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June 26, 2008

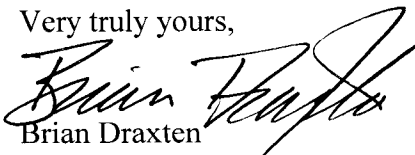
Illona Jeffcoat-Sacco  
Executive Secretary  
North Dakota Public Service Commission  
State Capitol Building  
Bismarck, ND 58505

Attention: Illona Jeffcoat-Sacco

Subject: **OTTER TAIL POWER COMPANY'S TEN-YEAR PLAN – JUNE 2008**

Enclosed are ten paper copies of Otter Tail Power Company's North Dakota Ten-Year Plan in accordance with NDCC 49-22-04. Notice of the filing of this plan is given pursuant to Article 69-06-02-02 of the North Dakota Administrative Code to the state agencies and officers as designated in Article 69-06-01-05 of the Administrative Code. A copy of Otter Tail Power Company's Ten Year Plan has also been filed with the County Auditor of any county in which any part of a preferred or alternate site or corridor is proposed to be located.

Very truly yours,

  
Brian Draxten  
Manager, Resource Planning

Enclosures

cc: Barnes County Auditor Ed McGough

1 **PU-08-402** Filed: 6/27/2008 Pages: 26  
**2008 Ten Year Plan**

Otter Tail Corporation

# **NORTH DAKOTA TEN-YEAR PLAN**



**Report RP08-1  
Resource Planning  
June 2008**

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## **INTRODUCTION**

In accordance with the rules and regulations of the North Dakota Public Service Commission governing the siting of energy conversion and transmission facilities pursuant to Chapter 49-22 of the North Dakota Century Code, Otter Tail Corporation, dba Otter Tail Power Company, hereby files this Ten-Year Plan.

Ten copies of this Ten-Year Plan are being filed with the Commission. Notices of the filing of this report have been given to those state agencies and officers designated in Article 69-06-01-05 of the Administrative Code



## **SECTION A: Existing Energy Conversion Facilities**

1. Otter Tail Corporation, dba Otter Tail Power Company, (Otter Tail) owns 35% of the 427 MW rated Coyote facility or 149.45 MW in the summer and the winter seasons. Otter Tail is the operating agent and provides the filing of the appropriate Federal Forms. Other co-owners include Northern Municipal Power Agency (Minnkota Power Cooperative (MPC) acts as the agent for Northern Municipal Power Agency), Montana Dakota Utilities (MDU), and Northwestern Energy (NWE). The Coyote facility was commissioned for commercial operation May 1, 1981.
2. Otter Tail owns 100% of two combustion turbines located at Jamestown, North Dakota. These combustion turbines have a combined summer and winter capacity rating of about 43 MW and 57.6 MW respectively. These facilities were commissioned for commercial operation in 1976 and 1978.
3. Otter Tail is contracted to receive energy from a customer owned waste sunflower hull fired cogeneration facility in Enderlin, ND. No energy was received in 2007 from this facility.
4. Otter Tail purchases energy from three non-utility wind-powered generating facilities in North Dakota. One is a customer-owned two-unit facility that has a total capacity of 50 kW and delivered 0 MWh of energy to Otter Tail in 2007. The second facility is the FPL Energy ND Wind II 21,000 kW farm owned by FPL Energy that delivered 62,760 MWh to Otter Tail in 2007. Otter Tail purchases the output of 19.5 MW of wind turbines from Langdon Wind, LLC that delivered 1,970 MWh in 2007. The facility just began operation in late December 2007, so future purchases are expected to be significantly higher. There is a fourth 100 kW facility that is fully utilized by the customer, so no energy is delivered to Otter Tail Power.
5. Otter Tail purchases peaking capacity from two customer-owned diesel generators with a total nameplate capacity of 3.5 MW.
6. Otter Tail owns 40.5 MW of wind generation 6-12 miles south of Langdon, North Dakota. The project began commercial operation in January of 2008.
7. No unit retirements of Otter Tail facilities in North Dakota are planned within the next ten years.

## **SECTION B: Energy Conversion Facilities Under Construction**

On April 30, 2008, Otter Tail announced contractual agreements to build and own 48 MW of a planned wind farm to be operated by FPL Energy known as the Ashtabula Wind Center. The wind farm will be built in Barnes County and is anticipated to be operational by late 2008. Construction start is planned for June 2008. The entire Ashtabula Wind Center has a project size of 200 MW. Table 1 below identifies further details associated with the Otter Tail portion of the project.

