

Northwest Regional Forecast of Power Loads and Resources

2014 through 2023

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PNWCC

April 2013

Special thanks to PNUCC System Planning Committee members and utility staff that provided us with this information.

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Table of Contents

Executive Summary	1
Overview	7
Planning Area	7
Northwest Region Requirements and Resources	8
Annual Energy – <i>Table 1</i>	8
2013-14 Monthly Energy – <i>Table 2</i>	9
Winter Peak – <i>Table 3</i>	10
Summer Peak – <i>Table 4</i>	11
Northwest New and Existing Resources	12
Recently Acquired Resources – <i>Table 5</i>	13
Committed New Supply – <i>Table 6a</i>	14
Demand Side Management Programs – <i>Table 6b</i>	15
Planned Resources – <i>Table 7</i>	16
Northwest Generating Resources – <i>Table 8</i>	18
Report Procedures	31
Load Estimates	31
Demand Side Management	32
Generating Resources	32
Contracts	35
Utilities Included in Northwest Regional Forecast – <i>Table 9</i>	36
Definitions	37

Executive Summary

A Unique Perspective

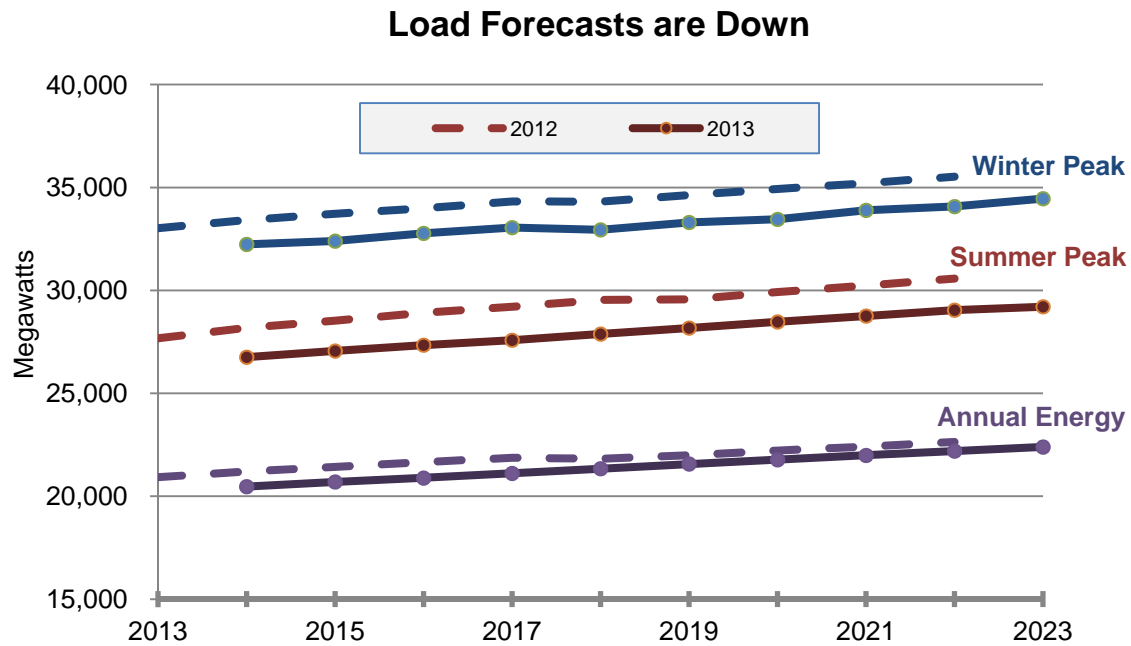
PNUCC's *Northwest Regional Forecast (Forecast)* offers a unique view of the Pacific Northwest's loads and resources. Unlike other regional forecasts, this report incorporates retail utilities' in-house data on their loads, the resources they have in the stack to meet them and their demand-side management efforts.

The utilities range from small full-requirements customers of Bonneville Power Administration (BPA) to large multistate utilities that own and operate large-scale generating plants. All utilities base their resource plans on metrics and criteria that fit their unique circumstances. Utilities plan for their service territories and focus on conditions and economic realities that affect their ability to provide reliable and affordable service directly to customers. As the last stop in the chain of responsibility for delivering electricity, they have a distinct lens for viewing loads and resources.

The *Forecast* pulls utilities' information into a regional framework that considers normal weather conditions, low water supply for fueling the hydro system, expected performance of other generating resources, a planning margin for assessing peak needs and no dependence on near-term power markets. This gives a sense of future needs based on utility provided data. Year after year the same criterion is applied to the utilities' information to annually assess the need for power. This provides us a sense of how future load and resource expectations are changing over time.

Forecasts Down for the Count

Load forecasts bounce around from year to year. No surprise. But for 2014 to 2023, the report shows load forecasts are down and remaining so compared with projections a year ago. The energy forecast starts 700 average megawatts lower than last year, and for the 2014 summer and winter peak, the forecast is lower by more than 1,200 megawatts.



Anecdotal evidence suggests that loads lost during the severe economic downturn five years ago are not rebounding, and the latest utility forecasts confirm this load loss. While it isn't perfectly clear what is behind this development, the utilities' forecasts track projections for employment over the next 10 years, as well as other economic indicators.

Although demand has decreased utilities still project that loads will grow. The annual energy and summer peak forecasts are projected to grow at about one percent per year. Winter growth has dampened to about 0.75 percent a year (an almost 600 MW drop in expected growth over 10 years). The load growth in the report is what utilities forecast after they factor in savings from demand-side management efforts, such as energy efficiency and market transformation programs.

Shifting Focus in Demand-Side Management

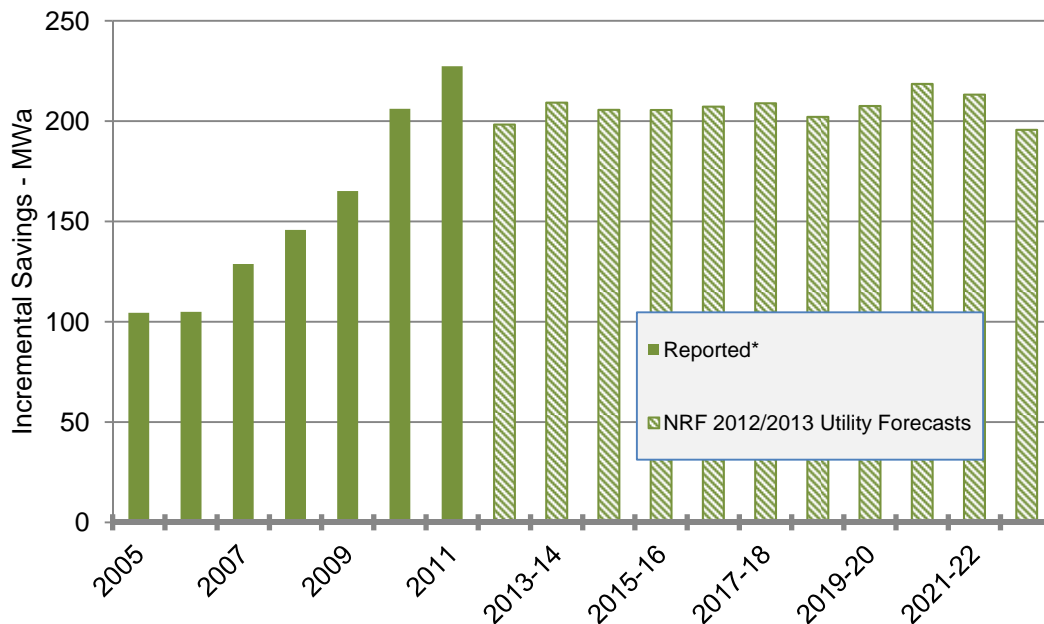
The 2013 *Forecast* suggests there may be a paradigm shift in the offing with demand-side management. For over three decades utilities have been fully invested in efforts to manage demand. These efforts include residential consumers' energy efficiency programs and specialized efforts for commercial and industrial customers. The region overall has chalked up impressive achievements.

Along with saving kilowatt hours, demand-side management may be another tool to use in meeting peak demand. Utilities are reporting new efforts, including pilot programs to meet peak needs through demand response, peak-shaving programs and making arrangements with specific customers to alter service for as little as an hour or a few days. The goal is to have greater ability to meet demand in a peaking situation.

Utilities are also honing in on how energy efficiency programs can affect load shape and evaluating how to design and assure that demand-side programs are adding rather than subtracting from system flexibility.

The *Forecast* shows utilities expect to continue a relatively high rate of energy savings through demand-side management efforts over the next decade, with a projection of around 200 average megawatts per year.

Energy Savings Forecasted to Continue

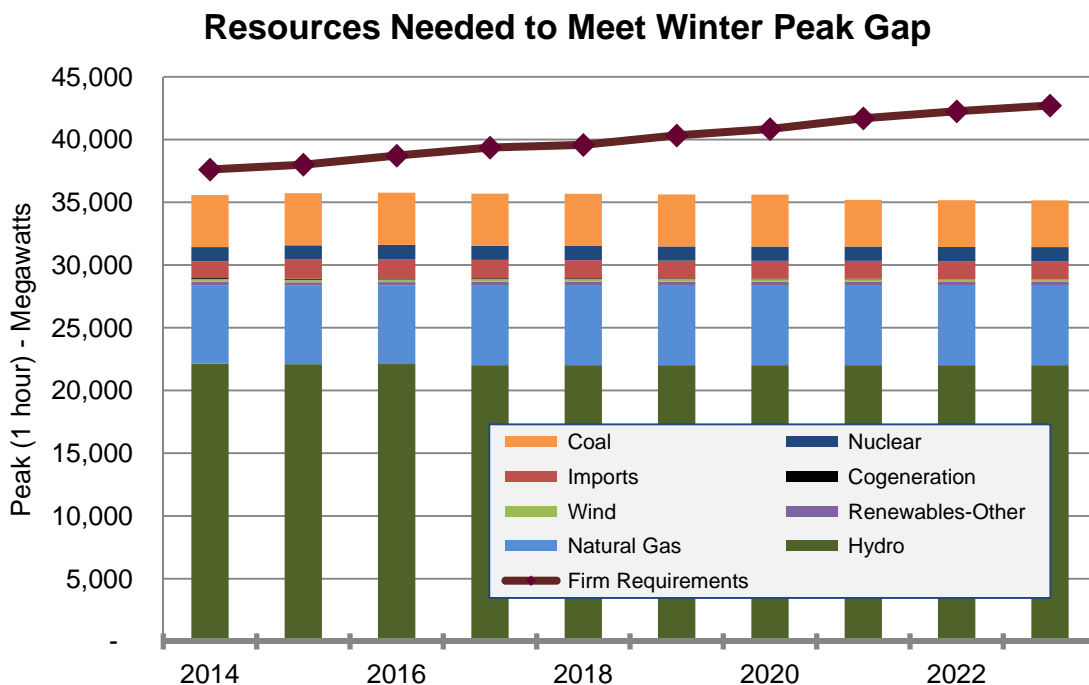


* Northwest Power & Conservation Council Data. Savings from utility programs only. Does not include market transformation savings reported by Northwest Energy Efficiency Alliance.

Winter Peak Need gets the Attention

While the overall drop in the 2014 to 2023 load projections has closed the gap (between winter peak loads and winter peak resources) to about half of what it was in 2012, peak resources over the next 10 years are still short in the peak winter period.

