

Section 1: Introduction

Description of the White Book

The Pacific Northwest Loads and Resources Study (White Book), which is published annually by the Bonneville Power Administration (BPA), establishes one of the planning bases for supplying electricity to customers. The White Book contains projections of regional and Federal system load and resource capabilities, along with relevant definitions and explanations. The White Book also contains information obtained from formalized resource planning reports and data submittals including those from individual utilities, the Northwest Power and Conservation Council (Council), and the Pacific Northwest Utilities Conference Committee (PNUCC).

The White Book is not an operational planning guide, nor is it used for determining BPA revenues. Operation of the Federal Columbia River Power System (FCRPS) is based on a set of criteria different from that used for resource planning decisions. Operational planning is dependent upon real-time or near-term knowledge of system conditions that include expectations of river flows and runoff, market opportunities, availability of reservoir storage, energy exchanges, and other factors affecting the dynamics of operating a power system.

In this loads and resources study, resource availability is compared to an expected level of retail electricity consumption. The forecasted electricity load demand and contract obligations are subtracted from the sum of contract purchases and the projected capability of existing resources to determine whether BPA and the region will be surplus or deficit. Surplus energy is available when resources are greater than loads. This energy could be marketed to increase revenues. Deficits occur when resources are less than loads. Energy deficits could be met by any combination of the following: better than critical water conditions, demand-side management and conservation programs, additional contract purchases, and/or new generating resources.

- This study incorporates information on Pacific Northwest (PNW) regional retail loads, contract obligations and contract resources; and resource capability estimates provided by BPA, PNW Federal agencies, public agencies, cooperatives, U.S. Bureau of Reclamation (USBR), and investor-owned utility (IOU) customers furnished through annual PNUCC data submittals for 2002 and direct submittals to BPA.

The loads and resources analysis in this study simulates the operation of the power system under the Pacific Northwest Coordination Agreement (PNCA). The PNCA defines the planning and operation of the U.S. northwest regional hydro system. The hydroregulation study used for the 2002 White Book incorporates measures from the National Oceanographic and Atmospheric Administration Fisheries (NOAA Fisheries) Biological Opinions dated December 2000, (2000 FCRPS BO) for the Snake River and Columbia River projects. These measures include:

- Increased flow augmentation for juvenile fish migrations in the Snake and Columbia rivers in the spring and summer;
- Mandatory spill requirements at the Lower Snake and Columbia dams to provide for non-turbine passage routes for juvenile fish migrants; and
- Additional flows for Kootenai River white sturgeon in the spring.

The hydroregulation criteria for this analysis includes: an updated Detailed Operation Plan for Treaty reservoirs for Operating Year (OY)¹ 2004, updated PNCA planning criteria for OY 2003, and revised juvenile fish bypass spill levels for 2000 FCRPS BO implementation.

The 2002 White Book is presented in two documents: 1) this summary document of Federal system and PNW region loads and resources, and 2) a technical appendix (available in electronic format only) which shows the components of the regional loads and resources. Individual customer information regarding loads and marketer contracts are not detailed. The 2002 White Book analysis updates the December 2001 White Book.

This analysis projects the yearly average energy consumption and resource availability for OY 2004 through 2013. The study shows the expected Federal system's and the region's monthly peak demand, monthly energy demand, monthly peak generating capability, and monthly energy generation for OY 2004, 2008, and 2013. The Federal system and regional monthly capacity surplus/deficit projections are summarized for 10 operating years.

This document analyzes the PNW's projected loads and available generating resources in two parts: 1) the loads and resources of the Federal system, for which BPA is the marketing agency; and 2) the larger PNW regional power system, which includes loads and resources in addition to the Federal system. The Federal system analysis is presented in Section 4, beginning on page 13. The analysis for the PNW region is presented in Section 5, page 35.

The Administrator's Record of Decision (ROD) for the 2002 White Book is contained in Section 9, page 115.

The glossary of terms and a list of acronyms are included in Section 10, page 121.

This document and the 2002 Pacific Northwest Loads and Resources Study Technical Appendix are available on BPA's external web site at <http://www.bpa.gov/power/whitebook2002>.

Additional copies of this summary document are available from BPA's Public Involvement Office, toll-free, 1-800-622-4520.

¹ Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 2004 is August 1, 2003, through July 31, 2004.

Section 2: Background

Pacific Northwest Planning Area

The PNW regional planning area is defined by the 1980 Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act), and includes Oregon, Washington, Idaho, Montana west of the Continental Divide, and portions of Nevada, Utah, and Wyoming that lie within the U.S. Columbia River drainage basin. The PNW planning area also includes rural electric cooperative customers not in the geographic area described above that were served by BPA on the effective date of the Northwest Power Act. 16 U.S.C. §839(14).

White Book Study Assumptions

This traditional loads and resources analysis for the Federal system and PNW region has been produced using a specific set of assumptions concerning contracts, non-hydro and hydro resources. The Federal system assumptions are detailed in Section 4, Federal System Analysis, page 13. Regional assumptions are presented in Section 5, Regional Analysis, page 35.

Total Retail Load Forecast

For this study, a total retail load forecast for each PNW entity was estimated separately and then grouped into the following categories: Federal agencies, public agencies, cooperatives, USBR, IOUs, and direct service industries (DSIs). The retail load forecasts for Federal agencies, public agencies, cooperatives, and USBR were developed by BPA's East and West Hubs using linear trend methods based on individual customers' historical annual energy consumption and their 2001 Power Sales Contracts' (PSC) Exhibit C submittals. Similarly, the forecasts for the IOUs were developed from data submitted in their PNUCC submittals or load forecasts sent directly to BPA. DSI total retail load estimates are based on their current PSCs with BPA. All total retail load forecasts were finalized on June 30, 2003, with the exception of the DSI loads, which were updated September 9, 2003.

Pacific Northwest Hydro and Thermal Resources

Hydroelectric Operations Under the PNCA: The 1964 PNCA agreement, that expired July 31, 2003, was replaced with the 1997 PNCA agreement, which will remain in place through September 15, 2024. Incorporating the NOAA Fisheries Biological Opinions into the PNCA changed the shape of energy production during the PNCA planning year. One aspect of the 2000 FCRPS BO is to increase flows in the spring and summer to aid in the downstream migration of juvenile salmon. To do this, reservoirs are no longer drafted to meet firm loads in the fall and winter but are operated to retain as much water as flood control requirements will allow by mid-April. The additional water in storage going into the spring snowmelt period results in additional flow in the river during the spring and summer. The ability to shift and shape hydro energy production to meet firm loads is greatly reduced as a result.

To illustrate the monthly variability of the hydro system under the current PNCA, this document presents the Federal system and regional firm surpluses and deficits for OY 2004 through 2013 for each of 50-historical water conditions on record (1929 through 1978). The results are shown in Exhibits 8 through 17, pages 73 through 84, for the Federal system, and in Exhibits 25 through 34, pages 103 through 114, for the region.

Hydroelectric Energy Capability: This study uses OY 1937-water conditions (the 12-month period from August 1936 through July 1937) to estimate the firm hydro energy capability in low water conditions. This “critical period” represents the period of adverse water conditions during which the hydro system produced the maximum amount of firm energy by drafting the reservoirs from the maximum required content to the minimum permitted content.

Hydroelectric Capacity: The monthly instantaneous capacity of hydroelectric projects is defined as the full-gate-flow maximum generation available at each project, based on the average monthly elevation resulting from 1937-water reservoir levels. BPA assumes 1937-water levels to estimate the regional hydroelectric capacity because that year approximates a peaking capability that is consistent with the reliability criteria set forth in the PNCA.

The monthly instantaneous capacity is limited to 10 times the project's average monthly energy production because, at low or minimum water discharge, a plant may not be allowed to release enough water to achieve maximum capacity. The region's hydroelectric projects have constraints and storage limitations within any water condition.

BPA's planning projections reduce the estimated instantaneous hydroelectric capacity to reflect a Federal sustained peaking level of 50-hours-per-week. This level provides estimated firm hydroelectric capacity that can be maintained each day and continued for weeks at a time. This definition of firm capacity provides a better measure of resource peak capability. The hydroelectric generation is also adjusted to allow for scheduled hydro maintenance, spinning reserves, and forced outages.

Hydroelectric Projects Multiple-Use Planning: Federal hydroelectric projects in the PNW have many uses in addition to power generation. The projects may provide flood control, supply irrigation for farming, assist in river navigation, provide for reservoir recreation, and contribute to municipal water supplies. In addition, constraints also are in place to protect and enhance resident and anadromous fish and wildlife populations. Non-power reservoir operating requirements may reduce or increase hydroelectric power production. BPA's resource planning takes into account all presently known non-power operating requirements in assessing regional hydro system capability.

The Council, BPA, other Federal agencies, and other PNW entities will continue to evaluate ways to enhance fish and wildlife. Future proposals could include additional amendments to the Council's Columbia River Basin Fish and Wildlife Program, revision of the PNCA, renegotiation of Canadian Entitlement allocation agreements, and/or implementation of additional programs in support of the Endangered Species Act. The impacts of future proposals are unknown. These proposals, however, will most likely increase non-power requirements on the hydro system and change operating flexibility, the monthly shape of streamflows, and the availability of sustained Federal capacity. Future studies will incorporate any known impacts.

Hydroelectric Improvements: BPA has budgeted \$1.2 billion over the next 10- to 12-years for maintaining and improving the reliability of the Federal hydroelectric system. These improvements increase and preserve Federal hydro generation by:

- Replacing turbine runners to preserve and increase generation and to make the turbine operations more fish friendly;
- Providing increased reliability by decreasing forced and planned outages; and
- Implementing hydro optimization and operational planning tools to increase generation

Under critical water conditions, it is estimated that the combination of these hydroelectric improvements will annually preserve and create up to 305 average megawatts (aMW) by OY 2016, of which 76 aMW are associated with preserving the existing level of Federal hydro system generation capability from degradation and the remaining 229 aMW is potential additional Federal hydroelectric generation. The contribution of these hydroelectric improvements under average water conditions is estimated to be up to 1,013 aMW by OY 2016, of which about 712 aMW are associated with preserving the existing level of Federal hydro system generation capability and the remaining 301 aMW is potential additional Federal hydro generation. The total amount and timing of annual aMW realized over the next 10- to 12-years will be dependent on the timely completion of the scheduled installations, the success of the optimization changes, and hydrologic conditions. The estimated increases in generation are associated with the current level of fishery operations. If future fishery operations decrease the flexibility of the hydro system operations and/or increase the amount of spill, the annual megawatt contribution of the hydro improvements realized will most likely be lower.

The 2002 White Book assumes increases in Federal hydroelectric generation of up to 211 aMW due to reliability increases, turbine runner replacements, and hydro optimization under critical water conditions by OY 2013. As changes occur in the hydro improvements programs, further analyses will be performed to quantitatively assess impacts to hydroelectric generation and will be reflected in future studies.

Non-Hydroelectric Resources: The expected output of regional non-hydroelectric resources is based on the energy and capacity capability information submitted to BPA by the project owners. These projects include: nuclear, coal, gas-fired, oil-fired, and renewable resources such as wind, geothermal, solar, and biomass projects. Total plant output was reduced to account for scheduled maintenance, spinning reserves, and forced outage reserves. Merchant plants that have been built or that are in the process of construction have been added to the regional resource stack. The discussion of the Federal resources is in Section 4, page 21. Regional resources are discussed in Section 5, page 39.

Analysis of Federal System Firm Loads and Resources

BPA is the Federal power marketing agency in the PNW charged with power and transmission responsibilities to serve the firm electric load needs of its customers. BPA does not own generating resources. BPA's customer loads and contractual obligations, combined with the Federal and non-Federal resources from which BPA acquires the power it sells, are collectively called the Federal system in this study. BPA owns and operates the primary transmission grid, which includes more than 14,800 circuit miles of transmission lines above 115 kilovolts (high voltage) and 600 circuit miles below 115 kilovolts in the PNW.

The Federal system load obligations are comprised of BPA's sales to PNW Federal agencies, public agencies and cooperatives, USBR, IOUs, DSIs, and other firm contractual obligations to deliver power. BPA has no retail customers.

BPA is the designated marketer of the hydroelectric resources of the Federal system, which includes 31 dams owned and operated by the USBR and the U.S. Army Corps of Engineers (USACE). BPA also markets the generation from the hydroelectric projects owned by the City of Idaho Falls, and Lewis County Public Utility District (PUD). In addition, BPA markets the thermal generation from the Columbia Generating Station nuclear plant, operated by ENW, and the output from renewable power plants, primarily wind turbines, under power purchase contracts with BPA. The expected energy generation production from wind turbines is included in the analysis; however, since wind power production is intermittent and cannot be guaranteed to be available to meet peak hour loads, no capacity contribution is assumed. The Federal system analysis is shown in Section 4, beginning on page 13.

BPA Power Sales Contract Obligations

BPA signed either 5- or 10-year PSCs with its customers that began October 1, 2001. The following is a description of some of the contractual uncertainties associated with specific customer classes.

- Federal agency, public agency, cooperative, and USBR customers signed either 5- or 10-year PSCs. Some of the public agencies, and cooperatives signed up for the 10-year Slice of the System Product (see Slice of the System Product, page 15). BPA's PSC obligations with these customers end September 30, 2011; however, this study assumes the public agency, USBR, and cooperative customers' net requirements will be met by BPA throughout the study horizon. Though these contract obligations actually expire September 30, 2011, this study assumes that they will be met by BPA throughout the study horizon. Additionally, for OY 2007 through 2011, BPA's PSC obligations include 800 aMW of service that currently are not signed. In actual operation, BPA's obligations to the full-service customers may be higher or lower than those shown in this analysis;
- The IOU's signed 10-year contracts settling the Residential Purchase and Sales Agreement (RPSA). As a result of negotiations in 2001, IOU power deliveries under the RPSA settlement reflect reduced power deliveries in exchange for financial considerations through September 30, 2006. The net IOU RPSA settlement power deliveries are 258 aMW during this time period. The RPSA settlement allows BPA the option to provide its IOU customer's financial benefits and/or power deliveries of up to 2,200 aMW for the period October 1, 2006, through September 30, 2011. This study's base case assumes that BPA will exercise its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered October 1, 2006, through September 30, 2011. This is a change from the 2001 Study base case that showed BPA delivering to the IOU customers RPSA settlement of 2,200 aMW annually in power deliveries during this time period. BPA's potential exposure to impacts from the IOU RPSA settlement power deliveries could range from 0 to 2,200 aMW during this time period; and

- BPA's DSI customers signed 5-year contracts beginning October 1, 2001, through September 30, 2006. Due to economic conditions, the actual DSI loads may be lower than those depicted in this study. After September 30, 2006, Federal service to the DSIs is not assumed because the DSIs do not have signed contracts in place for service. This assumption does not represent a decision by BPA on firm DSI PSCs post-September 30, 2006.

