



Integrated Resource Plan



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Grays Harbor PUD Integrated Resource Plan

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Executive Summary

Public Utility District No. 1 of Grays Harbor County (“GHPUD”) has developed this Integrated Resource Plan (“IRP”) both to meet the State of Washington regulatory requirement (HB 1010) and to provide the district staff and Commissioners a strategic plan anchored in the budget development and tracking process. The district has chosen to examine the 15-year period from 1/1/2009 through 12/31/2023 specifically because the next resource decisions for supplying the District’s loads are driven by the Renewable Portfolio Standards (“RPS”) and the expiration of Grays Harbor’s power supply contract with the Frederickson Combined Cycle Combustion Turbine generator in 2022.

The analysis employed in this IRP is based on a most-likely estimate of future load growth. The methodology employed in that forecast is detailed in Appendix A. The Base Forecast is then varied stochastically via Monte Carlo simulations of both the rate of load growth across the 15-year period as well as Monte Carlo simulations of its Preference Power Supply (or, Tier 1 supply in the proposed 2011 Bonneville Power Administration (BPA) power supply contract language). The District anticipates a renewal of its Slice of System product contract at an estimated 2010 High Water Mark value of 138 average megawatts. That power is assumed to be supplied as 60% Slice (1.123% of the Federal system) and 40% block power supply. This split yields approximately 83 average megawatts of Slice and 55 average megawatts of Block supply in critical water conditions.

The District expects to evergreen this IRP via links to its shorter term (5-year) budget analysis. With the completion of the datasets and methods used to develop the expected load forecast and its uncertainties, the District has at its disposal a strategic look that is consistent with budget planning on a year-to-year basis.

Loads and Resources

Energy (Annual)

Figure 1 illustrates the District’s load forecast on an annual energy basis (plotted as MWh). Two load cases are shown: Expected Load (blue) and the 95th-percentile load from a 10,000-cycle Monte Carlo simulation that varies the year-on-year growth of the underlying residential and small commercial load (large loads are handled via a fixed forecast; see Appendix A). In Figure 2, the District’s Load/Resource balance is shown for both Expected and High load cases. As can be seen in Figure 2, the District’s resources are adequate on a total energy basis to supply the District’s energy needs until 2020 in the High Load Case and through contract expiration in the Base Case.

Capacity (Peak)

However, when peak loads are considered, peaking capacity at Critical Water is short of the Base Case Peak in 2009 and the High Case Peak in 2010. In the out-years of the forecast the District is short of peaking capacity. Thus, the first finding of the IRP: GHPUD has adequate energy through 2022; limited peaking capacity beginning in 2016.

Figure 1

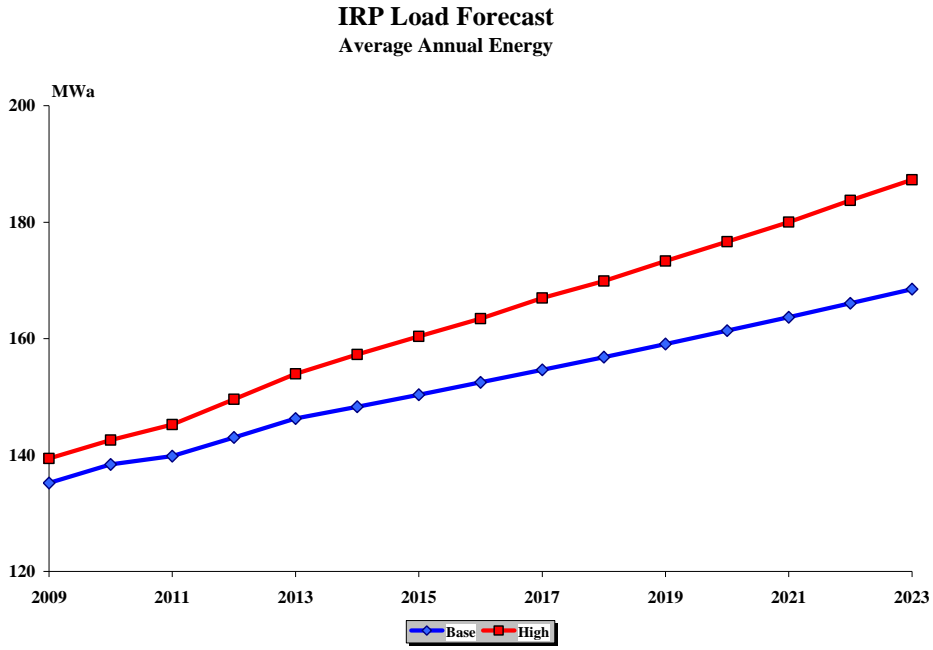


Figure 2

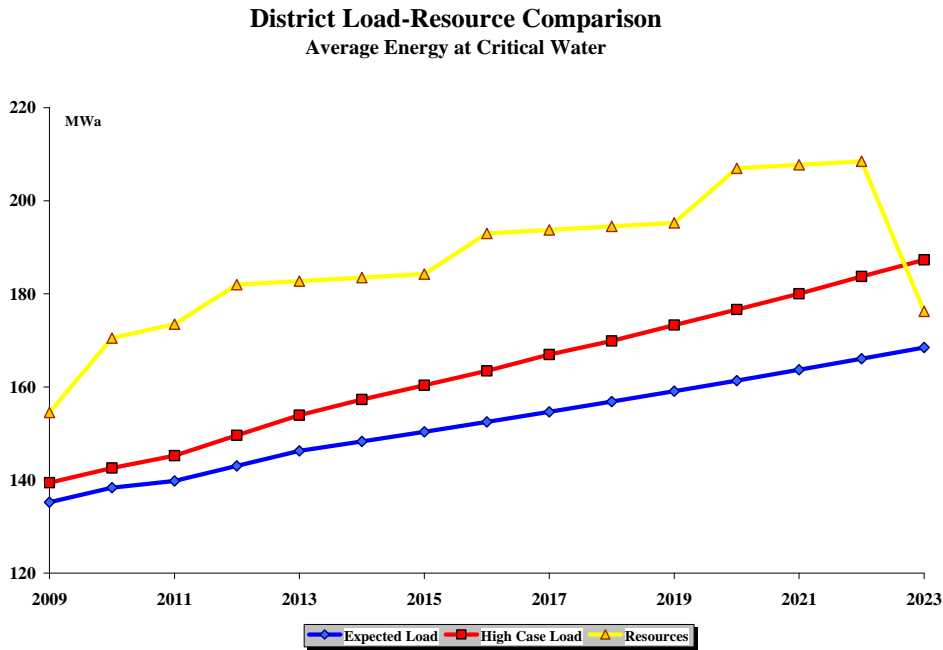
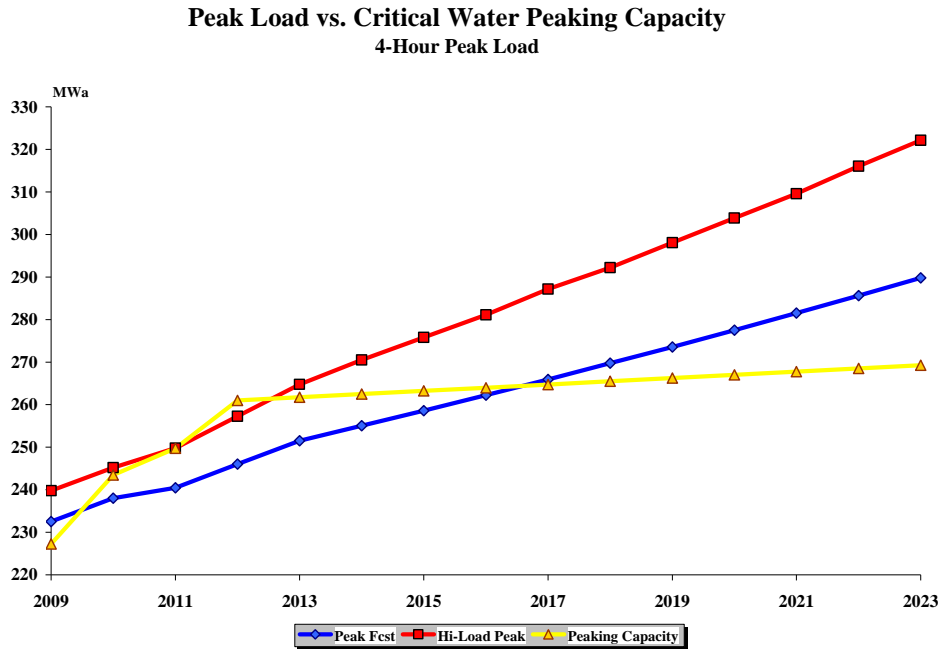


Figure 3



Renewable Portfolio Standards

The District’s satisfactory compliance with the Renewable Portfolio Standards (“RPS”) of Washington State Initiative 937 (“I-937”) is also a planning issue of concern to both regulators and District Staff and Commissioners. The District’s compliance with the RPS requirements is summarized in Figure 4. As can be seen in Figure 4, the District’s current portfolio will provide adequate renewable resource energy to comply until the second requirements increase to 9% in 2016. As the District is presently involved in negotiations for the purchase of renewable generation that will significantly increase its supply, the forecast employed in the IRP assumes that the GHPUD will meet its renewables requirements over the forecast period. A discussion of the largest such transaction can be found in Appendix B.

