Orcas Power and Light Cooperative

EES Consulting

Resource Plan Update and HB1010 Filing

Final

October 2010

EES Consulting

October 27, 2010

Mr. Mark Tilstra
Orcas Power and Light Cooperative
183 Mt. Baker Road
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SUBJECT: Resource Plan and HB1010 2010 Filing

Dear Mr. Tilstra:

Attached please find a final report that updates the 2008 Resource Plan for Orcas Power and Light Cooperative's 2010 HB1010 filing. We appreciate all of the help you and your staff have provided in conjunction with this study. Please feel free to contact me directly with any questions or comments.

Very truly yours,

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Contents

List of Tables

List of Figures

1 Introduction

Orcas Power and Light Cooperative (OPALCO) contracted EES Consulting (EESC) to develop a resource plan consistent with Engrossed Substitute House Bill 1010 (HB 1010) for Washington State utilities. OPALCO is currently a full requirements customer of the Bonneville Power Administration (BPA) which means that BPA provides all power requirements at cost-based rates. However, OPALCO's power supply portfolio will change and be impacted in the future due to fundamental changes to the pricing structure of BPA power sales beginning in October 2011. BPA has developed two pricing tiers to capture the difference in costs associated with existing BPA resources (Tier 1), and new resources or market priced purchases (Tier 2) required to meet customers' loads in excess of the current capability of the BPA system.

The intent of HB 1010 is to pursue safe, clean, and reliable energy resources to meet demand in Washington. HB 1010 requires all utilities, regardless of size, to develop resource plans that consider renewable and conservation resources. Because OPALCO serves fewer than 25,000 customers, HB 1010 requires that OPALCO develop a resource plan that:

1. Estimates loads for the next five and ten years;
2. Enumerates the resources that will be maintained and/or required to serve those loads; and
3. Explains why the resources in (2.) were chosen and, if the resources chosen are not renewable or conservation resources, why such a decision was made.

In 2008 OPALCO filed a Resource Plan to meet the requirements of HB 1010. This report is an update to the original 2008 filling. This update addresses each of the HB 1010 requirements and is meant as a planning document for meeting OPALCO's future energy requirements. First, OPALCO's current loads and resources are discussed. Then energy and demand forecasts are described and planned future resources identified. These planned resources include a combination of federal (Bonneville Power Administration, BPA) resources, demand-side resources, and other local resources. Lastly, a resource summary describes the resource choice identified in the forecasted loads and resource balance section.

2 Current Loads and Resources

Background

Orcas Power and Light Cooperative (OPALCO) is a rural electric cooperative serving 20 islands in San Juan County including Orcas, San Juan, Shaw, and Lopez. OPALCO serves approximately 14,500 residential, commercial, and lighting customers. Due to the rural nature of their service territory, OPALCO's customer base is primarily residential. Friday Harbor, located on San Juan Island, is the only incorporated town in the county. Tourism is the largest employer in San Juan County and tourism related services compose the majority of service related employment. The population in San Juan County nearly doubles during the peak of the tourist season (in the summertime).

Historic Loads

Figure 1 shows historic energy loads by customer. The lighting customer use is low (2,024 kWh in 2009) so is not visible on the graph. Total energy requirements have increased from 120,500 MWh in 1988 to 216,010 MWh in 2009. The increase is due to an average annual residential energy sales growth of 4.8 percent and 2.4 percent growth in commercial energy use. Lighting usage decreases over the same period from 104 MWh in 1988 to just over 2 MWh in 2009 due to decreasing average use per customer. Peak demand increased from 30.3 MW in 1988 to 54.8 MW in 2009.[1] Figure 2 shows weather adjusted loads for the period 1998 through 2009. The difference between total energy requirements and sales is due to utility use and losses. The total requirements in Figure 2 were calculated using Heating Degree Days (HDD) from the Friday Harbor Airport weather station provided by NOAA (National Oceanic and Atmospheric Administration).

[1] Assuming annual load factor is 45 percent in 2009.