Decisions and agreements may be reached through the Regional Dialogue process between BPA and its customers and other regional stakeholders to decide the nature of BPA's electrical service products post-2006. As decisions are made from the Regional Dialogue discussions, those decisions will be incorporated in future studies.

Analysis of Regional Firm Loads and Resources

The PNW regional analysis contains the Federal system loads and resources, plus non-Federal regional loads, contractual obligations, and generating resources. The region has several groups that represent load sectors: Federal agencies, public agencies, cooperatives, USBR, IOUs, and DSIs. The regional hydroelectric resources are owned and operated by various Federal entities, public agencies, cooperatives, and IOUs. The regional thermal generating resources, fueled by biomass, coal, natural gas, oil, or nuclear power are owned and operated by various regional entities. The regional analysis is presented in Section 5, beginning on page 35.

Canadian Treaty Downstream Benefits

The Columbia River Treaty between the United States and Canada enhanced the use of storage in the Columbia River Basin with the construction of three large storage projects in Canada. These Canadian Treaty projects provide downstream power benefits by increasing the firm power generating capability of U.S. hydroelectric projects. Under the terms of the Treaty, the downstream power benefits are shared equally between the two countries. The Determination of Downstream Power Benefits is performed annually and establishes the amount of benefits for each sixth succeeding year. BPA's obligations under the Columbia River Treaty vary during the study period.

Transition of Canadian Entitlement from Columbia Storage Power Exchange to Canada, Beginning April 1, 1998

Canada agreed to sell its share of the downstream power benefits, called the Canadian Entitlement, for three 30-year periods, each beginning with the completion of the three Canadian Treaty Projects (Mica, Duncan, and Keenleyside). The Canadian Entitlement was sold to the Columbia Storage Power Exchange (CSPE), a PNW municipal corporation formed to purchase the Canadian benefits for resale to participating PNW entities. The Canadian Entitlement sales to the CSPE began to expire April 1, 1998, 30 years after the completion of Duncan, the first Treaty Project, and fully expired March 31, 2003. All Canadian downstream power benefits will have reverted back to Canada. Downstream power benefits accrue to both Federal and non-Federal entities. Therefore, BPA and the benefiting non-Federal entities are obligated to provide their share of the Canadian Entitlement obligation. The Canadian Entitlement to Canada is included in each participating utility's loads and resources balance as a delivery to BPA. Participating utilities in this contract are the joint owners of the five non-Federal U.S. dams on the mainstem of the Columbia

River. BPA then delivers the total Canadian Entitlement to Canada as shown in Table 1, page 8, as a Federal export.

Table 1

**Canadian Entitlement to Canada
Energy and Capacity Obligations**

Energy in Average Megawatts

Operating Year	2004	2005	2006	2007¹	2008¹	2009¹	2010¹	2011¹	2012¹	2013¹
Investor-Owned Utilities	78	77	67	63	63	62	50	46	46	46
Public Agencies	55	55	64	67	66	66	77	81	81	80
Federal System	395	396	395	393	391	390	388	388	389	390
Other Entities	9	9	9	9	9	9	9	9	8	8
Total Energy Obligation	537	537	535	532	529	527	524	524	524	524

January Capacity in Megawatts

Operating Year	2004	2005	2006	2007¹	2008¹	2009¹	2010¹	2011¹	2012¹	2013¹
Investor-Owned Utilities	137	136	114	114	114	114	84	84	84	84
Public Agencies	96	97	119	119	119	119	149	149	149	149
Federal System	927	927	927	927	927	927	927	927	927	927
Other Entities	16	16	16	16	16	16	16	16	16	16
Total Capacity Obligation	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176

Major Sources of Uncertainty

This study reflects several potential major changes in regional resources and power sales products that could affect regional and Federal loads and resources.

Loads and Resources Uncertainty: Future Federal system and regional firm surpluses/deficits are subject to a number of uncertainties over the 10-year study period. Some of these uncertainties include:

- Changes in loads or available resources resulting from deregulation of retail sales in the electrical power industry;
- Volatility in short- and long-term market prices;
- Deviation from forecasted loads due to changes in the PNW economy;
- Failure of existing or contracted generating resources to operate at anticipated times and output levels;
- The availability of new regional resources that can be purchased to serve firm loads in the PNW region;
- Implementation of decisions and agreements that may be reached through the Regional Dialogue process for BPA's electrical service products post-2006;
- Additional changes to existing hydro system operation in response to programs developed to address the Endangered Species Act or other environmental considerations; and

¹ Values estimated for OY 2007 through 2013.

- The success of BPA's future purchasing and marketing efforts, including contracts, demand-side management programs, and conservation measures, and the purchase of the output of new or existing resources.

These uncertainties could affect both the size of projected surpluses or deficits and the times at which they occur.

Variability of BPA's Power Sales Contracts: To show the potential variability of BPA's PSC obligations, this study compares different scenarios depicting the boundary conditions of both the DSI service through September 30, 2006, and the IOU service for the period October 1, 2006, through September 30, 2011. The assumption differences between four BPA sales obligation scenarios are as follows:

Scenario 1: Base Case-2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI PSC obligations up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA will exercise its option to pass the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 2: No 2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI's do not purchase power under their PSCs through September 30, 2006, due to economic conditions; and
- For October 1, 2006, through September 30, 2011, BPA will exercise its option to pass the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 3: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 550 aMW

- DSI PSC obligations, up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA's IOU customers RPSA settlement consists of two parts:
 - 1) Annual power deliveries of 550 aMW; and
 - 2) The remaining 1,650 aMW in the form of financial benefits.

Scenario 4: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 2,200 aMW

- DSI PSC obligations, up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, IOU customers annually purchase RPSA settlement power deliveries of 2,200 aMW.

See Variability of Federal Firm Annual Energy Load Obligations, page 15.

Regional Total Retail Load Uncertainty

To show the potential variability of PNW regional firm annual energy load, this study compares different scenarios depicting the boundary conditions of DSI service throughout the study horizon. These scenarios depict different DSI load levels within the PNW region under normal weather conditions. Actual regional loads will most likely vary within the bounded area. The differences between the three load obligation scenarios are as follows:

Scenario 1: Base Case-100% Regional DSI Load Forecast

- Regional DSI load levels annually averaging up to 792 aMW throughout the study horizon;

Scenario 2: 50% Regional DSI Load Forecast

- Regional DSI load levels that annually average 50% of the Base Case DSI load forecast, up to 396 aMW, throughout the study horizon; and

Scenario 3: No Regional DSI Loads

- No regional DSI firm loads throughout the study horizon.

See Variability of PNW Regional Annual Energy Loads, page 37.

Section 3: Changes in the 2002 Pacific Northwest Loads and Resources Study

This section describes the major data updates and changes in the assumptions for the 2002 White Book analysis compared to the 2001 White Book. Specific resource and contract changes are detailed in the 2002 Pacific Northwest Loads and Resources Study Technical Appendix. The 2002 Technical Appendix will be available on BPA's external web site at <http://www.bpa.gov/power/whitebook2002>. The 2002 Technical Appendix presents auxiliary tables (A-tables) that contain aggregate information summarized by customer type.

Federal Firm Sales and Obligations

The 2002 White Book analysis reflects the following Federal system contract and obligation changes compared to the 2001 Study:

- BPA's Federal agency, public agency, cooperative, and USBR PSC obligations were updated using linear trend methods based on historical power consumption under their PSCs. Though these contract obligations actually expire September 30, 2011, this study assumes that they will be met by BPA throughout the study horizon. For OY 2007 through 2011, BPA's PSC obligations include 800 aMW of service that currently are not signed;
- BPA's base case assumption of IOU RPSA settlement power deliveries for the period October 1, 2006, through September 30, 2011, are significantly different from the 2001 White Book analysis. This study's base case assumes that BPA exercises its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered October 1, 2006, through September 30, 2011. The 2001 Study assumed annual IOU RPSA settlement power deliveries of 2,200 aMW during this time period. The potential impacts of different levels of IOU RPSA settlement power deliveries on the Federal system are presented on page 15. The assumptions for the IOU power deliveries prior to September 30, 2006, were not changed;
- BPA's DSI PSC obligations were reduced due to DSI curtailments, contract terminations, and closures. This study shows DSI obligations of up to 768 aMW through September 30, 2006. The 2001 Study assumed BPA's DSI PSC obligations of up to 1,150 aMW during this timeframe. In actual operation, the DSI obligations may continue to be lower due to closures, contract terminations, and/or economic conditions; and
- Updated Federal system contract sales.

Federal Resources

The 2002 White Book analysis reflects the following Federal system resource changes compared to the 2001 Study:

- New hydroregulation study that incorporates the assumptions of the current PNCA, including the Columbia River streamflow requirements of the 2000 FCRPS BO for Federal system hydroelectric resources; and
- Updated Federal system contract purchases.

PNW Total Retail Load

The 2002 White Book utilizes updated customer-by-customer regional retail load forecasts. The forecasts are based on a combination of their historical electrical load consumption, submittals provided for the 2001 PSCs, and/or their PNUCC data submittals. If available, the information and growth trends were verified with Federal Energy Regulatory Commission (FERC) filings. Below highlights the methods use to arrive at the load forecast. The forecasts reflect applicable load reduction agreements and were aggregated together for each of the following customer classes.

- Federal agency, public agency, cooperative, and USBR retail load forecasts were developed by BPA using linear trend methods that incorporate historical retail load data and their 2001 PSCs' Exhibit C submittals;
- IOU retail load forecasts were developed by BPA using data provided in their PNUCC data submittals;
- DSI retail load estimates were updated by BPA and are based on their current PSCs with BPA; and
- Updated PNW regional contract sales.

PNW Regional Resource Changes

The 2002 White Book analysis reflects the following regional resource changes compared to the 2001 Study:

- New hydroregulation study that incorporates the assumptions of the current PNCA, including the Columbia River streamflow requirements of the 2000 FCRPS BO for PNW regional hydroelectric resources;
- PacifiCorp (Wyoming) thermal import contract that estimated PacifiCorp's share of the Jim Bridger plant delivered to the PNW region was eliminated. In its place, PacifiCorp's shares of the Jim Bridger coal plant, units 1 through 4, are now shown as resources dedicated to serve its PNW regional load;
- Pennsylvania Power & Light Company (PPL Montana) purchased most of Northwestern Energy's (formally Montana Power Company) hydro and thermal resources. Most of these resources are east of the continental divide and are not dedicated to serve any specific load. Only resources dedicated to serve Northwestern Energy's loads in eastern Montana are shown as PNW resources;
- New PNW regional resources that annually generate up to 1,496 aMW throughout the study horizon; and
- Updated PNW regional contract purchases.

Section 4: Federal System Analysis

Federal System Base Case Assumptions

The Federal system loads and resources analysis is based on Federal resources, Federal contracts, and Federal power sales contract obligations that were finalized on June 30, 2003, with the exception of BPA's DSI load obligations. They were updated September 9, 2003. Federal Base Case study assumptions are as follows:

- Forecasted Federal load obligations reflect normal weather conditions;
- Generating resources include all operating requirements currently adopted by the hydroelectric project owners and the firm planning assumptions for assured resource capability for the PNCA;
- BPA's Federal agency, public agency, cooperative, and USBR customers' power sales contract obligations continue throughout the study period, even though they expire September 30, 2011. For OY 2007 through 2011, public PSC obligations include approximately 800 aMW of service that currently are not signed;
- BPA's IOU RPSA settlement power deliveries reflect reduced power deliveries for financial considerations through September 30, 2006. For October 1, 2006, through September 30, 2011, this study assumes that BPA will exercise its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered. This is a change from the 2001 Study that showed BPA annually delivering its IOU customers RPSA settlement of 2,200 aMW in power deliveries during this time period;
- BPA's DSI power sales contract obligations reflect near-term load reduction agreements and closures. DSI purchases total up to an annual maximum of 768 aMW per year through September 30, 2006;
- All existing Federal contractual arrangements not included under BPA's power sales contracts expire by the terms of their agreements and are not renewed;
- Federal surplus firm power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena are shown as capacity/energy exchanges until they expire April 15, 2008;
- The Federal surplus firm power sales with the cities of Modesto, Santa Clara, and Redding (MSR) expire September 30, 2005;
- The termination of all Enron Power Marketing contracts as of April 1, 2003;
- The Federal capacity sale contract with PacifiCorp expires August 31, 2011;
- Sustained capacity limits are 50-hours-per-week;
- Capacity surplus/deficit values do not reflect potential nighttime return problems on the Federal system; and
- Transmission losses are treated as a resource reduction.

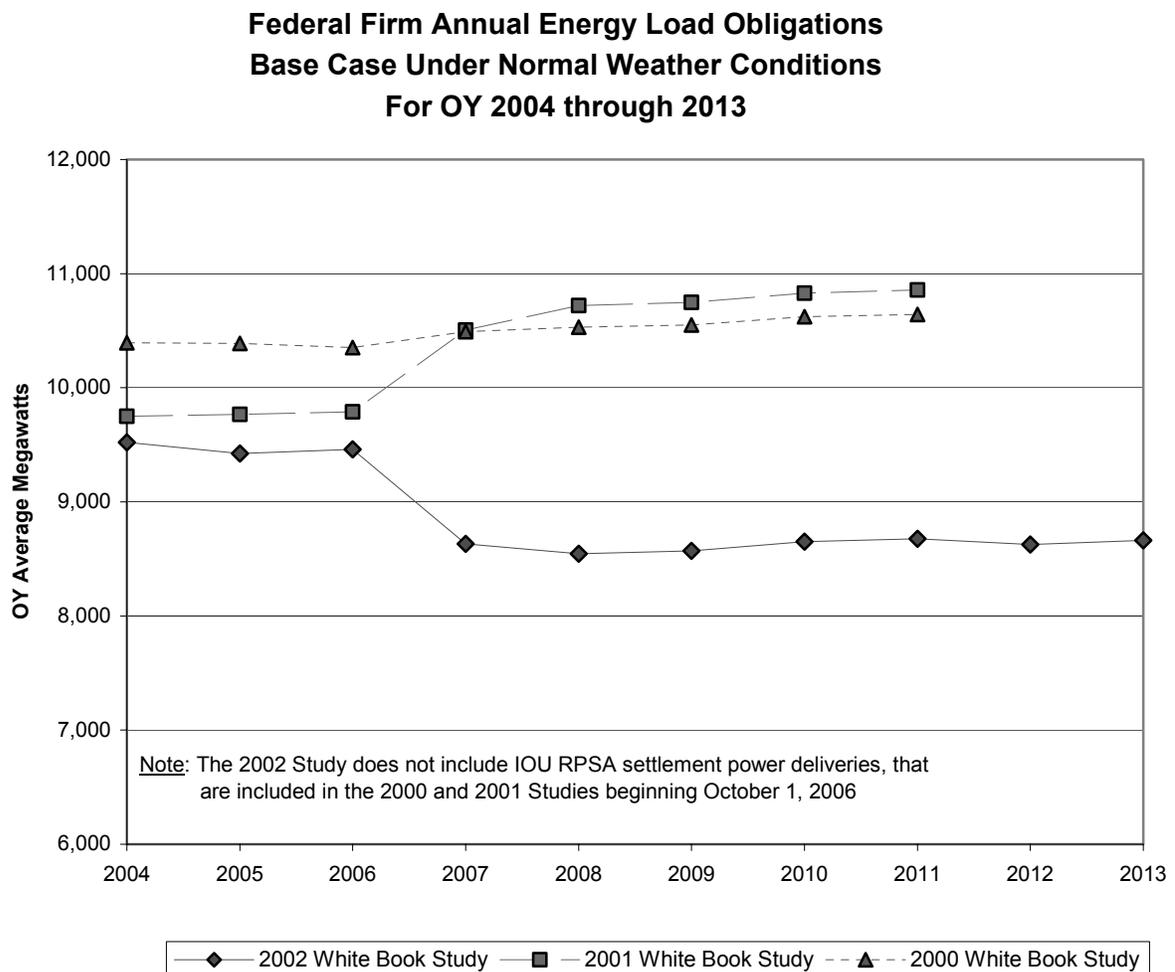
Federal Firm Annual Energy Load Obligations

In this study, the Federal system firm annual energy load obligations incorporate the preceding Federal System Base Case Assumptions and include BPA's forecasted firm 2001 power sales contract obligations, including the Slice product discussed on page 15, to PNW Federal agency, public agency, cooperative, USBR, IOU and DSI customers. The forecast assumes that PNW Federal agencies, public agencies,

cooperatives, and USBR customers purchase power from BPA under their power sales contracts to meet energy loads not served by their own resources. The Federal obligations also include contracted Federal deliveries within the PNW region and export contracts delivered outside the PNW. The methods and assumptions used to complete this year's Federal power sales contract obligations are based on the forecasts of individual entity's total retail load discussed in Total Retail Load Forecast, page 3.