Conservation

Conservation is being studied in detail by a consultant hired by the District in connection with I-937’s call for the assessment of cost-effective conservation methods and their submittal by January 1, 2010. Only preliminary results of that study are available as of 9/1/2008. An initial, quick-look suggests that the District will be able to economically gain an additional 0.75 MWa each year across the period, for a total of 11.25 MWa’s in 2023. That information is summarized in Figure 5. Note that conservation gains have been added to the District’s resources in previous charts

Fuel Diversity

The District has and will continue to have a diverse supply portfolio, with the Federal Columbia Hydro Electric System as its backbone. In addition to hydro, the District also

lists nuclear, conventional gas-fired thermal and wind among its sources of energy and peaking capacity. Tables 1 and 2 summarize the District's post-2011 fuel diversity.

Figure 4

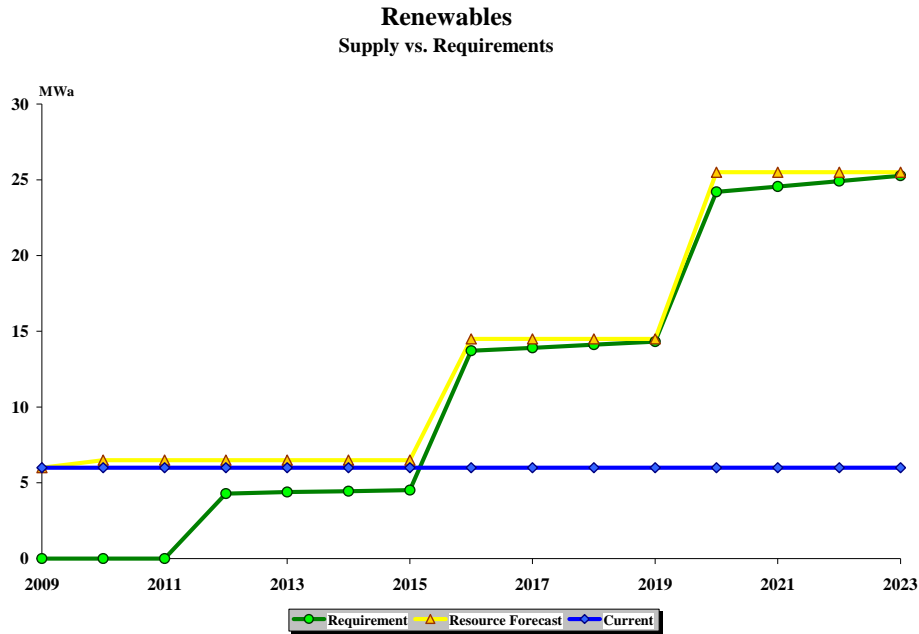


Figure 5

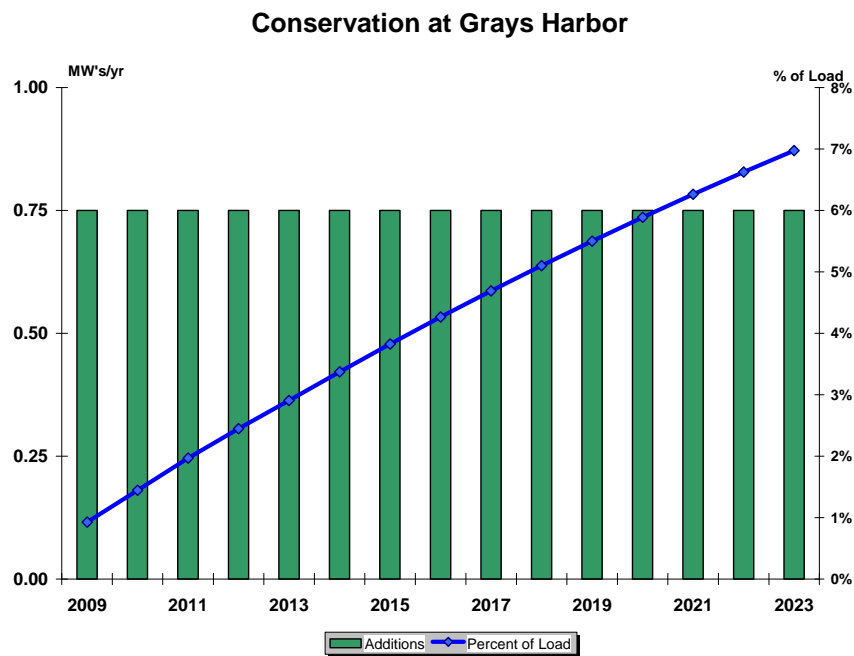


Table 1

2012 Energy and Peaking Fuel Diversity

	Mwa	MW's
Hydro	119	169
Nuclear	19	19
Thermal	33	67
Wind	6	0
Other	5	6
	182	261

Table 2

2012 Energy and Peaking Fuel Diversity (%)

Hydro	65%	65%
Nuclear	10%	7%
Thermal	18%	26%
Wind	3%	0%
Other	3%	2%
	100%	100%

Action Plan

The District's present resources meet all operational and regulatory requirements across the 2-year action planning period 2009-2010. Specific activities planned based on the District's business plan and this IRP will be to supplement the peaking capacity shortfall seen in Figure 3, further investigate the actual peaking capability of BPA's Slice of System product in winter at critical water, pursue the transaction described in Appendix B to its conclusion, and to participate in the ongoing activities surrounding the renewal of GHPUD's Slice contract for the 20-year period beginning 10/1/2011.

Introduction

The Grays Harbor Public Utility District (“GHPUD”, “Grays Harbor”, “the District”) integrated resource plan (“IRP”) is a 15-year forward look at the load-resource balance of the District, both for energy and peaking capacity. That period is chosen as it extends one year past the expiration of a 45MW power supply contract with the gas-fired, combined-cycle combustion turbine Frederickson, near Tacoma, WA. It has been the view of the District management that GHPUD is well supplied by its current resources until that contract expiration. Examination of even very aggressive load growth scenarios (below) demonstrates that to be the case. Further, the District is well satisfied with the performance resulting from its election to contract for the Slice of System product from Bonneville, starting in 2001. It takes reelection of that product as a given in this IRP. However, as a number of regulatory requirements have been enacted in the past few years, the District’s ability to comply with the full range of those requirements is worthy of examination. GHPUD desires to achieve the following items from this IRP:

1. Confirmation of management’s view regarding the adequacy of resources, both energy and capacity;
2. The conduct of a review of the District’s current compliance with regulatory requirements;
3. An estimate of the timing of any additional resources required to maintain compliance;
4. The provision of a strategic look at the District’s future business that ties to the tactical budgetary and risk management tools already in place in the District;
5. The provision of its Board of Commissioners and Staff with a planning tool that will inform current and future decisions regarding the District’s resource portfolio.

The involvement of the District’s customer/owners has been solicited through two public workshops, the first in July of the current year, focusing on conservation, the second in August, presenting the initial results of load forecasting and the load/resource balance.

