791,977	-	-	-	-	-	-	-	-	8	-	791,984	1,307,970
WPPI Energy		198,152	229,349	52,880	18,618	-	1,278	-	2,096	-	502,372	6,233	262,563	-	-	-	-	-	-	-	-	-	-	268,796	771,168
Wisconsin Public Service Corp		284,121	110,756	28,350	65,876	26,289	71,311	-	-	-	586,703	31,430	241,610	-	-	-	-	-	-	-	-	-	-	273,040	859,743
Wonewoc Electric & Water Util		126	87	11	4						228	-	347	-	-	-	-	-	-	-	-	-	-	347	575
TOTAL per State and Resource		1,353,525	1,297,978	350,530	159,130	44,980	326,935	37,845	5,799	-	3,576,721	403,510	3,549,902	30,360	2,092	-	85,702	71,068	8	-	-	-	-	4,142,642	7,719,363
% of Total Renewables		17.5%	16.8%	4.5%	2.1%	0.6%	4.2%	0.5%	0.1%	0.0%	46.3%	5.2%	46.0%	0.4%	0.0%	0.0%	1.1%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	53.7%	100.0%

Appendix E: 2016 Statistics Generated from Electric Provider Data

Includes both RPS and Green Pricing Program Renewable Energy

2016 Total Electric Energy Sales to Wisconsin Retail Customers (renewable and nonrenewable)

	(MWh)	% of Total Energy Sales
2016 Total Wisconsin Retail Energy Sales	69,724,917	100.0%

Renewable Energy by State

State	(MWh)	% of Total Energy Sales	% of Renewable Energy
TOTAL Renewable Energy from Wisconsin	3,576,721	5.1%	46.3%
TOTAL Renewable Energy from Other States	4,142,642	5.9%	53.7%
TOTAL Renewable Energy from ALL STATES	7,719,363	11.1%	100.0%

Renewable Energy by Renewable Resource

Renewable Energy Resource	(MWh)	% of Total Energy Sales	% of Renewable Energy
Wind	4,847,879	7.0%	62.8%
Hydro	1,757,035	2.5%	22.8%
Biomass	1,108,642	1.6%	14.4%
Solar	5,807	0.0%	0.1%
TOTAL Renewable Energy from ALL RESOURCES	7,719,363	11.1%	100.0%

Biomass Energy Broken Down

Biomass Type	(MWh)	% of Total Sales	% of Renewable Energy
Refuse-derived	44,980	0.1%	0.6%
Other*	108,913	0.2%	1.4%
Biogas	161,222	0.2%	2.1%
Landfill gas	380,890	0.5%	4.9%
Wood or wood waste	412,637	0.6%	5.3%
TOTAL from Biomass	1,108,642	1.6%	14.4%

*Other biomass represents waste from paper products, processed plant materials, agriculture products, and animal waste

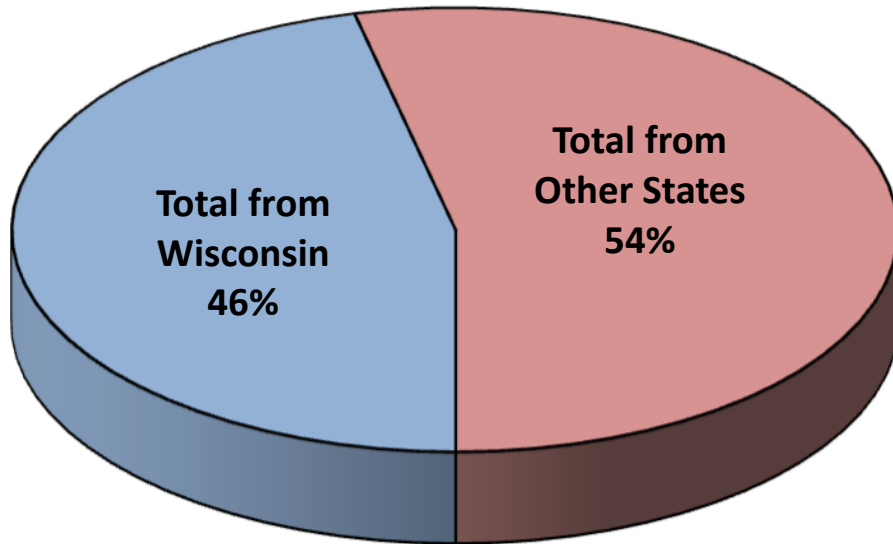
Renewable Energy by State and Renewable Resource

