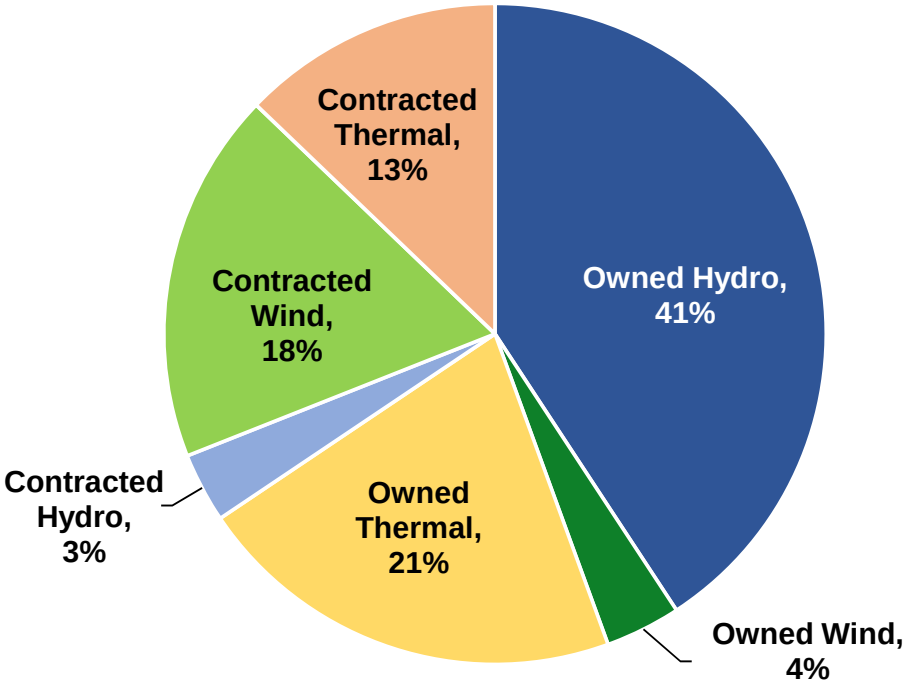
CHAPTER 8
EXISTING RESOURCES

Existing Resources Included in Modeled Portfolios

Introduction

NorthWestern serves retail loads using company-owned generation, a number of generation facilities under power purchase agreements ("PPAs"), and wholesale market purchases. Figure 8-1 summarizes the nameplate capacity percentages of owned and contracted resource types currently supplying energy to NorthWestern's Montana customers in 2016.

Figure 8-1 2016 Electricity Supply Portfolio
(Based on nameplate capacity)



NorthWestern's current resource portfolio consists of 1,084 MW of generation capacity. On an installed capacity basis, 66% of NorthWestern's current resources are renewable. However, because of the intermittent nature of wind, the realized capacity at time of peak loads is substantially less than nameplate for wind.

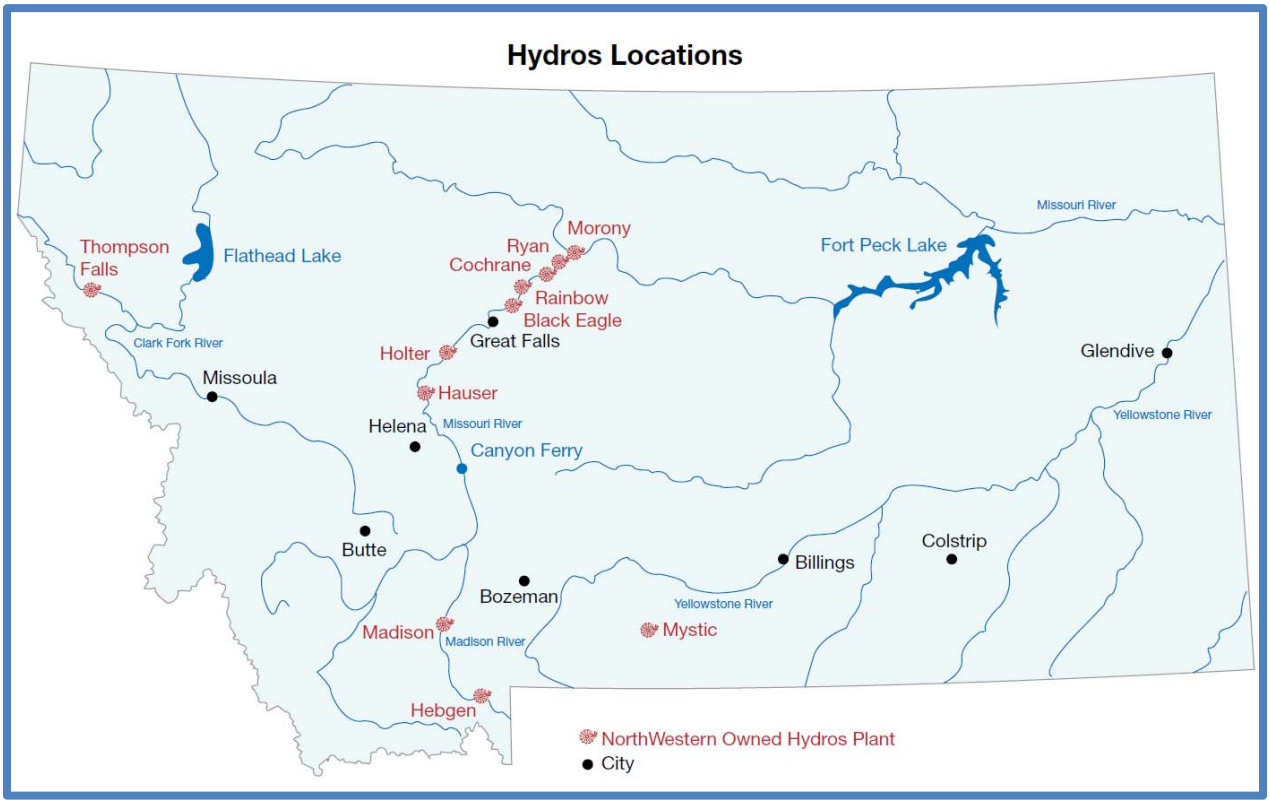
Figure 8-2 NorthWestern Energy Hydro Facilities