**Table 1: Ashtabula Wind Project Detail**

|                               |   |
|-------------------------------|---|
| <b>Location</b>               | Barnes County, North Dakota   |
| <b>Size</b>                   | 48 megawatts (MW)   |
| <b>Turbines</b>               | 32 owned turbines, 1.5 MW each, manufactured by General Electric                  |
| <b>Tower height</b>           | Approximately 250 feet to center of hub   |
| <b>Turbine blades</b>         | Variable pitch – 120 feet long  |
| <b>Estimated Net Capacity</b> | 35 – 45 %   |
| <b>Cut-in wind speed</b>      | 8 mph   |
| <b>Cut-out wind speed</b>     | 56 miles per hour   |
| <b>Maximum output</b>         | 35-55 mph   |
| <b>Interconnection point</b>  | Maple River Substation  |
| <b>Suppliers</b>              | When economically competitive, local labor, materials, and suppliers will be used |
| <b>Start-up date</b>          | Operational by late 2008  |

**SECTION C: Proposed Energy Conversion Facilities On Which Construction Is Intended Within The Ensuing Five Years**

In addition to the Ashtabula project, Otter Tail has entered into a letter of intent for a 50 MW Otter Tail owned wind project in ND. This project is subject to Board of Director approval, finalizing definitive agreements with the developer, and extension of the federal Production Tax Credit. The Otter Tail resource plan includes the addition of 160 MW of wind generating facilities. Approximately 111.3 MW of this amount has already been constructed or is designated for construction, including the Ashtabula project. Some of the remaining new wind facilities may be located in North Dakota.

**SECTION D: Proposed Energy Conversion Facilities During the Next Ten-Year Time Period**

No new energy conversion facilities owned by Otter Tail are proposed in the ensuing ten-year time period in North Dakota, outside of the North Dakota projects previously mentioned. The Otter Tail resource plan includes the addition of 160 MW of wind generating facilities, including the projects mentioned in SECTION C. Some of the remaining new facilities may be located in North Dakota.

**SECTION E: Existing Transmission Facilities (Electric)**

1. In-service dates for Otter Tail existing transmission facilities above 115 kV are:

|                                |      |
|--------------------------------|------|
| Wahpeton - Fergus Falls 230 kV | 1967 |
| Hankinson - Wahpeton 230 kV    | 1967 |
| Forman - Hankinson 230 kV      | 1967 |
| Ellendale - Forman 230 kV      | 1967 |
| West Fargo - Audubon 230 kV    | 1969 |
| Drayton - Grand Forks 230 kV   | 1970 |
| Big Stone - Hankinson 230 kV   | 1974 |
| Underwood - Harvey 230 kV      | 1986 |
| Harvey - Rugby 230 kV          | 2002 |

2. No transmission facility rated above 115 kV is scheduled for retirement within the next ten years.

We do not anticipate operating any of the transmission lines at 100% load factor. The nature of Otter Tail's native load makes this impossible.

**SECTION F: Existing Transmission Facilities (Pipeline)**

None.

**SECTION G: Proposed Transmission Facilities On Which Construction Is Intended Within The Ensuing Five Years**

In consideration of Minnkota Power Cooperative's proposed 230 kV Pillsbury to Maple River generator outlet line, Otter Tail anticipates that upgrades to the existing transmission lines in the Fargo area may be required to reliably handle the increased power injections into the Maple River substation as a result of the Ashtabula wind generation additions. In consideration of the uncertainty of other projects in the region, it is possible that operating guides or special protection schemes could be implemented as a short-term interim solution in lieu of network upgrades until other proposed projects are confirmed and a regional transmission plan is formulated. This regional plan would be coordinated with the local utilities, the Midwest ISO, and the Mid-Continent Area Power Pool.

A new ethanol plant near Casselton, ND will be served by Otter Tail Power Company and is expected to be in-service in October 2008. In order to provide reliable service to the ethanol plant, Otter Tail will construct a new 115 kV line from Mapleton to Casselton. The new 115 kV line will be double circuited with an existing 41.6 kV line to minimize impacts. In 2009, it is expected that the new 115 kV line to Casselton will be extended further west to the Buffalo substation to complete a 115 kV loop between the Sheyenne Substation and the Buffalo Substation. As part of this project, substation modifications are expected at Buffalo, Mapleton,

and Casselton. The ethanol plant has informed Otter Tail that they have plans to double their electrical demand within 2-3 years after initial start-up.

The jointly coordinated transmission studies completed to meet the Midwest ISO and Mid-Continent Area Power Pool study requirements for the Langdon Wind Energy Center has identified that the addition of the new Langdon – Hensel 115 kV line encourages 115 kV through-flow from Devils Lake to Grand Forks when the primary 230 kV transmission line (from the Ramsey Substation to the Prairie Substation) is out of service. This 115 kV through flow scenario is most evident with low generation levels at Langdon. As a result of this flow pattern, the existing 230/115 kV transformer at the Ramsey substation (near Devils Lake) is overloaded. As part of identifying a jointly coordinated regional transmission solution, Otter Tail has agreed to perform a transmission study to identify the best method of alleviating this transformer overload. This study is jointly coordinated with the Midwest ISO, Great River Energy (owner of the existing transformer), Western Area Power Administration, and Minnkota Power Cooperative. It is anticipated that this study work will be completed in the July/August 2008 timeframe. At this time, it is expected that a solution will be implemented in the November 2009 timeframe.

Otter Tail has investigated the installation of a reactor in the vicinity of the Jamestown or Buffalo substation. Previous studies conducted through the Midwest ISO have indicated the possibility of high voltage conditions in the Jamestown and Buffalo areas for outage of either the Jamestown to Buffalo 345 kV line or the Buffalo to Maple River (West Fargo) 345 kV line.

Likewise, recent generation interconnection studies performed through the MISO have indicated the possibility of low transient voltage concerns in the Jamestown and Buffalo areas. Since these areas are prone to both high voltage and low voltage issues, it may be optimal to install a reactive device with the capability to output reactive power in one situation, but be able to absorb reactive power in another situation.