Figure 1, below, illustrates the difference between the forecasted 2002 White Book Federal system annual energy load obligations for OY 2004 through 2013 from the previous 2000 and 2001 Studies. The expected lower Federal load obligations for OY 2004 through 2006 reflect changes in BPA's small public agency, cooperative, DSI, and export contracts. For OY 2007 through 2013, the Federal load obligations in this year's study has been significantly reduced from last year's due to the assumption that there will be no IOU power deliveries during this timeframe. The Federal firm annual energy load obligations for OY 2004 through 2013 are presented in Exhibit 1, page 59.

Figure 1



Slice of the System Product: Slice is a public preference power sales contract product based on the customer's net requirements that provides firm and secondary energy using a fixed percentage of the output generated by the Federal system Slice resources. The Slice product was contracted for 10-years and differs from traditional power sales contract products in that power is made available based on the level and shape of the generation output of a set of specific Federal system Slice resources. The total Federal system Slice resource stack is comprised of specific Federal resources less certain Federal obligations. Those specific Federal resources include the outputs of the Federal hydroelectric projects, Columbia Generating Station, James River Wauna, Federal Non-Utility Generation; and power deliveries from the Non-Federal Canadian Entitlement Return (CER) for CSPE, Non-Federal CER for Canada, and Non-Federal Supplemental Entitlement Capacity replacement. The Federal contract obligations that are subtracted from the Federal resources include deliveries for the CER Return to Canada, Non-Federal CER for CSPE, Non-Federal Supplemental Entitlement Capacity, and Federal pumping loads. These Federal resources less the Slice set of Federal obligations comprise the total Federal system Slice resources. The Slice customers purchased 22.63 percent of the Federal system Slice resource stack. The amount of Slice product available for delivery is dependent on the generation from non-hydro Federal resources and Federal hydro production that varies by water conditions.

The Slice product can only be purchased when combined with the purchase of the Slice Block product. The Slice Block product has a 100 percent load factor for each month. Slice customers initially had a choice of either 5- or 10-year Slice Block purchases. Customers that signed 10-year contracts for Slice Block product purchases have the option to increase their Slice Block product for the period October 1, 2006, through September 30, 2011, to cover load growth that may have occurred during the first 5-years of their Slice contract. Customers that signed contracts for 5-year Slice Block product purchases could later contract for another 5-year Slice Block product purchased but at the prevailing rate applicable to their product.

Variability of Federal Firm Annual Energy Load Obligations

Table 2, page 17, and Figure 2, page 18, show the potential variability of the Federal firm annual energy load obligations for four load scenarios. These scenarios depict different levels of expected IOU power deliveries and DSI power sales contract obligations that bound possible Federal system normal weather load obligations. Each scenario incorporates the same Federal System Base Case Assumptions presented on page 13, with the exceptions of:

- The level of BPA's IOU customers' RPSA settlement power deliveries beginning October 1, 2006, extending through September 30, 2011; and
- The DSI power sales contract service through September 30, 2006.

The differences between the assumptions for the four Federal system load obligation scenarios are as follows:

Scenario 1: Base Case-2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI PSC obligations, up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA exercises its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 2: No 2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI's do not purchase power under their PSCs through September 30, 2006, due to economic conditions; and
- For October 1, 2006, through September 30, 2011, BPA exercises its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 3: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 550 aMW

- DSI PSC obligations up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA's IOU customers' RPSA settlement consists of two parts:
 - 1) Annual power deliveries of 550 aMW; and
 - 2) The remaining 1,650 aMW in the form of financial benefits.

Scenario 4: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 2,200 aMW

- DSI PSC obligations up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, IOU customers annually purchase RPSA settlement power deliveries of 2,200 aMW.

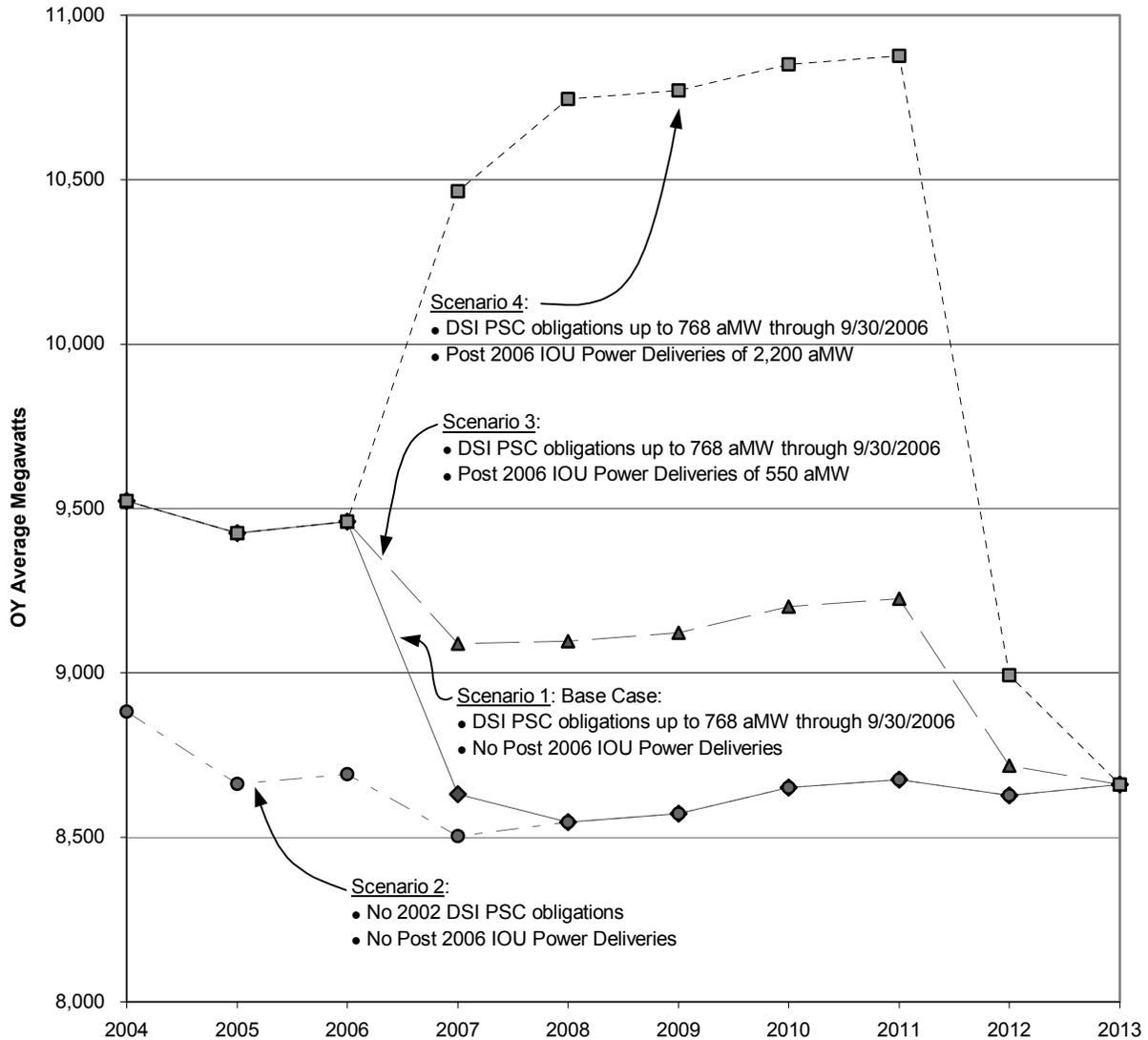
Table 2

**Variability of Federal Firm Annual Energy Load Obligations
Utilizing Different Levels of IOU and DSI Power Deliveries
For OY 2004 through 2013**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<u>Scenario 1:</u> Base Case: 2001 DSI PSC & No Post 2006 IOU Power Deliveries	9,523	9,425	9,460	8,632	8,546	8,572	8,651	8,676	8,627	8,661
<u>Scenario 2:</u> No 2001 DSI PSC & No Post 2006 IOU Power Deliveries	8,883	8,663	8,693	8,504	8,546	8,572	8,651	8,676	8,627	8,661
<u>Scenario 3:</u> 2001 DSI PSC & Post 2006 IOU Power Deliveries of 550 aMW	9,523	9,425	9,460	9,091	9,096	9,122	9,201	9,226	9,177	9,211
<u>Scenario 4:</u> 2001 DSI PSC & Post 2006 IOU Power Deliveries of 2,200 aMW	9,523	9,425	9,460	10,466	10,746	10,772	10,851	10,876	10,827	10,861

Figure 2

**Variability of Federal Firm Annual Energy Load Obligations
Utilizing Different Levels of IOU and DSI Power Deliveries
For OY 2004 through 2013**



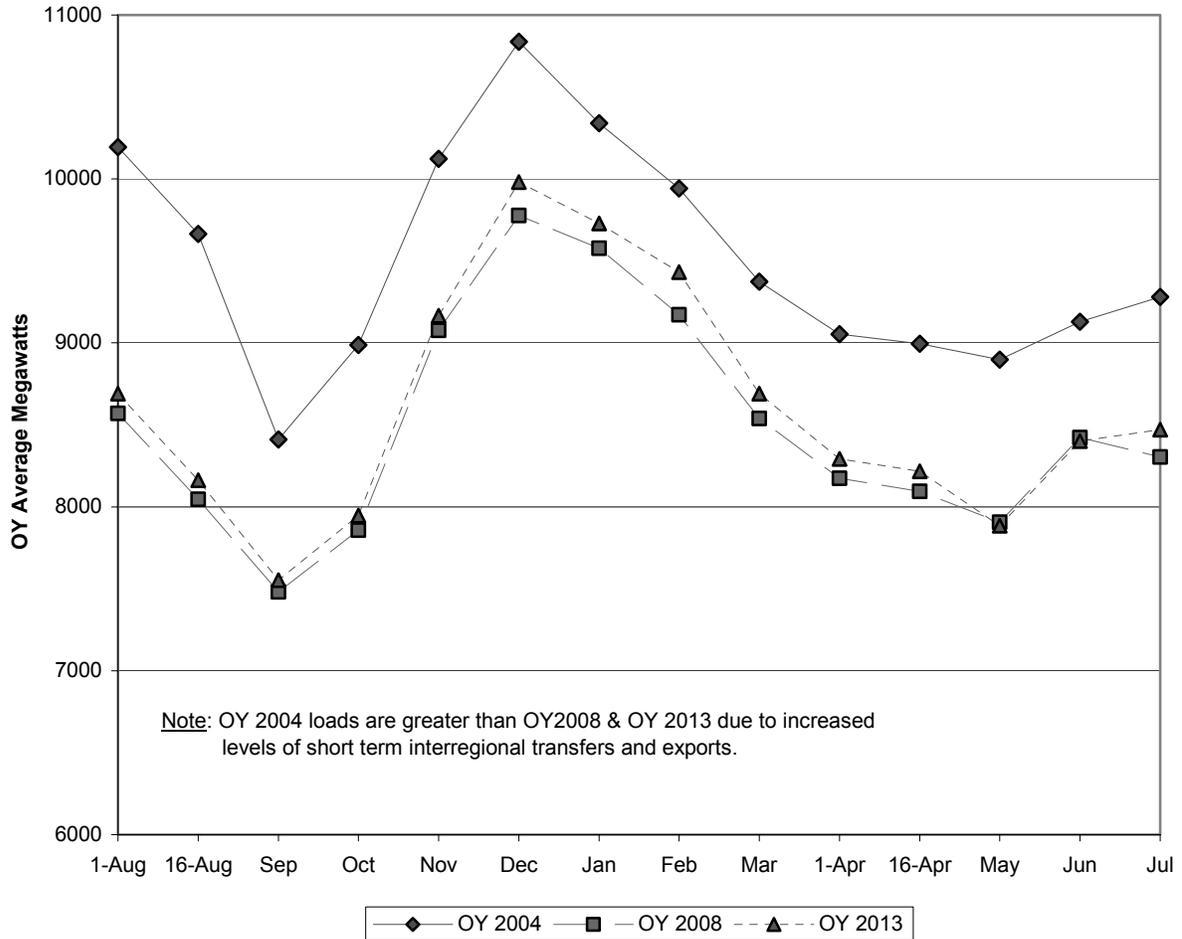
Federal Firm Monthly Energy Load Obligations

Figure 3, page 19, illustrates the Federal firm monthly energy load obligations for OY 2004, 2008, and 2013 and uses the Federal System Base Case Assumptions detailed on page 13. Beginning October 1, 2006, and extending through September 30, 2011, the base case Federal energy load obligations reflect no IOU customer RPSA power deliveries. The DSI power sales contracts are assumed to expire September 30, 2006.

The Federal firm monthly energy load obligations for OY 2004, 2008, and 2013, assuming 1937-water conditions, are shown in Exhibits 2 through 4, pages 63 through 65.