Regulatory Requirements

A number of recent State and Federal mandates have increased the compliance demand for utilities of comparable or larger size than Grays Harbor. Four such are germane to the present IRP. Beginning with State of Washington legislation

House Bill 1010

The prime driver for this document, HB 1010 requires that utilities with more than 25,000 customers develop an Integrated Resource Plan and submit it to the state by 9/1/2008 (this date has been extended to 9/9/2008). The requirements of that legislation are summarized as follows:

1. A range of forecasts of load covering a minimum of 10 years;
2. A detailed, short-term plan covering the first two years describing specific actions to be taken to meet load and other regulatory requirements;
3. An assessment of commercially available, utility-scale renewable and nonrenewable generating resources (Supply Side Management – SSM);

4. An assessment of commercially available conservation and efficiency resources (Demand Side Management – DSM)
5. A comparison of SSM and DSM, including all costs, against a “lowest reasonable cost” criterion;
6. Customer input regarding these issues;
7. The integration of all of the above into a long-range plan to meet current and anticipated loads at lowest reasonable cost.

Initiative 937

The publicly endorsed Initiative 937 dictates a requirement for the acquisition by utilities in the State of both conservation and renewably-fueled resources in the coming years. The initiative delegates to the utilities the estimation and pursuit of available conservation that is cost-effective, reliable and feasible. Further, the Renewable Portfolio Standard (“RPS”) of the initiative enjoins each such utility to employ renewably-fueled resources or acquire renewable energy credits (“REC’s”), or some combination of the two. The following annual, RPS targets are established for Washington utilities by I-937:

1. Three percent of load for the period January 1, 2012 through December 31, 2015;
2. Nine percent of load for the period January 1, 2016, through December 31, 2019; and
3. Fifteen percent of load by January 1, 2020, and all subsequent years.

I-937 requires that by January 1, 2010 each qualifying utility shall identify its achievable cost-effective conservation potential through 2019. The methodologies of the Northwest Power and Conservation Council are to be taken as a basis for that assessment, with the latitude to redefine cost-effectiveness on a local basis. Increasingly, the consensus has formed that market prices, amplified by delivery and ancillary service costs, shall be the basis for the determination of the avoided cost achieved by conservation. After 2009, each utility must generate and make available for public discussion a biennial acquisition target for cost-effective conservation. They are further required to achieve that conservation goal in the two years following its establishment.

Senate Bill 6001

Washington State has initiated a greenhouse gas emissions policy. One result of that exercise is Senate Bill 6001. In addition to establishing goals for greenhouse gas emissions (“GHG”) reduction and clean energy economy goals for the State, SB 6001 also establishes a “carbon footprint” standard for all baseload electric generation, beginning July 1st, 2008. That standard is 1100 pounds of CO₂ emissions per megawatt hour. SB 6001 applies to all generation used to serve load in Washington, whether or not that generation is located within the state. It defines baseload generation as generation that is “designed and intended to provide electricity” at an annualized capacity factor of at least 60 percent. As the District’s base-load resources currently meet or exceed that standard, and as any future resource acquisitions will be directed toward compliance with the RPS, SB 6001 has little or no impact on Grays Harbor.

Energy Policy Act of 2005 (Federal)

As an amendment to the PURPA of 1978, the Federal Energy Policy Act of 2005 directs utilities to begin diversifying the fuels of resources in its portfolio. Currently, the District has a diverse set of resource fuels, as shown below in Table 1. Given that fact, EPA 2005 will not be addressed again in this IRP.

Table 1

2012 Fuel Diversity	Energy Mwa	Peaking MW's
Hydro	119	169
Nuclear	19	19
Thermal	33	67
Wind	6	0
Other	5	6
	182	261

Table 2

2012 Fuel Diversity (%)	Energy Mwa	Peaking MW's
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Wind	3%	0%
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	100%	100%

The IRP Process at Grays Harbor PUD

EnergyRisk, LLC was contracted in late spring to aggregate and write Grays Harbor's Integrated Resource Plan. From the outset, the District's management and Board of Commissioners were explicit in their desire to build an IRP system that would be a long-term planning tool to supplement the District's five-year budget tracking tools. Compatibility with those tools was the first requirement in that regard, moving beyond those of HB 1010. GHPUD's budget is tracked via an Excel workbook, detailing monthly estimates of all loads, resources and costs having an impact on the Net Margin from Power Revenues that the District experiences in the budget year. That workbook contains a budgetary quality forecast that covers five years. It is updated monthly as actual loads, cost, etc. become available. A number of analytic aids are available within the workbook. For the purposes of compatibility, the first five years of GHPUD's IRP are further refined beyond the regulatory requirements of the exercise, yielding the monthly term-structure employed in the budget tools. In developing this report a load-forecasting tool has been constructed that will feed the loads employed in that 5-year look. Anticipated large-load additions and future resources will be treated as scenarios in the budgetary process.

At one point or another in its development, GHPUD's IRP proceeded along four parallel paths:

1. Load forecasting, derived from an analysis of recent load histories at the District;
2. The cataloging of likely new large loads and potential resources currently known to management;
3. The solicitation of public input from the District's customer-owners.
4. A separate effort by another consultant to adapt the Northwest Power Conservation Council's conservation methodologies to the specifics of Grays Harbor's loads and climate. That study is in connection with the 1/1/2010 deadline of HB 1010. Its results are expected late 4th Quarter 2008 or early 1st Quarter 2009.

Each of these strands is discussed below. More detail regarding load forecasting methodology can be found in Appendix A.

Grays Harbor PUD Loads

GHPUD serves the electric power needs of Grays Harbor County and small portions of the surrounding counties. Its 2007 base-year loads of 125.5 MWa were 51% residential, 27% commercial and 22% industrial. For forecasting purposes those loads were divided differently:

- Gross load** – the entire load in the District's service territory; GHPUD's load for regulatory purposes;
- Net load** – gross load less industrial customer-owned generation not committed to load;
- “Native” load** – net load less the loads of the top seven industrial loads served by the District, a proxy for residential and the associated commercial loads.

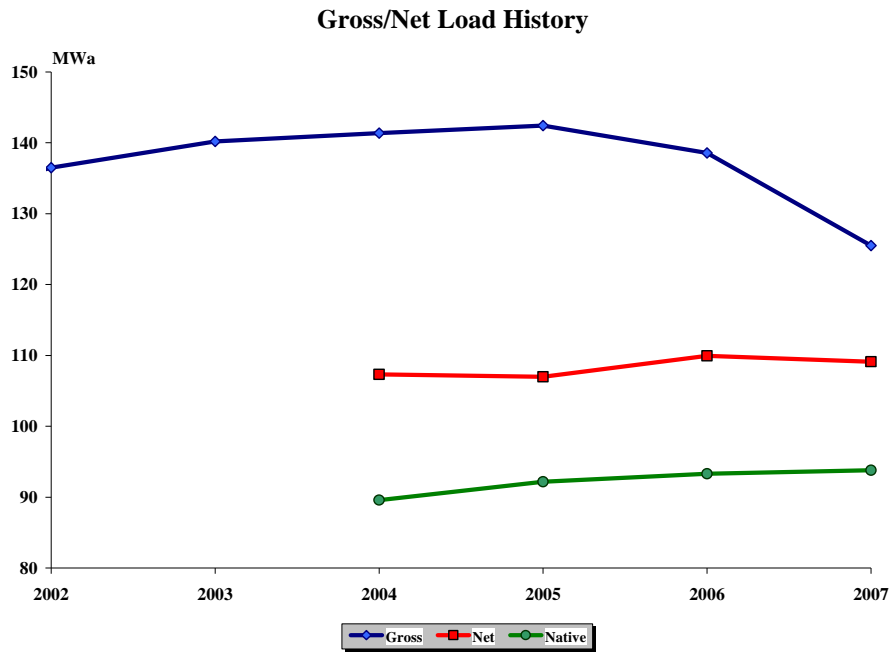
Over the past several years, the District has seen significant growth in that last category, as the county has increasingly been seen as potential suburban real estate for Olympia, WA. With the closing of Weyerhaeuser's Cosmopolis Pulp Mill in the second half of 2006, gross loads fell significantly, with the loss of 23 MWa's of load at the plant and 15MWa's of customer generation. Net loads, however, have remained relative flat to slightly up with the expansion of existing industrial activity and the addition of new loads. As can be seen in Figure 6, native load is up noticeably in the period shown. It grew at 2.9% from 2004 to 2005. The ongoing credit and mortgage crisis reduced that rate to a half a percent from 2006 to 2007.

Figure 7 illustrates the native load forecast employed as the basis of load forecasting for this IRP. The forecast was first bracketed with “High”, “Low” and “Linear Regression” cases based on native load history. The blue line in the figure was taken as the base forecast for the District. Its economic underpinning assumes that the suburban-Olympia load growth seen in the past few years returns in the 2009-2010 time frame (see Appendix A) In the out-years of the forecast it grows at an expected 2%/yr. To that

tranche of District load is added 20MWa’s of customer generation and new industrial loads to comprise the gross load of Grays Harbor.