Study work to identify reactive power devices in the Jamestown area is currently in suspension due to the announcement of a new generating station at the Spiritwood substation just east of Jamestown, ND. This generating facility will be a new base-load unit capable of approximately 99 MW and will have dynamic reactive capability to help stabilize the voltage in the Jamestown area. With the high capacity factor of this baseload unit, it is likely that this new generator will be able to off-set the need for additional reactive device installations. The new generator is expected to be in-service in early 2010.

As part of this generator addition at Spiritwood, it is expected that a large substation renovation will take place at the existing Ladish substation. The existing 115/41.6 kV substation will be modified to include a new six breaker ring-bus to accommodate the new generator and future 115/12.5 kV transformers to serve an increased load at the Cargill plant and a future ethanol plant at the same site. This work is expected to be completed in 2009 to allow for the plant to become commercially available in early 2010.

In addition to the local substation upgrades at Ladish, it is expected that approximately 12 miles of 115 kV line between the Jamestown Peaking Plant substation and the Jamestown 345 kV substation (via the Jamestown Downtown and Jamestown North load deliveries) will need to be

upgraded. This upgrade will be needed in order to deliver the full 99 MW of generation from Spiritwood to the bulk transmission system while the existing Peaking Plant units are at full output. The upgrade of the 115 kV line will need to be coordinated through the Large Generator Interconnection Procedures at MISO. In order to meet the expected in-service date of the Spiritwood generator, it is anticipated that the 115 kV line upgrades will need to be completed by late 2009.

Transmission studies for the Big Stone II project have also identified potential line loading issues on the transmission system within North Dakota. Current results of the transmission studies are indicating upgrades may be necessary along the Hankinson – Wahpeton 230 kV line and the Fargo – Sheyenne 230 kV line. Facility upgrade requirements for these transmission lines are subject to further investigation to determine how the change in ownership in the Big Stone II project will affect the loadings on these transmission lines. With the current schedule of the Big Stone II project being in-service in the 2013 timeframe, it is expected that if these line upgrades are necessary, they will need to be completed in the 2012 timeframe.

Otter Tail continues to see a lot of activity within North Dakota related to increased interests in new wind generation development, large load expansions related to the ag-processing industry and energy transport industry. As these projects are further developed, it is possible that additional transmission will be required. Further study analysis will be required to determine the optimum transmission plan and will be coordinated through local and regional transmission planning processes in place at the Midwest ISO and MAPP.

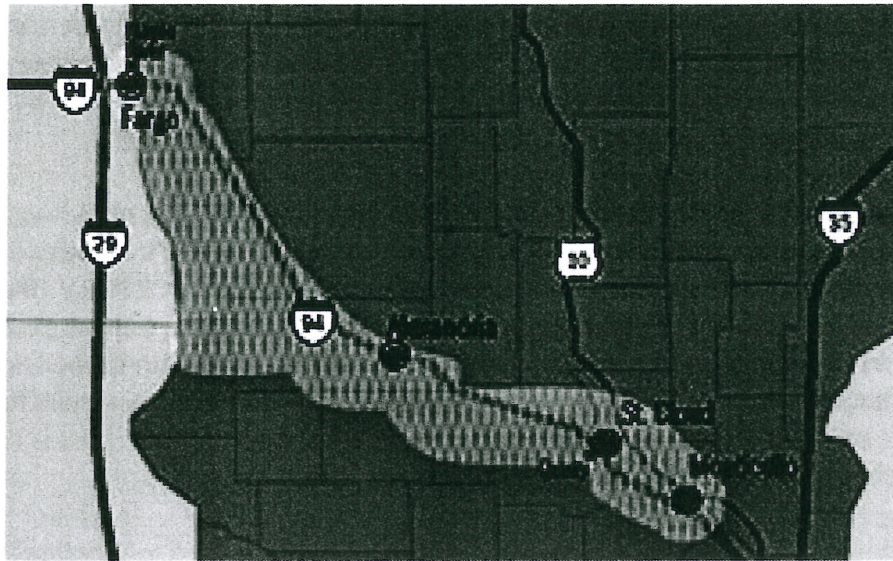
#### **SECTION H: Proposed Transmission Facilities On Which Construction Is Intended Within The Ensuing Five Years (Pipeline)**

None.

#### **SECTION I: Proposed Transmission Facilities During The Next Ten-Year Time Period (Electric and Pipeline)**

Otter Tail is a participant in the CapX 2020 effort that intends to permit and construct major transmission facilities in the region. A small portion of one of the initial projects, a proposed 345 kV transmission line from the Fargo, ND area to the St. Cloud/Monticello, MN area is located in North Dakota and shown in Figure 1. This project is in the permitting process within Minnesota and North Dakota. The current schedule for this facility indicates an in-service date is expected sometime between 2014–2018. Work has begun on the permitting of this project and the project has had a Certificate of Need filed for the Minnesota portion of the project in August of 2007. The project will be requesting a Corridor Certificate and a Route Permit for the North Dakota portion of the project sometime during the next year.