State and Renewable Resource	(MWh)	% of Total Energy Sales	% of Renewable Energy
WI Wind	1,297,978	1.9%	16.8%
WI Hydro	1,353,525	1.9%	17.5%
WI Biomass	919,420	1.3%	11.9%
WI Solar	5,799	0.0%	0.1%
Non WI Wind	3,549,902	5.1%	46.0%
Non WI Hydro	403,510	0.6%	5.2%
Non WI Biomass	189,222	0.3%	2.5%
Non WI Solar	8	0.0%	0.0%
TOTAL Renewable Energy from ALL STATES AND RESOURCES	7,719,363	11.1%	100.0%

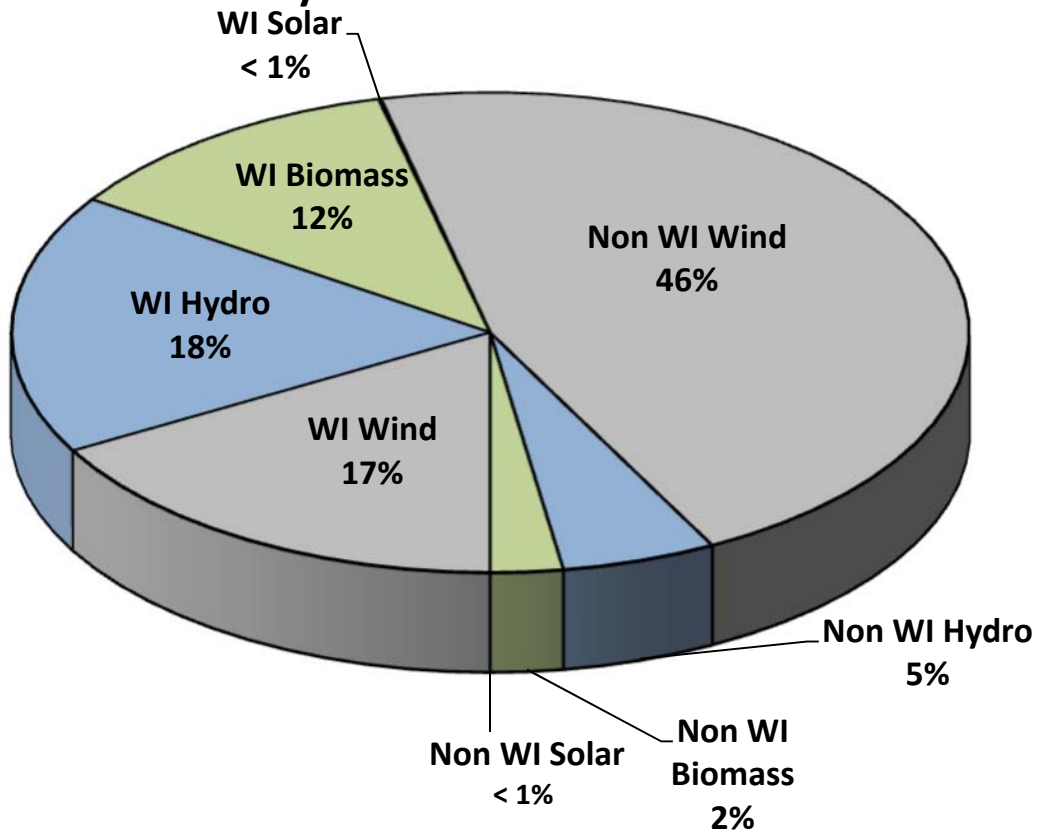
Appendix F: 2016 Figures of Statistics Generated from Electric Provider Data