Utility Hydroelectric Resources

NorthWestern's rate base hydroelectric resources consist of 10 hydroelectric generating facilities. Kerr Dam, while included in the Hydros purchase, was transferred to the Confederated Salish and Kootenai Tribes on September 5, 2015, reducing the Hydros

nameplate capacity from 633 MW to 442 MW.[1] Figure 8-3 shows the location of the Hydros. Nine of these facilities, including the storage reservoir at Hebgen Dam, are located on the Madison-Missouri River system. The Mystic generation facility is located on West Rosebud Creek, 75 miles southwest of Billings, Montana, and the Thompson Falls facility is located on the Clark Fork River in Thompson Falls, Montana. NorthWestern's Hydro Operations Control Center is located at the new Rainbow Dam power house in Great Falls. The control center monitors and controls most operations at all of the hydro facilities, including the storage facility at Hebgen Lake.

Figure 8-3 Hydros Locations



[1] The capacity value of the hydros without Kerr Dam has been upgraded from 439 MW to 442 MW. Capacity at Ryan increased by 3 MW due to two generator rewinds and three turbine replacements.

Table 8-1 below lists all 10 rate-based hydroelectric facilities and provides key characteristics of the facilities.

Table 8-1 NorthWestern Owned Hydro Resources

NorthWestern Owned Hydro Resources								
Resource	Nameplate Capacity (MW)	River System	Designated Run-of-the-River (ROTR)	Storage Capacity (acre-ft)	First Year in Service	Number of Units	Turbine Types	Historical Capacity Factor
Thompson Falls	94	Clark Fork	Yes	0	1916	7	Francis, Kaplan	60%
Mystic	12	Rosebud Creek	No	0	1925	2	Pelton	48%
Hebgen Lake	0	Madison	No	386,845	1915	0	N/A	N/A
Madison	8	Madison	Yes	27,200	1906	4	Francis	89%
Hauser	19	Missouri	Yes	64,200	1911	6	Francis	75%
Holter	48	Missouri	Yes	243,000	1918	4	Francis	65%
Black Eagle	21	Missouri	Yes	1,710	1891	3	Propeller	72%
Rainbow	60	Missouri	Yes	0	1910	1	Kaplan	70%
Cochrane	69	Missouri	No	0	1958	2	Kaplan	43%
Ryan	63	Missouri	No	5,000	1915	6	Francis	78%
Morony	48	Missouri	No	3,000	1930	2	Francis	61%
Total	**442**			**730,955**		**37**		

Licenses and Agreements

NorthWestern's Hydro projects on the Madison-Missouri River are operated jointly under one FERC license (Project No. 2188), which sets tolerances of associated reservoir levels, downstream flow rates, and maximum daily flow variation for each dam. Six of these facilities are considered "run-of-the-river", meaning that they must be operated in a manner that generally minimizes changes between upstream and downstream flow rates while maintaining reservoir levels at elevations specified by the license. Thompson Falls Dam (Project No. 1869) and Mystic Dam (Project No. 2301) each operate under their own FERC licenses. Additionally, there are hydro operating provisions requiring concurrence from the following agencies prior to any intentional deviation from the proposed operations, (refer to Volume 2, Chapter 5):

- Montana Fish Wildlife and Parks;
- U.S. Bureau of Land Management;
- Montana Department of Environmental Quality;
- U.S. Fish and Wildlife Service;
- Montana Department of Natural Resources and Conservation, and
- U.S. Bureau of Reclamation.

Altogether, these agreements serve to balance power generation with other resource needs, including flood control, preservation of wildlife, and recreational use of the rivers. Under the Federal Power Act, changes from licensed operations require agency approval and formal license amendment at FERC. The NorthWestern Energy Hydropower Operational Plan, included in Volume 2 of this Plan, is a summary of the operational constraints of these agreements and licenses that are the result of years of relicensing and post-license study, consultation, negotiations, and balancing of power generation with other interests.