Figure 3

**Federal Firm Monthly Energy Load Obligations
Base Case: Under Normal Weather Conditions
For OY 2004, 2008, and 2013**



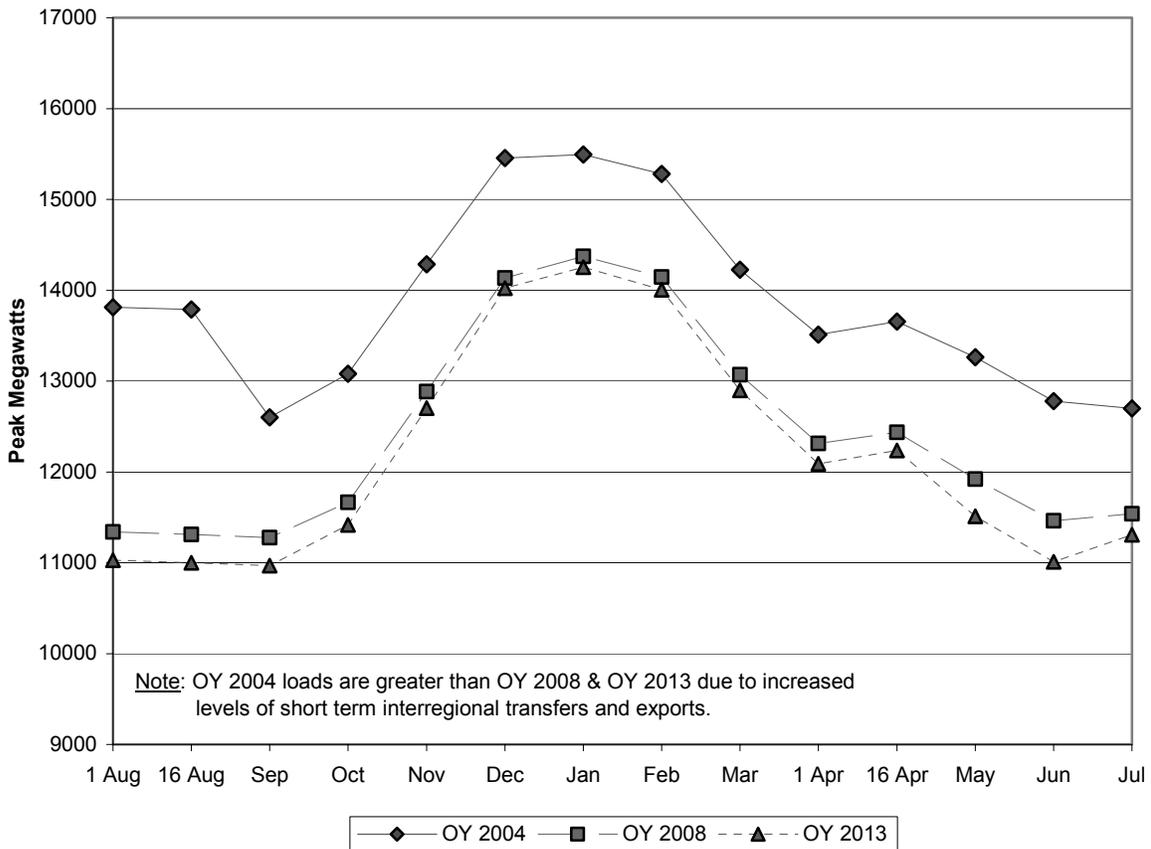
Federal Firm Monthly Peak Load Obligations

Figure 4, page 20, illustrates the Federal firm monthly peak load obligations for OY 2004, 2008, and 2013 and utilizes the Federal System Base Case Assumptions detailed on page 13. The figure shows the expected 1-hour monthly maximum demand under BPA's 2002 White Book Study load obligations. The forecast assumes that PNW Federal agencies, public agencies, cooperatives, and USBR purchase capacity from BPA under their power sales contracts to meet peak loads not served by their own resources with the exception of the Slice product customers. Federal load obligations include BPA's exports and interregional contracts. The

peak load obligations assume normal weather conditions with a 50-percent probability that the actual peak load obligations could be exceeded. The peak load projections are reduced by a diversity component to address the fact that all electrical peak demands do not occur simultaneously throughout the region.

Figure 4

**Federal Firm Monthly Peak Load Obligations
Base Case: Under Normal Weather Conditions
For OY 2004, 2008, and 2013**



The Federal peak load obligations reflect the expiration of export and interregional contracts throughout the study horizon. In addition, the IOU RPSA settlement power deliveries end September 30, 2006. Financial RPSA settlement benefits are assumed to begin October 1, 2006, and no power is delivered. Federal peak load obligations decline from OY 2013 due to lower level of load growth and the expiration of export and interregional contracts. The monthly Federal firm peak loads are presented in Exhibits 5 through 7, pages 69 through 71.

Federal Firm Resources

Table 3, below, summarizes the Federal system firm energy resources and contract purchases available to BPA to meet Federal firm load obligations for OY 2004. Federal system firm energy resources are approximately comprised of 70 percent from hydroelectric power, 10 percent from one nuclear power plant, and 20 percent from BPA's firm contracts and small thermal and renewable resources.

Table 3

**Federal Firm Resources for OY 2004
Based on 1937-Water Conditions
Capacity Based on January 2004**

Project Type	Sustained Peak Capacity (Peak MW)	Generating Peaking Capacity (Percent of Total)	Firm Energy (OY in aMW)	Firm Energy (Percent of Total)
Hydro	13,620 ¹	82.9%	6,978	70.3%
Nuclear	1,150	7.0%	1,000	10.1%
Firm Contracts/Small Thermal Resources	1,660	10.1%	1,948	19.6%
Total Federal Resources	16,430	100%	9,926	100%

The Federal system hydroelectric resources from which BPA markets power are detailed in Table 4, page 22. BPA also markets power purchased from non-Federally owned resources. In addition, BPA's capacity/energy exchange contracts provide marketable energy to BPA as payment for the capacity BPA delivers. Table 5, page 23, shows the non-Federally owned resources, return energy associated with BPA's existing capacity/energy exchanges, contractual resources, and other BPA hydro-related contracts.

Combined, these resources represent BPA's available firm resources. A detailed listing of Federal generating resources is in BPA's 2002 Pacific Northwest Loads and Resources Study Technical Appendix and is available on BPA's external web site at <http://www.bpa.gov/power/whitebook2002>.

¹ A Sustained Peaking Adjustment of -4,654 Peak MW reduces the hydroelectric capacity.

Table 4

**Federal System Hydroelectric Projects
Capacity and Energy Based on OY 2004**

Project	Initial Year of Service	Number of Units	Nameplate Rating (MW)	OY 2004	
				Instantaneous Generating Capacity ¹ (Peak MW)	Firm Energy ² (aMW)
U.S. Bureau of Reclamation Hydroelectric Projects					
Grand Coulee	1941	27	6,465	5,448	1,929
Grand Coulee Pump Gen.	1973	6	314	300	0
Hungry Horse	1952	4	428	281	77
Palisades	1957	4	176	122	66
Anderson Ranch	1950	2	27	36	16
Green Springs	1960	1	17	18	7
Minidoka	1909	4	28	26	16
Roza	1958	1	11	4	8
Black Canyon	1925	2	10	9	8
Chandler	1956	2	12	10	9
Total USBR Projects		53	7,488	6,254	2,136
U.S. Army Corps of Engineers Hydroelectric Projects					
Chief Joseph	1955	27	2,458	2,155	1,061
John Day	1968	16	2,160	2,037	802
The Dalles w/fish turbines	1957	24	1,808	1,752	594
Bonneville w/fish turbines	1938	20	1,093	839	362
McNary	1953	14	980	947	518
Lower Granite	1975	6	810	690	221
Lower Monumental	1969	6	810	677	223
Little Goose	1970	6	810	734	218
Ice Harbor	1961	6	603	540	138
Libby	1975	5	525	549	167
Dworshak	1974	3	400	422	126
Lookout Point	1954	3	120	67	35
Detroit	1953	2	100	96	41
Green Peter	1967	2	80	79	28
Lost Creek	1975	2	49	18	30
Albeni Falls	1955	3	43	23	25
Hills Creek	1962	2	30	30	18
Cougar	1964	2	25	25	16
Foster	1968	2	20	22	12
Big Cliff	1954	1	18	21	11
Dexter	1955	1	15	17	9
Total USACE of Engineer Projects		153	12,957	11,740	4,655
Total USBR and USACE Projects		206	20,445	17,994	6,791

¹ Maximum generation under optimum conditions for January 2004 assuming 1937-water conditions. Does not reflect reduction to the peaking capacity of the hydro system due to the drafting of reservoirs and other project constraints.

² Firm energy is a 12-month annual average for OY 2004 assuming 1937-water conditions.

Table 5

**Non-Federally Owned BPA Resources and Contracts
Capacity and Energy Based on OY 2004**

Project	Type	Operator	Date in Service	OY 2004	
				Capacity ¹ (Peak MW)	Firm Energy (aMW)
Existing Non-Federally Owned BPA Resources					
Columbia Generating Station	Nuclear	ENW	1984	1,150	1,000
Idaho Falls Bulb Projects	Hydro	City of Idaho Falls	1982	18	19
Cowlitz Falls	Hydro	Lewis County PUD	1994	13 ²	26
Big Creek Hydro Unit	Hydro	Mission Valley	1981	1	0
Clearwater	Hydro	State of Idaho DWR	1998	1	1
Dworshak Small Hydro	Hydro	State of Idaho DWR	2000	3	3
Glines Canyon	Hydro	US Parks Service	1927	16	15
Elwah Hydro	Hydro	US Parks Service	1910	13	9
James River Wauna	Cogen.	Clatskanie /EWEB	1996	32	29
Foote Creek 1	Wind	Foote Creek 1, LLC	1999	0	6
Foote Creek 2	Wind	Foote Creek 2, LLC	1999	0	1
Foote Creek 4	Wind	Foote Creek 4, LLC	2000	0	7
Stateline Wind Project	Wind	PPM, FLP	2001	0	30
Condon Wind Project	Wind	Condon Wind Project, LLC	2002	0	12
Klondike Phase 1	Wind	NW Wind Power	2001	0	8
Fourmile Hill Geothermal	Geo	Calpine	2005 ³	-	-
Ashland Solar Project	Solar	Ashland, Oregon	2000	0	0
Total Non-Federally Owned BPA Resources				1,247	1,166
Firm Contracts					
Canadian Entitlement for CSPE (non-Federal)				0	0
Canadian Entitlement for Canada (non-Federal)				249	142
Canadian Imports				0	1
Pacific Southwest Imports				23	71
Inland Southwest Imports				95	102
Eastern Imports				189	94
Pacific Northwest Purchase				1,288	1,559
Supplemental & Entitlement Replacement Energy				0	0
Total BPA Firm Contracted Resources				1,844	1,969
Total Non-Federally Owned BPA Resource Contracts				3,091	3,135

¹ Maximum generation under optimum conditions for January 2004 assuming 1937-water conditions.

² Operational capacity is 70 MW, but is restricted in January.

³ Fourmile Hill will be operational October 1, 2004. It has a January peak of 50 MW and annual energy of 50 aMW.

Federal Firm Annual Energy Surplus/Deficit Projections

The Federal firm annual energy surplus/deficit projections under 1937-water conditions for OY 2004 through 2013 are presented below in Table 6 and graphically in Figure 5, page 25. Figure 5 illustrates the change in the 2002 White Book from the 2001 and 2000 Studies. Under the Federal System Base Case Assumptions detailed on page 13, the Federal system is expected to be energy surplus in OY 2004 and have energy deficits of less than -100 aMW in OY 2005 through 2008. In OY 2009 through 2013, the Federal energy deficits climb from approximately -240 aMW to almost -465 aMW due to growth in BPA's public customers' loads, and the expiration of interregional purchases and import contracts. BPA will most likely meet these deficits using a combination of methods described in the Federal Resource Adequacy Section, page 34. The components of the annual Federal energy loads and resources balance under 1937-water conditions for OY 2004 through 2013 are presented in Exhibit 1, page 59.

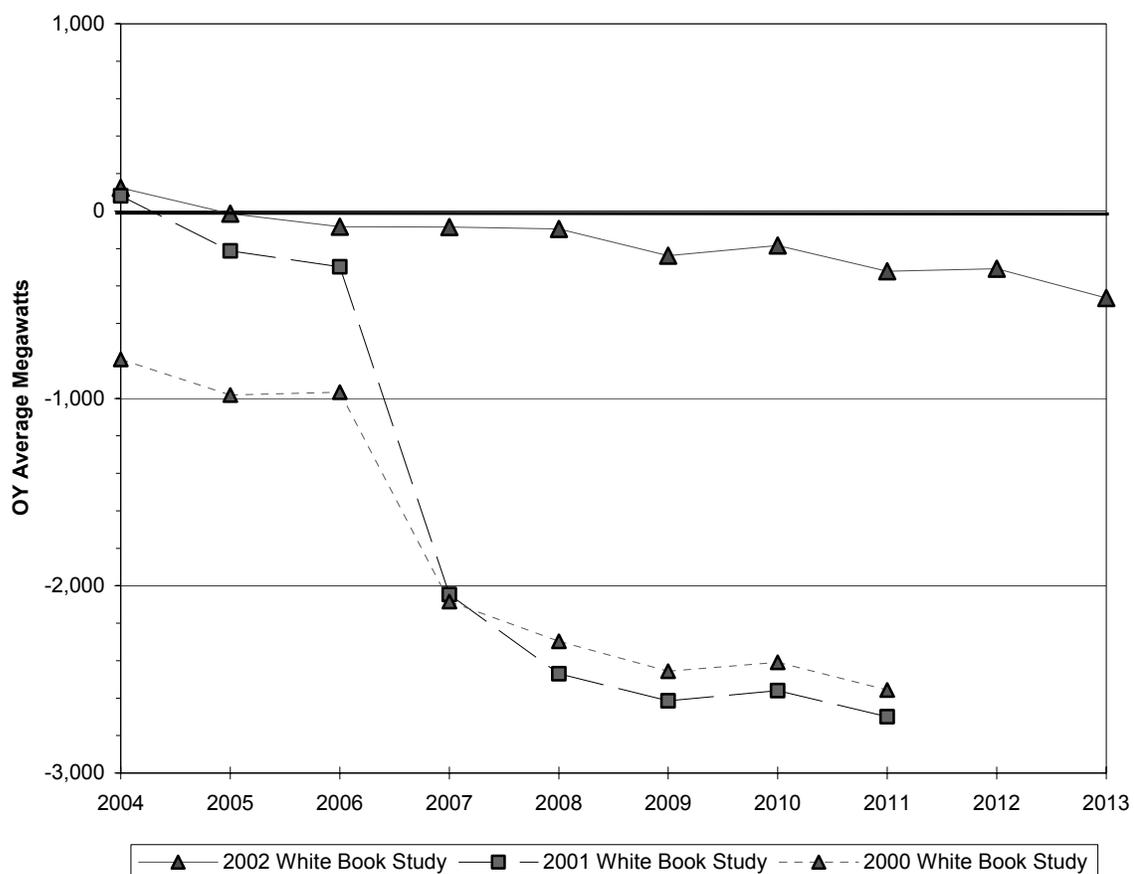
Table 6

**Federal Firm Annual Energy Surplus/Deficit Projections
Base Case: Assuming Existing Loads, Resources, Contracts,
and Normal Weather Conditions
Under 1937-Water Conditions
Energy in Average Megawatts**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Federal S/D	123	-14	-84	-86	-96	-239	-183	-321	-308	-464

Figure 5

**Federal Firm Annual Energy Surplus/Deficit Projections
Base Case: Assuming Existing Loads, Resources, Contracts,
and Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004 through 2013**



Variability of Federal Firm Annual Energy Surplus/Deficit Projections

Figure 6, page 28, and Table 7, page 27, show the potential variability of the Federal firm annual energy surplus/deficit for four Federal system load scenarios. The scenarios depict different levels of IOU RPSA settlement power deliveries and DSI PSC obligations that bound possible outcomes of the Federal system surplus/deficit under 1937-critical water conditions and normal weather conditions. Each scenario incorporates the Federal System Base Case Assumptions presented on page 13, with the exceptions of the level of BPA's IOU RPSA settlement power deliveries beginning October 1, 2006, through September 30, 2011, and DSI PSC service through September 30, 2006. The actual Federal system surplus/deficit will vary depending on conditions such as water, weather, and load levels. The differences between the assumptions for the four scenarios for the firm annual energy surplus/deficit analysis are as follows:

Scenario 1: Base Case-2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI PSC obligations, up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA exercises its option to pass the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 2: No 2001 DSI PSC & No Post-OY 2006 IOU Power Deliveries

- DSI's do not purchase power under their PSCs through September 30, 2006, due to economic conditions; and
- For October 1, 2006, through September 30, 2011, BPA exercises its option to pass the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered.