All of these components, native load, customer generation and industrial loads are varied in a high-repetition Monte Carlo simulation. The details of that exercise are outlined in Appendix A. The 95th percentile loads in each forecast year were defined as the “High Load Case” for purposes of the stress-testing the load-resource balance across the forecast period. The “Base” and “High Load” cases are shown in Figure 8.

Figure 6 – District Loads



Working through Grays Harbors Risk Management Committee (“RMC”), a number of likely new large loads were identified, sized and timed for onset. Table 3 summarizes the volumes from this exercise for the years 2009-2011, the limit of forward knowledge regarding the subject. An expected 12 MWa’s from existing large loads is also included.

Table 3: Additional Large Customer Loads Post-2007 (MWa)

2009	2010	>=2011
8.5	10.2	13.7

Figure 7 – Native Load Forecast

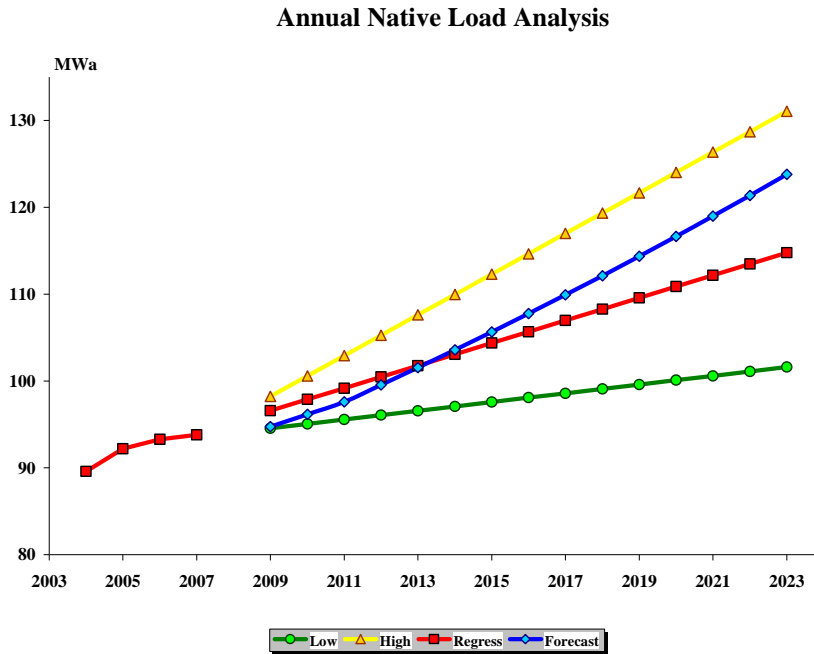
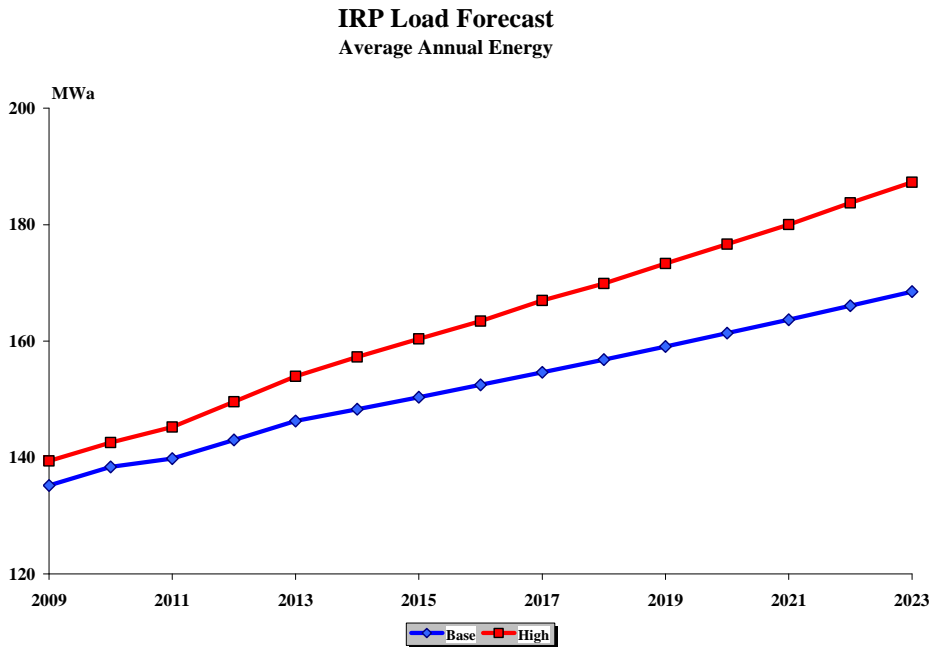


Figure 8



Grays Harbor PUD Resources

As a public utility, Grays Harbor is a beneficiary of Preference Power from the Federal Hydrogeneration System and Columbia Generating Station. Beginning in October of 2001, GHPUD has taken that power as a combination of BPA’s Slice of System product

and a Block Power supply that provides it adequate energy on an annual basis to meet its load during conditions of Critical Water. Grays Harbor's Staff and Board have been satisfied with the District's operational and financial performance under that regime.

Bonneville Power Administration (BPA) Contract Renewal

As nearly 3/4ths of the District energy and peaking capacity are supplied by BPA via Grays Harbor's current Slice of System contract, the Administration's ongoing contract renewal process is critical to GHPUD's resource portfolio. District Staff and consultants are at present actively involved in negotiations regarding the details of the contract emerging in the current run up to the filing of Letters of Intent with BPA this fall. The status of the Administration current Slice offering can be found on Bonneville's website. While no final decision is possible until the contract details are finalized, Staff has recommended to its Board of Commissioners to continue its Slice/Block supply in the new contract period, October 2011 through September 2031, pending the finalization of contract details satisfactory to the District. At the heart of the supply issue under Slice is the "High Water Mark ('HWM')" load measure to be taken in water year 2010. Based on the load forecasting methodology detailed in Appendix A, the current expectation is for an HWM at or near 138 MW's.

District Non-BPA Resources

In addition to its Preference Power share, the District owns or has long-term power purchase agreements with other generating resources:

- 1. Frederickson** – Since March 2001 GHPUD has held a long-term power purchase agreement for 45MW's from Frederickson Power LP's Frederickson combined cycle generator near Tacoma, WA for the term 9/1/2002 through 8/31/2022. The expiration of that contract determined the IRP forecast period, which includes the first year past contract termination, 2023. As will be seen in the load/resource balance, the District may need to replace that supply in all but low load scenarios. At a distance of 14 years from the date of the present IRP, that replacement remains a long-term planning item requiring no contemporary action. Based on hydrogeneration-heat rate studies, Frederickson provides 33 MWa's during the course of a Critical Water Year.
- 2. Pasco Combustion Turbine** – GHPUD and Franklin County PUD are joint owners of the 44 MW, gas fired, single-cycle combustion turbine peaker in Eastern Washington.
- 3. Nine Canyon Wind Project** – Grays Harbor owns a 20 MW capacity share of the Nine Canyon Wind Project in Eastern Washington. Nine Canyon provides 6 MWa's of renewably fueled generation, enough to satisfy the District's I-937 requirements through 2015.