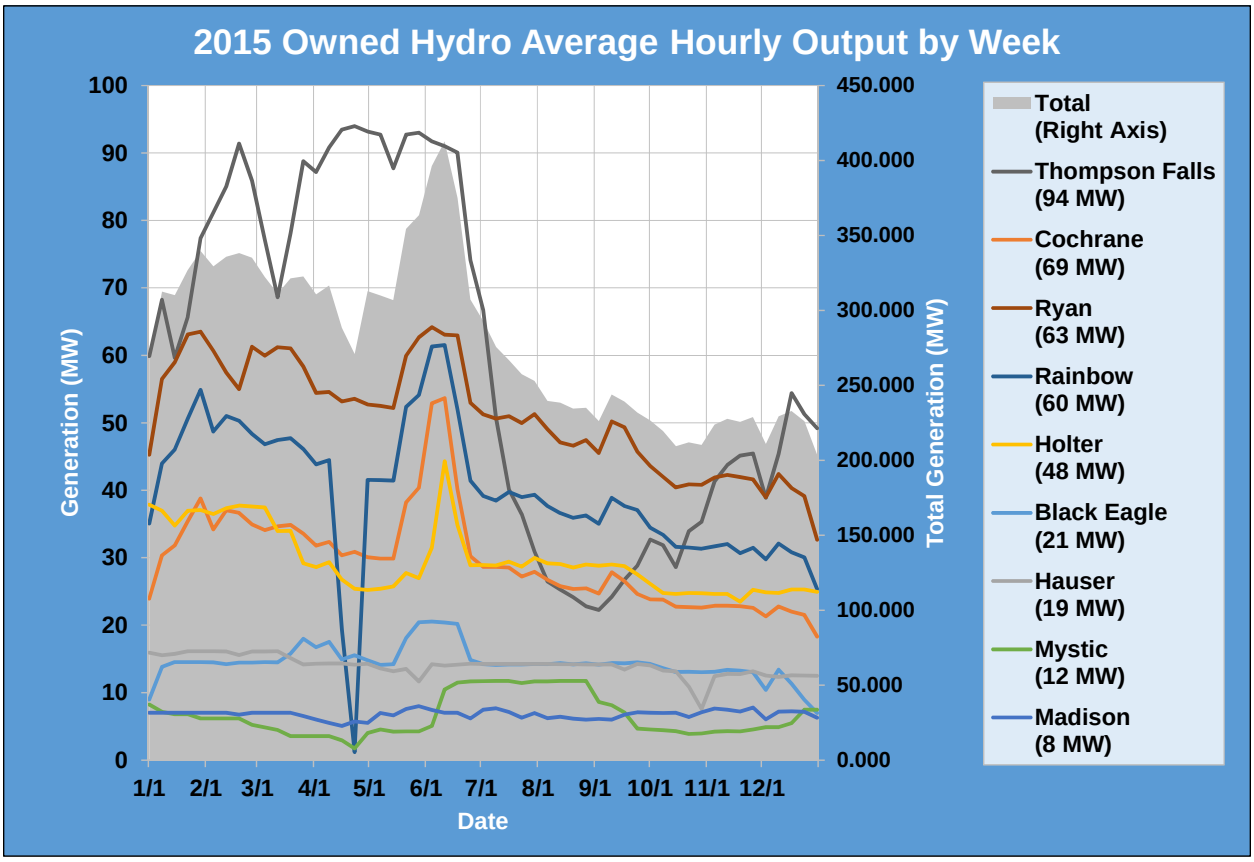
Hydroelectric Operations

With a few exceptions, the hydroelectric system is primarily a run-of-river system, as mentioned above. Inflow behind the dams is directed through the turbine units to produce power or, if conditions require, spilled without generating power. Mystic, Thompson Falls, Black Eagle, Rainbow, Cochrane, and Ryan facilities have traditionally been used to provide spinning reserves. The ability to provide spinning reserves depends upon license restrictions, current flow conditions, reservoir levels, and turbine unit availability. These conditions can change daily.

Mystic has traditionally been used as a peaking operation throughout the year with considerable restrictions in the spring and summer, maximizing generation during high load hours and minimizing generation during low load hours. Mystic's ability to provide

peaking service is dependent upon reservoir elevations and inflows. Conducted on a pre-scheduled, 24-hour cycle, peaking operations are restricted to the same volume of water that would have been available for baseload operations.

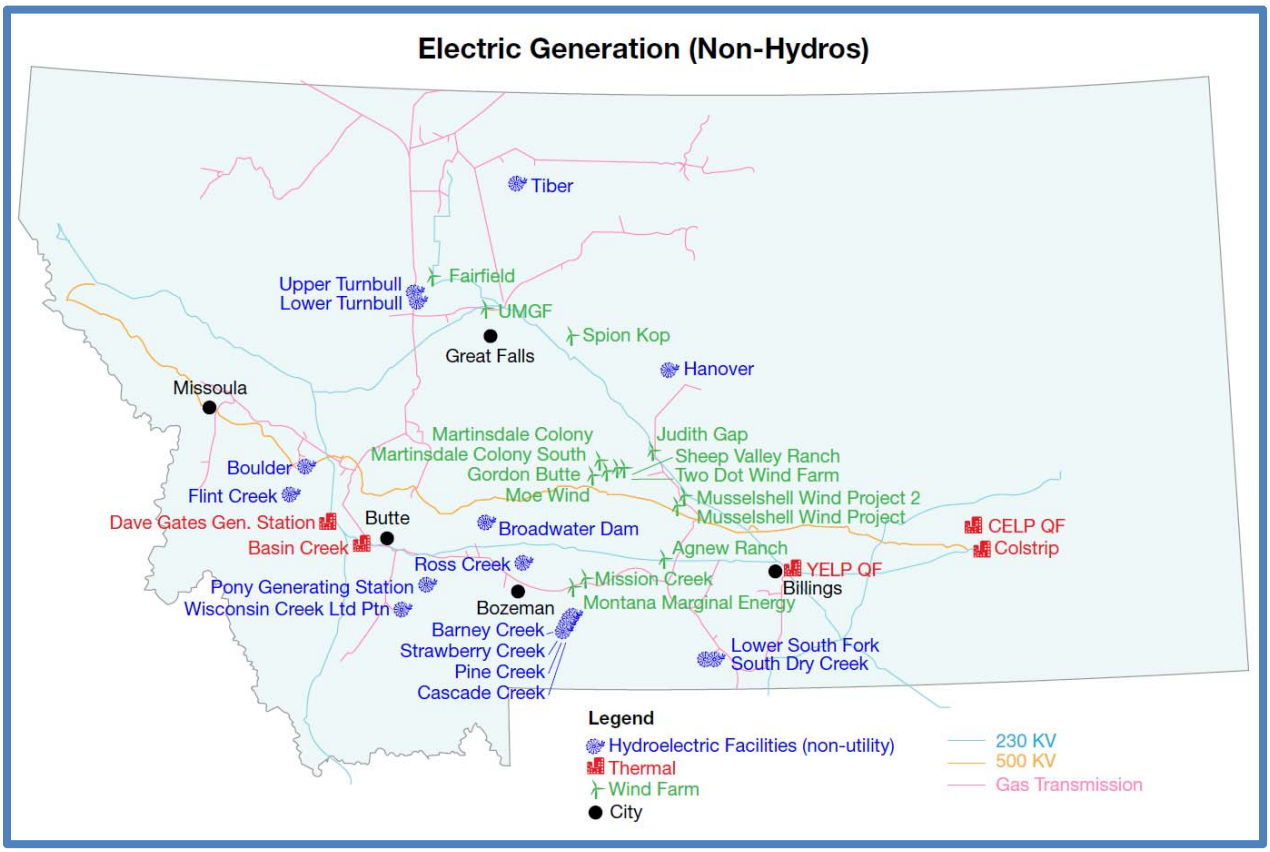
Figure 8-4 2015 Owned Hydro Average Hourly Output by Week



The average hourly output by week (MW) for each of the owned Hydros during 2015 is plotted in Figure 8-4, referenced to the left axis. The total combined output (gray area referenced to the right axis) shows the seasonality of hydroelectric power with the spring run-off months having the most production potential, and summer and fall having lower production. Hydraulic capacity of the hydro system determines the amount and timing of available production capability. The Hydro system has historically operated in the range of roughly 200 to 400 MW. The seasonality of the resource and the run-of-river

characteristics including flow and river elevation are captured in the portfolio modeling. Although the amount of hydroelectric system production changes during the year, it does not have the intermittent power production characteristics of resources such as wind and solar that react very quickly to changes in the weather. As a result, when scheduling output of the Hydros in the hourly, day-ahead, and longer timeframes, there is a high degree of certainty associated with the power delivery schedule.

