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June 30, 2010

Ms. Patricia Van Gerpen
Executive Director
South Dakota Public Utilities Commission
Capitol Building, 1st floor
500 East Capitol Avenue
Pierre, SD 57501-5070

Re: In the Matter of Otter Tail Power Company's Renewable, Recycled, and Conserved Energy Objective Compliance Report to the South Dakota Public Utilities Commission

Dear Ms. Van Gerpen:

Enclosed you will find the report of Otter Tail Power Company, to the South Dakota Public Utilities Commission on the Company's efforts and status on compliance with the South Dakota Renewable, Recycled, and Conserved Energy Objective contained in Statutes §49-34A-94 through §49-34A-96 and §49-34A-101 through §49-34A-106. This report is required annually commencing on July 1, 2009 and continuing through July 1, 2017.

If you have any questions regarding this filing, please contact me at 218-739-8693 or kkaseman@otpco.com.

Sincerely,

/s/ KERRY KASEMAN Kerry Kaseman Resource Planner

wao Enclosures By electronic filing



# Renewable, Recycled, and Conserved Energy Objective Compliance Report to the South Dakota Public Utilities Commission



# Report RP10-04 Resource Planning Department July 1, 2010

By: Kerry Kaseman

#### **PREFACE**

This document is the report of Otter Tail Power Company, to the South Dakota Public Utilities Commission on the Company's efforts and status on compliance with the South Dakota Renewable, Recycled, and Conserved Energy Objective contained in Statutes §49-34A-94 through §49-34A-96 and §49-34A-101 through §49-34A-106. This report is required annually commencing on July 1, 2009 and continuing through July 1, 2017.

Questions and comments regarding the information and data contained herein should be addressed to Kerry Kaseman at 218-739-8693 or <a href="kkaseman@otpco.com">kkaseman@otpco.com</a>.

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#### INTRODUCTION

Pursuant to South Dakota Codified Laws §49-34A-105, Otter Tail Power Company (Otter Tail or Company), makes this information filing electronically to the South Dakota Public Utilities Commission. This filing is the Company's second annual report on efforts to meet the state renewable, recycled, and conserved energy objective that 10% of all electricity sold at retail be obtained from renewable, recycled, and conserved energy sources by 2015.<sup>1</sup>

As the following pages of this report demonstrate, Otter Tail is well on the way to implementing renewable resources as part of its diverse resource portfolio and expects to be in full compliance of any and all renewable energy objectives and standards within all three state jurisdictions in which Otter Tail serves.

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<sup>&</sup>lt;sup>1</sup> South Dakota Codified Law §49-34A-101.

#### JURISDICTIONAL REQUIREMENTS

Otter Tail serves retail load in Minnesota, North Dakota, and South Dakota. All three state jurisdictions have some sort of renewable energy objective (REO) or renewable energy standard (RES). Discussion of compliance efforts with any single jurisdiction also requires a discussion of the other two jurisdictions so that a complete understanding of the Company's compliance efforts can be obtained. The following sections describe the requirements in each of the state jurisdictions.

#### Minnesota

Otter Tail is required to make a good faith effort to comply with the state REO through 2011. Beginning with 2012 the requirement switches to an RES. The state requirements<sup>2</sup> increase in a step-wise fashion, consisting of:

- 2005 1% of retail sales
- 2010 7% of retail sales
- 2012 12% of retail sales
- 2016 17% of retail sales
- 2020 20% of retail sales
- 2025 25% of retail sales.

Eligible energy technologies for compliance include solar, wind, hydroelectric with a capacity of less than 100 MW, hydrogen,<sup>3</sup> or biomass. Biomass includes landfill gas, anaerobic digestion, and mixed municipal solid waste or refuse-derived-fuel from mixed municipal solid waste as a primary fuel. Electricity generated by the combustion of biomass through co-firing with other fuels counts up to the percentage amount of biomass fuel relative to total fuel, only if the generating facility was constructed in compliance with new source performance standards promulgated under the federal Clean Air Act or

<sup>&</sup>lt;sup>2</sup> These REO and RES requirements only apply to utilities without nuclear generating assets. Utilities with nuclear generating assets have a more aggressive standard as detailed in Minn. Stat. §216B.1691.