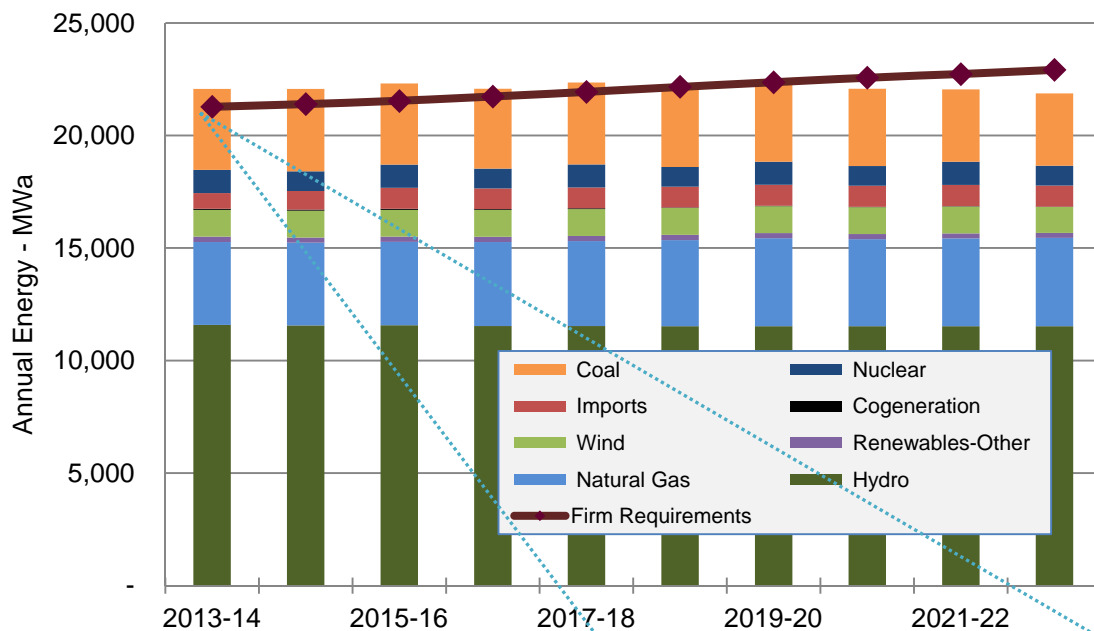
According to the *Forecast*, and shown in the chart below, the forecast period starts out with a winter peak deficit, and the gap between peak loads and peak resources grows to 3,000 megawatts by 2016. The need continues to grow throughout the forecast horizon, which assumes that utilities do not act to fill the gap.



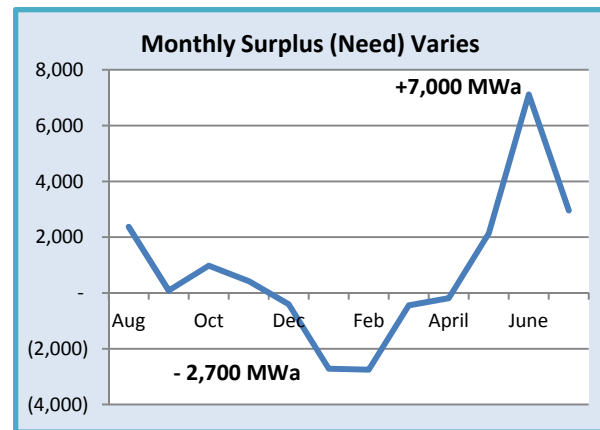
The summer peak picture is slightly less urgent than the winter peak snapshot. The summer peak power supply is sufficient to meet the peak demand until the year 2017. At that point, demand is projected to grow, creating a gap that is about half the magnitude of the winter gap by 2023.

It's a different story for resources to meet annual energy demand. Overall, the *Forecast* shows the region to be in energy load-resource balance on an annual basis. Loads, reflecting savings from demand-side efforts, are still forecast to grow, although at a bit slower pace. Additionally, resources are sufficient to meet annual energy projections for several years as seen in the following chart.

Resources Stack Up for Annual Energy Need



However, a quick examination of the monthly energy picture underscores the need to look beyond the annual energy metric to better appreciate the complexity of the Northwest power system. The monthly comparison of loads and resources in 2013-2014 reveals significant swings in monthly need. The annual surplus is almost 800 MWa, yet the monthly pictures ranges from -2,700 MWa (need) to 7,000 MWa surplus.



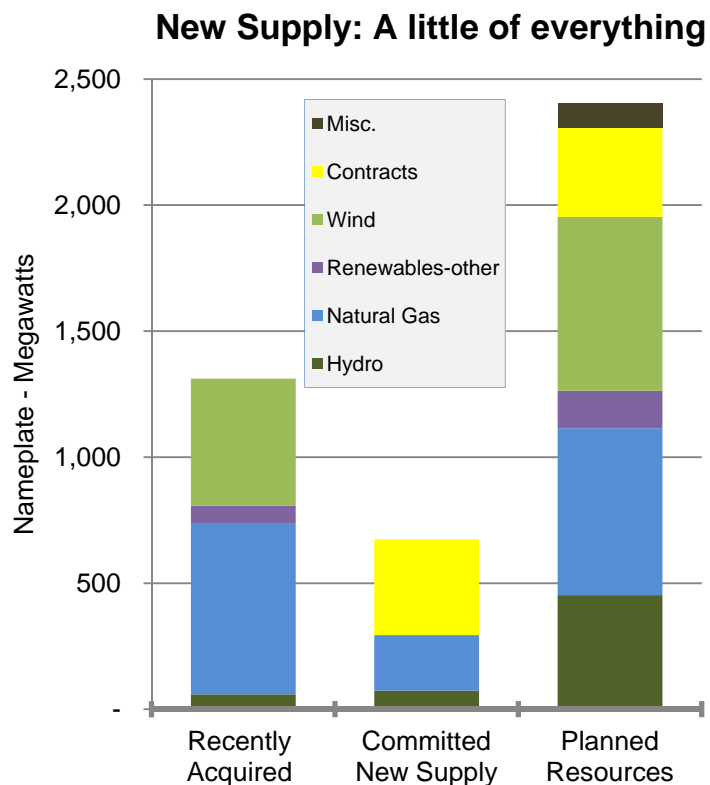
New Supply Looks Different

Utilities are looking to new demand-side programs to help meet peak loads. New generating resources will also be needed to assure the power system is reliable and that there is the flexibility to address the operating characteristics of variable resources like wind and solar. The new and future resources this year tell an interesting story. With a forecast of lower loads over the next decade, utilities have less aggressive, more complex resource plans. Utilities acquired more than 1,300 MW of supply this past year. Almost 700 MW was from natural gas-fired generation that will be used for meeting peak needs, as well as providing some annual energy.

An additional 700 MW of resources are committed to serve Northwest consumers and are being accounted for in the assessment of needs. These resources are composed of contracts, one natural gas project and a few small renewable projects.

Yet another 2,400 MW of nameplate capacity are in the planned resources pool. This pool is significantly smaller than in recent past reports. Utilities are tailoring acquisitions to meet specific needs, such as peaking capacity and system flexibility. For example, the planned resources pool contains an additional 650 megawatts of natural gas-fired generation. Utilities are also solidifying agreements to purchase power from independent power producers and using contract purchases to bridge seasonal gaps between loads and resources.

The *Forecast* also indicates that the amount of wind in future resource plans is smaller than it was a few years ago. Over the past seven years wind has been front and center in the stack of planned acquisitions. It has been the technology of choice for meeting renewable power mandates. While the planned nameplate capacity of wind still out paces other resources, other renewables (including hydro improvements, biomass and geothermal) are playing a more prominent role in the *2013 Forecast*, and natural gas-fired power projects continue to be a staple in utilities' plans to meet future base load and peak needs.



Overview

Each year the *Northwest Regional Forecast* compiles utilities' 10-year projections of electric loads and resources which provide information about the region's need to acquire new power supply. The *Forecast* is a comprehensive look at the capability of existing and new electric generation resources, long-term firm contracts, expected savings from demand side management programs and other components of electric demand for the Northwest.

This report presents estimates of annual average energy, seasonal energy and winter and summer peak capability in Tables 1 through 4 of the *Northwest Region Requirements and Resources* section. These metrics provide a multi-dimensional look at the Northwest's need for power and underscore the growing complexity of the power system.

Northwest generating resources are shown by resource type. Existing resources include those resources listed in Tables 5, 6a and 8. Table 5, *Recently Acquired Resources*, highlights projects and supply that became available most recently. And Table 6a, *Committed New Supply*, lists those generating projects where construction has started, as well as contractual arrangements that have been made for providing power at a future time. Table 8, *Northwest Generating Resources*, is a comprehensive list of generating resources that make up the electric power supply for the Pacific Northwest. These resources are utility-owned, utility contracted and owned by independent power producers.

In addition, utilities have demand side management programs in place to reduce the need for generating resources. Table 6b, *Demand Side Management Programs*, provides a snapshot of utilities expected savings from these programs for the next ten years. Table 7, *Planned Resources*, is a compilation of what utilities have reported in their individual integrated resource plans to meet future need.

Planning Area

The Northwest Regional Planning Area is the area defined by the Pacific Northwest Electric Power Planning and Conservation Act. It includes: the states of Oregon, Washington and Idaho; Montana west of the Continental Divide; portions of Nevada, Utah, and Wyoming that lie within the Columbia River drainage basin; and any rural electric cooperative customer not in the geographic area described above, but served by BPA on the effective date of the Act.



Northwest Region Requirements and Resources

Table 1 Northwest Region Requirements and Resources – Annual Energy

This table shows the sum of the individual utilities' requirements and resources for each of the next 10 years. Expected firm load and exports make up the total firm regional requirements.

Average Megawatts	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Firm Requirements										
Load ^{1/}	20,471	20,698	20,887	21,115	21,343	21,573	21,776	21,987	22,199	22,395
Exports	<u>801</u>	<u>694</u>	<u>644</u>	<u>609</u>	<u>594</u>	<u>589</u>	<u>584</u>	<u>579</u>	<u>527</u>	<u>523</u>
Total	21,271	21,392	21,531	21,724	21,937	22,162	22,360	22,566	22,726	22,917
Firm Resources										
Hydro	11,579	11,563	11,571	11,530	11,530	11,526	11,526	11,526	11,526	11,526
Small Thermal & Misc.	-	-	-	-	-	-	-	-	-	-
Natural Gas	3,686	3,671	3,703	3,735	3,776	3,825	3,907	3,864	3,900	3,923
Renewables-Other	242	231	230	234	232	232	233	231	225	224
Wind	1,190	1,193	1,193	1,192	1,193	1,193	1,192	1,192	1,192	1,145
Cogeneration	48	48	48	35	33	20	17	17	17	17
Imports	699	826	930	921	922	927	931	937	942	942
Nuclear	1,030	878	1,030	878	1,030	878	1,030	878	1,030	878
Coal	<u>3,593</u>	<u>3,657</u>	<u>3,604</u>	<u>3,547</u>	<u>3,638</u>	<u>3,630</u>	<u>3,608</u>	<u>3,430</u>	<u>3,216</u>	<u>3,213</u>
Total	22,066	22,066	22,308	22,072	22,354	22,231	22,445	22,074	22,048	21,868
Surplus (Need)	795	674	777	348	417	69	84	(492)	(678)	(1,049)

^{1/} Loads net of demand-side management

Table 2 Northwest Region Requirements and Resources – 2013-14 Monthly Energy

This table shows the sum of individual utilities' requirements and resources for monthly energy values for the 2013-14 operating year. Expected firm load and exports make up the total firm regional requirements.