Figure 1
Historic Energy Sales 1988 through 2009

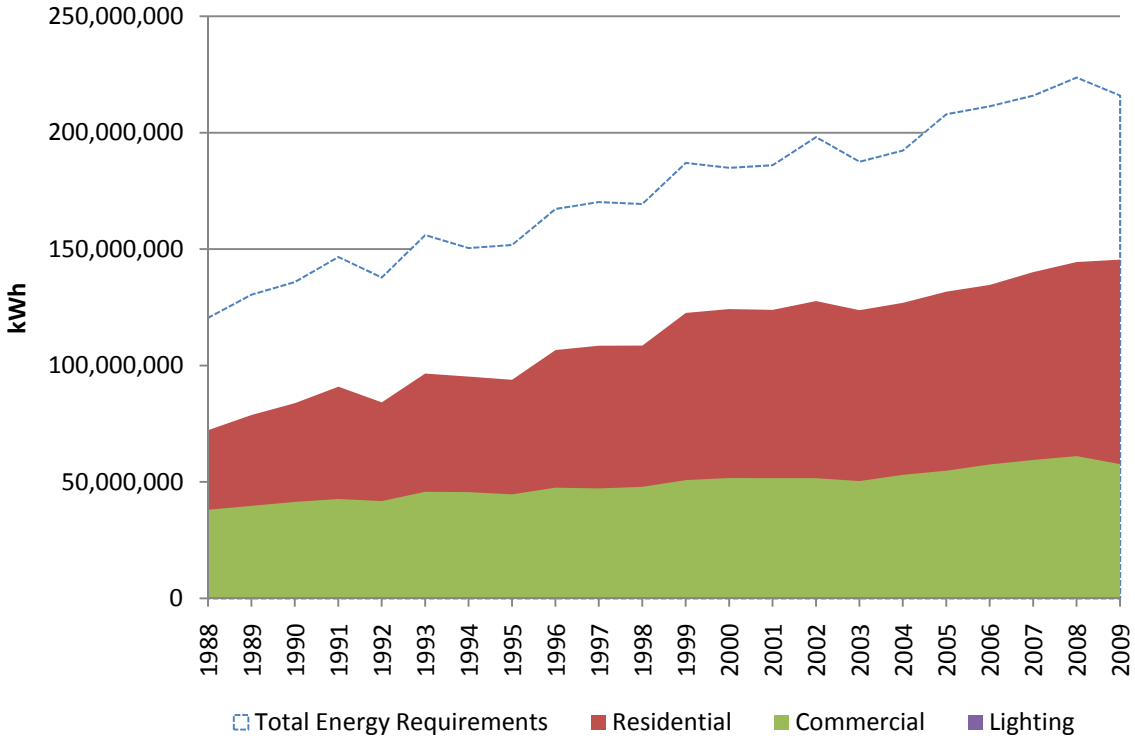
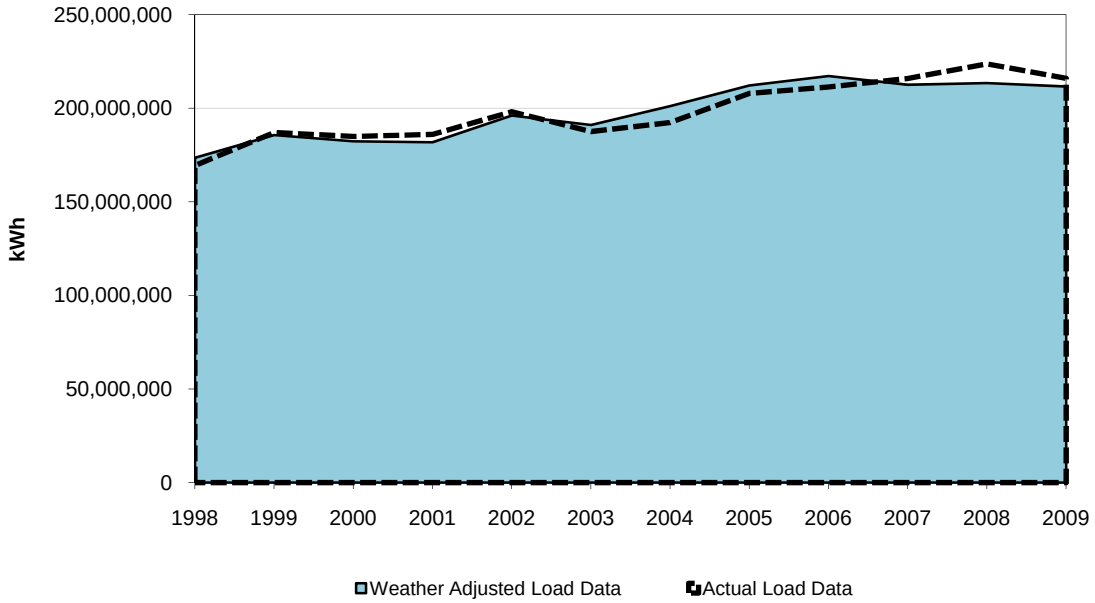