Anticipated New Resources

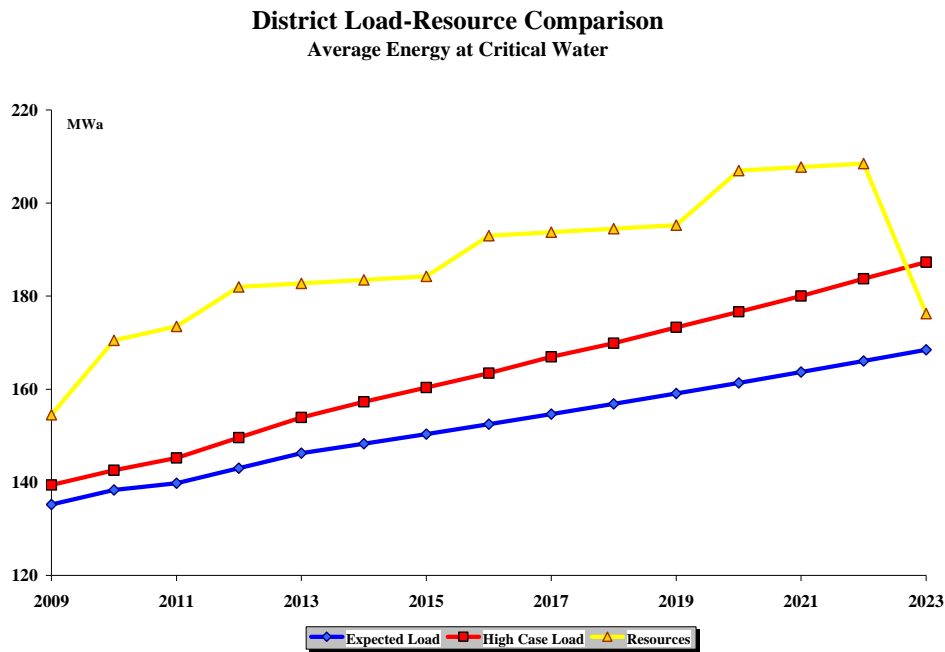
Grays Harbor anticipates the addition of several new resources across the time-course of this IRP. In 2010 it expects the addition of a 0.5 MWa hydroelectric resource associated with the municipal water supply of Aberdeen, WA. That resource will qualify as small-hydro renewables. In 2012 an additional 1 MWa of cogeneration is expected among the District's industrial customers. In order to meet its renewables requirement under the

RPS, the District will be required to acquire an additional 8 MWa’s by 2016 and another 11 by the beginning of 2020. These resources are assumed for the forecast Load-Resource Balance. The Cosmopolis restart and purchase, not included in the totals of this IRP would add 15 MWa’s of dispatchable, renewable energy should it occur.

Balances of Loads and Resources

Energy - The District’s load and resource balance is summarized in Figure 9. Currently, and for the forecast period, the District is well supplied on an annual energy basis. For the next 14 years, the District will be long energy, even in the High Load Case. In the Base Case, GHPUD will remain in excess of energy through the end of the forecast period. New resource(s) will be only be required if loads move along the High Case trajectory. As the net resource measure is positive for all years, no current action plan is required regarding energy adequacy. Figure 10 shows the yearly base case load-resource balance across the 15-year period. Note that the sign convention is reversed from that of the IRP cover sheet: excess resources are shown as positive numbers.

Figure 9



Peaking - However, when peaking capacity is considered, the situation is notably different. Figure 11 shows the estimated peaking capability of Grays Harbor. As can be seen in the chart, GHPUD’s peaking capability is challenged at the outset by the Base Case and continuously by the High Load Case. The situation clearly calls for further investigation by the District. It should be noted that an estimate of BPA’s peaking capability during a Critical Water Year is the largest source of uncertainty in this peaking estimate. Further investigation of that capability should be the first step in an action plan regarding peak load capability. It should also be noted that the potential impact of load offsets due to customer generation has not been included in these numbers

Figure 10

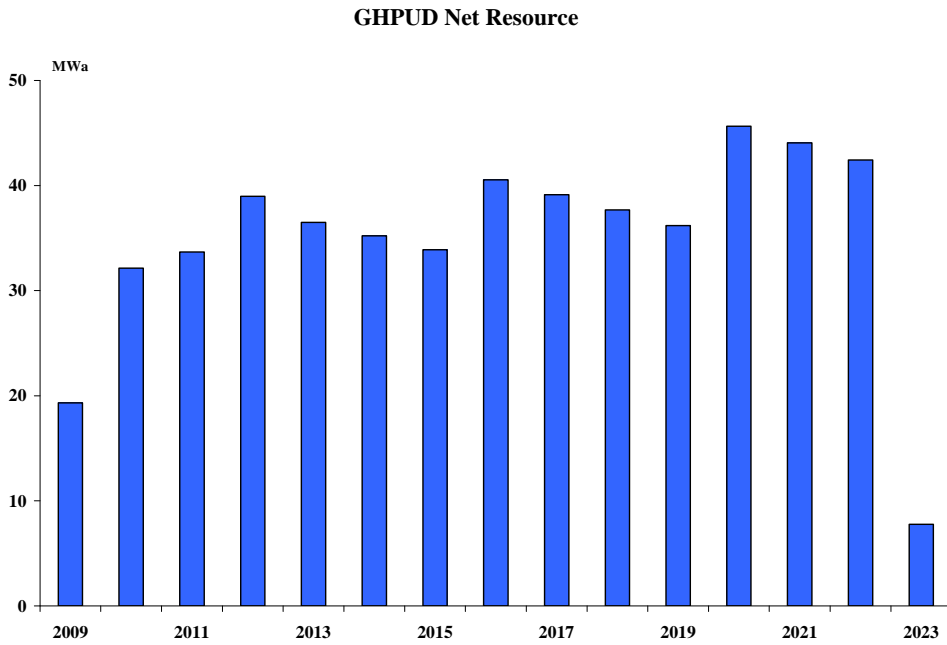
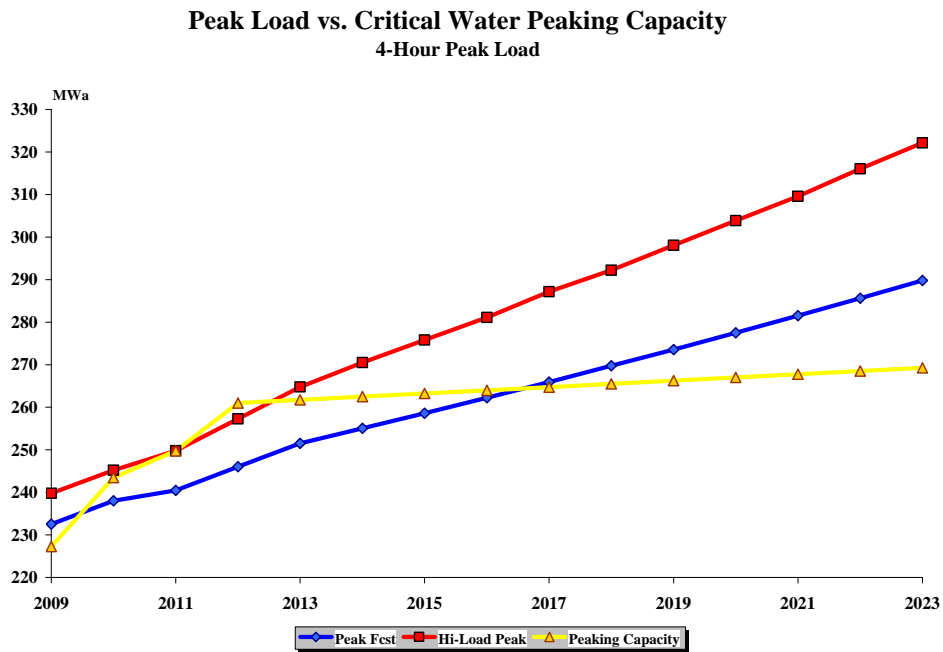


Figure 11



Customer-Owner Workshops

Two public workshops were held prior to District Board meetings. The first, held June 30th, 2008, focused on the customer-owners' views regarding conservation. Customers were presented with cost-benefit data regarding a variety of conservation means that the NPCC methodology deems cost-effective. There was common agreement that conservation is a desirable energy supply up to and including the market price and delivery costs as the definition of avoided cost.

The second public input workshop was held on August 25th, 2008. The initial results of the IRP study were presented. The public, staff and Commissioners present were encouraged by the District's energy picture. Much discussion of the District's peaking capacity situation ensued, with all present alerted to the potential issues.

GHPUD and the Renewable Portfolio Standards

The RPS mandates that an increasing fraction of the District's annual energy load be sourced from renewably fueled resources. The initiative requires 3% of load so fueled by 2012, increasing first to 9% in 2016 and finally to 15% in 2020. Toward satisfaction of that requirement, the District has acquired a 20-MW capacity interest in the Nine Canyon Wind Project. Early operating history suggests an average capacity factor of 30%, yielding an annual average 6 MW's of energy. The District is presently engaged in several initiatives which may add renewably fueled resources to the District's portfolio. Figure 12 is drafted with the assumption that GHPUD will satisfy its RPS requirements across the forecast period. Current portfolio renewables are also shown in the chart. That line demonstrates the District's ability to satisfy the first step of renewables supply, occurring in 2012. With the requirement's increase to 9% in 2016, additional renewable energy will be required. The Cosmopolis transaction, the largest of these renewable initiatives is discussed in Appendix B. It supplies an additional 15 MW's of dispatchable, renewable energy and would extend the consideration of additional renewable energy to 2020 in the Base Case load.