<sup>&</sup>lt;sup>3</sup> Provided that after January 1, 2010 the hydrogen must be generated from the other eligible energy technologies listed.

if the facility employs the maximum achievable or best available control technology for that type of facility.

#### North Dakota

The state REO is 10% of retail sales by the year 2015, and includes both renewable energy and recycled energy. The calculation contains a provision to reduce the amount of retail sales by any hydroelectric energy that cannot be counted toward the REO.<sup>4</sup> Renewable electricity and recycled energy includes electricity generated from solar, wind, biomass,<sup>5</sup> geothermal, hydrogen,<sup>6</sup> hydroelectric (must be from a facility with an inservice date of no earlier than January 1, 2007 or from efficiency improvements to a facility existing as of August 1, 2007), and recycled energy systems producing electricity from currently unused waste heat resulting from combustion or other processes into electricity and which do not use an additional combustion process. Recycled energy does not include any system whose primary purpose is the generation of electricity.

#### South Dakota

The state REO is 10% of retail sales by the year 2015, and includes renewable, recycled, and conserved energy. The calculation contains a provision to reduce the amount of retail sales by any hydroelectric energy from a facility with an in-service date prior to July 1, 2008. Renewable and recycled energy include electricity generated from solar, wind, biomass, geothermal, hydrogen, hydroelectric (statutes imply it must be from a facility with an in-service date of no earlier than July 1, 2008), and recycled energy systems producing electricity from currently unused waste heat resulting from combustion or other processes into electricity and which do not use an additional combustion process. Recycled energy does not include any system whose primary

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<sup>&</sup>lt;sup>4</sup> North Dakota Century Code §49-02-30.

<sup>&</sup>lt;sup>5</sup> Including agricultural crops and wastes and residues, wood and wood wastes and residues, animal wastes, and landfill gas.

<sup>&</sup>lt;sup>6</sup> Provided that the hydrogen is generated from a source listed in this section of North Dakota Century Code §49-02-25.

South Dakota Codified Laws §49-34A-101.

<sup>&</sup>lt;sup>8</sup> South Dakota Codified Laws §49-34A-103.

<sup>&</sup>lt;sup>9</sup> Includes agricultural crops and wastes and residues, wood and wood wastes and residues, animal and other degradable organic wastes, and landfill gas.

<sup>&</sup>lt;sup>10</sup> Provided that the hydrogen is generated from a source listed in this section of South Dakota Codified Laws §49-34A-94.

purpose is the generation of electricity. In the case of conserved energy, the objective will be measured by methods established by rules promulgated by the commission pursuant to chapter 1-26.

#### MIDWEST RENEWABLE ENERGY TRACKING SYSTEM

Otter Tail has registered almost all renewable energy resources within the Midwest Renewable Energy Tracking System (M-RETS). There is a number of small customer owned units, generally less than 50 kW each, which the Company has not registered. The customers self-serve a portion of their own load with Otter Tail receiving the remaining surplus energy. Otter Tail pays the cost of, both initial and annual fees, to register a facility in M-RETS and the cost per renewable energy credit (REC) can become quite high on these small units. For 2009, the amount of unregistered renewable energy was about 630 MWh, only about 0.12% of the over 539,736 MWh of registered renewable energy.

Otter Tail has developed an account structure within M-RETS to help segregate RECs by type and usage. For customer-owned facilities that self-serve customer load, all of the generation is reported within M-RETS. Otter Tail then transfers RECs associated with the energy used to self-serve load into an account in the customer's name, for their use as they deem appropriate. The RECs associated with energy purchased by Otter Tail will remain in the Otter Tail account.

The Otter Tail M-RETS accounts include a retirement account by state jurisdiction by year. Thus it will be easy to verify the amount of RECs retired annually for compliance with each state's requirements. RECs associated with **TailWinds**, the Company's green pricing program, are retired into separate state jurisdiction accounts to ensure proper accounting for the green pricing tracker balance.