Average Megawatts	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July
Firm Requirements												
Load ^{1/}	19,861	18,635	18,682	20,858	23,395	23,229	22,071	20,471	19,450	18,949	19,430	20,640
Exports	<u>1,238</u>	<u>1,016</u>	<u>906</u>	<u>623</u>	<u>658</u>	<u>657</u>	<u>773</u>	<u>769</u>	<u>631</u>	<u>660</u>	<u>750</u>	<u>925</u>
Total	21,100	19,652	19,588	21,481	24,053	23,885	22,843	21,240	20,081	19,609	20,180	21,565
Firm Resources												
Hydro	12,592	9,307	10,106	11,153	12,229	10,098	9,348	10,308	10,302	12,740	16,896	13,706
Small Thermal & Misc.	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas	3,875	3,657	3,645	3,714	4,017	4,017	3,723	3,697	3,520	2,844	3,656	3,874
Renewables-Other	242	237	242	253	251	247	244	242	232	228	222	240
Wind	1,220	1,151	1,160	1,061	1,098	1,066	1,093	1,329	1,244	1,247	1,342	1,252
Cogeneration	63	60	71	72	77	78	76	76	65	58	45	66
Imports	683	532	548	852	1,178	887	833	661	540	516	549	602
Nuclear	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030
Coal	<u>3,765</u>	<u>3,765</u>	<u>3,765</u>	<u>3,765</u>	<u>3,765</u>	<u>3,748</u>	<u>3,748</u>	<u>3,452</u>	<u>2,964</u>	<u>3,083</u>	<u>3,553</u>	<u>3,748</u>
Total	23,470	19,740	20,566	21,900	23,644	21,170	20,094	20,796	19,896	21,746	27,292	24,519
Surplus (Need)	2,370	88	978	419	(410)	(2,716)	(2,749)	(444)	(185)	2,137	7,112	2,954

^{1/} Loads net of demand-side management

Table 3 Northwest Region Requirements and Resources – Winter Peak

The sum of the individual utilities' firm requirements and resources for the peak hour in January for each of the next 10 years are shown in this table. Firm peak requirements include a planning margin to account for planning uncertainties.

Megawatts	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firm Requirements										
Load ^{1/}	32,240	32,398	32,776	33,056	32,946	33,306	33,455	33,895	34,077	34,459
Exports	1,508	1,390	1,353	1,338	1,355	1,355	1,355	1,355	1,355	1,355
Planning Margin ^{2/}	<u>3,869</u>	<u>4,212</u>	<u>4,589</u>	<u>4,958</u>	<u>5,271</u>	<u>5,662</u>	<u>6,022</u>	<u>6,440</u>	<u>6,815</u>	<u>6,892</u>
Total	37,616	38,000	38,718	39,353	39,573	40,324	40,832	41,691	42,247	42,707
Firm Resources										
Hydro	22,129	22,092	22,111	22,018	22,018	22,017	22,017	22,017	22,017	22,017
Small Thermal & Misc.	3	3	3	3	3	3	3	3	3	3
Natural Gas	6,265	6,266	6,266	6,386	6,386	6,386	6,386	6,386	6,386	6,386
Renewables-Other	269	259	259	259	259	259	257	255	249	249
Wind	210	211	211	211	211	211	211	211	210	201
Cogeneration	80	81	81	67	62	62	41	41	17	17
Imports	1,338	1,529	1,550	1,466	1,453	1,413	1,419	1,426	1,432	1,432
Nuclear	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130
Coal	<u>4,153</u>	<u>4,153</u>	<u>4,153</u>	<u>4,151</u>	<u>4,150</u>	<u>4,150</u>	<u>4,150</u>	<u>3,723</u>	<u>3,723</u>	<u>3,722</u>
Total	35,632	35,777	35,817	35,745	35,726	35,686	35,669	35,245	35,221	35,211
Surplus (Need)	(1,984)	(2,222)	(2,902)	(3,608)	(3,847)	(4,638)	(5,164)	(6,446)	(7,027)	(7,496)

^{1/} Loads net of demand-side management

^{2/} Planning Margin accounts for forced outages, unanticipated load growth, load variation due to temperatures, and operating reserves

Table 4 Northwest Region Requirements and Resources – Summer Peak

This table shows the sum of the individual utilities' firm requirements and resources for a peak hour in August for each of the next 10 years. Firm peak requirements include a planning margin to account for planning uncertainties.

Megawatts	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Firm Requirements										
Load ^{1/}	26,759	27,061	27,344	27,584	27,882	28,176	28,474	28,759	29,045	29,210
Exports	2,420	2,170	1,971	1,859	1,877	1,817	1,817	1,817	1,517	1,517
Planning Margin ^{2/}	<u>3,211</u>	<u>3,518</u>	<u>3,828</u>	<u>4,138</u>	<u>4,461</u>	<u>4,790</u>	<u>5,125</u>	<u>5,464</u>	<u>5,809</u>	<u>5,842</u>
Total	32,390	32,749	33,143	33,581	34,219	34,783	35,416	36,040	36,371	36,568
Firm Resources										
Hydro	20,908	20,871	20,889	20,796	20,796	20,796	20,796	20,795	20,795	20,795
Small Thermal & Misc.	3	3	3	3	3	3	3	3	3	3
Natural Gas	5,639	5,639	5,639	5,859	5,859	5,859	5,859	5,859	5,859	5,859
Renewables-Other	262	260	260	260	260	260	260	258	257	250
Wind	197	197	197	197	197	197	197	196	196	192
Cogeneration	57	57	57	43	38	38	38	20	8	8
Imports	977	983	1,169	1,220	1,218	1,222	1,226	1,231	1,235	1,235
Nuclear	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130
Coal	<u>4,152</u>	<u>4,152</u>	<u>4,152</u>	<u>4,151</u>	<u>4,151</u>	<u>4,151</u>	<u>4,151</u>	<u>4,151</u>	<u>3,723</u>	<u>3,722</u>
Total	33,234	33,202	33,406	33,570	33,562	33,566	33,570	33,553	33,117	33,106
Surplus (Need)	845	453	263	(11)	(658)	(1,217)	(1,846)	(2,487)	(3,254)	(3,463)

^{1/} Loads net of demand-side management

^{2/} Planning Margin accounts for forced outages, unanticipated load growth, load variation due to temperatures, and operating reserves

Northwest New and Existing Resources

The following tables provide details about new and existing generating resources and demand side programs. **Table 5 *Recently Acquired Resources*** highlights those projects that have most recently come on line and **Table 6a *Committed New Supply*** lists contracts and generating projects where construction has started and that utilities are counting on to meet need. All supply listed in these tables are included in the regional analysis of power needs.

Table 6b *Demand Side Management Programs* was added to this year's report to provide a snapshot of the regional utilities' efforts to manage demand. The majority of the reported savings is from energy efficiency, distribution efficiency and market transformation efforts. Some utilities also include savings from fuel switching, fuel conversion or energy storage. This table also shows reported demand response programs.

Table 7 *Planned Resources* captures resources utilities have identified to meet their own needs. The table shows planned generating projects that are being counted on to meet the growing demand. This information is a compilation of what utilities have reported in their individual integrated resources plans. These resources are not included in the regional analysis of power needs.

Table 8 *Northwest Generating Resources* is a comprehensive list of generating resources that make up the electric power supply for the Pacific Northwest. These resources are utility-owned, utility contracted, and owned by independent power producers.

**Table 5
Recently Acquired Resources**

Project	Date	Fuel/Tech	Nameplate (MW)	Winter Peak (MW)	Energy (MWa)	Utility
Box Canyon Upgrade (Unit 3)	Aug-12	Hydro	6		1	Pend Oreille County PUD
Cold Springs	Dec-12	Wind	20	1	6	Idaho Power
Desert Meadow Windfarm	Dec-12	Wind	20	1	6	Idaho Power
Double A Digester	Jan-12	Biomass	5	0	1	Idaho Power
Ferndale Cogen	Dec-12	Natural Gas	280	270	230	Puget Sound Energy
Hammett Hill Windfarm	Dec-12	Wind	20	1	6	Idaho Power
High Mesa Wind	Dec-12	Wind	40	2	12	Idaho Power
Klamath Peaker	Nov-12	Natural Gas	100	100		Puget Sound Energy
Langley Gulch	Jul-12	Natural Gas	300	330	251	Idaho Power
Lime Wind Energy	Oct-12	Wind	3	0	1	Idaho Power
Lower Snake River I	Apr-12	Wind	342	33	102	Puget Sound Energy
Mainline Windfarm	Dec-12	Wind	20	1	6	Idaho Power
Mill Creek Hydroelectric (Cove)	Dec-12	Hydro	1	1	0	Idaho Power
Neal Hot Springs	Nov-12	Geothermal	22	22	22	Idaho Power
Neal Hot Springs	Nov-12	Geothermal	20	1	6	Idaho Power
Rock Creek Dairy	May-12	Biomass	4	0	1	Idaho Power
Ryegrass Windfarm	Dec-12	Wind	20	1	6	Idaho Power
Schedule 91 Contracts	Dec-12	Renewables	17	12	12	Puget Sound Energy
Two Ponds Windfarm	Dec-12	Wind	20	1	6	Idaho Power
W02 Turbine/Generator Replacement	Dec-12	Hydro	23	2	2	Grant County PUD
W05 Turbine/Generator Replacement	Feb-12	Hydro	23	2	2	Grant County PUD
Whitefish Hydro	Sep-12	Hydro	0	0	0	Flathead Electric Cooperative
Youngs Creek	Nov-11	Hydro	8	7	2	Snohomish County PUD
Total			1,312			

**Table 6a
Committed New Supply**

Project	Date	Fuel/Tech	Nameplate (MW)	Winter Peak (MW)	Energy (MWa)	Utility
Box Canyon Upgrade (Unit 2)	Jul-13	Hydro	6		1	Pend Oreille County PUD
Calligan Creek	Dec-17	Hydro	6	6	2	Snohomish County PUD
Coal Transition PPA	Dec-14	Contract		380	380	Puget Sound Energy
Cushman North Fork Powerhouse	Feb-13	Hydro		4	2	Tacoma Power
Hancock Creek	Dec-16	Hydro	6	6	3	Snohomish County PUD
Lower Baker 4	Dec-14	Hydro	30	30	13	Puget Sound Energy
Port Westward Unit 2	Dec-15	Natural Gas	220	200	0	Portland General Electric
Stoltze Biomass	Oct-13	Biomass	3	3	3	Flathead Electric Cooperative
W01 Turbine/Generator Replacement	Sep-13	Hydro	23	23	23	Grant County PUD
			Total*	677		

*note that the total includes incremental hydro and contracts

**Table 6b
Demand Side Management Programs**

	Date	Type	Winter Peak (MW)	Summer Peak (MW)	Energy (MWa)	Utility
Cumulative Conservation	by 2023		2,757	2,435	2,074	All regional utilities
Demand response	2014		21	21		City of Port Angeles
Demand response	2023		4	4		City of Port Angeles
Demand response	2014	Industry interruptible	40			Chelan County PUD
Demand response	2016	Agricultural		351		Idaho Power
Demand response	2019			46		PacifiCorp
Demand response	2021			31		PacifiCorp
Demand response	2016		45	45		Portland General Electric
Demand response	2016		50	50		Puget Sound Energy
Demand response	2018		60	40		Puget Sound Energy
Demand response	2023		60	45		Puget Sound Energy
Total			280	633		

Other utilities are conducting demand response pilot programs that are not presented here. Demand response programs in this table vary in structure. Some are structured to be used only in emergency situations whereas others may see semi-regular use.