Figure 8-5 Electric Generation (Non-Hydros)



Thermal Generation Resources

NorthWestern owns or controls the generation of three thermal resources: 30% of Colstrip Unit 4, DGGS, and Basin Creek Equity Partners LLC (tolling agreement). Additionally, NorthWestern purchases energy from two thermal QFs: Colstrip Energy Limited Partnership and Yellowstone Energy Limited Partnership – Billings Generation Inc. These

resources are listed in Table 8-2, and the locations of all thermal and other non-Hydros resources are shown in the map of Figure 8-5 above.

Table 8-2 NorthWestern Thermal Generation

NorthWestern Energy Thermal Resources				
Resource	Nameplate Capacity (MW)	2015 Generation (MWh)	Ownership / Contract Type	Fuel
Colstrip Unit 4	222	1,610,151	Rate-based	Coal
Basin Creek	52	62,770	Tolling PPA	Natural Gas
DGGS (Energy Supply)	7	61,313	Rate-based	Natural Gas
Colstrip Energy Limited Partnership - MT1 (CELP)	35	294,033	Tier II	Waste Coal
Yellowstone Energy Limited Partnership - BGI (YELP)	52	500,087	Tier II	Waste Coke
Total	**368**	**2,528,354**		

Colstrip Unit 4

NorthWestern's ownership interest in CU4 provides our Montana electric customers with low-cost, baseload electricity. Colstrip Steam Electric Station ("CSES") consists of four separate coal-fired generating units ("CU 1, 2, 3, and 4") capable of nearly 2100 MW of net generation. CSES is jointly owned by NorthWestern, Talen Energy LLC ("Talen"), Puget Sound Energy, Portland General Electric, Avista Corp., and PacifiCorp. CU 1&2 are capable of producing 307 MW each, and CU 3&4 are capable of producing 740 MW each. CU 1&2 and CU 3&4 are operated as separate projects under separate operating agreements. Talen is the operator on behalf of all owners of all units at CSES. Table 8-3 below summarizes the ownership of all four Colstrip Units, CU1 - CU4.

Through contractual arrangements with Talen, which owns a 30% share of CU3, NorthWestern and Talen share their respective ownership of the CU 3&4 project equally. Through this arrangement, NorthWestern and Talen act as one 30% owner, each of which has the rights to 15% of the output from both CU 3&4; both owners are also responsible for 15% of the costs for operation, maintenance, and capital improvements. This

arrangement results in reduced risk as the impacts of an outage are spread across both units for NorthWestern.

Table 8-3 Colstrip Generation, Ownership

Colstrip Units 1 - 4 Ownership					
Unit Owners	CU1 (307 MW)	CU2 (307 MW)	CU3 (740 MW)	CU4 (740 MW)	Total Net Capacity (MW)
Puget Sound Energy	50%	50%	25%	25%	677
Talen Energy, LLC	50%	50%	30%	0%	529
Portland General Electric	0%	0%	20%	20%	296
Avista Corp.	0%	0%	15%	15%	222
NorthWestern Energy	0%	0%	0%	30%	222
PacifiCorp	0%	0%	10%	10%	148
Total	**100%**	**100%**	**100%**	**100%**	**2,094**

The operation of the CU 3&4 project is governed by the Colstrip Unit 3&4 Ownership and Operation Agreement ("OOA"). An operating committee, comprised of representatives from each owner, votes to approve operations, maintenance, and capital budgets and operation strategy.

Some key conditions of the OOA are listed below:

- The term of the agreement continues as long as CU 3&4 operate and only concludes when salvage is complete and all requirements of law are met.
- Each owner must be prepared to take, at a minimum, their share of generation necessary to keep the plant on-line (CU 3&4 each require 200 net MW) and must be prepared to provide sufficient fuel to operate at minimum levels. An owner can take less than minimum generation and provide less than minimum fuel so long as other owners requiring operation of the unit(s) in the aggregate are operating the unit(s) at a level high enough to meet the minimum generation required to keep the unit(s) on-line.

- The duties, obligations, and liabilities of the owners are intended to be several and not joint or collective and no owner shall be jointly or severally liable for the acts, omissions, or obligations of any other owner.
- An owner wanting to sell its interest in CU3 or CU4 must first offer to sell to other current owners at fair market value based on current ownership percentage.
- Until such time that ownership is transferred to another party, an owner is obligated to pay for its share of costs to operate & maintain CU 3&4 as well as its share of capital additions.
- There must be 100% owner consensus to shut down CU3 or CU4 either temporarily or permanently.

CSES is located adjacent to the Rosebud coal mine. The Rosebud mine is located on the north end of the Powder River Basin, the largest coal producing region in the United States. At the Rosebud Mine, coal is taken from the Rosebud coal seam of the Fort Union formation. This low-sulfur sub-bituminous coal is supplied to all four units by Western Energy Company, a subsidiary of Westmoreland Coal Company.

CU 3&4 receive coal under a cost-plus contract with Western Energy Company. The current contract will end in 2019 unless amended, restated, or extended. Negotiations are underway to extend the contract term. Coal reserve estimates indicate that sufficient coal exists to operate CSES for 25+ years.

Typical Rosebud coal quality is 25% moisture, 10% ash, and less than 1% sulfur. The coal has a heating value of approximately 8,500 Btu/lb. CU 3&4 collectively average 6.3 million tons of coal consumption per year.