Scenario 3: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 550 aMW

- DSI PSC obligations up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, BPA's IOU customers RPSA settlement consists of two parts:
 - 1) Annual power deliveries of 550 aMW; and
 - 2) The remaining 1,650 aMW in the form of financial benefits.

Scenario 4: 2001 DSI PSC & Post-OY 2006 IOU Power Deliveries of 2,200 aMW

- DSI PSC obligations up to 768 aMW annually through September 30, 2006; and
- For October 1, 2006, through September 30, 2011, IOU customers annually purchase RPSA settlement power deliveries of 2,200 aMW.

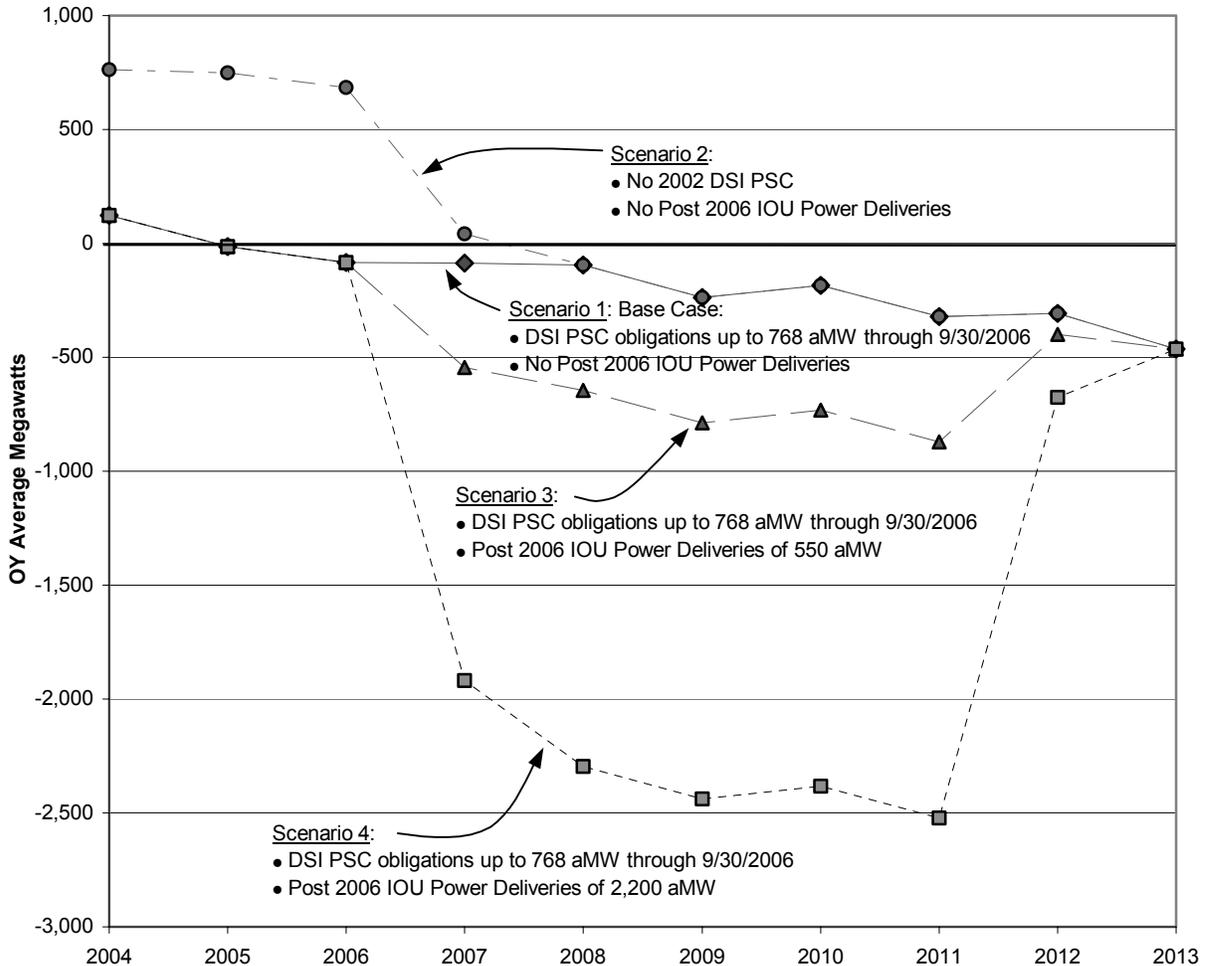
Table 7

**Variability of Federal Annual Energy Surplus/Deficit Projections
Utilizing Different Levels of IOU And DSI Power Deliveries
Assuming Normal Weather Conditions
Under 1937-Water Conditions**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<u>Scenario 1:</u> Base Case: 2001 DSI PSC & No Post 2006 IOU Power Deliveries	123	-14	-84	-86	-96	-239	-183	-321	-308	-464
<u>Scenario 2:</u> No 2001 DSI PSC & No Post 2006 IOU Power Deliveries	763	748	684	42	-96	-239	-183	-321	-308	-464
<u>Scenario 3:</u> 2001 DSI PSC & Post 2006 IOU Power Deliveries of 550 aMW	123	-14	-84	-544	-646	-789	-733	-871	-400	-464
<u>Scenario 4:</u> 2001 DSI PSC & Post 2006 IOU Power Deliveries of 2,200aMW	123	-14	-84	-1,919	-2,296	-2,439	-2,383	-2,521	-675	-464

Figure 6

**Variability of Federal Annual Energy Surplus/Deficit Projections
Utilizing Different Levels of IOU and DSI Power Deliveries
Assuming Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004 through 2013**



Federal Firm Monthly Energy Surplus/Deficit Projections

To depict the monthly variability of the loads and resources, under the Federal system Base Case assumptions detailed on page 13, the monthly Federal system energy components under 1937-water conditions for OY 2004, 2008, and 2013 are shown in Exhibits 2 through 4, pages 63 through 65. Figure 7, page 29, graphically illustrates the monthly Federal system firm energy loads and resources for OY 2004. This figure demonstrates the monthly timing of Federal system surpluses and deficits under the provisions of the PNCA.

Under critical water conditions, Federal hydroelectric resources are generally operated at lower power production levels during the January through March timeframe to allow the reservoirs to store water for release in the spring to assist fish passage.

In addition to the monthly variability of the Federal surplus/deficit under critical water conditions, the Federal surplus/deficit can vary greatly depending on water conditions in the PNW. Exhibits 8 through 17, pages 75 through 84, illustrate the Federal firm energy surplus/deficit projections under the 50-water years of record.

Figure 7

**OY 2004 Federal Firm Monthly Energy Loads and Resources
Base Case: Assuming Normal Weather Conditions
Under 1937-Water Conditions**

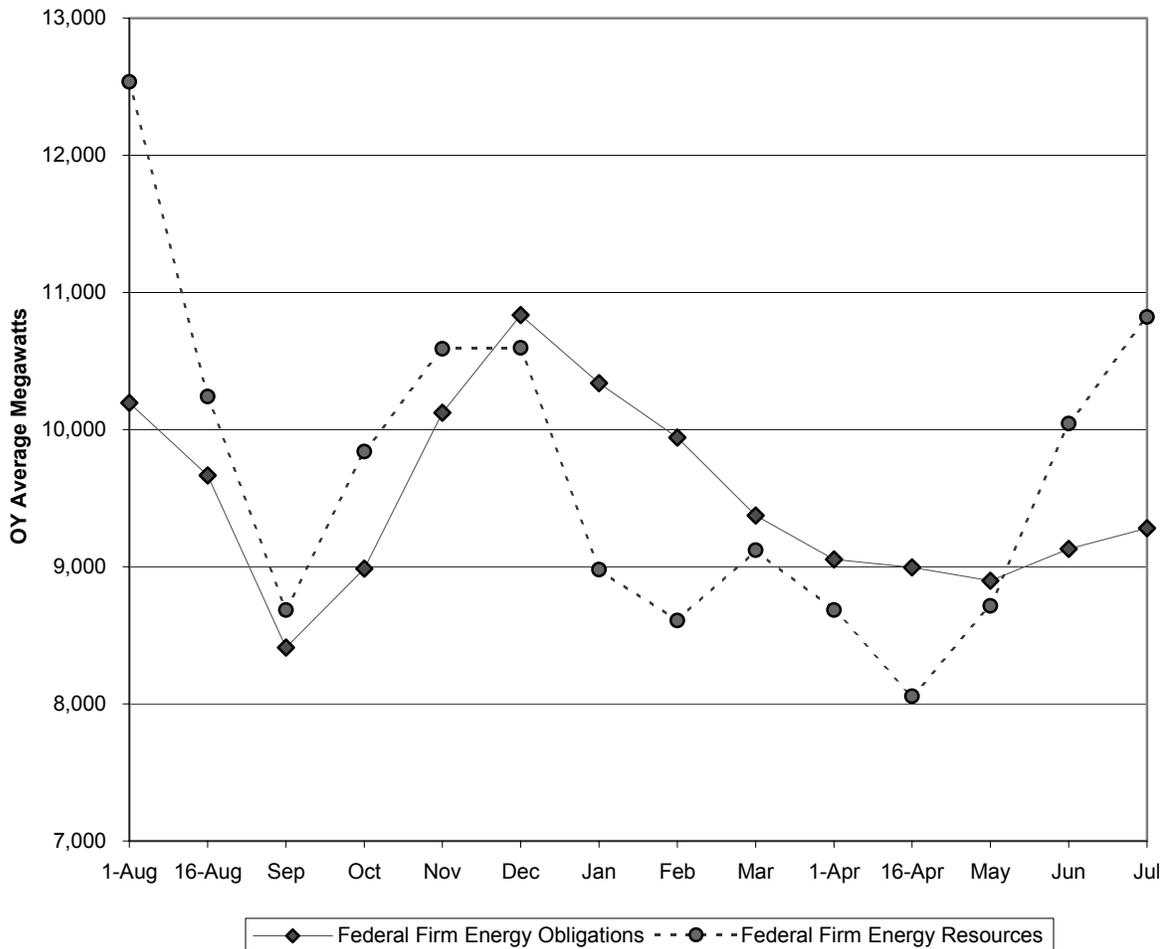
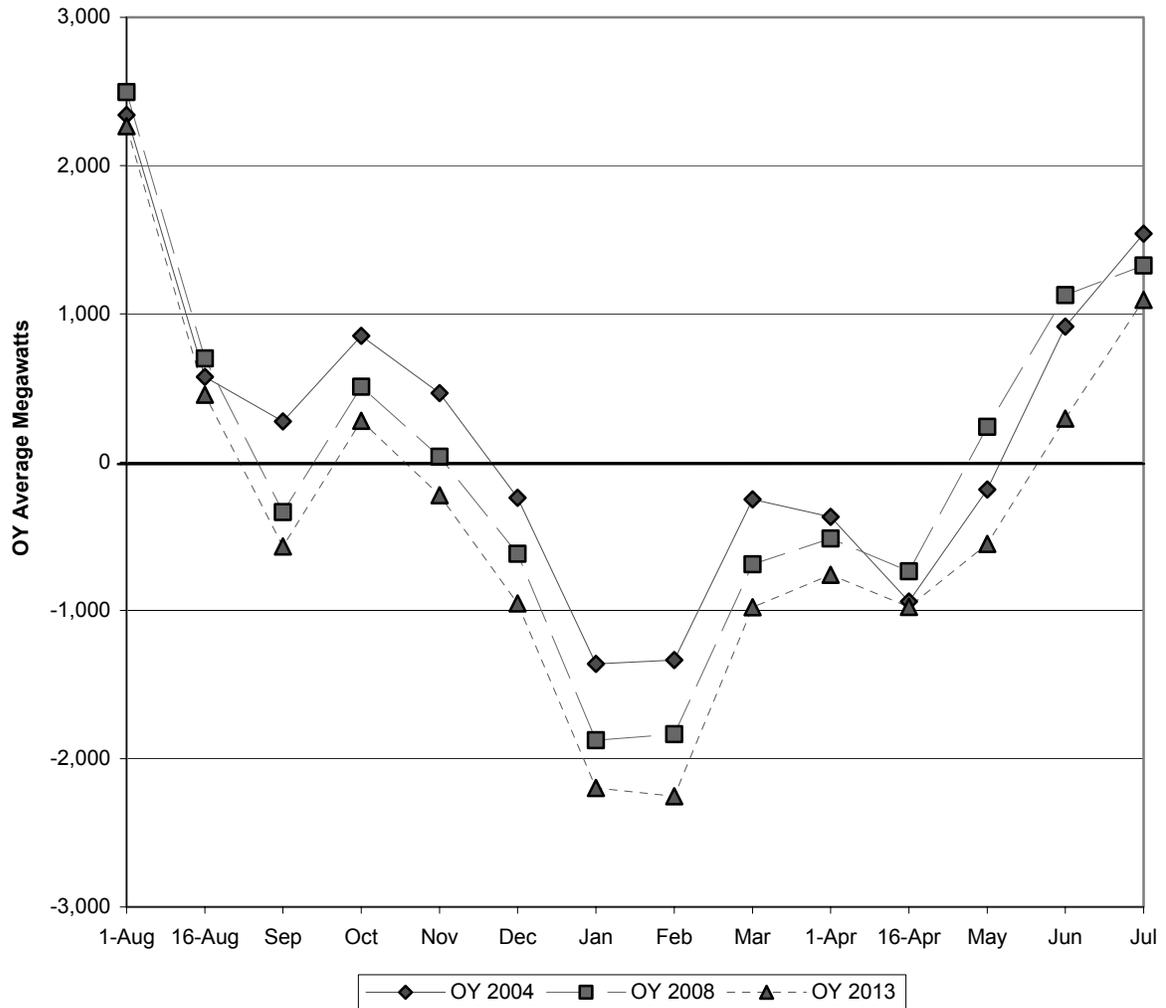


Figure 8, below, shows the monthly Federal firm energy surplus/deficit projections for OY 2004, 2008, and 2013 and incorporates the Federal System Base Case Assumptions detailed on page 13.