Figure 2
Weather Adjusted Total Requirements
1998 through 2009



Existing Resources

Bonneville Power Administration Resources

OPALCO is a BPA full requirements customer; they rely solely on BPA to provide their energy and demand requirements at low rates. Under BPA's current rate structure, when BPA acquires additional resources to serve its customers' increasing loads (load growth), the cost of purchasing additional power is averaged or "melded" with the cost of the existing resources. As a result, BPA's current rates reflect the average cost of both its existing and new resources.

In addition to the preference power OPALCO purchases, OPALCO also purchases 0.33 aMW of green power from BPA. OPALCO is able to offer customers the option to buy their power from green resources.

Local Resources

OPALCO has acquired several local renewable resources in their service territory through BPA's CR&D and CAA programs. Table 1 shows capacity and energy produced for each type of resource. OPALCO has a combination of solar and micro-hydro projects located in their service territory. Solar projects are most prominent.

Table 1
Small Renewable Resources

	Capacity (watts)	kWh per Year	aMW
Solar	180,000	200,000	0.023
Micro-Hydro	20,000	23,000	0.003
Total	200,000	223,000	0.025

Conservation/ Energy Efficiency/Demand-Side Management

Demand-Side Management (DSM) for OPALCO has primarily included conservation resources in the past. Mainly, OPALCO has participated in Bonneville's conservation programs. These programs include commercial and residential CAA, CR&D, and ConAug programs. Table 2 provides historic conservation data for the period 2004 through 2009. Expenditures are shown for 2004 through 2007. OPALCO expenditures are approximately 24 cents per kWh savings. Figure 3 illustrates annual savings for each year. Early start savings and expenditures (via BPA credit) for are included in the 2009 figures. Orcas Power and Light has saved an average of 0.2 aMW in the last two years through several conservation and energy efficiency measures including: residential and commercial lighting, heat pump upgrades, Energy Star® New Homes (manufactured), energy efficient water heaters and appliances.

Table 2
Historic Conservation Savings

Year	Expenditures nominal $	Savings aMW	Early Start Expenditures	Early Start Savings
2004	62,634	0.02		
2005	46,906	0.05		
2006	41,088	0.01		
2007	31,124	0.02	18,123	0.01
2008		0.16		
2009		0.24		

Figure 3
Historic Conservation Savings 2004 to 2009

Northwest Energy Efficiency Alliance Savings

The Northwest Energy Efficiency Alliance (NEEA) is an organization that coordinates regional conservation efforts through a multitude of programs. The Bonneville Power Administration contributes money each year toward NEEA's conservation efforts, and so each BPA customer (utility) can claim their pro rata share of BPA savings. For this resource plan, EES Consulting estimated OPALCO's share of the BPA NEEA savings. This estimate is based on the assumption that BPA funds 50 percent of NEEA's total budget and so BPA can claim 50 percent of the savings. Also, OPALCO's pro rata share of BPA's conservation savings is calculated using the high watermark data released in August 2007. OPALCO's actual share of NEEA savings may vary depending on actual

load data. OPALCO's average NEEA savings from 2001 through 2009 is approximately 0.08 aMW per year. Table 3 shows the details of the NEEA estimates.