The coal is mined from areas west of the plants and is crushed into smaller chunks (2-3 inch) and then transported via conveyor (about 4 miles) where it is stored in bunkers and piles at the plant site. Coal is transferred into the plant via conveyor into silos located within the plants.

Planned maintenance outages are normally scheduled for spring time to coincide with elevated hydro conditions in the Northwest that typically produce surplus power conditions, favorable market prices, and the opportunity to make economy purchases. CU 3&4 are each on a separate 3-year planned outage schedule where every third year the units typically do not experience a planned outage and are available to operate.

CU4 historically has been used to provide baseload power, with generation being reduced during periods where more economical energy sources are available. Typically, CU4 capacity is scheduled by NorthWestern to meet load on a seasonal-to-day-ahead basis. However, updated system generation and load levels, weather conditions, and market prices are reviewed hourly by the real-time desk, and adjustments from the previous hour's generation are made as necessary. During periods of low electricity market prices, CU4's output is sometimes reduced so that lower-cost market purchases can be made as a benefit to customers. Generation is also reduced when load can be satisfied without full output from CU4. This often occurs during the spring when hydro output is higher due to increased snowmelt and load is lower due to milder weather conditions.

Exportation of excess generation to other markets is generally not cost effective due to the added transmission costs for delivery which include energy losses. Furthermore, other Colstrip owners may experience similar conditions such as low load and excess generation due to increased hydro production and therefore have no interest in purchasing NorthWestern's excess generation. In these cases, the output is reduced until conditions

change significantly enough such that increasing production is economical. This "economic de-rate" of CU4 generation is subject to limitations covered in the OOA outlined above. Alternately, if electricity market prices are high enough, then excess generation is sold on an hour-by-hour determination and the profits are returned to customers in the form of revenue credits, which helps reduce overall supply costs.

NorthWestern, consistent with the terms of the OOA, has the right to make adjustments to the generation output. Generally, when requests are made to change generation levels, CU 3 & 4 generation changes at a ramp rate of +/- 8 MW per minute per unit with NorthWestern's share being 15% of 8 MW or 1.2 MW per minute per unit.

Colstrip generation has historically resulted in Montana being a net exporter of power because the amount of generating capability greatly exceeded native load. Other Northwest utilities and large customers in Montana who purchase their power from non-utility sources have been able to avoid transmission costs associated with importing power from other states because of Colstrip generation.

The Colstrip resource has characteristics that provide many positive benefits to NorthWestern's supply portfolio and the customers we serve:

- Baseload power – one of only two NorthWestern baseload assets;
- Load-serving capacity and a reliable source of capacity at times of peak demand;
- Reliability and price stability;
- Component of portfolio optimization plan;
- Complements baseload hydro: reduced production during high hydro and low load conditions; and
- Stable fuel pricing; low price volatility.

Dave Gates Generating Station

DGGS is a NorthWestern-owned and operated natural gas-fired plant located near Anaconda, Montana that has traditionally provided regulation service for the NorthWestern BA. Market operations historically scheduled 7 MW of generation each hour into the portfolio to account for the minimum level of output from the plant. DGGS is comprised of three 50-MW generation units powered by six Pratt & Whitney FT8 simple-cycle combustion turbines ("SCCT"). NorthWestern typically operates two units at a time, reserving the third unit to be utilized during maintenance outages or during periods of elevated regulation demand. The DGGS facility was constructed to physically accommodate a fourth unit.

DGGS has the ability to quickly ramp (30 MW/minute per unit), providing regulation through automatic generation control and electronic signals from the NorthWestern Operations Center in Butte. The control signal, a number representing the needed increase or decrease in generation to keep system load and generation in balance, is generated in sub-minutely time increments based on these signals. Typically, the facility generates between 7 MW and 100 MW. Regulation service is a capacity-based product that creates energy as a byproduct of the balancing service it performs. DGGS produced approximately 428,000 MWh of energy in 2015.

Basin Creek Equity Partners, LLC

Basin Creek is a 52-MW natural gas plant located in Butte, Montana. It is composed of nine 5.7 MW Caterpillar 16GCM34 reciprocating internal combustion engines ("IC") that are designed for flexible operation and can be started and ramped to full capacity in less than ten minutes. Basin Creek has been used historically for serving load and peak demand, and to provide non-spinning reserves. With a heat rate near 9,000 Btu/kWh, it is often dispatched in times of high market prices when the variable cost to generate is lower than the market price for electricity. NorthWestern staff at the Market Operations Real-Time

Desk schedule and dispatch energy and reserves from this resource on a day-ahead and hourly basis depending on needs and market conditions. Additionally, energy and non-spinning reserves may be sold to the market on an hourly basis when economical to do so. Basin Creek produced approximately 63,000 MWh in 2015 and has been used to supply non-spinning reserves from up to three units to meet Energy Supply's transmission reserve requirements. NorthWestern has operational control of this facility under a tolling agreement that will expire in July 2026, with an option to extend the agreement for another five years.

Thermal QF Resources

NorthWestern is contractually obligated to purchase energy from two thermal QF resources: Yellowstone Energy Limited Partnership ("YELP") and Colstrip Energy Limited Partnership ("CELP"). YELP is a 52-MW facility using waste petroleum coke as its primary fuel source. CELP is a 35-MW facility using waste coal as its primary fuel source. Both of these facilities' installed capacities are greater than the contracted capacity. In the case of YELP the installed capacity is 61 MW and for CELP the installed capacity is 41.5 MW for an aggregated total of 102.5 MW. The CELP contract ends June 30, 2024 and the Yelp contract ends December 31, 2028. For purposes of modeling in this plan, it is not assumed that either of these contracts will be renewed after contract expiration.

Wind Generation

NorthWestern receives the power generated from 237 MW of wind projects delivering energy to the supply portfolio. The 40-MW Spion Kop Wind Project is the only company-owned project and the remaining 197 MW are under purchase power contracts with third parties. Table 8-4 is a listing of all wind projects currently delivering energy to NorthWestern. The Greenfield project (25 MW) is not listed, but is expected to be built and enter commercial production during 2016, raising the total wind installed production capability to 262 MW.