Figure 8

**Federal Firm Monthly Energy Surplus/Deficit Projections
Base Case: Assuming Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004, 2008, and 2013**

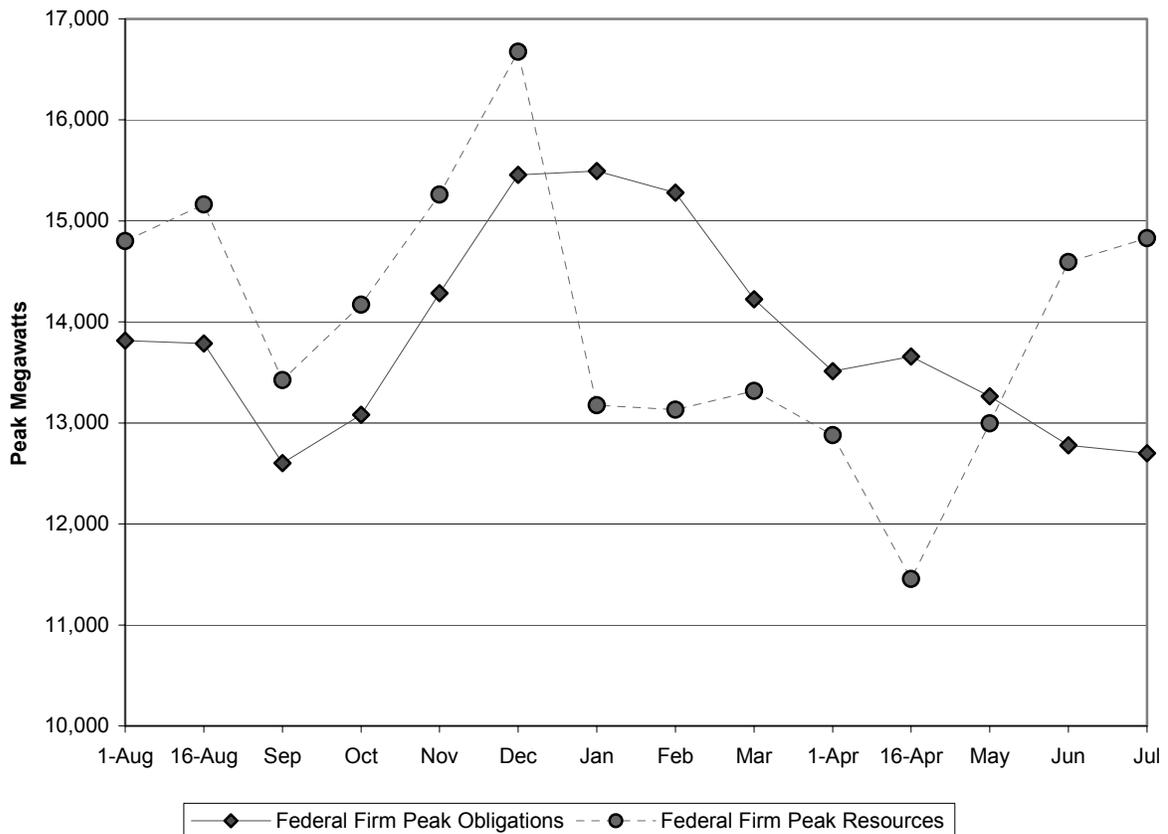


Federal Firm Capacity Surplus/Deficit Projections

Figure 9, below, shows the monthly Federal system peak loads and resources for OY 2004 under the Federal System Base Case Assumptions detailed on page 13. The projections assume 1937-water conditions, normal weather conditions, and a 50-percent probability that the actual peak loads will be exceeded. This figure illustrates the timing and magnitude of the Federal system capacity surpluses and deficits that could occur in any operating year.

Figure 9

**OY 2004 Federal Monthly Capacity Loads and Resources
Base Case: Assuming Normal Weather Conditions
Under 1937-Water Conditions
Peak in Megawatts**



BPA's surplus firm capacity values take into account the following Federal system hydro constraints:

- Limitations on moving water between projects, including upstream storage;
- Pondage limitations due to hydraulic imbalance from reservoir to reservoir; and
- Navigation and recreation constraints, including restrictions on the rate of rise or fall of tailwater and forebay elevations.

This analysis, however, does not take into account potential nighttime return problems from capacity sales. Nighttime return problems can occur when replacement energy from capacity sales combined with minimum Federal hydroelectric generation, thermal resources, and other Federal contract returns are greater than BPA's nighttime load. The following factors may contribute to nighttime return problems:

- Low nighttime Federal system load obligations;
- Minimum nighttime contract levels from contract purchases, peaking replacement, and exchange energy;
- The inability of Federal non-hydroelectric resources—especially ENW's Columbia Generating Station—to cycle to fit differing day to night load requirements; and
- Additional nonpower hydro requirements that dictate minimum streamflows.

Any of these factors can potentially restrict the ability to accept nighttime return energy even though there is surplus generating capability during the daytime.

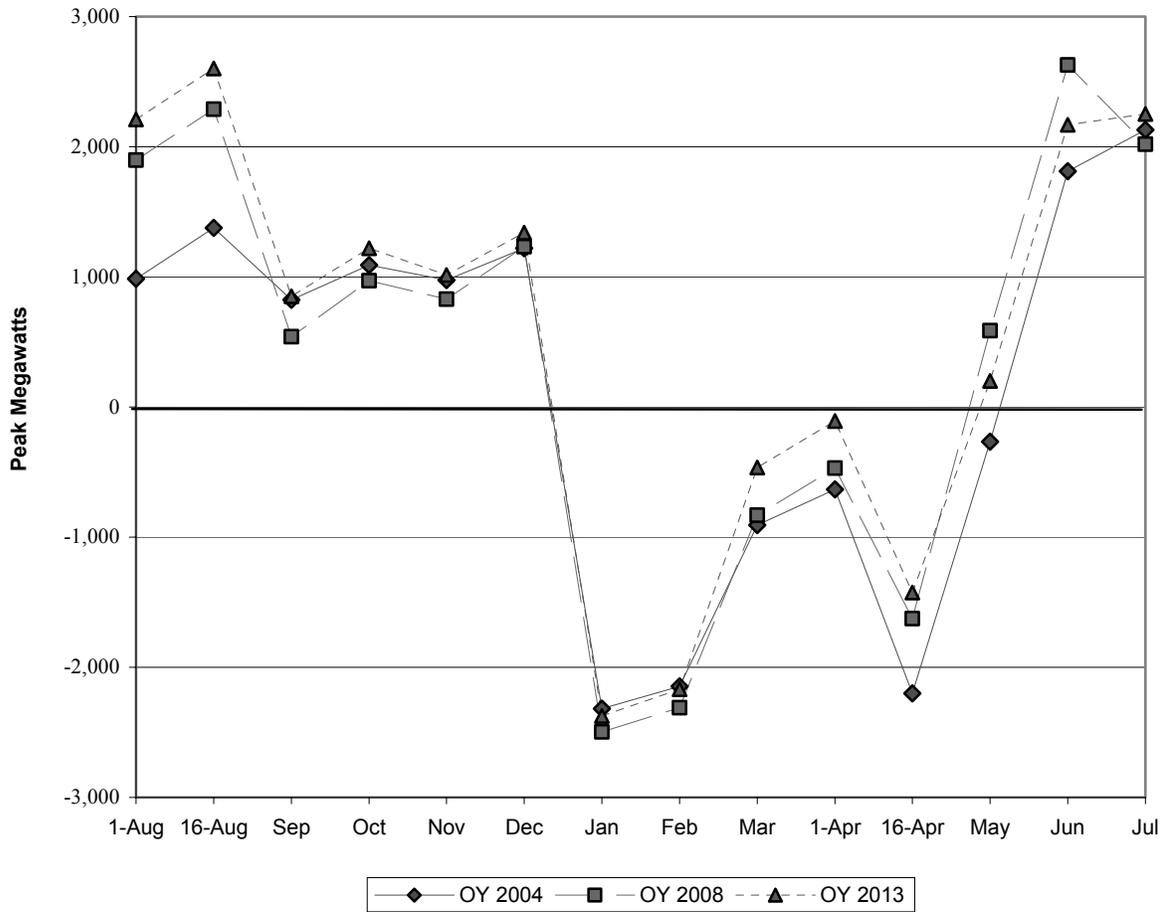
If BPA makes additional market purchases, the added capacity most likely will increase capacity available to the Federal system.

Figure 10, page 33, illustrates the Federal firm capacity surplus/deficit projections for OY 2004, 2008, and 2013.

Federal capacity surplus/deficit projections, assuming normal weather conditions and 1937-water conditions for OY 2004, 2008, and 2013, are shown in Exhibits 5 through 7, pages 69 through 71.

Figure 10

**Federal Monthly Capacity Surplus/Deficit Projections
Base Case: Assuming Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004, 2008, and 2013**



Federal Resource Adequacy

The Federal system energy and capacity load resource projections use the Federal System Base Case Assumptions presented on page 13 and are considered conservative. This analysis assumes Federal system hydroelectric generation under 1937-critical water conditions; Federal non-hydroelectric resources operating at expected generation levels; and Federal contract obligations and purchases delivered at maximum contract levels. In addition, this analysis includes Federal power purchases or new resources that were acquired prior to June 30, 2003. The Federal system load resource deficits may be reduced or met by any combination of the following:

- Better than critical water conditions, which increases water flow and water storage thereby increasing the output of the Federal hydroelectric system;
- Power purchases from new merchant plants operating or under construction in the PNW;
- Power purchases from merchant plants operating outside the PNW region;
- Purchase of off-system storage and exchange agreements that allow for seasonal shaping of Federal hydropower with other PNW entities or other regions; and
- BPA's DSI power sales contract obligations have been reduced to 768 aMW annually through load reduction agreements and closures. In actual operation, BPA's DSI obligations may be lower than their full contracted amounts through September 30, 2006, due to economic or other conditions.

As the Federal system contracts for additional power purchases or generation from new or existing resources, those amounts will be incorporated into future studies.

Section 5: Regional Analysis

Regional Analysis Assumptions

This regional loads and resources analysis is based on regional loads, resources and contracts that were finalized on June 30, 2003, with the exception of the DSI total retail loads, which were updated September 9, 2003. Study assumptions for the regional Base Case analysis are as follows:

- Total retail load forecasts reflect normal weather conditions;
- Generating resources include all operating requirements currently adopted by the hydroelectric project owners and the firm planning assumptions for assured resource capability for the PNCA;
- All existing regional import and export contracts expire by the terms of their agreements and are not renewed;
- Federal surplus firm power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena are shown as capacity/energy exchanges until they expire April 15, 2008;
- The Federal surplus firm power sales with the cities of Modesto, Santa Clara, and Redding (MSR) expire September 30, 2005;
- The termination of all Enron Power Marketing contracts as of April 1, 2003;
- Sustained capacity limits are 50-hours-per-week;
- Capacity surplus/deficit values do not reflect potential nighttime return problems for regional entities;
- Transmission losses are treated as a resource reduction;
- New generating resources brought into operation are considered merchant plants unless they are formally dedicated to serve regional utility load; and
- There is no substantial operational change in non-Federal hydro licensing for regional hydro resources.

Regional Firm Annual Energy Load Projections

BPA's 2002 White Book regional firm annual energy load projections include two components:

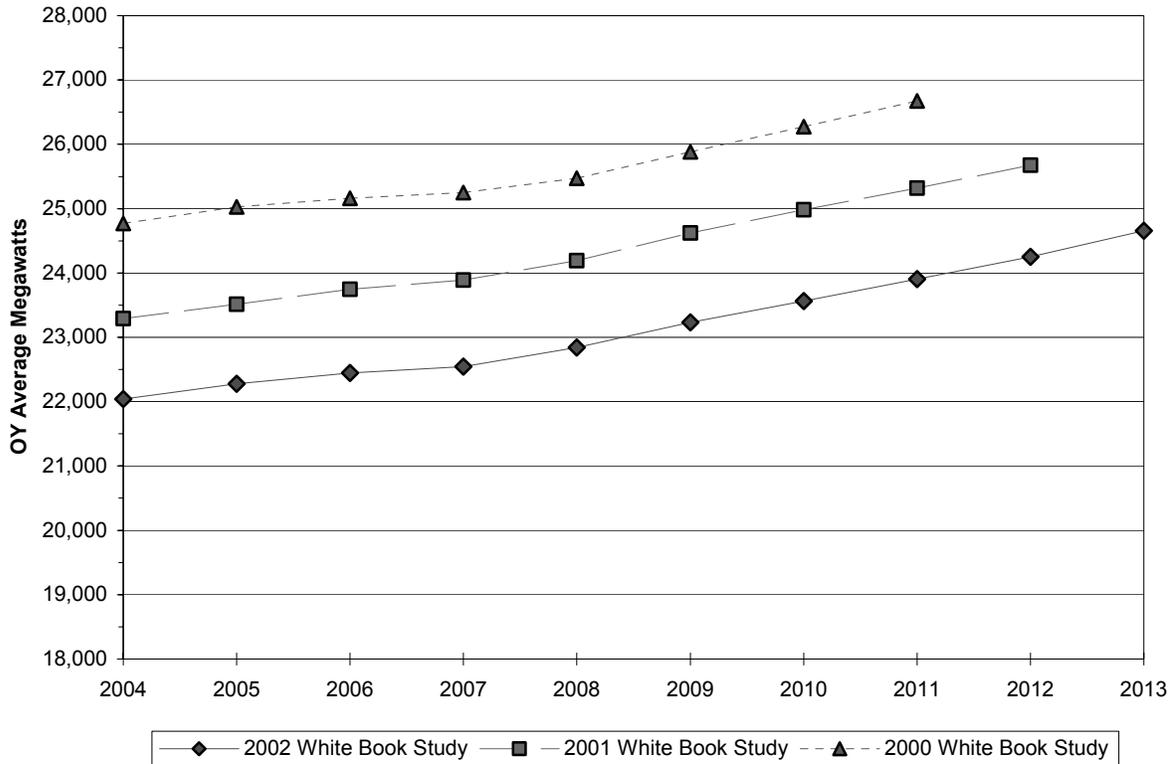
- Total retail load consumption based on the individual entity's total retail load forecast discussed in Total Retail Load Forecast, page 3; plus
- All long-term and multi-year export contracts made by PNW entities including BPA.