Table 3
Orcas Power & Light Cooperative Share of NEEA Savings

	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Alliance Programs	30.17	35.39	33.53	35.14	28.89	24.53	55.00	74.00	50.00	**40.74**
BPA Share of NEEA	15.09	17.70	16.76	17.57	14.44	12.27	27.50	37.00	25.00	**20.37**
Orcas Share	0.06	0.07	0.06	0.07	0.05	0.05	0.10	0.14	0.09	**0.08**

3 Forecasted Loads and Resources

Electric Load Forecast

BPA's load forecast dated June 1, 2009 was used to update OPALCO's load forecast. BPA forecasted that OPALCO's load would increase from 25.5 aMW to 28.6 aMW during the 2010 to 2014 time period. An average annual growth rate of 1.56 percent is used to project BPA's load forecast through 2029. In addition, historic conservation was added to BPA's forecast. Table 4 illustrates BPA's forecast and the adjustments made for historic conservation trends.

Table 4
BPA Load Forecast for OPALCO
Adjusted for Conservation, aMW

	BPA Load Forecast *a*	Historic Conservation Trends *b*	BPA Load Forecast Excluding Conservation *c = a + b*
2010	26.50	0.09	26.59
2011	26.94	0.18	27.12
2012	27.37	0.27	27.64
2013	27.97	0.36	28.33
2014	28.56	0.45	29.01
2015	29.01	0.54	29.55
2016	29.46	0.63	30.09
2017	29.92	0.72	30.64
2018	30.38	0.81	31.19
2019	30.86	0.90	31.76
2020	31.34	0.99	32.33
2021	31.82	1.08	32.90
2022	32.32	1.17	33.49
2023	32.82	1.26	34.08
2024	33.33	1.35	34.68
2025	33.85	1.44	35.29
2026	34.38	1.53	35.91
2027	34.92	1.62	36.54
2028	35.46	1.71	37.17
2029	36.01	1.80	37.81

Planned Resources

Bonneville Power Administration Resources

Beginning in October 2011, BPA will implement a tiered rate system where the traditional low rates will be available for only the first block of power. The first block is known as the utility's high water

mark (HWM) and is equal to 2010 loads. Loads above a utility's HWM will be met with either Tier 2 BPA resources (at higher rates than Tier 1 resources) or non-federal resources chosen by the utility. Tier 1 is intended to capture the costs of BPA's current resources and Tier 2 is intended to capture the costs of additional resources acquired by BPA to serve its customers' loads in excess of their Tier 1 allocation. The general structure of the products that BPA intends to make available at Tier 1 rates is likely to remain essentially unchanged from the products that it currently provides.

At the time of this resource plan, OPALCO's Tier 1 energy is estimated based on BPA's Projected Customer Loads and Transition High Water Marks for Regional Discussion. BPA estimates that OPALCO's HWM[2] is 27.145 aMW per year.

Local Resources

This resource plan assumes that no additional renewable energy resources are installed during the ten-year planning period. Historic renewable energy in OPALCO's service territory sums to 0.025 aMW per year. While projects may be installed during the planning period, the power supply provided by these new projects is likely to remain too small to include in this plan.

Conservation/ Energy Efficiency/DSM

OPALCO utility programs are projected using the most recent two years of historic achievement. Future conservation savings from utility programs are estimated at 0.2 aMW per year. Future savings due to NEEA efforts is estimated at 0.08 aMW/year. Together, historic OPALCO program savings and NEEA savings amount to an average of 0.28 aMW per year of conservation resources. OPALCO will continue to work with BPA to determine and implement cost effective programs in the service area.