**Figure 1: Proposed 345 kV line from Fargo, ND area to St. Cloud/Monticello Area**



As the transmission system approaches its full capability, and with the proposed generation projects of others in North Dakota, it is inevitable that more transmission will be required to meet the needs of the system. Otter Tail continues to participate in transmission studies looking at the adequacy of the transmission system throughout North Dakota.

## **SECTION J: Regional Coordination**

### ***Regional Coordination through the MISO Process***

Otter Tail conducts transmission planning in a coordinated environment, involving neighboring utilities, load serving entities, state regulatory commissions and members of the public to collaborate in the planning process.

As a transmission-owning member of the Midwest ISO, Otter Tail participates in various transmission planning efforts, the most significant of which is the annual Midwest ISO Transmission Expansion Planning (“MTEP”) process.

Planning analyses performed through the MTEP process tests the transmission system under a wide variety of conditions by using standard industry applications to model steady state power flow, angular and voltage stability, short-circuit, and economic parameters, as determined appropriate by the stakeholders involved in the study effort.

The Midwest ISO, with input from various stakeholders, evaluates the system for both reliability and economic needs. Projects included in the MTEP process may be based upon any applicable planning criteria, including accepted NERC reliability standards, Midwest Reliability Organization (MRO) reliability standards, local reliability or economic planning criteria, and any economic or other planning criteria.

Local planning of the Otter Tail facilities, less than 100 kV, is primarily coordinated on a subregional and state level. Otter Tail's locally planned projects are then reviewed by the Midwest ISO and may become part of the MTEP. Developing local transmission plans at a subregional level and rolling them up to the Midwest ISO provides for regional coordination of local transmission plans, which leads to transmission projects being built in a coordinated manner to address the transmission needs of the larger region. This coordination for identifying new transmission projects also augments the larger region by providing for a transmission plan that maximizes the benefits of the new projects and in many cases reduces the number of new transmission projects that are needed than if the transmission planning was done solely on an individual basis. Regional coordination of local transmission plans also results in study efficiencies by keeping a broader group of utilities, states, and stakeholders informed through the transmission planning process.

The regional planning process is performed through a continuous series of planning cycles (12 to 24 months in duration), with each cycle typically addressing system needs through a rolling planning horizon. Each cycle commences with regional model development, identification of potential expansions from the local planning processes of the Transmission Owners, and concludes with recommended solutions to system needs.

During the course of the MTEP process, the Midwest ISO seeks opportunities to coordinate or consolidate, where possible, individually defined transmission projects into more comprehensive cost-effective developments. The Midwest ISO coordinates with Transmission Owners, and considers the input from various stakeholder groups (through the Subregional Planning Meetings, Planning Subcommittee, and Planning Advisory Committee) to develop expansion plans to meet the needs of the transmission system. This multi-party collaborative process allows for all projects with regional and inter-regional impacts to be analyzed for their combined effects on the transmission system. Moreover, this collaborative process is designed to ensure the most efficient and cost-effective MTEP that will meet reliability needs and expand trading opportunities, in addition to better integrating the grid, and alleviating congestion, while giving consideration to the inputs from all stakeholders.

The Midwest ISO also collaborates with representatives from adjacent regions to develop long-term inter-regional transmission plans for the benefit of the combined regions.

Additionally, subregional, state, and non-Midwest ISO coordination is necessary because the Otter Tail transmission system is highly interconnected with neighboring non-Midwest ISO/Mid-Continent Area Power Pool ("MAPP") transmission owners. The Otter Tail Balancing Authority Area is the farthest, most western border of the Midwest ISO footprint; therefore, it is interconnected with several transmission-owning utilities that are not members of the Midwest ISO, but instead remain members of MAPP.

### ***Regional Coordination through the MAPP Process***

Otter Tail is still a party to the MAPP Restated Agreement and therefore continues to participate in the MAPP Regional Transmission Committee (RTC). Similar to the Midwest ISO, the MAPP RTC plans for the future transmission needs of the region and publishes the results of its coordinated system assessments for the ensuing 10-Year horizon within a biennial regional

transmission plan (“Regional Plan”). The Regional Plan integrates the transmission plans developed by individual members and subregional planning groups and documents all system deficiencies and planned projects of the participating utilities necessary to address any noted system deficiencies. The Regional Plan ensures that transmission needs of the MAPP region members and non-members will be met on a consistent, reliable, environmentally acceptable and economic basis and to avoid unnecessary duplication of facilities.

In addition to the RTC, MAPP sponsors several Sub-regional Planning Groups (“SPGs”) throughout the MAPP/Midwest ISO footprint. Otter Tail actively participates in the Missouri Basin SPG (“MB SPG”) and the Northern MAPP SPG (“NM SPG”). These SPGs meet every other month to discuss members’ planned projects (including the identification of member-system enhancements that could relieve congestion or integrate new resources), share study results, and establish ad-hoc study groups for regional and local concerns at all voltage levels. The SPGs provide forums for the coordination of individual utility transmission plans, coordination with other SPGs, and coordination with neighboring non-MAPP utility systems.

SPG meetings are open to all MAPP members, non-members and regulatory participants that have an interest in the transmission facilities of the subregion. Representatives from each participating utility use these meetings to discuss planning studies and solicit comments and participation from attendees. Non-MAPP neighboring transmission owning utilities and RTOs are encouraged to join the SPGs and participate in the process to promote joint planning between MAPP and its neighboring regions. For example, the Midwest ISO personnel actively participate in the MAPP SPG process.