**Table 7
Planned Resources**

Project	Schedule	Fuel/Tech	Nameplate (MW)	Peak (MW)	Energy (MWa)	Utility
Biomass	Dec-22	Wood Waste/Cogen	30		30	Seattle City Light
Biomass	Dec-23	Wood Waste/Cogen	10		10	Seattle City Light
Bi-Seasonal Capacity	Dec-16	Contract		202		Portland General Electric
Box Canyon Upgrade (Unit 1)	Jul-14	Hydro	6		1	Pend Orielle PUD
CCCT	Dec-16	Natural Gas	220	220	203	Portland General Electric
CHP	Dec-16	CHP	2	2	2	Portland General Electric
Clark Canyon Dam	Mar-13	Hydro	5	0	1	Idaho Power
Combined Heat and Power	Dec-17	CHP	42	42	42	Pacific Power
Double B Dairy	Feb-14	Biomass	22	20	13	Idaho Power
DSG (2010-2013)	Dec-16	Diesel	52	52		Portland General Electric
Dynamis Ada County Landfill Project	Feb-14	Biomass	22	20	13	Idaho Power
Fall Creek Hydro	In License ILP Process	Hydro	10	8	2	Not determined
Fargo Drop Hydroelectric	Apr-13	Hydro	1	1	-	Idaho Power
Geothermal	Dec-17	Geothermal	30		20-30	Snohomish CountyPUD
Gorge Tunnel II	Dec-23	Hydro Eff.	5		5	Seattle City Light
Grandview Solar One	Jul-12	Solar	20	1	6	Idaho Power
Landfill Gas	Dec-21	Landfill Gas	8		8	Seattle City Light
Little Falls Unit 1	Dec-16	Hydro Eff.		1	1	Avista Corp.
Little Falls Unit 2	Dec-17	Hydro Eff.		1	1	Avista Corp.
Little Falls Unit 3	Dec-14	Hydro Eff.		1	1	Avista Corp.
Little Falls Unit 4		Hydro Eff.		1	1	Avista Corp.
Nine Mile 1 & 2	Dec-15	Hydro Eff.		16	13	Avista Corp.
Peakers CT	Dec-17	Natural Gas	221	221		Puget Sound Energy
Peakers CT	Dec-17	Natural Gas	221			Puget Sound Energy
RPS Renewables	Dec-16	Renewables	300	15	101	Portland General Electric
Shoshone Falls Upgrade	Jul-17	Hydro	49	2	9	Idaho Power
Solar (PV and Micro)	Dec-17	Solar	4	1	4	PacifiCorp
Swager Farms	Oct-12	Biomass	2	0	1	Idaho Power
Tidal	Dec-13	Tidal	0.25		0.02	Snohomish County PUD

**Table 7
Planned Resources**

Project	Schedule	Fuel/Tech	Nameplate (MW)	Peak (MW)	Energy (MWa)	Utility
W01 Transformer A Replacement	Apr-13	Hydro	23			Grant County PUD
W02 Transformer A Replacement	Apr-13	Hydro	23	21	21	Grant County PUD
W03 Generator Replacement	Jul-18	Hydro	23	9	9	Grant County PUD
W03 Transformer B Replacement	Oct-13	Hydro	23	12	12	Grant County PUD
W04 Generator Replacement	Mar-16	Hydro	23	9	9	Grant County PUD
W04 Transformer B Replacement	Oct-13	Hydro	23	12	12	Grant County PUD
W05 Transformer C Replacement	Apr-15	Hydro	23	21	21	Grant County PUD
W06 Generator Replacement	Sep-17	Hydro	23	9	9	Grant County PUD
W06 Transformer C Replacement	Apr-15	Hydro	23	12	12	Grant County PUD
W07 Transformer D Replacement	Jun-14	Hydro	23	21	21	Grant County PUD
W08 Generator Replacement	Sep-14	Hydro	23	21	21	Grant County PUD
W08 Transformer D Replacement	Jun-14	Hydro	23			Grant County PUD
W09 Generator Replacement	Dec-16	Hydro	23	9	9	Grant County PUD
W09 Transformer E Replacement	Nov-14	Hydro	23	12	12	Grant County PUD
W10 Generator Replacement	Jun-15	Hydro	23	21	21	Grant County PUD
W10 Transformer E Replacement	Nov-14	Hydro	23			Grant County PUD
Wind	2022	Wind	300	0	100	Puget Sound Energy
Wind	Dec-23	Wind	20		20	Seattle City Light
Wind	Dec-24	Wind	70		70	Seattle City Light
Winter-only Capacity	Dec-16	Contract		152		Portland General Electric
			Total*	2,403		

*note that the total includes incremental hydro and contracts

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
HYDRO			33,176
Albeni Falls	US Corps of Engineers	Federal System (BPA)	43
Alder	Tacoma Power	Tacoma Power	50
American Falls	Idaho Power	Idaho Power	92
Anderson Ranch	US Bureau of Reclamation	Federal System (BPA)	40
Arrowrock Dam	Clatskanie PUD/Idaho & Oregon irrigation	Clatskanie PUD	18
Ashton	PacifiCorp	PacifiCorp	6
B. Smith	PacifiCorp	PacifiCorp	0
Barber Dam	Enel North America	Idaho Power	4
Bell Mountain	PacifiCorp	PacifiCorp	1
Bend Power Dam	PacifiCorp	PacifiCorp	-
Big Cliff	US Corps of Engineers	Federal System (BPA)	18
Big Fork	PacificCorp	PacifiCorp	4
Big Sheep Creek	Everand Jensen	Avista Corp.	0
Birch Creek	Everand Jensen	Idaho Power	0
Birch Creek	PacifiCorp	PacifiCorp	3
Black Canyon	US Bureau of Reclamation	Federal System (BPA)	10
Black Canyon # 3	Big Wood Canal Co.	Idaho Power	0
Black Creek Hydro		Puget Sound Energy	4
Blind Canyon	Blind Canyon Hydro	Idaho Power	2
Bliss	Idaho Power	Idaho Power	75
Boise River Diversion	US Bureau of Reclamation	Federal System (BPA)	2
Bonneville	US Corps of Engineers	Federal System (BPA)	1,102
Boston Power		PacifiCorp	-
Boundary	Seattle City Light	Seattle City Light	1,040
Box Canyon	Pend Oreille County PUD	Pend Oreille County PUD	70
Box Canyon-Idaho	Richard Kaster	Idaho Power	0
Briggs Creek	Richard Kaster	Idaho Power	1
Brownlee	Idaho Power	Idaho Power	585
Bypass	Bypass, Ltd.	Idaho Power	10
Cabinet Gorge	Avista Corp.	Avista Corp.	265
Calispel Creek	Pend Oreille PUD	Pend Oreille PUD	1
Canyon Springs	J.D. McCollum	Idaho Power	0
Carmen-Smith	Eugene Water & Electric Board	Eugene Water & Electric Board	80
Cascade	US Bureau of Reclamation	Idaho Power	12
CDM Hydro	PacifiCorp	PacifiCorp	6
Cedar Draw Creek	Crys. Sprgs. Hydro	Idaho Power	2
Cedar Falls, Newhalem	Seattle City Light	Seattle City Light	20
Central Oregon Siphon		PacifiCorp	5
Chandler	US Bureau of Reclamation	Federal System (BPA)	12
Chelan	Chelan County PUD	Chelan County PUD	59
Chief Joseph	US Corps of Engineers	Federal System (BPA)	2,457

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
C. J. Strike	Idaho Power	Idaho Power	83
Clear Lake	Idaho Power	Idaho Power	3
Clearwater	Non - Utility	Federal (BPA)	1
Clearwater #1	PacifiCorp	PacifiCorp	15
Clearwater #2	PacifiCorp	PacifiCorp	26
Cline Falls	COID	PacifiCorp	1
COID	PacifiCorp	PacifiCorp	7
Copco #1	PacifiCorp	PacifiCorp	20
Copco #2	PacifiCorp	PacifiCorp	27
Cougar	US Corps of Engineers	Federal System (BPA)	25
Cowlitz Falls	Lewis County PUD	Federal (BPA)	70
Crystal Springs	Crystal Springs Hydro	Idaho Power	2
Curry Cattle Company	Curry Cattle Co.	Idaho Power	0
Curtis Livestock	PacifiCorp	PacifiCorp	0
Cushman 1	Tacoma Power	Tacoma Power	43
Cushman 2	Tacoma Power	Tacoma Power	81
Deep Creek	Gordon Foster	Avista Corp.	0
Derr Creek	Jim White	Avista Corp.	0
Detroit	US Corps of Engineers	Federal System (BPA)	100
Dexter	US Corps of Engineers	Federal System (BPA)	15
Diablo Canyon	Seattle City Light	Seattle City Light	153
Dietrich Drop	Enel North America	Idaho Power	5
Dry Creek		PacifiCorp	4
D. Wiggins		PacifiCorp	-
Dworshak	US Corps of Engineers	Federal System (BPA)	400
Eagle Point	PacifiCorp	PacifiCorp	3
East Side	PacifiCorp	PacifiCorp	3
Electron	Puget Sound Energy	Puget Sound Energy	23
Elk Creek	El Dorado Hydro	Idaho Power	2
Eltopia Branch Canal	SEQCBID	Seattle City Light	2
Fall Creek	PacifiCorp	PacifiCorp	3
Falls River	Marysville Hydro Partner	Idaho Power	9
Faraday-Clackamas	Portland General Electric	Portland General Electric	37
Farmers Irrigation	PacifiCorp	PacifiCorp	3
Faulkner Ranch	Faulkner Brothers Hydro Inc.	Idaho Power	1
Felt	PacifiCorp	PacifiCorp	-
Fish Creek	PacifiCorp	PacifiCorp	11
Fisheries Development Co.	Fisheries Devel.	Idaho Power	0
Foster	US Corps of Engineers	Federal System (BPA)	20
Frontier Technologies	PacifiCorp	PacifiCorp	4
Galesville Dam	PacifiCorp	PacifiCorp	2
Gem State Hydro		Other Publics (BPA)	23
Geo-Bon No 2	Enel North America, Inc.	Idaho Power	1
Georgetown Power	PacifiCorp	PacifiCorp	0

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Gorge	Seattle City Light	Seattle City Light	207
Grace	PacifiCorp	PacifiCorp	33
Grand Coulee	US Bureau of Reclamation	Federal System (BPA)	6,494
Green Peter	US Corps of Engineers	Federal System(BPA)	80
Green Springs	US Bureau of Reclamation	Federal System (BPA)	16
Hailey CSPP	City of Hailey	Idaho Power	0
Hazelton A	SE Hazelton ALP	Idaho Power	8
Hazelton B	Hazelton Power Co.	Idaho Power	8
Hells Canyon	Idaho Power	Idaho Power	392
Hills Creek	US Corps of Engineers	Federal System (BPA)	30
Hood Street Reservoir	Tacoma Power	Tacoma Power	1
Horseshoe Bend	Horseshoe Bend Hydro	Idaho Power	10
Hungry Horse	US Bureau of Reclamation	Federal System (BPA)	428
Hutchinson Creek	STS Hydro	Puget Sound Energy	1
Ice Harbor	US Corps of Engineers	Federal System(BPA)	603
Ingram Warm Springs	PacifiCorp	PacifiCorp	1
Iron Gate	PacifiCorp	PacifiCorp	18
Island Park		Fall River Rural Electric	5
Jackson (Sultan)	Snohomish County PUD	Snohomish County PUD	112
James Boyd		PacifiCorp	-
Jim Ford Creek	Ford Hydro	Avista Corp.	2
Jim Knight	Big Wood Canal Co.	Idaho Power	0
John C. Boyle	PacifiCorp	PacifiCorp	90
John Day	US Corps of Engineers	Federal System(BPA)	2,160
John Day Creek	Dave Cereghino	Avista Corp.	1
John H Koyle	John H Koyle	Idaho Power	1
Joseph Hydro		PacifiCorp	-
Kasel-Witherspoon	Kasel & Witherspoon	Idaho Power	1
Kerr	PPL Montana	-	194
Koma Kulshan	Koma Kulshan Associates	Puget Sound Energy	11
La Grande	Tacoma Power	Tacoma Power	64
Lacomb Irrigation	PacifiCorp	PacifiCorp	1
Lake Oswego Corp.		Portland General Electric	1
Last Chance			2
Lateral No. 10	Lateral 10 Ventures	Idaho Power	2
Leaburg	Eugene Water & Electric Board	Eugene Water & Electric Board	14
Lemolo #1	PacifiCorp	PacifiCorp	32
Lemolo #2	PacifiCorp	PacifiCorp	33
Lemoyne	John Lemoyne	Idaho Power	1
Libby	US Corps of Engineers	Federal System(BPA)	525
Lilliwaup Falls		Public	1
Little Falls	Avista Corp.	Avista Corp.	32
Little Goose	US Corps of Engineers	Federal System(BPA)	810
Little Wood	Little Wood Irr District	Idaho Power	2