Conservation

EES Consulting has been contracted to carry out an in-depth study of the District's loads and climate. That study will adapt the NPCC's conservation cost/benefit analysis specifically to Grays Harbor PUD. Only an initial, quick-look result was available at the deadline for IRP submission. Based on those initial projections, the District is showing a new-capacity conservation figure of 0.75 MWa each year across the period of this IRP. The accumulated savings equal 7% of the District's load in 2023, the last year of the study. These results are shown in Figure 13. Depending on the actual path of loads across the period, the District may be able to substitute conservation for additional resources at the Frederickson contract expiry.

Figure 12

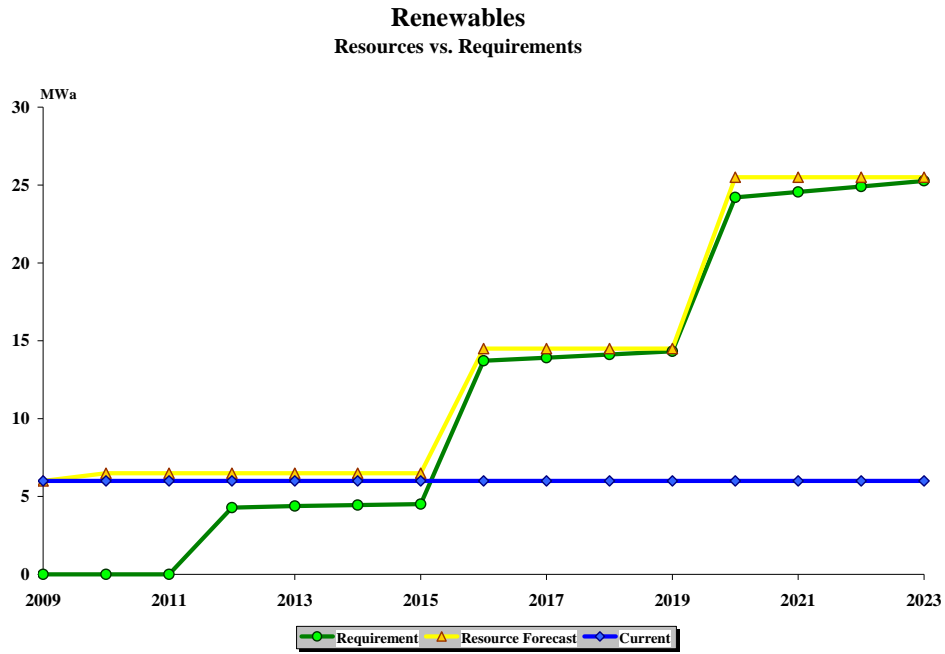
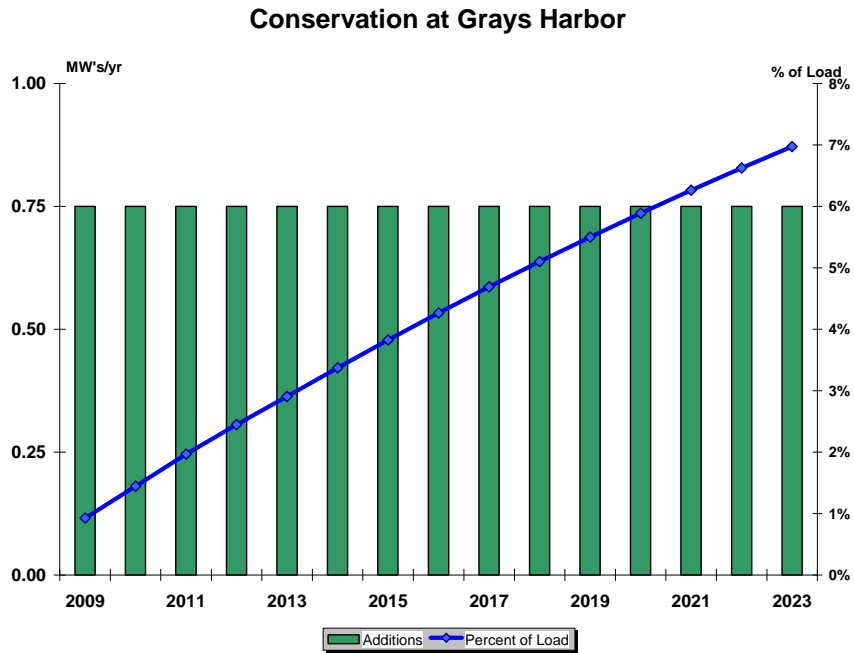


Figure 13



Summary

1. Grays Harbor PUD is well-supplied on an annual energy basis throughout the 15-year study period of this IRP;
2. Peaking capacity may be in shorter supply, particularly if the expected large loads are added to the District's load mix. The proposed Cosmopolis transaction exacerbates the problem. As the present study indicates a possible problem in 2009, presumably in January, the District's historic peak-load month, immediate action regarding peaking is required. A more definitive study of BPA's peaking capacity at critical water should be the first step.
3. A number of specific large loads and several potential resources were discussed within the District's RMC and included in this report.
4. The District currently expects to be able to add significant conservation to its resource portfolio across the 15 years, 7% of load or more

Action Plan

1. Given the fact that the majority of Grays Harbor's energy and capacity supply is BPA's Proposed Tier 1 preference power, the most important element of this Action Plan is participation in the regional and sub-regional conversations regarding the nature of the Slice of System product from BPA for the 2011 contract. This is currently an ongoing effort at the District.
2. As the District's HWM will be calculated first from WY 2010, then revised with WY 2011 results, it is essential that the District reduce load uncertainty across the course of the first 3 quarters of 2009. In particular, potential large load customers should be educated as to the impact of delay in startup on their power costs;
3. The issue of peaking capacity during critical water years is of both immediate and lasting concern. It should be addressed at once. A number of activities could mitigate the problem:
 - a. Further study of BPA's peaking capability during the winters of critical water-years should commence;
 - b. The availability of customer generation and the District's ability to recall such power needs to be explored and detailed by District management;
 - c. Currently, market forward prices are well below what might be expected during such a peak event. The District should consider purchases for January 2009.
4. The conservation study needs to be completed and integrated into this long-term forecast. Grays Harbor will need to devise the means for subsidizing conservation methods among its customers, tracking the impact of the program and verifying actual gains.

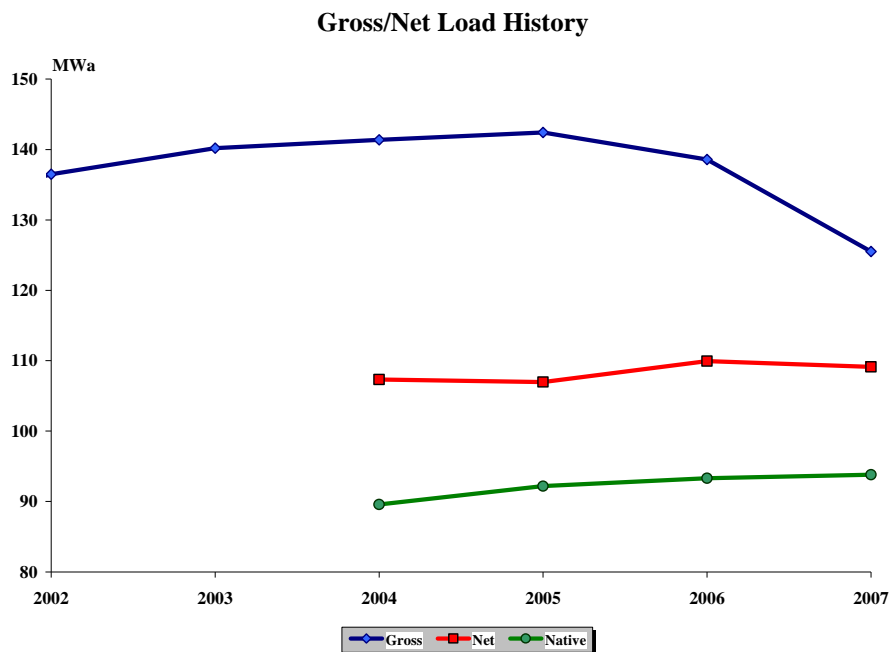
Appendix A Load Forecasting

Load forecasts were based on recent District histories – primarily 2004 through 2007 – with the addition of known or anticipated major load additions as defined by the General Manager and Power Manager. Year-to-date 2008 was not employed, both due to the partial nature of the year and the perception that the first half of 2008 evidenced loads that were anomalously high due to cold weather late into the spring months.