Retired RECs will be tracked on a calendar basis. While Otter Tail began recording renewable energy within M-RETS in the last half of 2007, when the M-RETS system first became operational, the Company began full use of the M-RETS system for reporting verification beginning with the first full calendar year commencing January 1, 2008.

Through 2009, Otter Tail did not sell or purchase any RECs separate from the renewable energy. All energy used for compliance was energy generated by Otter Tail or energy purchased by Otter Tail under power purchase agreements.

### RENEWABLE AND RECYCLED ENERGY RESOURCES

The breakdown of existing and potential future renewable energy resources for Otter Tail, to the extent known, at the time of this report are shown in Appendix A. The data provided includes the name of the facility, kW rating, vintage, technology and energy source, whether owned or through a PPA, and state eligibility. For customer-owned facilities, the customer name is not provided in order to protect customer information. The information provided includes future resources which may or may not be constructed, but for which development work has commenced. There are additional renewable energy facilities which are under discussion, but these have not been included in the data since they are still in preliminary stages of feasibility studies.

#### SOUTH DAKOTA RENEWABLE AND RECYCLED ENERGY

The following data is for the January 1, 2009 – December 31, 2009 time period. The data assumes that renewable energy is allocated across the Otter Tail system based on retail kWh sales. The exceptions to this allocation methodology are that TailWinds energy is based on the amount of wind energy sold under the green pricing program in South Dakota. Pursuant to South Dakota Codified Law §49-34A-103, the hydroelectric energy shown in the table below does not count toward compliance, but can be subtracted from retail sales before calculating the percentage of compliance.

South Dakota Renewable and Recycled Energy MWh January 1, 2009 – December 31, 2009					
Resource	Total kWh	SD	SD kWh		
		Percentage			
Borderline Wind	2,099,000	9.67%	203,053		
FPL Energy ND	63,538,000	9.67%	6,146,539		
Wind II					
Customer D1	799,000	9.67%	77,294		
FPLE Langdon	75,479,000	9.67%	7,301,688		
OTP Langdon	154,578,000	9.67%	14,953,567		
Ashtabula Wind	156,438,000	9.67%	15,133,499		
Luverne Wind	56,869,000	9.67%	5,501,393		
Big Stone Plant	3,111,004	9.71%	302,163		
Biomass					
South Dakota	197,915	100.0%	197,915		
Tail <i>Winds</i>					
OTP Owned Hydro	24,569,000	9.67%	2,376,756		
Manitoba Hydro	208,800,000	9.67%	20,198,894 <sup>11</sup>		
WAPA Hydro	29,870,478	9.67%	2,889,610 <sup>12</sup>		

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<sup>&</sup>lt;sup>11</sup> This hydroelectric energy includes only energy under the firm 50 MW contract, which is specified as coming from hydro facilities. (261 days X 16 hours/day X 50 MW)

<sup>&</sup>lt;sup>12</sup> The WAPA hydroelectric energy is an allocation to five Native American tribes.

South Dakota Renewable and Recycled Energy Compliance January 1, 2009 – December 31, 2009					
South Dakota Retail Sales	410,948,029 kWh				
Less Hydro Energy Adjustment	-25,465,261 kWh				
Net SD Retail Sales for REO Compliance	385,482,768 kWh				
South Dakota Renewable Energy	49,817,110 kWh				
SD REO Compliance Percentage	12.92%				