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Little Wood/Arkoosh	William Arkoosh	Idaho Power	1
Lloyd Fery	PacifiCorp	PacifiCorp	0
Long Lake	Avista Corp.	Avista Corp.	70
Lookout Point	US Corps of Engineers	Federal System (BPA)	120
Lost Creek	US Corps of Engineers	Federal System (BPA)	49
Lower Baker	Puget Sound Energy	Puget Sound Energy	85
Lower Granite	US Corps of Engineers	Federal System(BPA)	810
Lower Malad	Idaho Power	Idaho Power	14
Lower Monumental	US Corps of Engineers	Federal System(BPA)	810
Lower Salmon	Idaho Power	Idaho Power	60
Low Line #2	Enel North America, Inc.	Idaho Power	3
Lowline Canal	S. Forks	Idaho Power	8
Lowline Midway	Idaho Power	Idaho Power	3
Lucky Peak	IID	Seattle City Light	113
Magic Reservoir	Magic Reservoir Hydro	Idaho Power	9
Main Canal Headworks	SEQCBID	Seattle City Light	26
Malad River	V. Ravenscroft	Idaho Power	1
Mayfield	Tacoma Power	Tacoma Power	162
McNary	US Corps of Engineers	Federal System(BPA)	980
Merwin	PacifiCorp	PacifiCorp	136
Meyers Falls	Michael Johnson	Avista Corp.	1
Middlefork Irrigation	PacifiCorp	PacifiCorp	3
Mile 28	Contractors Power Group Inc.	Idaho Power	2
Mill Creek		Other Publics (BPA)	1
Milner	Idaho Power	Idaho Power	59
Minidoka	US Bureau of Reclamation	Federal System (BPA)	28
Mink Creek	PacifiCorp	PacifiCorp	3
Mitchell Butte	Owyhee Irrigation District	Idaho Power	2
Monroe Street	Avista	Avista Corp.	15
Mora Drop	Riverside LLC	Idaho Power	2
Morse Creek		Port Angeles	1
Mossyrock	Tacoma Power	Tacoma Power	300
Mountain Energy	PacifiCorp	PacifiCorp	0
Mount Tabor	City of Portland	Portland General Electric	0
Mud Creek/S&S	H.K.Hydro	Idaho Power	1
Mud Creek/White	Mud Creek Hydro	Idaho Power	0
N-32 Canal (Marco Ranches)	Ranchers Irrig., Inc.	Idaho Power	1
Nicols Gap	PacifiCorp	PacifiCorp	1
Nicolson SunnyBar	PacifiCorp	PacifiCorp	0
Nine Mile	Avista	Avista Corp.	26
Nooksack	Puget Sound Hydro, LLC		3
North Fork-Clackamas	Portland General Electric	Portland General Electric	41
North Fork Sprague	PacifiCorp	PacifiCorp	1
Noxon Rapids	Avista Corp.	Avista Corp.	466

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
N.R. Rousch	PacifiCorp	PacifiCorp	0
Oak Grove-Clackamas	Portland General Electric	Portland General Electric	51
Odell Creek	PacifiCorp	PacifiCorp	0
O.J. Power	PacifiCorp	PacifiCorp	0
Oneida	PacifiCorp	PacifiCorp	30
Opal Springs	PacifiCorp	PacifiCorp	5
Ormsby		PacifiCorp	-
Owyhee Dam	Owyhee Irrigation District	Idaho Power	5
Owyhee Tunnel No.1	Owyhee Irrigation District		8
Oxbow	Idaho Power Company	Idaho Power	190
Packwood	Energy Northwest	Benton County PUD	26
Palisades	US Bureau of Reclamation	Federal System (BPA)	177
Paris	PacifiCorp	PacifiCorp	1
PEC Headworks	SEQBID	Grant County PUD	7
Pelton	Portland General Electric	Multiple Utilities	110
Pelton Reregulation	Warm Springs Tribe	Portland General Electric	19
Phillips Ranch	Glen Phillips	Avista Corp.	0
Pigeon Cove	Pigeon Cove Power	Idaho Power	2
Portland Hydro-Project	City of Portland	Portland General Electric	36
Portneuf River		PacifiCorp	1
Post Falls	Avista Corp.	Avista Corp.	15
Potholes East Canal 66 Headworks	SEQCBID	Seattle City Light	5
Powerdale	PacifiCorp	PacifiCorp	6
Preston City	PacifiCorp	PacifiCorp	0
Priest Rapids	Grant County PUD	Multiple Utilities	956
Pristine Springs	Pristine Springs, Inc	Idaho Power	0
Pristine Springs #3	Pristine Springs, Inc	Idaho Power	0
Prospect #1	PacifiCorp	PacifiCorp	4
Prospect #2	PacifiCorp	PacifiCorp	32
Prospect #3	PacifiCorp	PacifiCorp	7
Prospect #4	PacifiCorp	PacifiCorp	1
Quincy Chute	SEQBID	Grant County PUD	9
R.D. Smith	SEQCBID	Seattle City Light	6
Reeder Gulch		Other Publics (BPA)	0
Reynolds Irrigation	Reynolds Irr.	Idaho Power	0
Rim View	Rim View Trout Co.	Idaho Power	0
River Mill-Clackamas	Portland General Electric	Portland General Electric	19
Rock Creek No. 1	Rock Creek Joint	Idaho Power	2
Rock Creek No. 2	Enel North America	Idaho Power	2
Rock Island	Chelan County PUD	Multiple Utilities	629
Rocky Reach	Chelan County PUD	Multiple Utilities	1,300
Ross	Seattle City Light	Seattle City Light	360
Round Butte	Portland General Electric	Multiple Utilities	247
Roza	US Bureau of Reclamation	Federal System (BPA)	13

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Sagebrush	Big Wood Canal Co.	Idaho Power	0
Sahko	Sahko	Idaho Power	1
Santiam	PacifiCorp	PacifiCorp	0
Schaffner	Lemhi Hydro Co.	Idaho Power	1
Sheep Creek	Glen Phillips	Avista Corp.	2
Shingle Creek	Willis D Deveny	Idaho Power	0
Shoshone II	Shorock Hydro	Idaho Power	1
Shoshone CSPP	Shorock Hydro, Inc.	Idaho Power	0
Shoshone Falls	Idaho Power	Idaho Power	13
Slide Creek	PacifiCorp	PacifiCorp	18
Smith Creek	Eugene Water & Electric Board	Eugene Water & Electric Board	38
Snake River Pottery	Snake River Pottery	Idaho Power	0
Snedigar Ranch	David Snedigar	Idaho Power	1
Snoqualmie Falls	Puget Sound Energy	Puget Sound Energy	54
Soda Springs	PacifiCorp	PacifiCorp	11
South Fork Tolt	Seattle City Light	Seattle City Light	17
Spokane Upriver	City of Spokane	Avista Corp.	16
Stauffer Dry Creek		PacifiCorp	-
Steffen Hydro		Snohomish County PUD	-
Stone Creek	Eugene Water & Electric Board	Eugene Water & Electric Board	12
Strawberry Creek	South Idaho Public Agency	Other Publics (BPA)	-
Summer Falls	SEQCBID	Seattle City Light	92
Sunshine #2	McMillian		0
Swan Falls	Idaho Power	Idaho Power	25
Swift 1	PacifiCorp	Multiple Utilities	219
Swift 2	Cowlitz County PUD	Multiple Utilities	77
Sygitowicz	Cascade Clean Energy	Puget Sound Energy	0
TGS/Briggs		PacifiCorp	-
The Dalles	US Corps of Engineers	Federal System(BPA)	1,807
The Dalles Fishway	Northern Wasco Co. PUD	Northern Wasco Co. PUD	5
Thompson Falls	PPL Montana	-	94
Thousand Springs	Idaho Power	Idaho Power	9
Tiber Dam	Tiber Montana, LLC	Idaho Power	8
Toketee	PacifiCorp	PacifiCorp	43
Trail Bridge	Eugene Water & Electric Board	Eugene Water & Electric Board	10
Trout Company	Branch Flower Co.	Idaho Power	0
Tunnel #1	Owyhee Irrig. Dist.	Idaho Power	7
Twin Falls	Idaho Power	Idaho Power	53
Twin Falls	Twin Falls Hydro Association LP	Puget Sound Energy	20
TW Sullivan	Portland General Electric	Portland General Electric	15
Upper Baker	Puget Sound Energy	Puget Sound Energy	106
Upper Falls	Avista Corp.	Avista Corp.	10
Upper Malad	Idaho Power	Idaho Power	8
Upper Salmon 1 & 2	Idaho Power	Idaho Power	18

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Upper Salmon 3 & 4	Idaho Power	Idaho Power	17
Walla Walla	PacifiCorp	PacifiCorp	2
Wallowa Falls	PacifiCorp	PacifiCorp	1
Walterville	Eugene Water & Electric Board	Eugene Water & Electric Board	8
Wanapum	Grant County PUD	Mutiple Utilities	934
Weeks Falls	So. Fork II Inc.	Puget Sound Energy	5
Wells	Douglas County PUD	Mutiple Utilities	774
West Side	PacifiCorp	PacifiCorp	1
White Water Ranch	White Water Ranch	Idaho Power	0
Wilson Lake Hydro	Wilson Pwr. Co.	Idaho Power	8
Woods Creek	Snohomish County PUD	Snohomish County PUD	1
Wynoochee	Tacoma Power	Tacoma Power	13
Yale	PacifiCorp	PacifiCorp	134
Yelm		Other Publics (BPA)	12
Yakima-Tieton	PacifiCorp	PacifiCorp	3
Young's Creek	Snohomish PUD	Snohomish PUD	8

COAL **6,999**

Boardman	Portland General Electric	Mutiple Utilities	642
Centralia #1	TransAlta		670
Centralia #2	TransAlta		670
Colstrip #1	PP&L Montana, LLC	Mutiple Utilities	330
Colstrip #2	PP&L Montana, LLC	Mutiple Utilities	330
Colstrip #3	PP&L Montana, LLC	Mutiple Utilities	740
Colstrip #4	NorthWestern Energy	Mutiple Utilities	805
Corette	PP&L Montana, LLC		163
Jim Bridger #1	PacifiCorp / Idaho Power	Mutiple Utilities	540
Jim Bridger #2	PacifiCorp / Idaho Power	Mutiple Utilities	540
Jim Bridger #3	PacifiCorp / Idaho Power	Mutiple Utilities	540
Jim Bridger #4	PacifiCorp / IPC	Mutiple Utilities	508
Valmy #1	NV Energy / Idaho Power	Mutiple Utilities	254
Valmy #2	NV Energy / Idaho Power	Mutiple Utilities	267