Historic loads were divided into three categories and examined separately. The first was customer generation, which is included in the District’s gross load and will be included in the upcoming High Water Mark (HWM) calculation for the 2011 contract. The second tranche of load was computed from the seven largest customer loads of GHPUD: the Weyerhaeuser pulp mill (now closed), the Weyerhaeuser saw mill, Grays Harbor Paper Company, the Stafford Creek Incarceration Facility, Pacific Veneer, Rohm & Haas and Ocean Spray. The balance of the load, taken as a proxy for the residential and small commercial loads of the District, was designated as the “Native” load.

Figure A-1 illustrates the findings of this initial division.

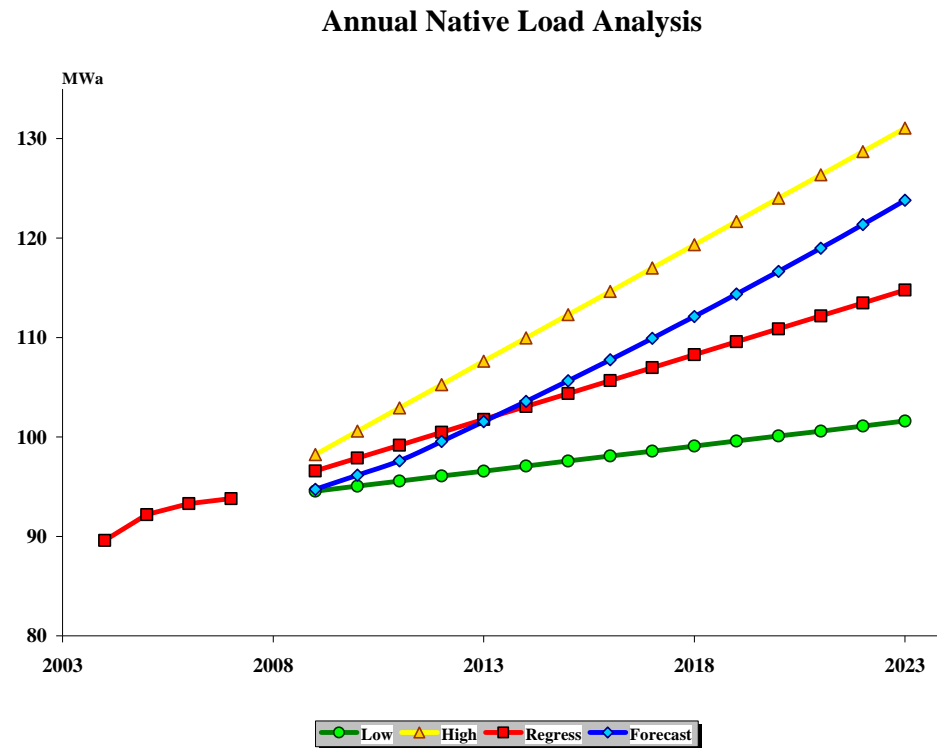
Figure A-1



As is apparent from the chart, Grays Harbor PUD has evidenced a widely varying gross load, with most of its fall due to the closure of the Weyerhaeuser pulp mill. However, net load (total minus customer generation) has been relatively flat across the 4-year period, while the underlying “Native” load has actually grown at a compound rate of about 1.25%/yr.

Grays Harbor County has seen significant influx of population in the past few years as the county has become a site for Olympia, WA suburban residential growth. With the credit and mortgage crisis of the past 15 months, that influx has slowed along with housing construction in general. While the financial distress is forecast to continue through 2009, a return to residential load growth in the District is inevitable. A range of growth rates for this portion of the District's load were calculated. The lowest was based on the 2006-2007 growth, of about 0.5%; the highest the 2004-2005 growth of about 2.9%. Using this data in a linear regression across the 4 years produces an average, compound growth rate of 1.3%. That regression was significant beyond the 0.05 level. These results are illustrated in Figure A-2

Figure A-2



In order to emulate the surrounding economic conditions, a native load growth of 1% from the Base Year (2007) data to 2009 was employed. With the expected return of a more robust economy in 2010-11 that annual increase was raised to 1.5%/yr. Post-2011, native load is forecast to grow at levels more like the 2004-2005 period, compounding at 2%/yr. After adding forecast new large-customer loads and generation, the compound growth rate of the District's gross load was approximately 1.5%, 2011 through 2023.

For Monte Carlo purposes, these components of load were varied in one or another random fashion. The native loads were calculated recursively from 2009, with the annual growth rates varied as in Table A-1. A uniformly random adder between the min and

max was added to the growth rate for each year in the recursive routine used to define native load. In order to account for uncertainty in timing of the end of the current housing problems, 2010 was allowed to fall as low as a zero growth rate. Growth post 2010 is forecast to be strictly positive by at least 0.5%. These are also summarized in Table A-1

Table A-1: Native Load Growth Rates and Stochastic Variability

	Base - 2009	2010	2011	Post-2011
Expected Growth	1.0%	1.50%	1.50%	2.0%
Min Growth	1.0%	0%	0.50%	1.0%
Max Growth	1.0%	2.50%	2.50%	3.0%

Existing large customer loads were taken as 12 MWa. To those were added a number of new loads anticipated by District staff to come on during the 2009-2011 period. These are summarized below in Table A-2.

Table A-2: Additional Large Customer Loads Post-2007 (MWa)

2009	2010	>=2011
8.5	10.2	13.7

Both the large customer loads, existing and new, and the 20MWa's of customer owned generation were allowed to vary stochastically, based on measured standard errors of those loads and resources (3 MW and 2 MW standard deviations, respectively) and assets) around their mean values.

Appendix B

GHPUD Forecasts with Cosmopolis Transaction

At the time of submittal of this IRP, the District is actively engaged in negotiations aimed at bringing new ownership to the closed Weyerhaeuser Pulp Mill in Cosmopolis, WA. Reopening what had been one of the largest GHPUD customers is forecast to have significant impact on Grays Harbor County, bringing 200 or more additional jobs to the area, and upon the District itself. As an aid to the plant reopening, GHPUD is considering the purchase of 15 MW's of cogeneration at the plant site. Fired by a combination of process waste, "hog fuel" and Bunker C oil, the generation qualifies as a renewably fueled resource under the terms of the RPS. It is not anticipated that this new resource would be declared to load. The reopening of the pulp mill would bring an estimated 23 Mwa's of load to Grays Harbor PUD as well as the renewably fueled generation. This Appendix assumes that the entire transaction, plant reopening and generation purchase, is completed prior to the IRP forecast period.

The acquisition would impact both load and District resources. Prior to the new BPA contract starting 10/1/2011, the District would benefit from the generation itself as well as a substantial increase in Renewable Energy Credits ("REC's"). Post 10/1/2011, the District's forecast HWM would rise to approximately 161 MW's. Assuming a 60/40 split of Slice and Block power from BPA, the District's Slice of System fractions would increase to 1.31% of the 7,400 Mwa's definition of the Federal system at critical water. The impact on District loads and resources are shown below in Charts 1-B through 4-B.