### ***Regional Coordination Through the Local Process***

Otter Tail also participates in CapX 2020 (Capacity Expansion by 2020), which is a joint initiative of transmission-owning electric utilities in Minnesota and the surrounding region created on the basis of expanding the electric transmission grid to ensure electric reliability for several years into the future. The CapX 2020 utilities (including cooperatives, municipal utilities and investor-owned utilities) collaboratively assess the current transmission system and plan for the necessary future transmission infrastructure investments. This collaborative process and the planning studies performed as part of this effort are coordinated with the Midwest ISO.

Otter Tail has Integrated Transmission Agreements (ITA) with Central Power Electric Cooperative, Missouri River Energy Services, Minnkota Power Cooperative, and Great River Energy (GRE). These agreements provide for joint use of transmission facilities in common areas of service and require that the utilities jointly plan and coordinate additional facilities required for the common service area. In addition, Otter Tail has agreements for joint use of transmission and interconnection with Xcel Energy (formerly Northern States Power), East River Electric Cooperative, Montana Dakota Utilities, Manitoba Hydro (MHEB), Northwestern Energy, and Western Area Power Administration (WAPA). These agreements were all precipitated through joint studies and coordination of facilities required to provide high reliability of service at the minimum cost. Facilities proposed and committed through this local process become part of the MISO Transmission Expansion Plan (MTEP) and are also coordinated with the Mid-Continent Area Power Pool (MAPP).

## ***Summary of Regional Coordination***

As discussed above, Otter Tail coordinates extensively with its neighboring interconnected systems to share system plans and identify system enhancements through the Midwest ISO regional MTEP process, the MAPP Regional Plan, and through local participation in coordinated transmission planning (such as CapX 2020 and the ITAs). The Midwest ISO MTEP provides coordinated planning for the entire 15-state Midwest ISO footprint. The MAPP Regional Plan provides coordinated planning for the historic 7-state MAPP region, which includes both utilities that are Midwest ISO members and utilities that are not Midwest ISO members.

## ***Transmission Interconnections***

Since joining MISO and transferring operational control of its high voltage transmission facilities to MISO, Otter Tail has seen positive benefits to the generator interconnection processes, from a transmission owner perspective. Several generators have successfully interconnected to the Otter Tail transmission system under MISO's generator interconnection procedures.<sup>1</sup> Under MISO's Open Access Transmission and Energy Markets Tariff (TEMT)<sup>2</sup>, all generator interconnection requests (regardless of generator size or interconnecting voltage level) are required to abide by the MISO generator interconnection process if the generator intends on engaging in wholesale transactions. The MISO, as an independent system operator, ensures comparable treatment for all customers and has the necessary staff in order to provide and administer this service. Otter Tail receives value and efficiencies from the MISO process. Additionally, for interconnection projects and delivery service transmission requests on Otter Tail's system, in some cases, MISO contracts with Otter Tail to have Otter Tail perform most of the required study work. This is an efficient process and a benefit to all parties since Otter Tail has ultimate knowledge and familiarity with its system. Project coordination, administration, and filing requirements fall upon MISO, thus freeing up Otter Tail's resources to focus on its key priority of providing clean, efficient, and low cost energy to its customers. In the recent years, the number of interconnection requests for adding new generation to the Otter Tail transmission system has increased substantially.

## ***Transmission Facilities***

Otter Tail serves many very small communities located in a geographical area about the size of the State of Wisconsin. The characteristics of the customer loads and locations have required an extensive transmission and sub-transmission system. When compared to many investor-owned utilities, Otter Tail's customer count per mile of transmission and sub-transmission facilities is quite small. To minimize cost Otter Tail has become party to several integrated transmission agreements. The Company participates in many shared networks with other investor owned utilities, municipals, Generation and Transmission (G & T) cooperatives, and rural electric cooperatives. In many cases, a 41.6 kV or 69 kV transmission line will serve an equal number of non-Otter Tail and Otter Tail distribution substations.

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<sup>1</sup> Attachments R and X of the MISO's TEMT delineate MISO's generator interconnection procedures

<sup>2</sup> FERC Docket No. ER04-691-000, et al

These agreements have resulted in over 200 points of interconnection with other utilities. Such a network adds to the complexity of operating the transmission system, but also adds the capability for the facilities of one utility to provide either full time or emergency service to another utility. The ultimate result is reduced cost and increased reliability for the customer.

Table 2 lists the mileage of various voltage classes of transmission lines. All of these lines are overhead lines except for 0.57 miles of underground cable in the 41.6 kV class. A map of Otter Tail's existing transmission facilities in North Dakota is on record with the state and not reprinted here due to the critical energy infrastructure information the map contains. See 18 C.F.R. § 388.113. When modifications to Otter Tail's transmission facilities occur, Otter Tail will update the map and provide it to the state at that time.