NUCLEAR **1,230**

Columbia Generating Station	Energy Northwest	Federal System (BPA)	1,230
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NATURAL GAS **8,042**

Alden Bailey	Clatskanie PUD	Clatskanie PUD	11
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**Table 8
Northwest Generating Resources**

Project	Owner	NW Utility	Nameplate (MW)
Beaver	Portland General Electric	Portland General Electric	516
Beaver 8	Portland General Electric	Portland General Electric	25
Bennett Mountain	Idaho Power	Idaho Power	162
Big Hanaford Plant	TransAlta		248
Boulder Park	Avista Corp.	Avista Corp.	25
Chehalis Generating Facility	PacifiCorp	PacifiCorp	517
Coyote Springs I	Portland General Electric	Portland General Electric	266
Coyote Springs II	Avista Corp.	Avista Corp.	287
Danskin	Idaho Power	Idaho Power	92
Danskin 1	Idaho Power	Idaho Power	179
Dave Gates Generating Station	NorthWestern Energy	NorthWestern Energy	150
Encogen	Puget Sound Energy	Puget Sound Energy	159
Ferndale Cogen Station (Tenaska)	Puget Sound Energy	Puget Sound Energy	245
Frederickson Generation Station	EPCOR Power L.P./PSE	Multiple Utilities	258
Fredonia 1 & 2	Puget Sound Energy	Puget Sound Energy	208
Fredonia 3 & 4	Puget Sound Energy	Puget Sound Energy	108
Fredrickson 1 & 2	Puget Sound Energy	Puget Sound Energy	149
Goldendale	Puget Sound Energy	Puget Sound Energy	261
Grays Harbor (Satsop)	Invenergy		650
Hermiston Generating Project	PacifiCorp/Hermiston Generating Company	PacifiCorp	469
Kettle Falls CT	Avista Corp.	Avista Corp.	7
Klamath Cogen Plant	Iberdrola Renewables		502
Klamath Peaking Units 1-4	Iberdrola Renewables	Puget Sound Energy	100
Lancaster Power Project	Avista Corp.	Avista Corp.	270
Langley Gulch	Idaho Power	Idaho Power	300
March Point 1	March Point Cogen		80
March Point 2	March Point Cogen		60
Mint Farm Energy Center	Puget Sound Energy	Puget Sound Energy	305
Northeast A&B	Avista Corp.	Avista Corp.	62
Pasco Generation Station	Franklin PUD/Grays Harbor PUD	Multiple Utilities	44
Port Westward	Portland General Electric	Portland General Electric	415
Port Westward Unit 2	Portland General Electric	Portland General Electric	220
Rathdrum 1 & 2	Avista Corp.	Avista Corp.	167
River Road Generating Project	Clark Public Utilities	Clark Public Utilities	248
Rupert (Magic Valley)	Rupert Illinois Holdings	Idaho Power	10
Sumas Energy	Puget Sound Energy	Puget Sound Energy	121
Whitehorn #2 & 3	Puget Sound Energy	Puget Sound Energy	149

COGENERATION

274

Billings Cogeneration	Billings Generation, Inc.	NorthWestern Energy	64
Boise Cascade	PacifiCorp	PacifiCorp	9
DAW	PacifiCorp	PacifiCorp	-

**Table 8
Northwest Generating Resources**

Project	Owner	NW Utility	Nameplate (MW)
Freres Lumber	Evergreen BioPower	PacifiCorp	10
Glenns Ferry (Magic West)	PURPA	Idaho Power	10
Harbor Paper	Harbor Paper LLC		16
Hampton Lumber		Snohomish County PUD	5
International Paper Energy Center	International Paper	Eugene Water & Electric Board	26
James River - Camas	PacifiCorp	PacifiCorp	52
Rough & Ready Lumber	Rough & Ready	PacifiCorp	1
Simplot-Pocatello	PURPA	Idaho Power	12
Tasco-Nampa	Tasco	Idaho Power	2
Tasco-Twin Falls	Tasco	Idaho Power	3
Thompson River	NorthWestern Energy	NorthWestern Energy	12
University of Oregon	University of Oregon		10
Warm Springs Forest Products	PacifiCorp	PacifiCorp	8
Wauna (James River)	Western Generation Agency	Multiple Utilities	36

RENEWABLES-OTHER **477**

Ashland Solar Project		Federal System (BPA)	-
Bellevue Solar	Bellevue Solar, LLC	Portland General Electric	1
Bettencourt B6	Cargill	Idaho Power	2
Bettencourt Dry Creek	Cargill	Idaho Power	2
Big Sky West Dairy	Dean Foods Co. & AgPower Partners LLC	Idaho Power	2
Bio Energy		Puget Sound Energy	1
Bio Fuels, WA		Puget Sound Energy	5
Biomass One	PacifiCorp	PacifiCorp	25
City of Spokane Waste to Energy	City of Spokane	Avista Corp.	26
Clearwater Paper	Avista Corp.	Avista Corp.	114
Coffin Butte Resource Project	Power Resources Cooperative	PNGC Power	6
Cogen Company	Prairie Wood Products Co-Gen Co.	Oregon Trail Coop	8
Co-Gen II - DR Johnson Lumber	PacifiCorp	PacifiCorp	8
Columbia Ridge Landfill Gas	Waste Management	Seattle City Light	6
Convanta Marion	Portland General Electric	Portland General Electric	16
Double A Digester	PURPA-Andgar Corp	Idaho Power	5
Dry Creek Landfill	Dry Creek Landfill Inc.	PacifiCorp	3
Edaleen Dairy		Puget Sound Energy	1
Farm Power Tillamook	Tillamook	Tillamook	1
Finn Hill Solar (Lake Wash SD)		Puget Sound Energy	0
Flathead County Landfill	Flathead Electric Cooperative, Inc.	Flathead Electric Cooperative	2
Four Mile Hill Geothermal	Calpine	Federal System (BPA)	50
Hidden Hollow Landfill	G2 Energy	Idaho Power	3
Hooley Digester	Tillamook PUD	Tillamook PUD	1
H. W. Hill Landfill	Allied Waste Companies	Multiple Utilities	10.5
Interfor Pacific-Gilchrist	Midstate Electric Co-op	Midstate Electric Co-op	

**Table 8
Northwest Generating Resources**

Project	Owner	NW Utility	Nameplate (MW)
Island Solar		Puget Sound Energy	0
Kettle Falls	Avista Corp.	Avista Corp.	51
King Estate Solar	Lane County Electric Coop	Lane County Electric Coop	-
Lynden	Farm Power	Puget Sound Energy	1
Mead (Methane Energy Agricultural Development)		Tillamook PUD	2
Mill Creek (Cove)		Idaho Power	1
Neal Hot Springs	U.S Geothermal	Idaho Power	23
Olympic View 1&2	Mason County PUD #3	Mason County PUD #3	5
Pine Products	PacifiCorp	PacifiCorp	6
Pocatello Wastewater	Idaho Power	Idaho Power	0
Portland Wastewater	City of Portland	Portland General Electric	1.7
Qualco Dairy Digester		Puget Sound Energy	1
Raft River 1	US Geothermal	Idaho Power	16
Rainier Biogas		Puget Sound Energy	1
Rexville	Farm Power	Puget Sound Energy	1
River Bend Landfill	McMinnville Water & Light	McMinnville Water & Light	-
Rock Creek Dairy	PURPA	Idaho Power	4
Seneca	Seneca Sustainable Energy, LLC	Eugene Water & Electric Board	20
Short Mountain		Emerald PUD	3
Skookumchuck		Puget Sound Energy	1
Smith Creek		Puget Sound Energy	0
Stimson Lumber	Stimson Lumber	Avista Corp.	7
Stoltze Biomass	F.H. Stoltze Land & Lumber	Flathead Electric Coop	3
Tamarack	Idaho Power	Idaho Power	5
Treasure Valley			3
Van Dyk		Puget Sound Energy	0
VanderHaak Dairy	VanderHaak Dairy, LLC	Puget Sound Energy	0
Whitefish Hydro	City of Whitefish	Flathead Electric Coop	0
Wild Horse Solar Project	Puget Sound Energy	Puget Sound Energy	1
Yamhill Solar	Yamhill solar, LLC	Portland General Electric	1

WIND

7,753

3Bar-G Wind		Puget Sound Energy	1
Bennet Creek	Bennet Creek	Idaho Power	21
Big Horn	Iberdrola Renewables		199
Big Horn-Phase 2	Iberdrola Renewables		50
Big Top	Big Top LLC (QF)	PacifiCorp	2
Biglow Canyon - 1	Portland General Electric	Portland General Electric	125
Biglow Canyon - 2	Portland General Electric	Portland General Electric	150
Biglow Canyon - 3	Portland General Electric	Portland General Electric	174
Burley Butte Wind Farm	PURPA	Idaho Power	21

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Butter Creek Power	Butter Creek Power LLC	PacifiCorp	5
Camp Reed Wind Park	PURPA	Idaho Power	23
Cassia Gulch	John Deere		21
Cassia Wind Farm	Cassia Wind Farm	Idaho Power	11
Coastal Energy	CCAP	Grays Harbor PUD	6
Cold Springs	PURPA	Idaho Power	23
Combine Hills I	Eurus Energy of America	PacifiCorp	41
Combine Hills II	Eurus Energy of America	Clark Public Utilities	63
Condon Wind	Goldman Sachs (75%), SeaWest NW (25%)	Federal System (BPA)	25
Desert Meadow Windfarm	PURPA	Idaho Power	23
Elkhorn Wind	Telocaset Wind Power Partners	Idaho Power	101
Foot Creek Rim 1	PacifiCorp & EWEB	Multiple Utilities	41
Foot Creek Rim 2	PPM Energy	Federal System (BPA)	2
Foot Creek Rim 4	PPM Energy	Federal System (BPA)	17
Fossil Gulch Wind	Idaho Power Company	Idaho Power	11
Four Corners Windfarm	Four Corners Windfarm LLC	PacifiCorp	10
Four Mile Canyon Windfarm	Four Mile Canyon Windfarm LLC	PacifiCorp	10
Glacier Wind - Phase 1	Naturener	San Diego Gas & Electric	107
Glacier Wind - Phase 2	Naturener	San Diego Gas & Electric	104
Golden Valley Wind Farm	PURPA	Idaho Power	12
Goodnoe Hills	PacifiCorp	PacifiCorp	94
Goshen North	Ridgeline Energy		125
Hammett Hill Windfarm	PURPA	Idaho Power	23
Harvest Wind		Multiple Utilities	99
Hay Canyon Wind	Hay Canyon Wind Project LLC (Iberdrola)	Snohomish County PUD	101
High Mesa Wind	PURPA	Idaho Power	40
High Plains	PacifiCorp	PacifiCorp	99
Hopkins Ridge	Puget Sound Energy	Puget Sound Energy	157
Horseshoe Bend	Horseshoe Bend Wind Park LLC	Idaho Power	9
Hot Springs Wind	Hot Springs Wind	Idaho Power	21
Judith Gap	Invenergy Wind, LLC	NorthWestern Energy	135
Juniper Canyon - Phase 1	Iberdrola Renewables		151
Kittitas Valley	Horizon		101
Klondike I	PPM Energy	Federal System (BPA)	24
Klondike II	PPM Energy	Portland General Electric	75
Klondike III	PPM Energy	Multiple Utilities	221
Klondike IIIa	Iberdrola Renewables		77
Knudson Wind		Puget Sound Energy	0
Lava Beds Wind	PURPA		18
Leaning Juniper 1	PPM Energy	PacifiCorp	101
Leaning Juniper II-North	Iberdrola Renewables		90
Leaning Juniper II-South	Iberdrola Renewables		109
Lime Wind Energy	PURPA	Idaho Power	3
Linden Ranch	NW Wind Partners		50