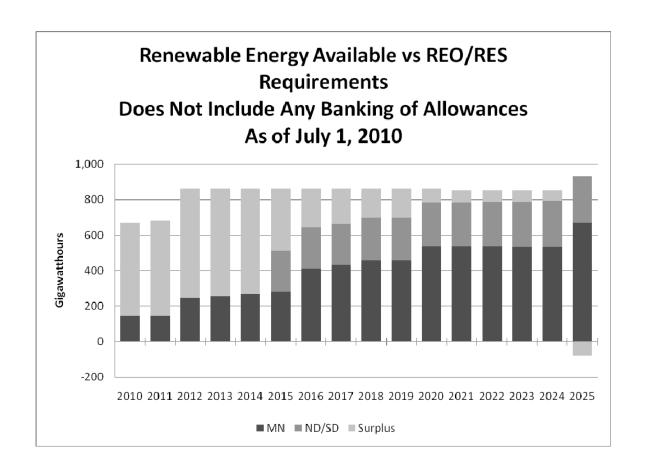
The data shows that Otter Tail is already compliant with the South Dakota statute. The level of compliance will increase in 2010 as the 49.5 MW Luverne Wind Farm experiences a full year of operation. In addition, the 2011-2025 Otter Tail resource plan includes the addition of 50 MW of nameplate wind generation capacity to be operational by the end of 2011. Otter Tail will sell excess RECs and/or bank RECs for future use.

#### FORECAST OF FUTURE REO/RES COMPLIANCE

Combined with energy output from the 49.5 MW Luverne Wind Farm, the 48 MW the Company owns at the Ashtabula Wind Farm, energy output from the 60 MW the Company owns or purchases from the Langdon Wind Farm, and an additional 50 MW planned to be operational at the end of 2011, Otter Tail is well positioned to comply with the renewable energy objectives and standards in all three states.

The following graph shows the Company's expected available renewable energy compared to the REO/RES requirements going out to 2025. The graph assumes that all RECs are counted in the year they are generated and are not banked for future compliance use. The graph includes 50 MW planned to be operational at the end of 2011. The graph does not include new customer-owned facilities that may be developed. Otter Tail is seeing significant customer interest in owning wind generation. The Company is obligated to purchase any renewable energy offered from customers under the federal Public Utility Regulatory Policies Act of 1978 (PURPA).

The North Dakota and South Dakota requirements are very similar and are lumped together in the graph. As demonstrated in the graph, Otter Tail expects by 2012 to have sufficient renewable energy available to comply with state REO/RES requirements until beyond 2024.



#### BARRIERS TO REO/RES COMPLIANCE

The most significant obstacles fall into three basic categories, including:

#### Transmission

- Operator (MISO) interconnection queue has been a major impediment to the development of any resource because interconnection queue process timelines don't match up well with project development timelines.
- O Transmission Congestion As more and more wind generation is developed in the upper Midwest, the transmission system continues to become more and more congested. This congestion creates issues with both economic dispatch of wind generation and the siting of new wind farms. Otter Tail is a part of the CAPX 2020 group proposing new major high voltage transmission. If approved and constructed, the CAPX 2020 transmission additions will not alone resolve transmission congestion. CAPX 2020 is studying the situation to determine what other new transmission resources are likely to be required.
- Economic and financing issues The recent economic downturn is hampering the
  development of renewable resources because there is less capital available at a
  higher cost than before the downturn.
- Retail Sales Uncertainty Planning for the REO/RES requirements requires forecasting retail sales since the requirements are based on a percentage of retail sales. There are many factors that go into forecasting retail sales and there is some uncertainty surrounding those factors. One such factor is energy efficiency and conservation. The 2011-2025 Otter Tail integrated resource plan selects significant levels of economic and achievable energy efficiency and conservation over the planning horizon. Energy efficiency, by reducing load, can reduce the amount of renewable energy credits that must be secured for compliance with REO/RES requirements in each of the Company's respective jurisdictions. If the

conservation levels are not realized as planned, the annual REO/RES requirements will be greater and consume more of the Company's banked renewable energy credits and/or annual generation. Therefore, the barriers to REO/RES compliance are tied to any barriers in achieving energy efficiency objectives.

#### **SUMMARY**

Otter Tail has stepped forward with its development of renewable resources for a variety of reasons and is completing new renewable energy facilities ahead of REO/RES requirements. The 2006-2020 Otter Tail integrated resource plan called for 160 MW of new wind generation. Otter Tail has completed that amount of wind generation addition to the system. The 2011-2025 Otter Tail integrated resource plan calls for an additional 50 MW of new wind generation to be operational at the end of 2011. All of these wind additions have been shown to be economic by Otter Tail's capacity expansion modeling.