**Table 2: Circuit Miles of Transmission by Voltage**

| <b>Voltage (kilovolts)</b> | <b>Circuit length</b> |
|----------------------------|-----------------------|
| 345 kV                     | 48 miles              |
| 230 kV                     | 405 miles             |
| 115 kV                     | 810 miles             |
| 69 kV                      | 216 miles             |
| 41.6 kV                    | 3,792 miles           |

## **SECTION K: Environmental Information**

Otter Tail employees are involved with other groups in a variety of organizations to keep informed on various environmental issues. Edison Electric Institute (EEI), the Utility Air Regulatory Group, MAPP, and the Lignite Energy Council all provide information exchange on environmental issues. On an individual basis, employees participate in Energy and Environment Research Center (EERC) conferences, Air and Waste Management Conferences, and MPCA task forces and other informational meetings. Otter Tail, along with other government and industrial entities, funds various types of research projects such as the Energy and Environment Research Center's Coal-Ash Research Resources Consortium (CARRC) and the Center for Air Toxic Metals (CATM). The CARRC was established to evaluate potential beneficial uses of coal combustion by-products. CATM is devoted to the study of the emission, control, and fate of hazardous air pollutants with primary emphasis on mercury.

Otter Tail Power generating plants are subject to stringent federal and state standards and regulations regarding, among other things, air, water and solid waste pollution. Otter Tail estimates that operation and maintenance expenditures related to environmental items at Coyote Station in 2007 were \$4,976,238. In addition, there was \$1,194,873 in capital expenditures relating to environmental items at Coyote Station in 2007.

Otter Tail Power has complied in the past and will continue to comply with all requirements of the Public Service Commission in siting, operating and maintaining all proposed energy conversion and transmission facilities located in North Dakota.

### ***Air Quality***

Pursuant to the Federal Clean Air Act (the Act), the United States Environmental Protection Agency (EPA) has promulgated national primary and secondary standards for air pollutants. The Coyote Station has sulfur dioxide removal equipment. The removal equipment, referred to as a dry scrubber, consists of a spray dryer, followed by a fabric filter. The Coyote Station is currently

operating within all presently applicable federal and state air quality and emission standards.

On December 19, 1996, the EPA adopted nitrogen oxide emissions regulations that are applicable to cyclone-fired boilers such as those used at the Coyote Station. The regulations required that the cyclone boilers meet the emission standards beginning on January 1, 2000 and Coyote Station meets those standards. In February of 2008, Basin Electric Power Cooperative, Minnkota Power Cooperative, and Otter Tail Power Company completed a Memorandum of Understanding forming the North Dakota Lignite-Fired Cyclone Boiler NO<sub>x</sub> Reduction Group. The purpose of the group is to evaluate technologies for NO<sub>x</sub> reduction on North Dakota lignite-fired cyclone boilers that have greater NO<sub>x</sub> removal efficiencies than currently available technologies.

The Act contains a list of hazardous air pollutants, which includes certain substances believed to be emitted by Otter Tail plants. The Act calls for EPA studies of the effects of emissions of the listed pollutants by electric utility steam generating plants. The EPA has completed the studies and sent reports to Congress. On December 14, 2000, the EPA announced that it affirmatively decided to regulate mercury emissions from electric generating units. The EPA published final mercury emission rules in the May 18, 2005 Federal Register. On October 28, 2005, EPA announced a reconsideration of portions of the final rules. EPA reaffirmed most relevant portions of the rules in their May 31, 2006, final action on the reconsideration. On February 8, 2008, the United States Court of Appeals for the District of Columbia granted petitions for review of the EPA mercury rules that would have allowed the EPA to regulate mercury emissions based on a cap and trade approach. The Court issued a mandate vacating the rules on March 14, 2008. Given the Court's decision, future mercury regulatory requirements for the electric utility industry are uncertain at this time.

The two combustion turbines located at Jamestown are not impacted by the Act's emission reduction standards.

### ***Water Quality***

The Federal Water Pollution Control Act Amendments of 1972, and amendments thereto, provide for, among other things, the imposition of effluent limitations to regulate discharges of pollutants, including thermal discharges, into the waters of the United States. The EPA has established effluent guidelines for the steam electric power generating industry. Discharges must also comply with state water quality standards. Water discharge permits for the Coyote Station were renewed on April 1, 2008 for a five-year term.

### ***Solid Waste***

The EPA has promulgated various solid and hazardous waste regulations and guidelines. These provide for the comprehensive control of various solid and hazardous wastes from generation to final disposal. The North Dakota Department of Health issued Coyote Station permits for disposal of ash and other solid wastes.

**SECTION L: Projected Demand For Service**

***Historical Growth and Long Range Forecast***

The ten-year historical growth of Otter Tail annual peak demand is shown in Table 3.

**Table 3: Historical Annual MW Peak Demands**

| <b>Year</b> | <b>Peak</b> | <b>Annual Growth %</b> | <b>Cumulative Growth %</b> |
|-------------|-------------|------------------------|----------------------------|
| 1998        | 635         | 0.0                    | 0.0                        |
| 1999        | 628         | -1.1                   | -1.1                       |
| 1990        | 643         | 2.3                    | 1.1                        |
| 2001        | 630         | -2.1                   | -0.9                       |
| 2002        | 640         | 1.5                    | 0.6                        |
| 2003        | 669         | 4.3                    | 5.2                        |
| 2004        | 686         | 2.5                    | 7.8                        |
| 2005        | 665         | -3.1                   | 4.5                        |
| 2006        | 680         | 2.2                    | 6.9                        |
| 2007        | 705         | 3.7                    | 10.6                       |

A long-range forecast was made using an econometric model developed with the assistance of Christensen Associate of Madison, Wisconsin. This model is designed to incorporate a number of different assumptions about important variables such as weather, economic growth, and demographics.