Table 8-4 Renewable Wind Resources

Renewable Wind Resources					
Resource	Nameplate Capacity (kW)	2015 Generation (MWh)	Ownership / Contract Type	Renewable Energy Credits	Historical Capacity Factor
Spion Kop	40,000	127,662	Rate-based	REC	40%
Musselshell	10,000	24,055	QF-1	REC	30%
Musselshell Two	10,000	28,257	QF-1	REC	35%
Fairfield Wind	10,000	31,605	QF-1	REC	38%
Two Dot Wind Farm	9,720	29,845	QF-1	REC	38%
Gordon Butte	9,600	36,651	QF-1	CREP	49%
United Materials of Great Falls Inc.	9,000	3,460	QF-1	N/A	4%
Two Dot Wind LLC (Martinsdale Colony South)	2,000	759	QF-1	N/A	8%
Two Dot Wind LLC (Martinsdale Colony)	750	1,235	QF-1	N/A	20%
Two Dot Wind LLC (Sheep Valley Ranch)	455	611	QF-1	N/A	19%
Two Dot Wind LLC (Moe Wind)	450	620	QF-1	N/A	15%
Two Dot Wind Energy LLC (Montana Marginal Energy)	195	0	QF-1	N/A	0%
Mr. Thomas G. Agnew (Agnew Ranch)	65	21	QF-1	N/A	1%
Two Dot Wind Energy LLC (Mission Creek)	65	21	QF-1	N/A	1%
Judith Gap	135,000	455,389	PPA	REC	40%
Total	**237,300**	**740,191**			

When considered in the context of NorthWestern's load-serving obligation and the other resources that comprise the supply portfolio, the scale of wind power, much of it required purchases from QFs, is very large. NorthWestern's retail load averages approximately 750 MW for all hours over the calendar year with a minimum load of about 450 MW. The current installed wind capacity represents just over one-third of our average load and about 60% of minimum load. When the intermittency of wind power is taken into account, it is clear that this resource has a significant impact on the management of the supply portfolio and poses challenges unlike other resources such as thermal and hydro. Also, NorthWestern has limited real time operating information on QF wind projects.

Figure 8-6 Net Wind Generation Hourly Output – Daily Examples

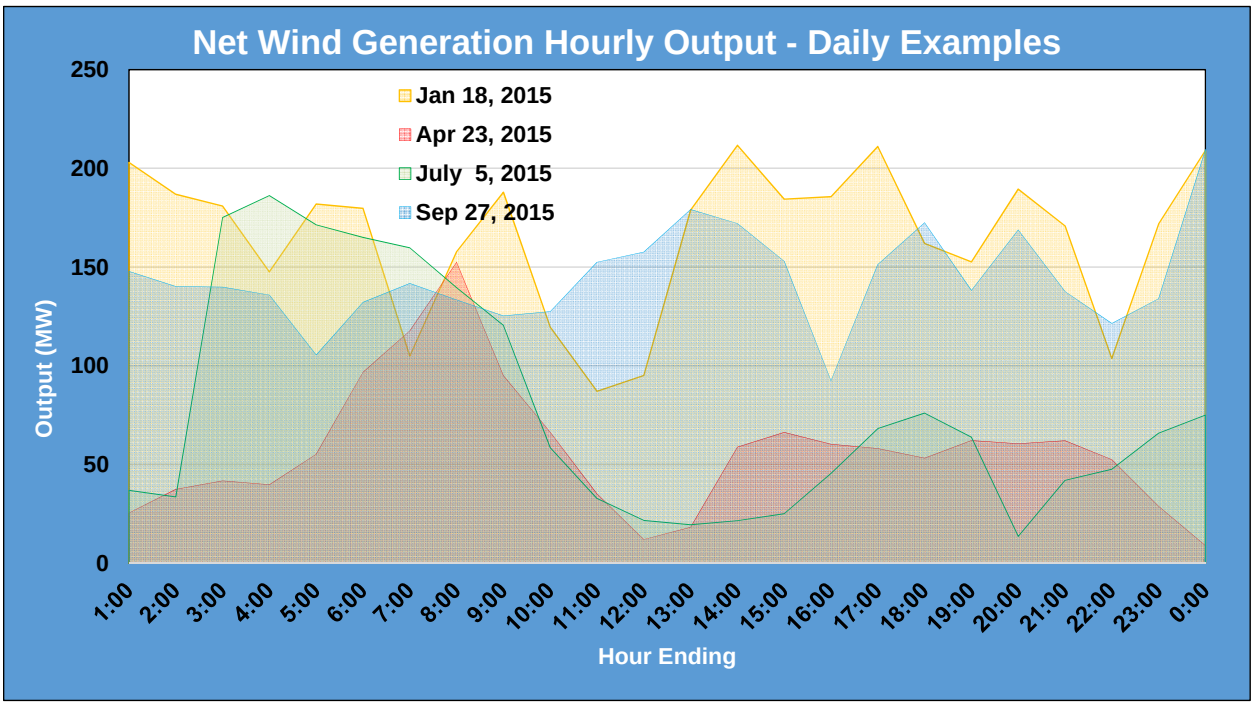


Figure 8-6 shows examples of the variability of hourly wind output of the current wind fleet on four different days in 2015. One aspect of wind that is evident in this figure is the magnitude of hourly change in output. For example, on July 5th (green), the net wind output changes from 34 MW in hour ending 2:00am to 175 MW in hour ending 3:00am, only to drop back to near 20 MW by noon. These drastic fluctuations can also happen many times in a day, as shown on January 18th (yellow) when 14 separate hourly changes exceeded 30 MW. Planning and scheduling for those periods using weather and wind forecasts includes uncertainty. Lastly, Figure 8-6 illustrates days when wind generation was changing throughout the day. NorthWestern also experiences days when wind has a high average daily capacity factor, but more days when wind has a low average daily capacity factor – 27 days greater than 80% and 130 days less than 20%. Although not depicted on Figure 8-6, wind power production also varies substantially within the hourly timeframe with equivalent levels of intermittency.