Part of the reason why the capacity expansion modeling is showing wind additions as economic is because of the federal PTC and wind development incentives in North Dakota. The PTC reduces the cost of wind generation by about 33% and is currently set to expire after 2012. The wind development incentives in North Dakota also improve economics and have sunset provisions.

With the current renewable resources and the 50 MW planned for 2011, additional resources for REO/RES compliance will likely not be needed until sometime after 2024. This forecast does not include counting the many small customer owned units currently being installed. There are many uncertainties going forward with all forecasts, including load growth, conservation efforts, and customer-owned renewable resources.

## APPENDIX A - RENEWABLE AND RECYCLED ENERGY RESOURCES

Existing Renewable and Recycled Generating Facilities							
Name	State	kW Rating	Vintage	Technology	Power Source	Owned/PPA	State Eligibility
Customer A	MN	225	1997	Wind	Wind	PPA	MN, ND, SD
Customer B	SD	90	2002	Wind	Wind	PPA	Tail <i>Winds</i> <sup>13</sup>
Hendricks	MN	900	2001	Wind	Wind	PPA	Tail <i>Winds</i>
Borderline	MN	900	2003	Wind	Wind	PPA	MN, ND, SD
FPLE ND	ND	21,000	2003	Wind	Wind	PPA	MN, ND, SD
Wind II							
Customer C	ND	50	1985	Wind	Wind	PPA	MN, ND, SD
FPLE	ND	19,500	2007	Wind	Wind	PPA	MN, ND, SD
Langdon							
OTP	ND	40,500	2008	Wind	Wind	Owned	MN, ND, SD
Langdon							
Ashtabula	ND	48,000	2008	Wind	Wind	Owned	MN, ND, SD
Wind							
Customer	MN	1,650	2005	Wind	Wind	PPA	MN, ND, SD
D1							
Customer E	ND	660	2008	Wind	Wind	PPA	MN, ND, SD
Customer F	MN	39.5	2008	Wind	Wind	PPA	MN, ND, SD
Customer G	MN	39.5	2008	Wind	Wind	PPA	MN, ND, SD
Customer H	MN	39.5	2008	Wind	Wind	PPA	MN, ND, SD
Customer I	MN	3.5	2007	Wind	Wind	PPA	MN, ND, SD
Customer J	MN	1.8	2008	Wind	Wind	PPA	MN, ND, SD
Customer K	MN	1.8	2008	Wind	Wind	PPA	MN, ND, SD
Customer L	ND	20	2008	Wind	Wind	PPA	MN, ND, SD
Customer T	MN	3	2008	Photovoltaic	Sun	PPA	MN, ND, SD

<sup>&</sup>lt;sup>13</sup> At this time Tail*Winds* energy counts in ND and SD, but not MN. Tail*Winds* is the Company's green pricing tariff and the energy is counted only as customers purchase the energy, not as it is generated.

# APPENDIX A – RENEWABLE AND RECYCLED ENERGY RESOURCES

Existing Renewable and Recycled Generating Facilities (Continued)							
Name	State	kW Rating	Vintage	Technology	Power Source	Owned/PPA	State Eligibility
Big Stone Plant	SD	245,784	1975	Steam	Biomass	Owned	ND, SD <sup>14</sup>
Bemidji Hydro	MN	740	1907	Hydro	Water	Owned	MN
Taplin Gorge	MN	560	1925	Hydro	Water	Owned	MN
Hoot Lake	MN	1,000	1914	Hydro	Water	Owned	MN
Pisgah	MN	520	1918	Hydro	Water	Owned	MN
Wright	MN	400	1922	Hydro	Water	Owned	MN
Dayton Hollow	MN	980	1909	Hydro	Water	Owned	MN
WAPA Allocation	Several	5,566	Various	Hydro	Water	PPA	None
Manitoba Hydro	Manitoba	50,000	Various	Hydro	Water	PPA	None
Customer X	MN	7.2	2009	Wind	Wind	PPA	MN, ND, SD
Customer W	MN	75	2010	Wind	Wind	PPA	MN, ND, SD
Customer AA	MN	2,130	2010	Internal Combustion	Biogas	PPA	MN, ND, SD
Customer U (Bakke)	SD	2.6	2009	Wind	Wind	PPA	MN, ND, SD
Customer V (Elkton)	SD	1.8	2009	Wind	Wind	PPA	MN, ND, SD