Includes both Wisconsin RPS and Green Pricing Program Renewable Energy

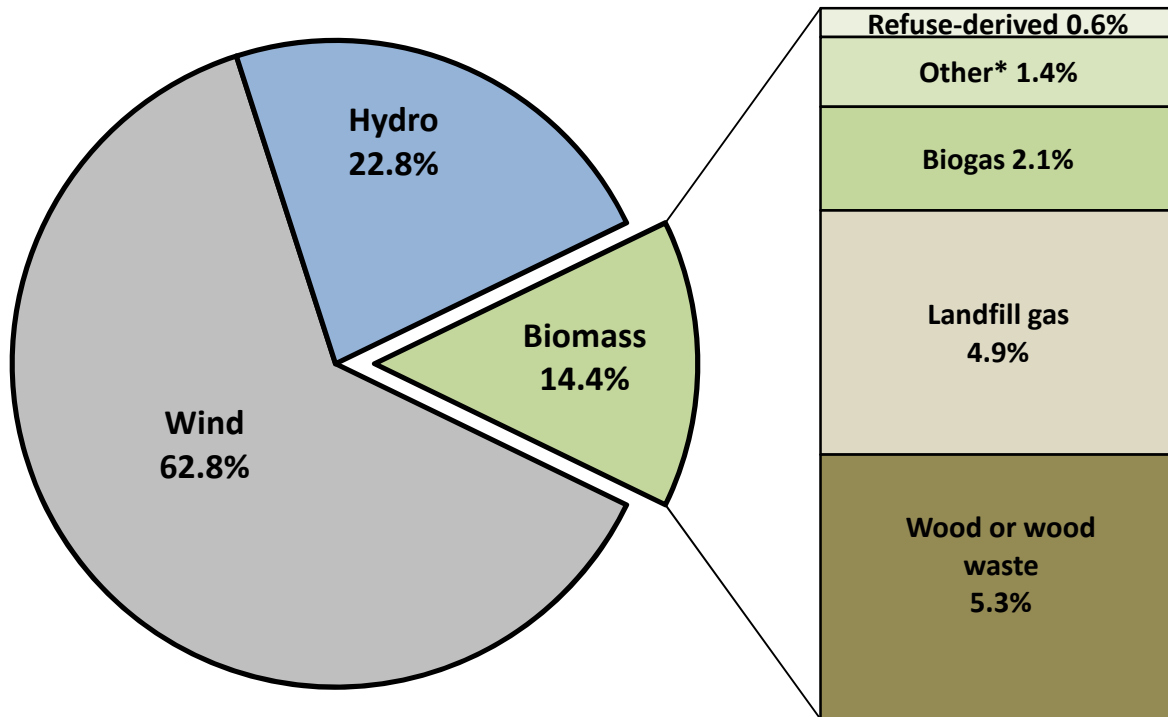
2016 Renewable Energy by State



2016 Renewable Energy by State and Resource

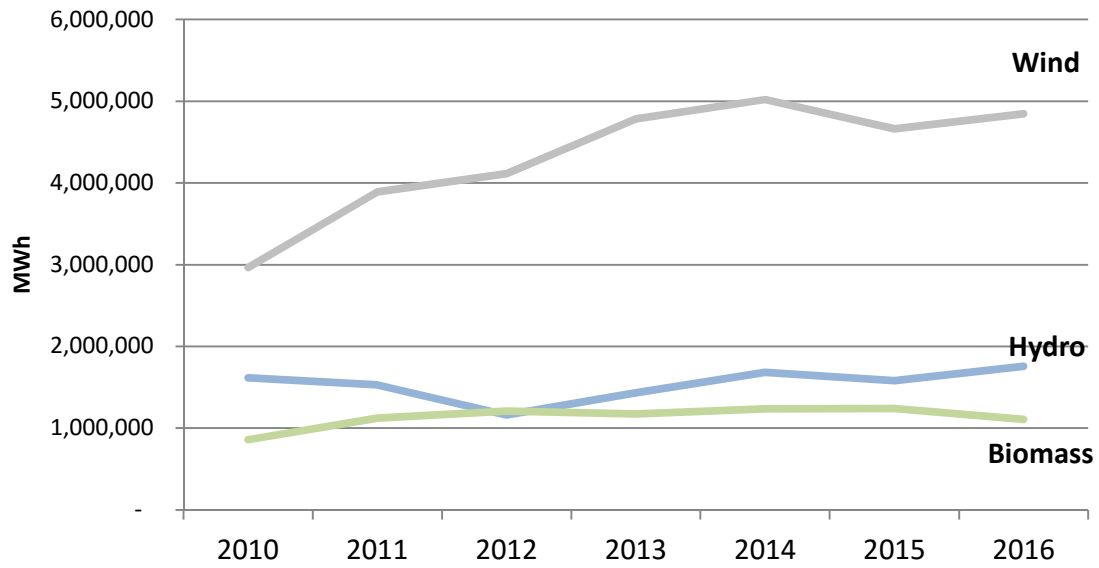


2016 Renewable Energy by Resource



*Other biomass represents waste from paper products, processed plant materials, agriculture products, and animal waste

Renewable Energy by Renewable Resource (2010-2016)



Renewable Energy from Solar Photovoltaic (2010-2016)