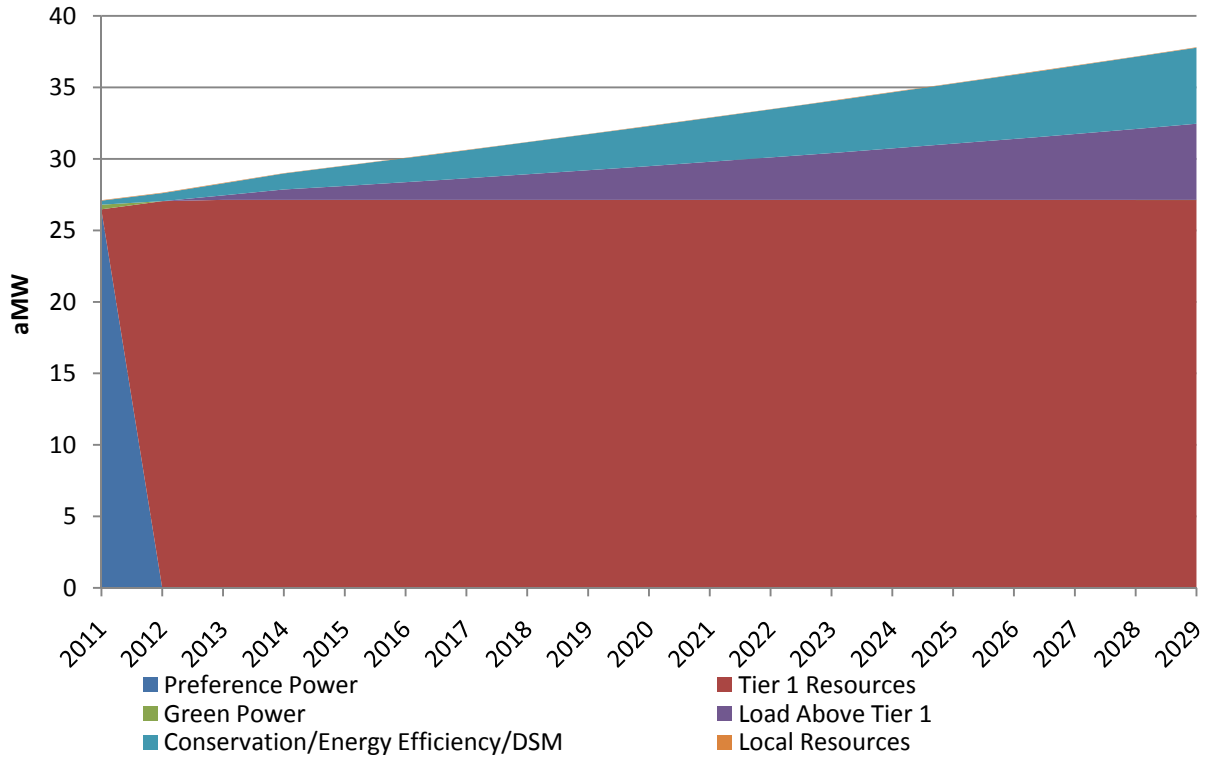
In addition to conservation programs, OPALCO is currently working on implementing a demand response pilot program. This pilot is focused on providing peak demand reductions by cycling off residential water heaters. If the pilot program proves to be a cost-effective method for reducing peak demand, OPALCO will evaluate a wider implementation of the program.

Load Resource Balance

Figure 4 illustrates OPALCO's load resource balance for the period 2010 through 2029. OPALCO's continued conservation efforts reduce power requirements above Tier 1 resources. Since energy produced from local resources is small, it does not show prominently in Figure 4. Also, based on current information, OPALCO plans to continue offering the option for customers to purchase green power through the end of the planning period. Green power purchased from BPA through 2011 is shown below in Figure 4. Note that the load forecast below is the forecast in column *c* from Table 4 above where historic conservation trends have been added back into the load forecast. Average historic conservation is approximately 0.09 aMW annually (incremental).

[2] Transition HWM

Figure 4
Load Resource Balance - ENERGY



Load Above Tier 1

At this time, OPALCO plans to meet load above Tier 1, DSM, and Local resources with BPA's load following product. Since OPALCO's estimated load growth is low (1.56 percent), and local resources are available, only a small portion of OPALCO's load requirements are subject to BPA Tier 2 rates. Compared with the 2008 OPALCO Resource Plan, this updated plan shows that a great share of load growth will be met with DSM resources. OPALCO will continue to explore other resource options, such as DSM (conservation) or renewable resources, as they become available.