Three scenarios were used in this forecast: the Base Scenario, the Upper Scenario, and the Lower scenario. The Base Scenario represents the best-fit econometric forecast of the statistically significant variables impacting customer load. The Upper and Lower Scenarios are calculated using confidence intervals that effectively describe the uncertainty around the forecast values. Otter Tail’s projected unmanaged winter peak demand is presented in Table 4, and Otter Tail’s unmanaged summer peak demand is presented in Table 5.

**Table 4: Forecasted Unmanaged Winter Peak Demands (MW)**

| <b>Year</b> | <b>Lower</b> | <b>Base</b> | <b>Upper</b> |
|-------------|--------------|-------------|--------------|
| 2008        | 753          | 789         | 826          |
| 2009        | 767          | 804         | 841          |
| 2010        | 777          | 814         | 881          |
| 2011        | 786          | 824         | 862          |
| 2012        | 806          | 844         | 883          |
| 2013        | 815          | 854         | 893          |
| 2014        | 825          | 865         | 904          |
| 2015        | 834          | 875         | 915          |
| 2016        | 844          | 885         | 926          |
| 2017        | 854          | 896         | 938          |
| 2018        | 864          | 906         | 949          |

**Table 5: Forecasted Unmanaged Summer Peak Demands (MW)**

| <b>Year</b> | <b>Lower</b> | <b>Base</b> | <b>Upper</b> |
|-------------|--------------|-------------|--------------|
| 2008        | 656          | 693         | 731          |
| 2009        | 691          | 729         | 768          |
| 2010        | 707          | 746         | 786          |
| 2011        | 719          | 759         | 799          |
| 2012        | 730          | 771         | 812          |
| 2013        | 752          | 794         | 836          |
| 2014        | 764          | 807         | 850          |
| 2015        | 776          | 820         | 864          |
| 2016        | 788          | 833         | 878          |
| 2017        | 800          | 846         | 893          |
| 2018        | 812          | 860         | 907          |

## Load Management Capability

Otter Tail has been developing its Load Management System for many years. This system has allowed Otter Tail to delay capacity and energy production facilities. The load forecast used in Otter Tail's projected forecast reflects conservation efforts that are customer driven and those that develop as a natural result of load management efforts. Otter Tail offers load management and demand-side management programs to its ND customers that are rate related and offers off-peak rates.

**Table 6: Load Management Capability Forecast**

| <b>Year</b> | <b>Summer Season<br/>(May-October)<br/>Base Forecast<br/>Scenario (MW)<sup>1</sup></b> | <b>Winter Season<br/>(November-April)<br/>Base Forecast<br/>Scenario (MW)<sup>1</sup></b> |
|-------------|--|---|
| 2007        | 29   | 80  |
| 2008        | 29   | 80  |
| 2009        | 29   | 80  |
| 2010        | 29   | 80  |
| 2011        | 29   | 80  |
| 2012        | 29   | 80  |
| 2013        | 29   | 80  |
| 2014        | 29   | 80  |
| 2015        | 29   | 80  |
| 2016        | 29   | 80  |
| 2017        | 29   | 80  |

1. Values assume a winter morning peak at -22 °F and a summer afternoon peak at 92 °F.

The 2007-2017 MAPP Load & Capability Forecast reports Otter Tail's seasonal projected surpluses and deficits. As a company, Otter Tail will continue to use a combination of load management and purchase agreements with other utilities to meet any future deficits. Otter Tail also continues to study and assess the potential for future additions to its generation. In 2007, Otter Tail had a system peak of 705 MW on February 2nd for the hour ending at 10 a.m.

Otter Tail has purchased year-round capacity, as well as summer and winter season peaking capacity for the year 2008. Otter Tail has purchased summer and winter capacity from Manitoba Hydro Electrical Board for May 1, 2000 through April 30, 2010. OTP has also purchased participation power from other MISO members for the summer and winter of 2008. Further detailed information may be obtained from Otter Tail's Resource Plan documents that are filed with the Minnesota Public Utilities Commission. Copies of the Company's Resource Plans are provided to the North Dakota Public Service Commission.

## ***Operational Improvements to Generation Facilities***

Otter Tail continues to explore operating improvements at its generating facilities to increase their efficiency and to lower the cost of production.

### **Big Stone Plant:**

Big Stone Plant continues to make competitive gains by lowering its operational costs and improving its efficiency of operation. As a result of such gains and the switch to sub-bituminous coal, Big Stone has also been able to increase its cruise rating to 460 MW.

### **Coyote Station:**

The Coyote Station is a sister unit to Big Stone Plant, but six years newer. In order to correct design deficiencies with the existing low-pressure rotor, a new rotor was installed in 2003. The new rotor improves overall plant efficiency by approximately 2%. The Coyote Station approved outlet rating is only 427 MW, due to transmission limitations. The unit has consistently exceeded this level in its URGE test the past few years. The facility also has two emergency diesel generators that are not accredited in MAPP due to the transmission limitations. The co-owners are pursuing a 25 MW increase to the transmission outlet capacity of Coyote. A North Dakota Group Study, which includes the proposed increase at Coyote along with a few other North Dakota projects, is underway with the Midwest ISO. The co-owners signed an Interconnection Facilities Study Agreement in February of 2008 and continue to pursue the increase to the transmission outlet capability.