Small Hydroelectric Generation

NorthWestern is currently purchasing energy from 13 small QF and two small PPA hydroelectric projects with total nameplate capacities of 16.423 and 20.5 MW, respectively. Table 8-5 lists these small hydro facilities which include three CREP-qualifying resources.

Table 8-5 Small Hydro Resources

Small Hydro Resources					
Resource	Nameplate Capacity (kW)	2015 Generation (MWh)	Ownership / Contract Type	Renewable Energy Credits	Historical Capacity Factor
Turnbull	13,000	25,124	PPA	CREP	9%
Tiber	7,500	21,953	PPA	N/A	8%
State of MT DNRC (Broadwater Dam)	10,000	47,296	Tier II	N/A	59%
Hydrodynamics Inc - South Dry Creek	1,200	9,276	Tier II	N/A	74%
Ross Creek Hydro LLC	450	2,274	Tier II	N/A	62%
Estate of Howard Carter (Pine Creek)	300	1,307	Tier II	N/A	29%
Hydrodynamics Inc. (Strawberry Creek)	190	1,700	Tier II	N/A	91%
James Walker Sievers (Cascade Creek)	68	436	Tier II	N/A	65%
James Walker Sievers (Barney Creek)	60	109	Tier II	N/A	27%
Flint Creek Hydroelectric, LLC	2,000	10,165	QF-1	CREP	68%
Wisconsin Creek Limited Partnership	550	720	QF-1	N/A	18%
Boulder Hydro Limited Partnership	510	1,484	QF-1	N/A	38%
Lower South Fork, LLC	455	1,292	QF-1	CREP	20%
Gerald Ohs (Pony Generating Station)	400	1,384	QF-1	N/A	39%
Donald Fred Jenni (Hanover Hydro)	240	252	QF-1	N/A	12%
Total	**36,923**	**124,772**			

Qualifying Facility Power Purchase Agreements

NorthWestern's QF contracts consist of two main groups: older Tier II QF contracts under Final Order Nos. 5986w and 6353c under combined Docket Nos. D97.7.90 and D2001.1.5 and newer or renewal of older QF contracts executed under the QF-1 Tariff. QF wind resources are listed in Table 8-4; QF hydro resources are listed in Table 8-5, and QF thermal resources are shown in Table 8-2 above. In total, NorthWestern is currently purchasing approximately 166 MW of QF resources from 28 projects with annual production of about 900 MWh. At the time of preparing this Plan, NorthWestern had

executed contracts for 47 MW of new QF-1 projects since November 2013 which have not been included in this discussion.

Like all QF contracts, the Tier II QF contracts cannot be dispatched by NorthWestern to follow load or to provide reserves. For planning purposes, the energy and capacity of these contracts are based upon the historical operating performance of the facilities. NorthWestern has made no assumptions in this planning cycle concerning the longevity of QF projects beyond the term of the current agreements. This means NorthWestern must plan for resources to replace them.

NorthWestern recently signed two QF contracts for future wind and hydro resources totaling 33 MW and five QF contracts for future solar PV resources totaling 14 MW. A summary of these facilities is given in Table 8-6. At the time of writing this plan, six solar PV generation developers had expressed an interest in negotiating additional QF contracts. Five of these developers have submitted requests for multiple locations, and in some cases, a definitive number of locations has not yet been specified.

Table 8-6 Future Renewable Resources

Future Renewable Resources						
Resource	Nameplate Capacity (MW)	Contract COD Date	Contract Expiration Date	Ownership / Contract Type	Renewable Energy Credits	Fuel
Greenfield Wind, LLC	25.0	2016	2041	QF-1	TBD	Wind
Sleeping Giant Hydro	8.0	2016	2042	QF-1	TBD	Hydro
Green Meadow Solar LLC	3.0	2016	2041	QF-1	TBD	Solar
Deer Creek	3.0	2016	2041	QF-1	TBD	Solar
Ragen Ranch	3.0	2016	2041	QF-1	TBD	Solar
South Mills	3.0	2016	2041	QF-1	TBD	Solar
River Bend Solar LLC	2.0	2016	2041	QF-1	TBD	Solar
Total	**47.0**					

TBD – To Be Determined by Montana Public Service Commission

Renewable Portfolio Standards

Under Montana's Renewable Power Production and Rural Economic Development Act, NorthWestern is subject to § 69-3-2004, MCA, Renewable Resource Standard, generally known as the Renewable Portfolio Standard ("RPS"). NorthWestern is required to purchase a portion of the electricity used to serve retail loads from eligible renewable resources built after January 1, 2005. For 2015 and subsequent years, the RPS requirement is set at 15% of the previous year's retail sales. Unused renewable energy credits ("RECs") may be carried forward or "banked" for up to two years. NorthWestern's RPS-eligible resources are listed at the bottom of Table 8-7 below and denoted as "REC" to identify them as eligible renewables as determined by the Commission.