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<sup>&</sup>lt;sup>14</sup> Only the biomass portion of the fuel is counted. For the January 1, 2009 – December 31, 2009 time period only about .04% of the fuel was biomass.

# APPENDIX A – RENEWABLE AND RECYCLED ENERGY RESOURCES

Planned and Expected Future Renewable and Recycled Generating Facilities							
Name	State	kW Rating	Vintage	Technology	Power Source	Owned/PPA	State Eligibility
Customer M	MN	39.5	Unknown	Wind	Wind	PPA	MN, ND, SD
Customer Q	MN	4,500	Unknown	Steam	MSW	PPA	MN
Customer S	MN	2.4	Unknown	Wind	Wind	PPA	MN, ND, SD
Customer W2	MN	75	Unknown	Wind	Wind	PPA	MN, ND, SD

# APPENDIX B – CALENDAR YEAR 2009 RREO REPORT

Calendar Year 2009 RREO Report	Value	Comments
Retail Sales		
Total - All States (MWh)	4,248,063	
SD (MWh)	410,948	
Generation Capacity Owned		
Total - All States (MW)		Based on Net Dependable Capacity of owned generation facilities and does not count any contracted capacity.
SD (MW)	278.4	Based on Net Dependable Capacity of owned generation facilities and does not count any contracted capacity.
Renewable Generation Capacity Owned		
Total - All States (MW)	400 =	
Wind	138.5	
Solar	-	
New Hydro	-	
Old Hydro	3.8	
Hydrogen	256.0	Depresents Die Stane Dont which can burn hierage generally 140/ of annual annuation
Biomass	256.0	Represents Big Stone Plant, w hich can burn biomass, generally < 1% of annual generation.
Geothermal Proceeded	-	
Recycled Total - All States (MW)	398.3	
Total - All States (WWW)	390.3	
SD (MW)		
Wind	-	
Solar	-	
New Hydro	-	
Old Hydro	-	
Hydrogen	-	
Biomass	256.0	
Geothermal	-	
Recycled	-	
Total SD (MW)	256.0	
Renewable Energy Credits Retired for SD		No Renewable Energy Credits were Retired for SD for 2009.
Total - Generated In All States (MWh)		
Wind	-	
Solar	-	
New Hydro	-	
Old Hydro	-	
Hydrogen	-	
Biomass	-	
Geothermal	-	
Recycled	-	
Total - All States (MWh)	-	
Concreted in SD (MM/h)		
Generated in SD (MWh)	_	
Solar	-	
New Hydro	_	
Old Hydro	-	
Hydrogen	-	
Biomass	-	
Geothermal	-	
Recycled	-	
Total SD (MWh)	-	
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# APPENDIX B- CALENDAR YEAR 2009 RREO REPORT

Calendar Year 2009 RREO Report	Value	Comments
Renewable Energy Credits Retired for Other States		
Total - Generated In All States (MWh)		
Wind	-	
Solar	-	
New Hydro	-	
Old Hydro	21,352	
Hydrogen	-	
Biomass	-	
Geothermal	-	
Recycled	-	
Total - All States (MWh)	21,352	
Generated In SD (MWh)		
Wind	-	
Solar	-	
New Hydro	-	
Old Hydro	-	
Hydrogen	-	
Biomass	-	
Geothermal	-	
Recycled	-	
Total SD (MWh)	-	
Conserved Energy & Capacity		
Conserved Energy (MWh)		
Total - All States	39,728	
SD	4,021	
Conserved Capacity (MW)		
Total - All States	9.6	
SD	1.4	