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Lower Snake River 1	Puget Sound Energy	Puget Sound Energy	342
Mainline Windfarm	PURPA	Idaho Power	23
Magic Wind Park	PURPA		20
Marengo	Renewable Energy America	PacifiCorp	140
Marengo II	PacifiCorp	PacifiCorp	70
Martinsdale Colony North	Two Dot Wind		1
Martinsdale Colony South	Two Dot Wind		2
McFadden Ridge I	PacifiCorp		29
Milner Dam Wind Farm	PURPA	Idaho Power	20
Moe Wind	Two Dot Wind	NorthWestern Energy	1
Mountain Wind	Edison Mission	PacifiCorp	61
Mountain Wind II	Edison Mission	PacifiCorp	80
Nine Canyon	Energy Northwest	Multiple Utilities	96
Notch Butte Wind	PURPA		18
Oregon Trail Windfarm	Oregon Trail Windfarm LLC	PacifiCorp	10
Oregon Trails Wind Farm	PURPA	Idaho Power	14
Pa Tu Wind Farm	Pa Tu Wind Farm, LLC	Portland General Electric	9
Pacific Canyon Windfarm	Pacific Canyon Windfarm LLC	PacifiCorp	8
Palouse Wind	Palouse Wind, LLC	Avista Corp.	105
Paynes Ferry Wind Park	PURPA	Idaho Power	21
Pebble Springs Wind	Iberdrola Renewables		99
Pilgrim Stage Station Wind Farm	PURPA	Idaho Power	11
Rattlesnake Rd Wind (aka	Horizon Wind		103
Rock River	SeaWest	PacifiCorp	50
Rockland Wind	PURPA	Idaho Power	80
Rogerson Flats Wind Park	PURPA	Idaho Power	20
Rolling Hills	PacifiCorp	PacifiCorp	99
Ryegrass Windfarm	PURPA	Idaho Power	23
Salmon Falls Wind Farm	PURPA	Idaho Power	22
Sand Ranch Windfarm	Sand Ranch Windfarm LLC	PacifiCorp	10
Sawtooth Wind	PURPA	Idaho Power	21
Seven Mile Hill	enXco	PacifiCorp	99
Seven Mile Hill II	enXco	PacifiCorp	20
Sheep Valley Ranch	Two Dot Wind	NorthWestern Energy	1
Shepards Flat Central	Caithness Energy		290
Shepards Flat North	Caithness Energy		265
Shepards Flat South	Caithness Energy		290
Stateline Wind	NextEra	Multiple Utilities	300
Swauk Wind		Puget Sound Energy	4
Thousand Springs Wind Farm	PURPA	Idaho Power	12
Three Mile Canyon	Momentum RE	PacifiCorp	10
Tuana Gulch Wind Farm	PURPA	Idaho Power	11
Tuana Springs Expansion Wind	Cassia Gulch Wind Park	Idaho Power	36
Two Ponds Windfarm	PURPA	Idaho Power	23

Table 8
Northwest Generating Resources

Project	Owner	NW Utility	Nameplate (MW)
Vancycle II (Stateline III)	NextEra		99
Vansycle Ridge	ESI Vansycle Partners	Portland General Electric	25
Vantage Wind	Invenergy		90
Wagon Trail Windfarm	Wagon Trail Windfarm LLC	PacifiCorp	3
Ward Butte Windfarm	Ward Butte Windfarm LLC	PacifiCorp	7
Wheat Field Wind Project	Wheat Field Wind LLC (Horizon Energy/EDP)	Snohomish County PUD	97
White Creek	White Creek Wind I LLC	Multiple Utilities	205
Wild Horse	Puget Sound Energy	Puget Sound Energy	273
Willow Creek	Invenergy		72
Windtricity - Imrie	Windtricity		100
Windy Flats Dooley-Phase 1			30
Windy Flats Dooley-Phase 2			233
Windy Point II	Windy Point Partners		153
Wolverine Creek	Invenergy	PacifiCorp	65
Yahoo Creek Wind Park	PURPA	Idaho Power	21
SMALL THERMAL AND MISCELLANEOUS			46
Colstrip Energy LP Coal	Colstrip Energy Limited Partnership		44
Crystal Mountain	Puget Sound Energy	Puget Sound Energy	3

Report Procedures

This report provides an estimate of regional ‘need to acquire’ generating resources using annual energy (August through July), monthly energy, winter peak-hour and summer peak-hour metrics. The peak need reflects information for January and August, as they present the greatest need for their respective seasons. These metrics provide a multi-dimensional look at the Northwest’s need for power and underscore the growing complexity of the power system.

This regional report reflects the summation of individual utilities’ forecasts. The utilities, in most cases, prepared their own projections. BPA provides much of the information for its smaller customers. Load (i.e. electricity demand), and resource information is included for the utilities listed in Table 9 at the end of this section. Procedures employed in preparing the regional load-resource comparisons of winter and summer peak and energy are described here. A list of definitions is included at the end of this section.

Load Estimate

Regional loads are the sum of loads estimated by the Northwest utilities and BPA for its federal agency customers, certain non-generating public utilities, and direct service industrial customers (DSI). Estimates are made for system peak and system energy loads. Load projections reflect network transmission and distribution losses, reductions in demand due to rising electricity prices, and the effects of appliance efficiency standards and energy building codes. Savings from demand-side management programs, such as energy efficiency and market transformation, are also reflected in the regional load forecasts.

Energy Loads

A ten-year forecast of monthly firm energy loads are provided. This forecast reflects normal weather conditions.

Peak Loads

Northwest regional peak loads are provided for each month of the ten year forecast period. The tabulated loads for winter and summer peak are the highest estimated 60-minute clock-hour average demand for that month, assuming normal weather conditions. The regional firm peak load is the sum of the individual utility peak loads, and does not account for the fact that each utility may experience its peak load at a different hour than other Northwest utilities.

Hence the regional peak load is considered non-coincident. The federal system (BPA) firm peak load is adjusted to reflect a federal coincident peak among its many utility customers.

Federal System Transmission Losses

Federal System (BPA) transmission losses for both firm loads and contractual obligations are embedded in federal load. These losses represent the difference between energy generated by the federal system (or delivered to a system interchange point) and the amount of energy sold to customers. System transmission losses are calculated by BPA for firm loads utilizing the federal transmission system.

Planning Margin

In the derivation of regional requirements, a planning margin has been added to the load. This regional planning margin is equal to 12 percent of the total peak load for the first year of the planning horizon, increasing one percent per year to 20 percent and remaining at 20 percent thereafter. They are intended to cover, for planning purposes, all elements of uncertainty not specifically accounted for in determining loads and resources. These include forced-outage reserves, unanticipated load growth, temperature variations, hydro maintenance and project construction delays. An increasing reserve requirement reflects greater uncertainty about load levels and of achieving construction schedules in the future.

Demand-Side Management Programs

Savings from demand-side management efforts are reported in *Table 6b: Demand Side Management Programs*. These estimates are the savings for the ten year study period and include expected future energy savings from existing and new programs in the areas of energy efficiency, distribution efficiency, market transformation, demand response, fuel conversion, fuel switching, energy storage and other efforts that reduce the demand for electricity.

These estimates reflect savings from programs that utilities fund directly, or through a third-party, such as the Northwest Energy Efficiency Alliance and Energy Trust of Oregon.

Generating Resources

This report considers existing resources, committed new supply (including resources under construction), as well as planned resources. For the assessment of need only the existing and committed resources are reflected in the regional tabulations. In addition, only those

generating resources (or shares) that are firmly committed to meeting Northwest loads are included in the regional analysis.

Hydro

Hydro resource capabilities are estimated from a regional analysis using a computer model that simulates reservoir operation of past hydrologic conditions. The historical stream flow record used covers the 70-year period from August 1928 through July 1998.

Energy

The firm energy capability of hydro plants is the amount of energy produced during the operating year with the lowest 12-month average generation. The lowest generation occurred in 1936-37 given today's river operating criteria. The firm energy capability is the average of 12 months, August 1936 to July 1937. Generation for projects that are influenced by downstream reservoirs reflects the reduction due to encroachment.

Peak Capability

For this report the peak capability of the hydro system represents the maximum hourly generation available to meet peak demand during the period of heavy load.

The peaking capability of the hydro system maximizes available energy and capacity associated with the monthly distribution of streamflow. The peaking capability is the hydro system's ability to continuously produce power for a specific time period by utilizing the limited water supply while meeting power and non-power requirements, scheduled maintenance, and operating reserves (including wind reserves).

Computer models are used to estimate the operational hydro peaking capability of the major projects, based on their monthly average energy for 70 water conditions. The peaking capability used for this report is the 8th percentile of the resulting hourly peak capabilities for January and August to indicate winter and summer peak capability respectively. These models shape the monthly hydro energy to maximize generation in the heavy load hours.

Columbia River Treaty

Since 1961 the United States has had a treaty with Canada that outlines the operation of U.S. and Canadian storage projects to increase the total combined generation. Hydropower generation in this analysis reflects the firm power generated by coordinating operation of three Canadian reservoirs, Duncan, Arrow and Mica with the Libby reservoir and other power

facilities in the region. Canada's share of the coordinated operation benefits is called Canadian Entitlement. BPA and each of the non-Federal mid-Columbia projects owners are obligated to return their share of the downstream power benefits owed to Canada. The delivery of the Entitlement is reflected in this analysis.

Downstream Fish Migration

Another requirement incorporated in the computer simulations is modified river operations to provide for the downstream migration of anadromous fish. These modifications include adhering to specific flow limits at some projects, spilling water at several projects, and augmenting flows in the spring and summer on the Columbia, Snake and Kootenai rivers. Specific requirements are defined by various federal, regional and state mandates, such as project licenses, biological opinions and state regulations.

Thermal and Renewable Resources

Thermal resources are reported in a variety of categories. Coal, cogeneration, nuclear, and natural gas projects are each totaled and reported as individual categories.

The category of Other Renewables includes energy from small hydropower, biomass, geothermal, solar, municipal solid waste projects and other small projects. Wind projects are reported in their own category.

All existing generating plants, regardless of size, are included in amounts submitted by each utility that owns or is purchasing the generation. The energy capabilities of plants are computed on annual planning equivalent availability factors submitted by the sponsors of the projects. The factors include allowance for scheduled maintenance (including refueling), forced outages and other expected operating constraints. Some small fossil-fuel plants and combustion turbines are included as peaking resources and their reported energy capabilities are only the amounts necessary for peaking operations. Additional energy potentially may be available from these peaking resources for emergencies but is not included in the regional load/resource balance.

New and Future Resources

The latest activity with new and future resource developments, including expected savings from demand-side management are tabulated in this report. These resources are reported as *Recently Acquired*, *Committed New Supply* and *Planned Resources* to reflect the different stages of development.

Recently Acquired Resources

The *Recently Acquired Resources* reported in Table 5 have been acquired in the past year and are serving northwest utility loads as of December 31, 2012. They are reflected as part of the regional firm needs assessment.

Committed New Supply

Committed New Supply reported in Table 6a includes those projects under construction or committed resources and supply to meet Northwest load that are not delivering power as of December 31, 2012. In this report, resources being built by utilities or resources where their output is firmly committed to utilities are included in the regional load-resource analysis. Future savings from committed demand-side management programs are reported in Table 6b.