Regional firm annual energy loads for OY 2004 through 2013 are shown in Figure 11, page 36. The regional firm annual energy loads are presented in Exhibit 18, page 89, and monthly firm energy loads for OY 2004, 2008, and 2013 are presented in Exhibits 19 through 21, pages 93 through 95.

Figure 11, below, illustrates the change of the annual regional firm energy load projections for OY 2004 through 2013 from the previous 2000 and 2001 studies. These differences reflect updates in the regional loads and export contracts for regional Federal agency, public agency, cooperative, USBR, IOU, and DSI customers. Due to changing economic conditions, the base levels of the regional load projections have been declining for each of the three studies. This trend is mostly attributed to the declining DSI load estimates.

Figure 11

**Regional Firm Annual Energy Load Projections
Including Exports
Base Case: Under Normal Weather Conditions
For OY 2004 through 2013**



Potential Variability of Regional Firm Annual Energy Load Projections

Table 8, below, and Figure 12, page 38, show the potential variability of the PNW regional firm annual energy load for three load scenarios. These scenarios depict different DSI load levels within the PNW region and will bound the most likely regional load levels expected to occur. Each scenario incorporates the same regional Base Case assumptions presented on page 35, with the exception of the level of DSI loads. The differences between the three regional load scenarios are as follows:

Scenario 1: Base Case-100% Regional DSI Load Forecast

- Regional DSI load levels averaging up to 792 aMW annually throughout the study horizon;

Scenario 2: 50% Regional DSI Load Forecast

- Regional DSI load levels that average 50% of the Base Case DSI load forecast, up to 396 aMW annually, throughout the study horizon; and

Scenario 3: No Regional DSI Loads

- No regional DSI firm loads throughout the study horizon.

Table 8

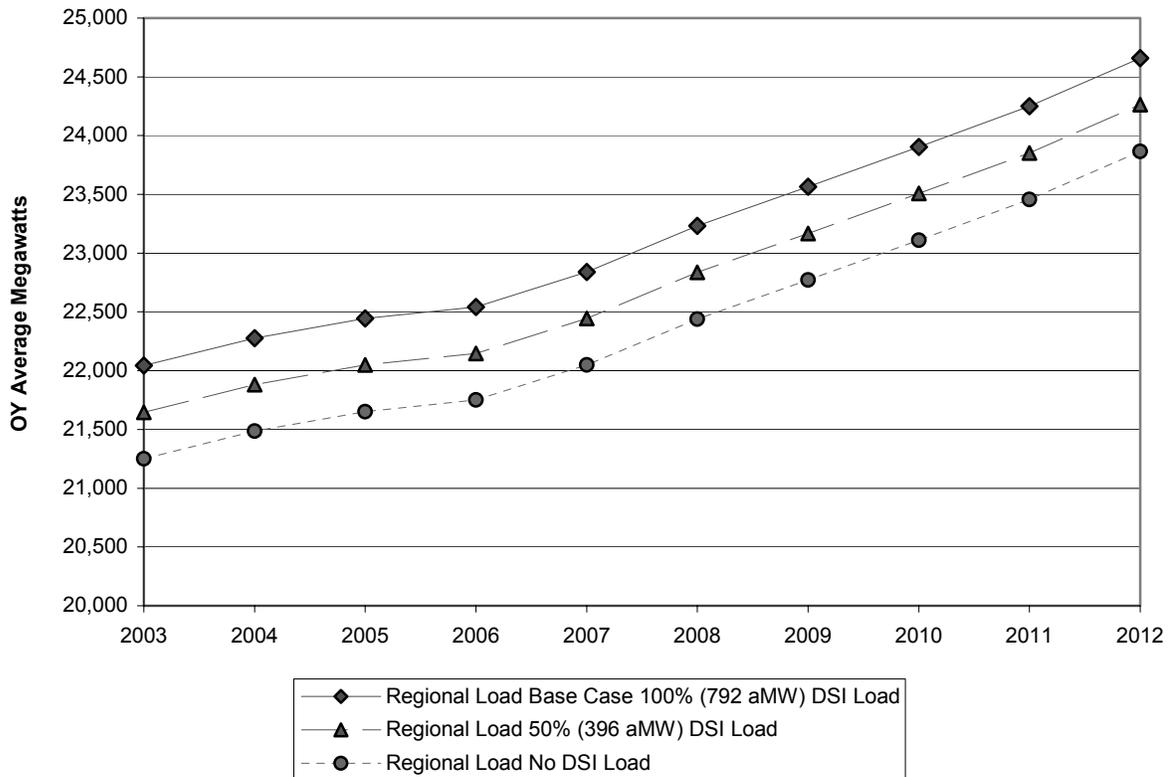
**Potential Variability of PNW Regional Firm Annual Energy Load Projections
Utilizing Different DSI Load Levels
For OY 2004 through 2013**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<u>Scenario 1:</u> Base Case: 100% Regional DSI Loads (792 aMW)	22,043	22,277	22,445	22,543	22,840	23,232	23,565	23,903	24,249	24,659
<u>Scenario 2:</u> 50% Regional DSI Loads (396 aMW)	21,647	21,881	22,049	22,147	22,444	22,836	23,169	23,507	23,853	24,263
<u>Scenario 3:</u> No Regional DSI Loads	21,251	21,485	21,653	21,751	22,048	22,440	22,773	23,111	23,457	23,867

Depending on the level of DSI loads, the regional loads can vary up to 792 aMW. Scenario 1, the Base Case, assumes 792 aMW of DSI loads throughout the study horizon. The regional firm annual energy loads, in this case, varies from just over 22,000 aMW in OY 2004, increasing to approximately 24,660 aMW in OY 2013. Scenario 2, the 50-percent DSI load scenario, assumes 396 aMW of regional DSI loads. This scenario shows that the regional loads vary from just over 21,600 aMW to almost 24,300 aMW by OY 2013. Scenario 3 assumes no DSI loads throughout the study period. It shows lower regional loads that vary from almost 21,300 aMW in OY 2004 to under 23,900 aMW by OY 2013.

Figure 12

**Variability of Regional Firm Annual Energy Load Projections
Including Exports
Utilizing Different DSI Load Levels
For OY 2004 through 2013**



Regional Firm Monthly Peak Load Projections

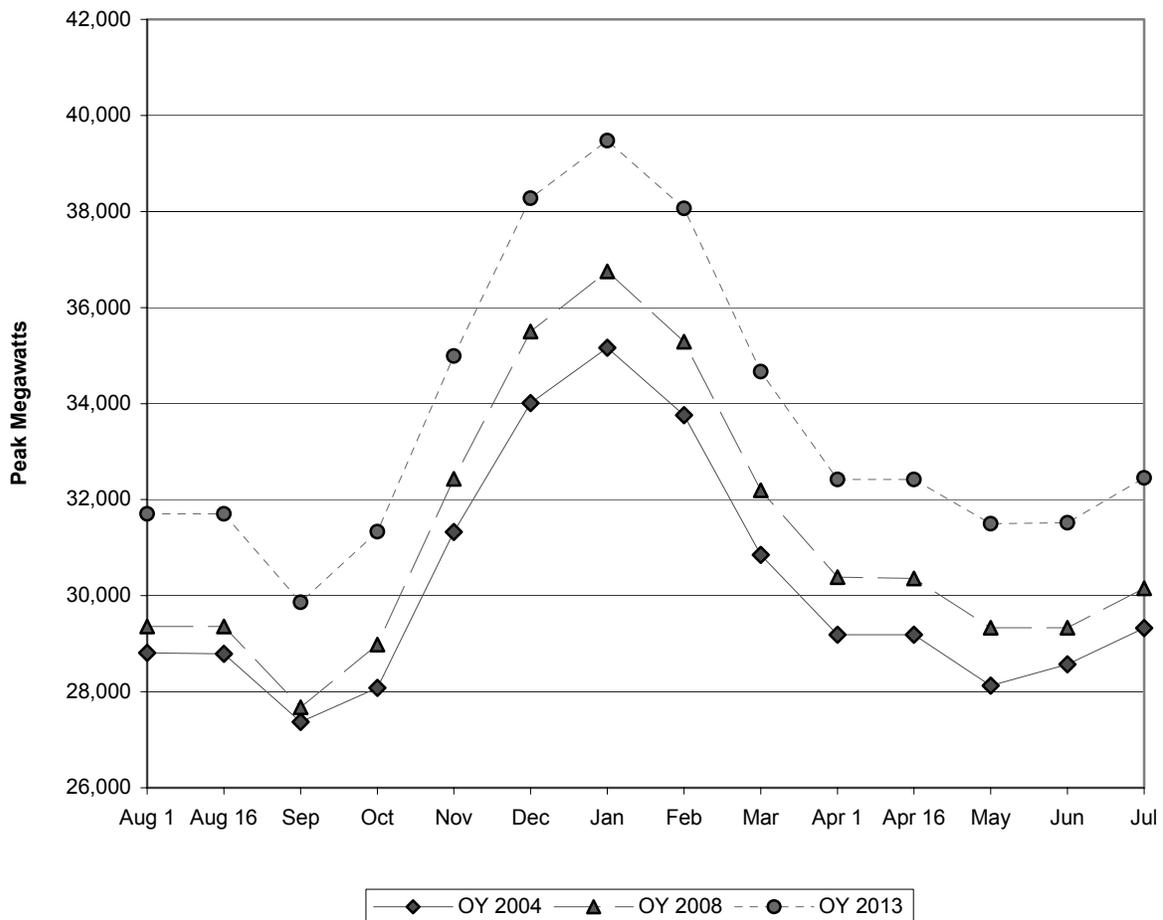
Figure 13, page 39, illustrates the regional firm monthly peak loads for OY 2004, 2008, and 2013. BPA's 2002 White Book peak total retail loads are based on the individual entity's total retail load forecasts and estimates of their expected 1-hour monthly demand. The peak loads are estimated based on normal weather conditions using a 50-percent probability that the forecasted peak load will be

exceeded. The projected regional peak loads include all intraregional contracts made by PNW utilities, including those in the Federal system. The peak load projections are decreased by a diversity factor to account for the fact that all electrical peak demands do not occur simultaneously throughout the region.

The monthly regional firm peak loads are presented in Exhibits 22 through 24, pages 99 through 101.

Figure 13

**Regional Firm Monthly Peak Load Projections
Base Case Under Normal Weather Conditions
For OY 2004, 2008, and 2013**



Regional Firm Resources

Table 9, page 40, and Figure 14, page 41, summarize the regional system resources for OY 2004. For the region, hydro resources represent a smaller share of the total regional resources than the hydro resource share for the Federal system. This is because regional IOU's own the majority of the PNW thermal resources. Regional thermal resources are comprised primarily of IOU-owned coal, gas, and oil-fired projects and ENW's Columbia Generating Station nuclear plant.

Regional resource changes: PacifiCorp (Wyoming) thermal import contract that estimated PacifiCorp's share of the Jim Bridger plant delivered to the PNW region was eliminated. In its place, PacifiCorp's shares of the Jim Bridger coal plant, units 1 through 4, are now modeled as resources dedicated to serve its PNW regional load. Additionally, Pennsylvania Power & Light Company (PPL Montana) purchased most of Northwestern Energy's (formally Montana Power Company) thermal and hydro resources. Most of these resources are east of the continental divide and are not dedicated to serve any specific PNW load. Only resources dedicated to Northwestern Energy's loads in eastern Montana are now shown as PNW resources.

Table 9

**Regional Firm Resources for OY 2004
Based on 1937-Water Conditions
Capacity Based on January 2004**

Project Type	Sustained Peak Capacity (Peak MW)	Generating Peaking Capacity (Percent of Total)	Firm Energy (OY in aMW)	Firm Energy (Percent of Total)
Hydro	24,361 ¹	61.2%	11,681	48.7%
Coal ²	5,842	14.7%	5,065	21.1%
Nuclear	1,150	2.9%	1,000	4.2%
Imports ²	1,632	4.1%	843	3.5%
Combustion Turbines	3,338	8.4%	2,018	8.4%
Cogeneration	2,227	5.6%	1,963	8.2%
Non-Utility Generation	1,135	2.9%	1,310	5.5%
Miscellaneous	92	0.2%	94	0.4%
Total Resources	39,777	100.0%	23,974	100.0%

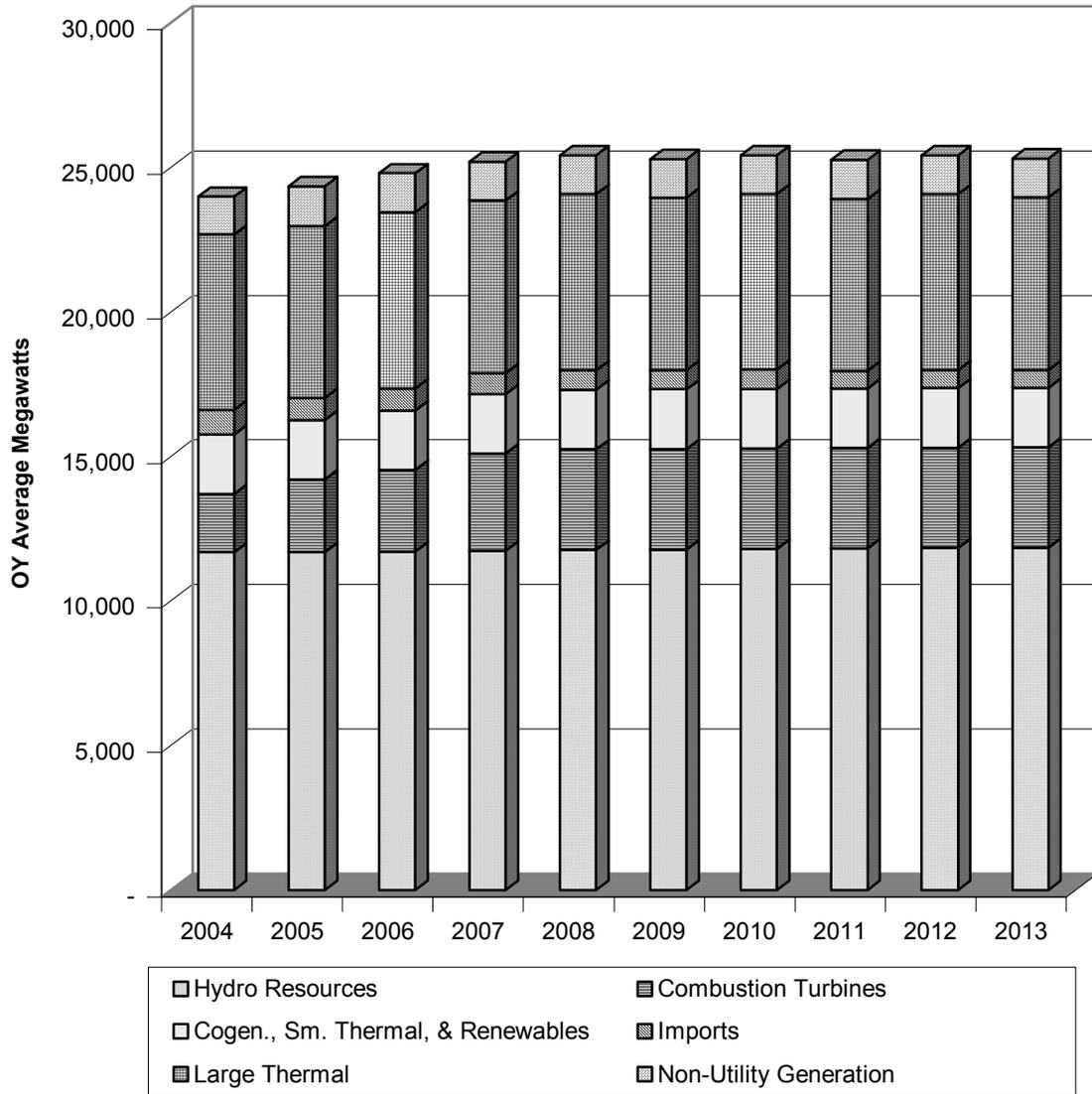
New Regional Resources: Of the expected 4,000 peak MW (annually 3,300 aMW) of new generation presented in the 2001 Study, all but approximately 1,776 peak MW (annually 1,496 aMW) of new generating resources have started operating in the PNW. These remaining regional resources are expected to be in operation by OY 2005 and are listed in Table 10, page 42. Currently, the output of all new projects is assumed to be connected to and delivered into the PNW region's transmission system and therefore are shown as regional resources. With the exception of new resources purchased by BPA, the majority of the output of these resources are not dedicated to meet PNW regional loads under provisions of the Northwest Power Act, § 5(b)(1)(b).