Resource Summary

Orcas Power and Light Cooperative has developed this plan in response to HB1010 requirements. Table 5 summarizes the planned resources for the period 2010 through 2029. Additional detail and the Cover Sheet and Summary of Biennial Utility Resource Plans form required by HB1010 can be found in the attached appendix. Table 5 shows that OPALCO might expect to purchase power at Tier 2 rates beginning in 2016. BPA forecasts that OPALCO would start to purchase power at Tier 2 rates in 2014 The different assumptions for conservation and local resources between this study and the BPA load forecast make up the difference between BPA forecasts and this resource plan.

Table 5
Planned Resources 2010-2029 (aMW)

	Total Power Requirements	Local Resources	Cumulative Conservation	Green Power	Preference Power	Tier 1 Resources	Load Above Tier 1[(1)]
2010	26.59	0.025	0.19	0.33	26.06		0.00
2011	27.12	0.025	0.28	0.33	26.48		0.00
2012	27.64	0.025	0.56			27.06[(2)]	0.00
2013	28.33	0.025	0.84			27.15	0.32
2014	29.01	**0.025**	**1.12**			**27.15**	**0.72**
2015	29.55	0.025	1.40			27.15	0.98
2016	30.09	0.025	1.68			27.15	1.24
2017	30.64	0.025	1.96			27.15	1.51
2018	31.19	0.025	2.24			27.15	1.78
2019	31.76	**0.025**	**2.52**			**27.15**	**2.07**
2020	32.33	0.025	2.80			27.15	2.36
2021	32.90	0.025	3.08			27.15	2.65
2022	33.49	0.025	3.36			27.15	2.96
2023	34.08	0.025	3.64			27.15	3.27
2024	34.68	0.025	3.92			27.15	3.59
2025	35.29	0.025	4.20			27.15	3.92
2026	35.91	0.025	4.48			27.15	4.26
2027	36.54	0.025	4.76			27.15	4.61
2028	37.17	0.025	5.04			27.15	4.96
2029	37.81	0.025	5.32			27.15	5.32

(1) When "Load above Tier 1" is less than 1 aMW, it will be part of the Tier 1 load following product and not subject to Tier 2 rates.
(2) The full HWM amount is not purchased based on OPALCO's load forecast, green power purchases, local resources, and DSM.

Resource Choice

OPALCO plans on continue purchasing all power requirements in excess of DSM and local resources from BPA. To meet power needs in excess of Tier 1, BPA plans to offer Tier 2 products. Tier 2 is

intended to be power from sources other than the existing federal system, offered at approximately the cost of the resources. For example, a Tier 2 product may consist of wind project output purchased by BPA or market purchases. For the purposes of this resource plan, Tier 2 is considered a distinct resource.

Orcas Power and Light Cooperative plans to continue active conservation resource acquisition to further reduce load requirements above Tier 1 resources. Also, local renewable resources are currently available. While this plan does not assume further investment in these resources, OPALCO may have opportunity to expand local renewable resources and benefit from reduced load requirements above Tier 1.

Appendix A

Cover Sheet and Summary of Biennial Utility Resource Plans
2010 Report

Orcas Power and Light Cooperative

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	Base Year of RP: Loads/Resources CY 2009	**Projected Energy**	
	Annual Energy (MWa)	**2014**	**2019**
(1) Loads	24.16	29.01	31.76
Resources			
(2) Conservation/Efficiency	N/A	1.12	2.52
(3) Demand Response	N/A		
(4) Cogeneration (minor)			
(5) Hydro (minor)	0.003	0.003	0.003
(6) Wind (minor)			
(7) Other Renewables (solar)	0.023	0.023	0.023
(8) BPA Base Year EPP	0.33		
(9) BPA Tier 1 Load Following	23.80	27.87	27.15
(10) BPA Tier 2: Load Growth Rate			2.07
(11) BPA Tier 2: Short-Term Rate			
(12) BPA Tier 2: Vintage Rate			
(13) Non BPA Load Following			
(14) Non BPA: Market Purchase			
(15) Other (Specify)			
(16) Total Resource	24.16	29.01	31.76
(17) Load/Resource Balance	0.00	0.00	0.00

If a resource other than Conservation and renewables is included in the plan (rows 9, 10, 12,13 or 14) please explain the choice:

Please see attached document.