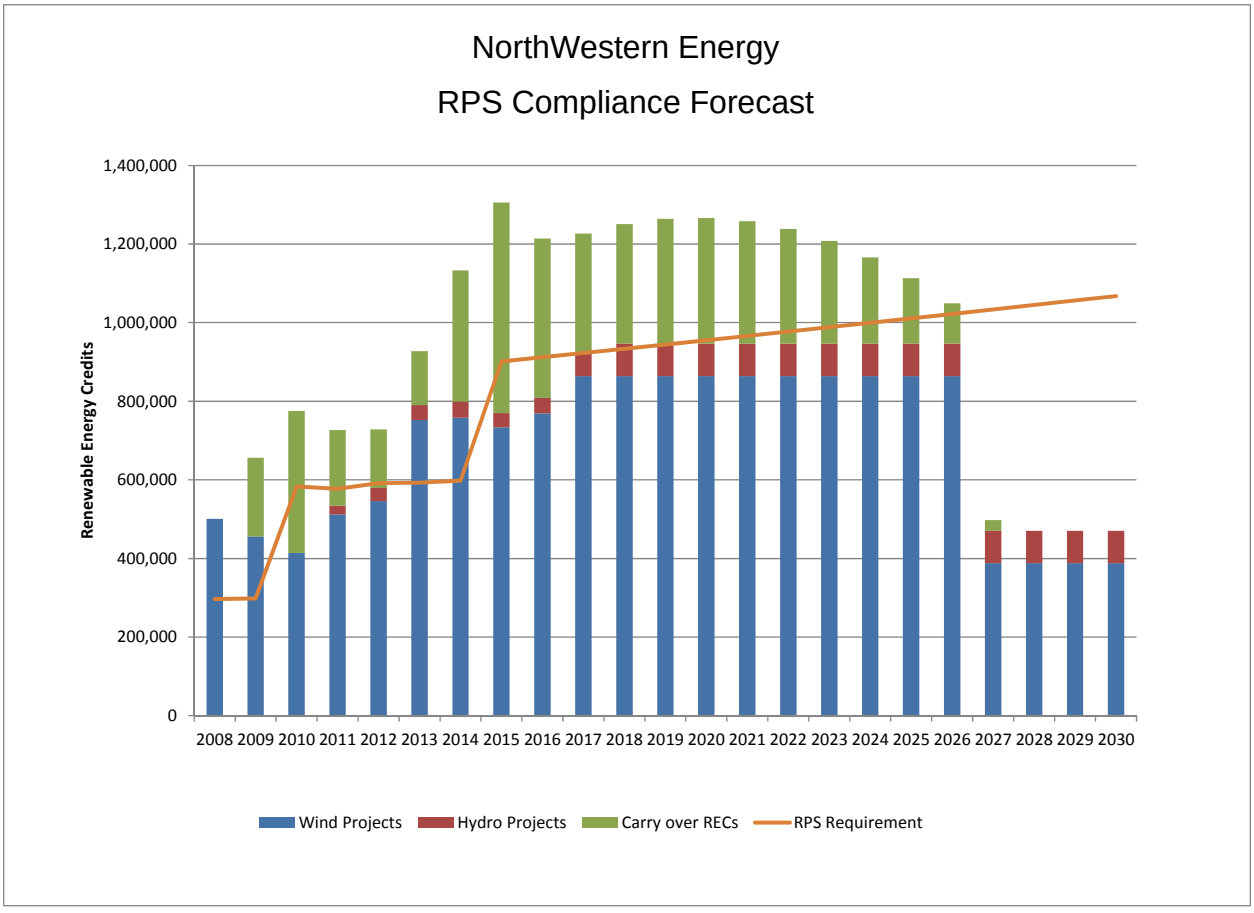
Table 8-7 RPS Eligible Renewable Resources

Eligible Renewable Resources					
Resource	**Nameplate Capacity (MW)**	**2015 Generation (MWh)**	**Ownership / Contract Type**	**Renewable Energy Credits**	**Fuel**
Turnbull	13.000	25,124	PPA	CREP	Hydro
Flint Creek Hydroelectric, LLC	2.000	10,165	QF-1	CREP	Hydro
Lower South Fork, LLC	0.455	1,292	QF-1	CREP	Hydro
Gordon Butte	9.600	36,651	QF-1	CREP	Wind
Judith Gap	135.000	455,389	PPA	REC	Wind
Spion Kop	40.000	127,662	Rate-based	REC	Wind
Musselshell	10.000	24,055	QF-1	REC	Wind
Musselshell Two	10.000	28,257	QF-1	REC	Wind
Fairfield Wind	10.000	31,605	QF-1	REC	Wind
Two Dot Wind Farm	9.720	29,845	QF-1	REC	Wind
Total	**239.775**	**770,045**			

NorthWestern's historical and forecasted RPS compliance is shown in Figure 8-7. The orange line depicts NorthWestern's historic actual and estimated RPS requirement for each compliance year and the blue and red bars show estimated wind and hydro RECs. The

green bars show the REC amount carried over from the previous compliance year. This forecast only depicts current RPS resources. NorthWestern is projected to meet its RPS requirement through 2026 with currently contracted and owned eligible renewable resources. If contracted resources including Greenfield wind and Sleeping Giant hydroelectric are delayed or do not achieve commercial operation, future compliance with renewable requirements will change significantly. Without these resources, NorthWestern will only meet its RPS obligation through 2018.

Figure 8-7 Forecast RPS Compliance



CREP Resources

Since 2012, the RPS law has also included a Community Renewable Energy Project ("CREP") requirement. CREPs are locally owned eligible renewable resources that have a generation capacity of up to 25 MW (15 MW for small hydroelectric facilities). For 2015, RPS requires Montana public utilities to make CREP-eligible purchases of RECs and electricity output that total at least 75 MW of nameplate capacity (previously 50 MW for the years 2012-2014). The vast majority of the CREP requirement is borne by NorthWestern. Based on 2014 electric energy retail sales, NorthWestern's share of the 2015 CREP requirement is estimated to be around 65.4 MW. NorthWestern currently has four contracts for CREP-eligible resources totaling about 25 MW of capacity and is deficient in meeting its current CREP obligation.

Distributed Energy Resources

Customer-driven Distributed Energy Resources ("DER") development is subsidized by funding mechanisms such as the Universal System Benefits Charge and through the net metering tariffs that allow behind-the-meter generation.[2] Projecting additional DER by project resource growth based on historical values is difficult because it relies, at least in part, on customer behavior and investment. During the period 1999-2014, approximately 5 MW of solar PV has been added and two small-scale hydroelectric projects totaling 7.5 kW have been added. For purposes of modeling future growth in DER, NorthWestern assumes that it all will come from net-metered rooftop solar PV.

Figure 8-8 shows the forecast growth in net metering on NorthWestern's system. Also shown, for informational purposes only, is what the growth in net metering would look like when escalated by the NWPCC's low and high growth rates for rooftop solar PV. Forecast growth in net metering is included in all modeling scenarios.

[2] Installations up to 50 kW.

Figure 8-8 Forecast Growth in Net Metering