### **Jamestown, ND, Lake Preston, SD, and Solway, MN Peaking Plants:**

The units continue to be operated during load peaking conditions and to provide transmission stability during emergency conditions and maintenance situations. They have also seen additional run time for reliability reasons in the Midwest ISO market. Otter Tail continues to review ways to improve the unit's efficiency. Improvements at Jamestown and Lake Preston include: upgrade of control systems, and installation in 2001 of an inlet fogging system to increase summer ratings.

Otter Tail added a 44.5 MW GE LM6000 combustion turbine (CT) unit at Solway, MN in the spring of 2003. The unit includes inlet chilling to improve the summer rating and efficiency, as well as water injection for NOX control and increased output. Interruptible natural gas is the primary fuel with fuel oil as the back-up fuel supply. The combustion turbine also includes a clutch to allow synchronous condensing service to support the transmission system. The LM6000 is an aero-derivative machine, powered by a Boeing 747 engine, and is one of the most fuel-efficient simple cycle turbines in the world.

### Hoot Lake Plant:

Hoot Lake Plant has also taken steps to lower its operating costs. Both Units #2 and #3 continue to maintain high levels of rating capability and performance. Unit #1, a 7.5 MW nameplate unit built in 1948, was retired in 2005.

### *Description of Generation Facilities*

Otter Tail owns or is a co-owner of the following generating facilities:

Coyote Station is a coal fired 427 MW facility located near Beulah, North Dakota. Coyote Station is a mine-mouth fed facility that uses ND lignite for its fuel source. Otter Tail is a co-owner with Montana Dakota Utilities (MDU), Northern Municipal Power Agency (Minnkota Power Cooperative (MPC) acts as the agent for Northern Municipal Power Agency), and Northwestern Energy (NWE). Otter Tail has a 35% ownership share in Coyote Station and is the operating agent of Coyote Station. The net generation from Coyote Station in 2007 was 3,008,041 MWh.

Big Stone Plant is a coal fired 472 MW facility located near Milbank, South Dakota. In association with using sub-bituminous coal for its fuel source, Big Stone Plant also burns a limited amount of tire-derived-fuel (TDF), refuse-derived-fuel (RDF), and agricultural biomass. Otter Tail is a co-owner with MDU, MPC, and NWE. Otter Tail has a 53.9% ownership share in Big Stone and is also the operator of the Big Stone Plant. The net generation from Big Stone Plant in 2007 was 2,467,184 MWh.

Hoot Lake Plant is a coal-fired facility consisting of 2 generators with a combined capacity of 145 MW located in Fergus Falls, Minnesota. Hoot Lake Plant burns sub-bituminous coal as its fuel supply and receives rail shipment from Burlington Northern. Otter Tail is the sole owner/operator of the Hoot Lake facility. Net generation for Hoot Lake Plant in 2007 was 955,328 MWh.

Otter Tail owns and operates 6 run-of-river hydro units in Minnesota. The total capacity of the six units is about 4 MW. The six hydro units produced net generation of 20,371 MWh in 2007.

Otter Tail owns two CT units in Jamestown, ND and a single CT unit in Lake Preston, SD. The three combustion turbines' capacity rating varies monthly, although all three have about a 28.8 MW winter capacity rating. All three units burn #2 fuel oil that is delivered by truck and stored in aboveground storage tanks. Net generation for the three combustion turbines was 5,397 MWh in 2007.

Otter Tail also has a 2,000 kW standby diesel generator located at its System Operations Control Center in Fergus Falls, MN. The generator had net generation of about 22 MWh in 2007.

Otter Tail owns a 44.5 MW nameplate rated LM6000 CT unit and a 1.250 MW diesel unit at Solway, MN. Net generation for Solway in 2007 was 53,834 MWh.

Otter Tail owns 40.5 MW of wind generation 6-12 miles south of Langdon, North Dakota. The project began commercial operation in January of 2008

Otter Tail is in the process of constructing the Ashtabula Wind Project in Barnes County, North Dakota. The 48 MW project consists of 32 1.5 MW General Electric turbines with an expected operation date of late 2008.

#### Proposed Big Stone II Plant:

Otter Tail Power Company is one of five utilities that have been working together to build a baseload-generating unit at Big Stone City, South Dakota. Otter Tail has 120 MW to 133 MW ownership share of a new super-critical pulverized coal-fired unit to be constructed adjacent to the existing Big Stone unit. The original project had seven owners and was planned to be a 630 MW plant. With the departure of two owners in September of 2007, additional need analyses was completed for two plant size alternatives, a 500 MW plant with the remaining five owners, or a 580 MW plant if another owner was included in the project. A decision has not yet been made on final size of the project. The proposed Big Stone II unit has a commercial operation date of 2013 and the energy generated is expected to serve the owners' retail and wholesale native load customers. Permitting delays could impact the commercial operation date of the Big Stone II Plant.