Figure 1-B

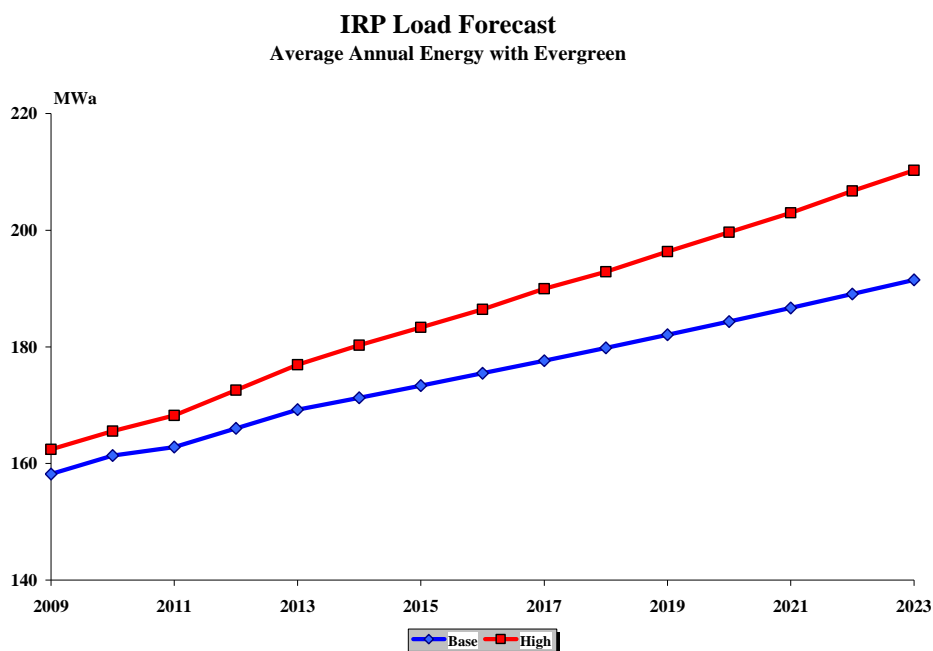
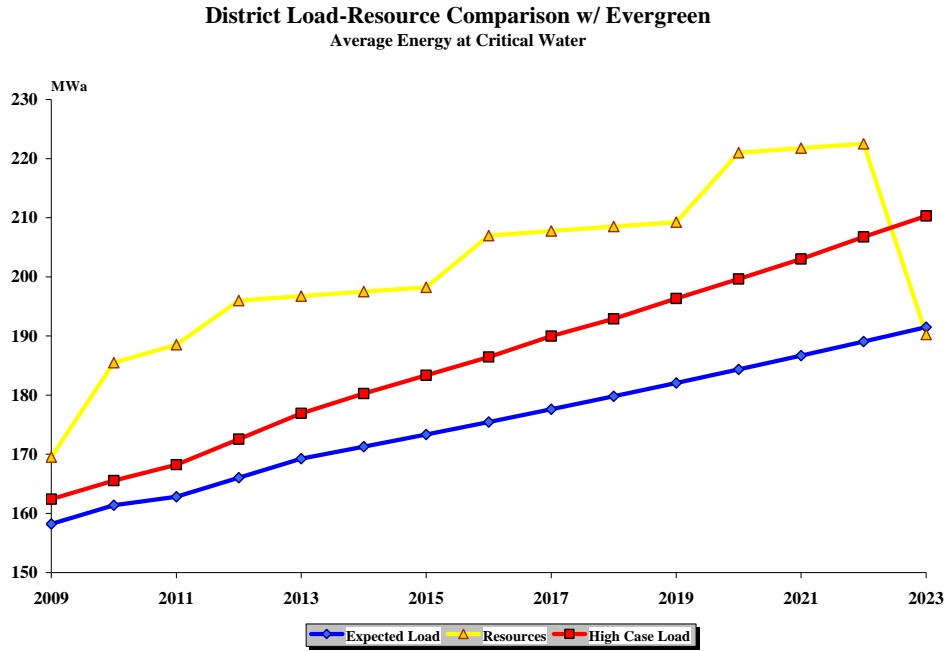
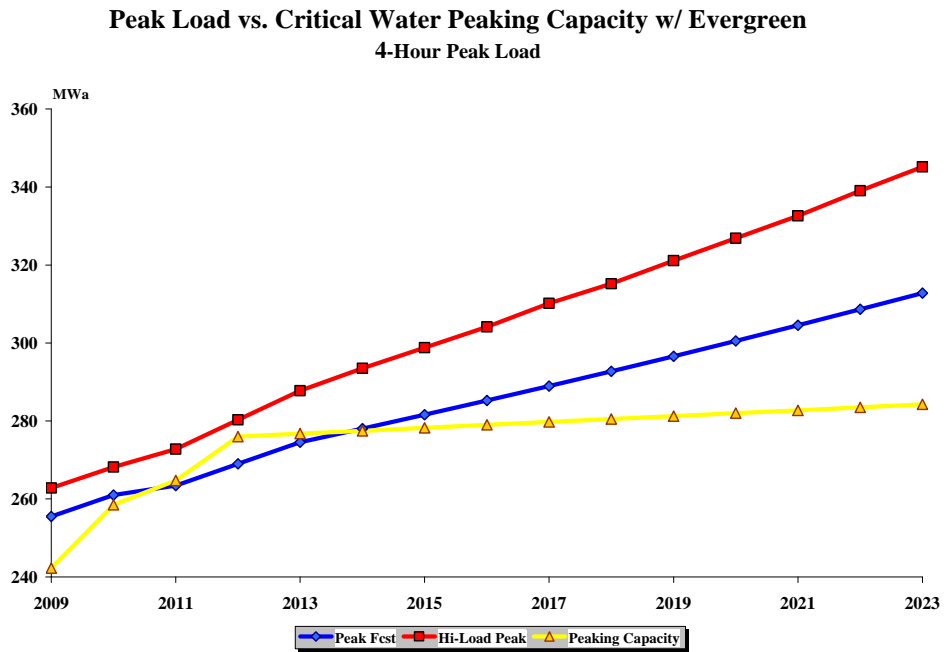


Figure 2-B



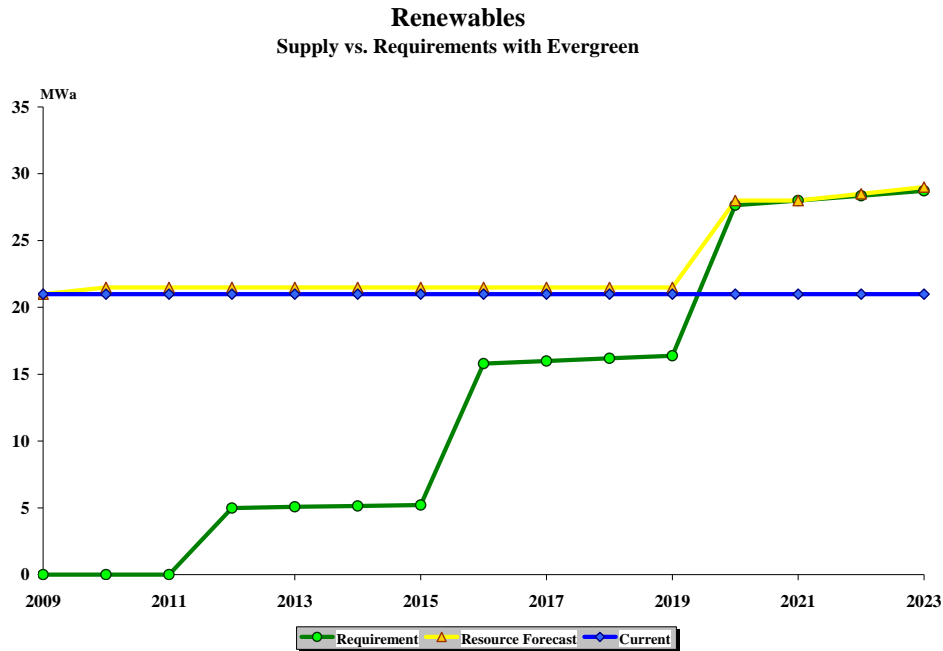
Once again we see that the District’s resources are adequate to supply the required total energy needed until the end of the Frederickson supply contract in 2022.

Figure 3-B



While the additional Slice of System supply does bring some additional peaking capacity, qualitatively the situation regarding peaking capacity is exacerbated by the acquisition.

Figure 4-B



As can be seen from the chart, the acquisition of 15 MW’s of renewably fueled resource in the transaction pushes the need for further renewables out to the final ramp-up in 2020 at which point an additional approximately 7 MW’s of renewables would be needed.

Tables 1-B and 2-B reflect the diversity of supply assuming the completion of the generation acquisition, both by size and percentage for average energy and peak capacity.

The generation acquisition will act to increase the District’s resource fuel diversity.

Table 1-B: Resource Diversity with Evergreen (2012)

	Energy Mwa	Peaking MW's
Hydro	139	190
Nuclear	22	30
Thermal	33	67
Wind	6	-
Other	21	21
	<u>221</u>	<u>308</u>

Table 2-B: Resource Diversity with Evergreen (2012)

	Energy Mwa	Peaking MW's
Hydro	63%	62%
Nuclear	10%	10%
Thermal	15%	22%
Wind	3%	0%
Other	<u>10%</u>	<u>7%</u>
	100%	100%