Planned Resources

Planned Resources presented in Table 7 include specific resources and/or blocks of resources identified in utilities' most current integrated resource plans. Projects specifically named in *Planned Resources* are not yet under construction as of December 31, 2012, but a firm commitment to construct or acquire the power has been. These resources are not part of the regional analysis.

Contracts

Imports and exports include firm arrangements for interchanges with systems outside the region, as well as with third-party developers/owners within the region. These arrangements comprise firm contracts with utilities to the East, the Pacific Southwest and Canada. Contracts to and from these areas are amounts delivered at the area border and include any transmission losses associated with deliveries.

Table 9: Utilities included in the Northwest Regional Forecast

Albion, City of	Fall River Rural Electric Cooperative	Pacific County PUD #2
Alder Mutual	Farmers Electric Co-op	PacifiCorp
Ashland, City of	Ferry County PUD #1	Parkland Light & Water
Asotin County PUD #1	Fircrest, Town of	Pend Oreille County PUD
Avista Corp.	Flathead Electric Cooperative	Peninsula Light Company
Bandon, City of	Forest Grove Light & Power	Plummer, City of
Benton PUD	Franklin County PUD	PNGC Power
Benton REA	Glacier Electric	Port of Seattle – SEATAC
Big Bend Electric Co-op	Grant County PUD	Portland General Electric
Blachly-Lane Electric Cooperative	Grays Harbor PUD	Puget Sound Energy
Blaine, City of	Harney Electric	Raft River Rural Electric
Bonnors Ferry, City of	Hermiston, City of	Ravalli Co. Electric Co-op
Bonneville Power Administration	Heyburn, City of	Richland, City of
Burley, City of	Hood River Electric	Riverside Electric Co-op
Canby Utility	Idaho County L & P	Rupert, City of
Cascade Locks, City of	Idaho Falls Power	Salem Electric Co-op
Central Electric	Idaho Power	Salmon River Electric Cooperative
Central Lincoln PUD	Inland Power & Light	Seattle City Light
Centralia, City of	Kittitas County PUD	Skamania County PUD
Chelan County PUD	Klickitat County PUD	Snohomish County PUD
Cheney, City of	Kootenai Electric Co-op	Soda Springs, City of
Chewelah, City of	Lakeview L & P (WA)	Southside Electric Lines
City of Port Angeles	Lane Electric Cooperative	Springfield Utility Board
Clallam County PUD #1	Lewis County PUD	Steilacoom, Town of
Clark Public Utilities	Lincoln Electric Cooperative	Sumas, City of
Clatskanie PUD	Lost River Electric Cooperative	Surprise Valley Elec. Co-op
Clearwater Power Company	Lower Valley Energy	Tacoma Power
Columbia Basin Elec. Co-op	Mason County PUD #1	Tanner Electric Co-op
Columbia Power Co-op	Mason County PUD #3	Tillamook PUD
Columbia REA	McCleary, City of	Troy, City of
Columbia River PUD	McMinnville Water & Light	Umatilla Electric Cooperative
Consolidated Irrigation Dist. #19	Midstate Electric Co-op	Umpqua Indian Utility Co-op
Consumers Power Inc.	Milton, Town of	United Electric Cooperative
Coos-Curry Electric Cooperative	Milton-Freewater, City of	US Corps of Engineers
Coulee Dam, City of	Minidoka, City of	US Bureau of Reclamation
Cowlitz County PUD	Missoula Electric Co-op	Vera Water & Power
Declo, City of	Modern Electric Co-op	Vigilante Electric Co-op
Douglas County PUD	Monmouth, City of	Wahkiakum County PUD #1
Douglas Electric Cooperative	Nespelem Valley Elec.Co-op	Wasco Electric Co-op
Drain, City of	Northern Lights Inc.	Weiser, City of
East End Mutual Electric	Northern Wasco Co. PUD	Wells Rural Electric Co.
Eatonville, City of	NorthWestern Energy	West Oregon Electric Cooperative
Ellensburg, City of	Ohop Mutual Light Company	Whatcom County PUD
Elmhurst Mutual P & L	Okanogan Co. Electric Cooperative	Yakama Power
Emerald PUD	Okanogan County PUD #1	
Energy Northwest	Orcas Power & Light	
Eugene Water & Electric Board	Oregon Trail Co-op	

Definitions

Annual Energy

Energy value in megawatts that represents the average of monthly values in a given year.

Average Megawatts

(MWA) Unit of energy for either load or generation that is the ratio of energy (in megawatt-hours) expected to be consumed or generated during a period of time to the number of hours in the period.

Biomass

Any organic matter which is available on a renewable basis, including forest residues, agricultural crops and waste, wood and wood wastes, animal wastes, livestock operation residue, aquatic plants, and municipal wastes.

Canadian Entitlement

Canada is entitled to one-half the downstream power benefits resulting from Canadian storage as defined by the Columbia River Treaty. Canadian entitlement returns estimated by Bonneville Power Administration.

Coal

This category of generating resources includes the region's coal-fired plants.

Cogeneration

Cogeneration is the technology of producing electric energy and other forms of useful energy (thermal or mechanical) for industrial and commercial heating or cooling purposes through sequential use of an energy source.

Combustion Turbines

These are plants with combined-cycle or simple-cycle natural gas-fired combustion turbine technology for producing electricity.

Committed Resources

This includes under construction projects and long-term power supply agreements that are committed but not yet producing power to meet Northwest load at the time of publication. This generation is included in the resources for calculating the regional load/resource balance.

Conservation

Any reduction in electrical power consumption as a result of increases in the efficiency of energy use, production, or distribution. For the purposes of this report used synonymously with energy efficiency.

Demand Response

Control of load through customer/utility agreements that result in a temporary change in consumers' use of electricity in times of system stress.

Demand-side Management

Peak and energy savings from conservation/energy efficiency measures, distribution efficiency, market transformation, demand response, fuel conversion, fuel switching, energy storage and other efforts that that serve to reduce electricity demand.

Dispatchable Resource

A term referring to controllable generating resources that are able to be dispatched for a specific time and need.

Distribution Efficiency

Infrastructure upgrades to utilities' transmission and distribution systems that save energy by minimizing losses.

Encroachment

A term used to describe a situation where the operation of a hydroelectric project causes an increase in the level of the tailwater of the project that is directly upstream.

Energy Efficiency

Any reduction in electrical power consumption as a result of increases in the efficiency of energy use, production, or distribution. For the purposes of this report used synonymously with conservation.

Energy Load

The demand for power averaged over a specified period of time.

Energy Storage

Technologies for storing energy in a form that is convenient for use at a later time when a specific energy demand is greater.

Exports

Firm interchange arrangements where power flows from regional utilities to utilities outside the region or to non-specific, third-party purchasers within the region.

Federal System (BPA)

The federal system is a combination of BPA's customer loads and contractual obligations, and resources from which BPA acquires the power it sells. The resources include plants operated by the U.S. Army Corps of Engineers (COE), U.S. Bureau of Reclamation (USBR) and Energy Northwest. BPA markets the thermal generation from Columbia Generating Station, operated by Energy Northwest.

Federal Columbia River Power System (FCRPS)

Thirty federal hydroelectric projects constructed and operated by the Corps of Engineers and the Bureau of Reclamation, and the Bonneville Power Administration transmission facilities.

Firm Energy

Electric energy intended to have assured availability to customers over a defined period.

Firm Load

The sum of the estimated firm loads of private utility and public agency systems, federal agencies and BPA industrial customers.

Firm Losses

Losses incurred on the transmission system of the Northwest region.

Fuel Conversion

Consumers' efforts to make a permanent change from electricity to natural-gas or other fuel source to meet a specific energy need, such as heating.

Fuel Switching

Consumers' efforts to make a temporary change from electricity to another fuel source to meet a specific energy need.

Historical Streamflow Record

A database of unregulated streamflows for 70 years (July 1928 to June 1998). Data is modified to take into account adjustments due to irrigation depletions, evaporations, etc. for the particular operating year being studied.

Hydro Maintenance

The amount of energy lost due to the estimated maintenance required during the critical period. Peak hydro maintenance is included in the peak reserve calculations.

Hydro Regulation

A study that utilizes a computer model to simulate the operation of the Pacific Northwest hydroelectric power system using the historical streamflows, monthly loads, thermal and other non-hydro resources, and other hydroelectric plant data for each project.

Imports

Firm interchange arrangements where power flows to regional utilities from utilities outside the region or third-party developer/owners of generation within the region.

Independent Power Producers (IPPs)

Non-utility entities owning generation that may be contracted (fully or partially) to meet regional load.

Intermittent Resource

An electric generating source with output controlled by the natural variability of the energy resource rather than dispatched based on system requirements. Intermittent output usually results from the direct, non-stored conversion of naturally occurring energy fluxes such as solar and wind energy.

Investor-Owned Utility (IOU)

A privately owned utility organized under state law as a corporation to provide electric power service and earn a profit for its stockholders.

Market Transformation

A strategic process of intervening in a market to accelerate the adoption of cost-effective energy efficiency.

Megawatt (MW)

A unit of electrical power equal to 1 million watts or 1,000 kilowatts.

Nameplate Capacity

A measure of the approximate generating capability of a project or unit as designated by the manufacturer.

Natural Gas-Fired Resources

This category of resources includes the region's natural gas-fired plants, mostly single-cycle and combined-cycle combustion turbines. It may include projects that are considered cogeneration plants.

Non-Utility Generation

Facilities that generate power whose percent of ownership by a sponsoring utility is 50 percent or less. These include PURPA-qualified facilities (QFs) or non-qualified facilities of independent power producers (IPPs).

Nuclear Resources

The region's only nuclear plant, the Columbia Generating Station, is included in this category.

Operating Year

Twelve-month period beginning on August 1 of any year and ending on July 31 of the following year. For example, operating year 2014 is August 1, 2013 through July 31, 2014.

Other Publics (BPA)

Refers to the smaller, non-generating public utility customers whose load requirements are estimated and served by Bonneville Power Administration.

Peak Load

The maximum demand for power during a specified period of time.

Planned Resources

Planned resources include those projects, measures, and transactions that utilities have made some commitment to acquire and are in some stage of state site certification process. However, either not all licenses have been obtained, no commercial operation data has been specified, or the specifics of the transaction have not been finalized.

Planning Margin

A component of regional requirements that is included in the peak needs assessment to account for various planning uncertainties.

Private Utilities

Same as investor-owned utilities.

Publicly-Owned Utilities

One of several types of not-for-profit utilities created by a group of voters and can be a municipal utility, a public utility district, or an electric cooperative.

PURPA

Public Utility Regulatory Policies Act of 1978. The first federal legislation requiring utilities to buy power from qualifying independent power producers.

Renewables - Other Resources

A category of resources that includes projects that produce power from such fuel sources as small hydropower, solar, geothermal, biomass (includes wood, municipal solid-waste facilities), and pilot level projects including tidal and wave energy.

Requirements

For each year, a utility's projected loads, exports, and contracts out. Peak requirements also include the planning margin.

Reservoir Plant

A hydroelectric plant on a reservoir with storage capacity, installed machine capacity, head characteristics, and flow levels, which will permit seasonal drafts.

Small Thermal & Miscellaneous Resources

This category of resources includes small thermal generating resources such as diesel generators used to meet peak and/or emergency loads.

Thermal Resources

Resources that burn coal, natural gas, oil, diesel or use nuclear fission to create heat which is converted into electricity.

Wind Resources

This category of resources includes the region's wind powered projects.