¹ The hydroelectric capacity is reduced by a Sustained Peaking Adjustment of -4,654 MWs.

² PacifiCorp's shares of the Jim Bridger coal plant, units 1 through 4, are now shown as resources dedicated to the PNW regional. In prior studies, power from these projects was shown as a thermal import.

Figure 14

PNW Regional Resource Stack
For OY 2004 through 2013



The operation of new resources and which markets that the power is dispatched into will depend on the following:

- The differential of the market price between the PNW and other regions, primarily in the Pacific Southwest;
- The availability of intraregional system transmission, which can limit the amount of new resources that can be exported to other regions;
- The availability and price of natural gas within the PNW markets; and
- Flow requirements placed on the hydroelectric system—especially under critical water conditions—could limit the ability of the region to serve regional peak loads under extreme weather conditions.

Even though regional deficit conditions appear to be less than in prior studies, as shown in the Section on Regional Firm Annual Energy Surplus/Deficit Projections, Figure 15, page 44, actual regional energy deficits are partially dependent on how much merchant plant power is purchased and used to meet PNW regional loads.

A detailed listing of regional generating resources is contained in the 2002 Pacific Northwest Loads and Resources Study Technical Appendix available electronically on BPA's external web site at <http://www.bpa.gov/power/whitebook2002>.

Table 10

**New PNW Regional Resources
Included in Both the 2002 and 2001 Studies
Expected to be in Operation by OY 2005**

Project Name	Project Participants	Capacity (Peak MW)	Firm Energy (aMW)	Start Date
Chehalis CCCT	Chehalis Power Inc.	520	417	8/2003
Coyote Springs #2	Avista Energy Co. (50%) Mirant Americas Mrktg. (50%)	280	252	10/2002
Longview - Mint CCCT	Mirant Americas Energy Mrktg.	286	203	10/2005
Satsop #1 CCCT	Duke Power	650	599	10/2004
SP Newsprint Cogeneration	SP Newsprint	40	25	3/2003
Total New PNW Resources by 10/2005		1,776	1,496	

Regional Firm Annual Energy Surplus/Deficit Projections

The regional firm annual energy surplus/deficit projections for OY 2004 through 2013, assuming 1937-water conditions, are presented below in Table 11 and are graphically illustrated in Figure 15, page 44. Under the current PNW regional resource stack, the region is expected to experience firm energy surpluses in all study years with the exceptions of OY 2012 and 2013, which are both deficit. In addition, the graph illustrates how the 2002 White Book regional energy surpluses, in OY 2004 through 2011, compare to the regional energy deficits expected in both the 2000 and the 2001 Studies. The changes in the regional surplus/deficit levels are due to a lower regional load forecast and the addition of new PNW regional resources. The region will most likely meet these deficits using a variety of methods as described in Regional Resource Adequacy, page 49.

The regional energy surpluses/deficits for all years of the study are presented in Exhibit 18, page 89. Monthly firm energy loads and resources balances for OY 2004, 2008, and 2013 are presented in Exhibits 19 through 21, on pages 93 through 95. In addition to the monthly variability of the regional surplus/deficit, the region's surplus/deficit can vary greatly depending on water conditions in the PNW. Exhibits 25 through 34, pages 105 through 114, illustrate the regional firm energy surplus/deficit projections under the 50-water years of record.

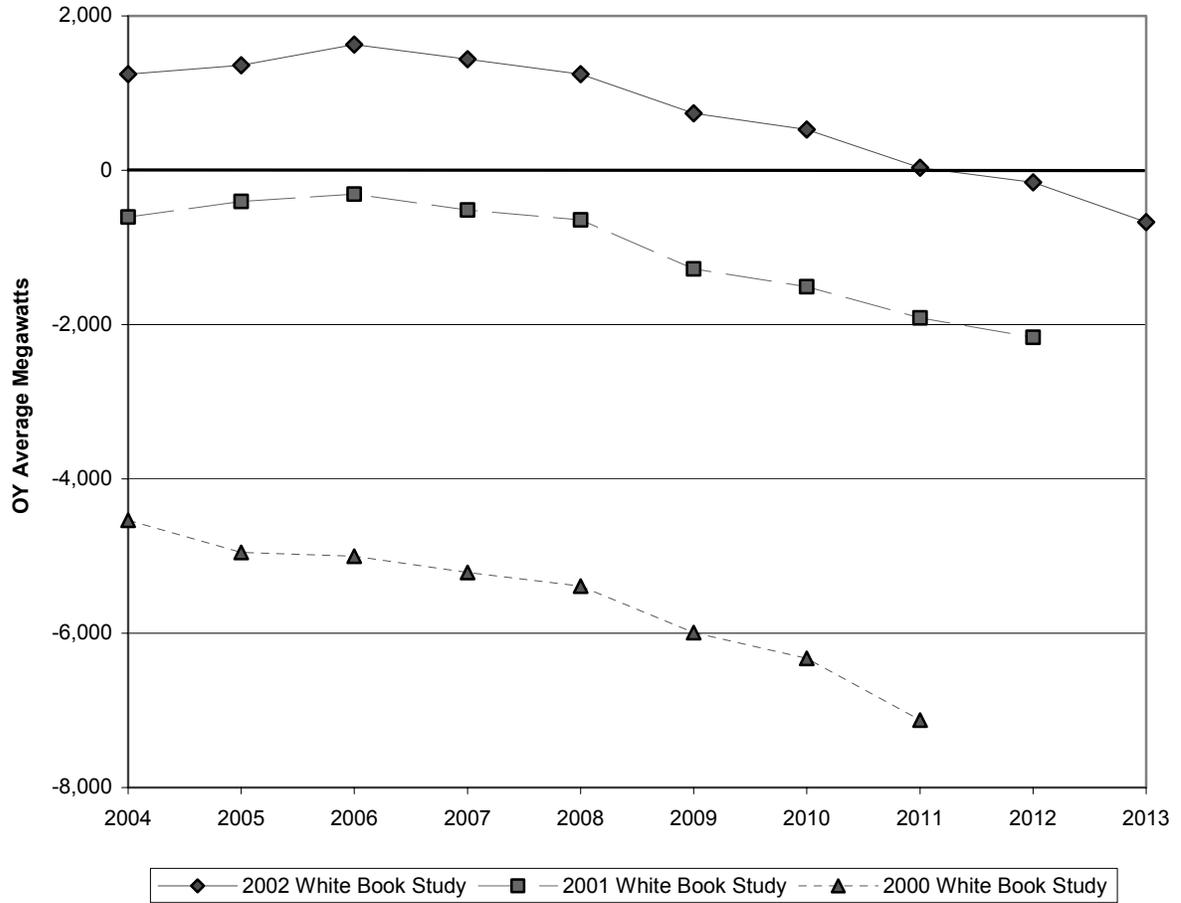
Table 11

**Regional Firm Energy Surplus/Deficit Projections
Base Case: Assuming Existing Loads, Resources, Contracts,
and Normal Weather Conditions
Under 1937-Water Conditions
Energy in Average Megawatts**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Regional Surplus/Deficit	1,244	1,359	1,629	1,438	1,245	738	528	34	-157	-674

Figure 15

**Regional Firm Annual Energy Surplus/Deficit Projections
Base Case: Assuming Existing Loads, Resources, Contracts,
and Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004 through 2013**



Potential Variability of Regional Annual Energy Surplus/Deficit Projections

Table 12, below, and Figure 16, page 46, show the potential annual variability of the PNW regional firm energy surplus/deficit for three load scenarios. The scenarios depict different levels of DSI load expected in the region under 1937-critical water conditions and normal weather conditions. Each scenario incorporates the regional Base Case assumptions presented on page 35, with the exception of regional DSI load levels. The actual regional surplus/deficit will vary, depending on conditions such as water conditions, weather conditions, and load levels. The differences between the three scenarios assumptions for the firm annual energy surplus/deficit analysis are as follows:

Scenario 1: Base Case-100% Regional DSI Load Forecast

- Regional DSI load levels averaging up to 792 aMW annually throughout the study horizon.

Scenario 2: 50% Regional DSI Load Forecast

- Regional DSI load levels that average 50% of the Base Case DSI load forecast, up to 396 aMW annually, throughout the study horizon; and

Scenario 3: No Regional DSI Loads

- No regional DSI firm loads throughout the study horizon.

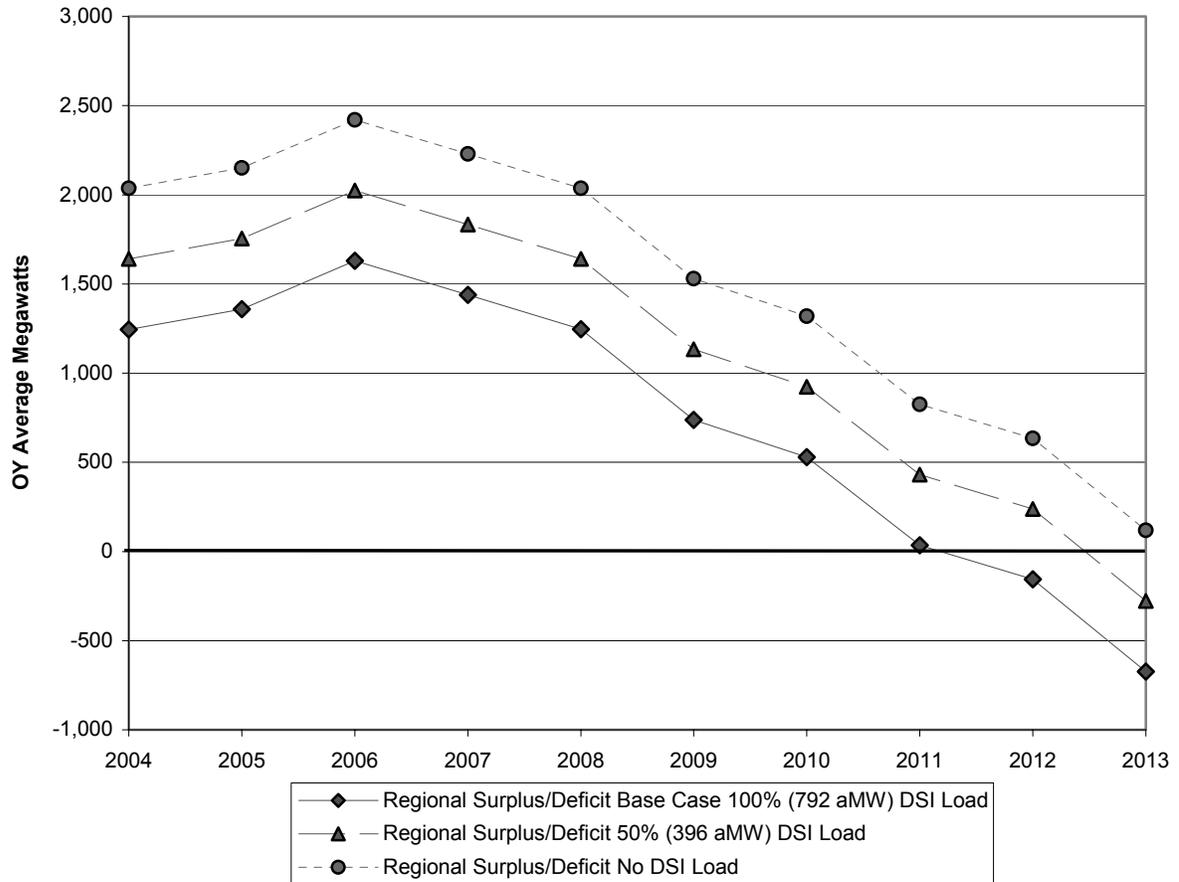
Table 12

**Potential Variability of Regional Firm Annual Energy Surplus/Deficit Projections
Utilizing Different DSI Load Levels
Assuming Normal Weather Conditions
Under 1937-Water Conditions**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<u>Scenario 1:</u> Base Case: 100% Regional DSI Loads (792 aMW)	1,244	1,359	1,629	1,438	1,245	738	528	34	-157	-674
<u>Scenario 2:</u> 50% Regional DSI Loads (396 aMW)	1,640	1,755	2,025	1,834	1,641	1,134	924	430	239	-278
<u>Scenario 3:</u> No Regional DSI Loads	2,036	2,151	2,421	2,230	2,037	1,530	1,320	826	635	118

Figure 16

Variability of Regional Annual Energy Surplus/Deficit Projections
Utilizing Different DSI Load Levels
Assuming Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004 through 2013



Regional Firm Monthly Capacity Surplus/Deficit Projections

Figure 17, page 48, graphically illustrates the regional firm 50-hours-per-week capacity surplus/deficit projections for OY 2004, 2008, and 2013. The regional firm capacity surplus/deficit projections incorporate the regional assumptions on page 35. Regional surplus firm capacity values take into account the following hydro constraints:

- Limitations on moving water between projects, including upstream storage;
- Pondage limitations due to hydraulic imbalance from reservoir to reservoir; and
- Navigation and recreation constraints, including restrictions on the rate of rise or fall of tailwater and forebay elevations.

This study, however, does not take into account potential nighttime return problems from capacity sales. Nighttime return problems can occur when replacement energy from capacity sales combined with minimum hydroelectric generation, thermal resources, and other contract returns are greater than the region's nighttime load. The following factors may contribute to nighttime return problems:

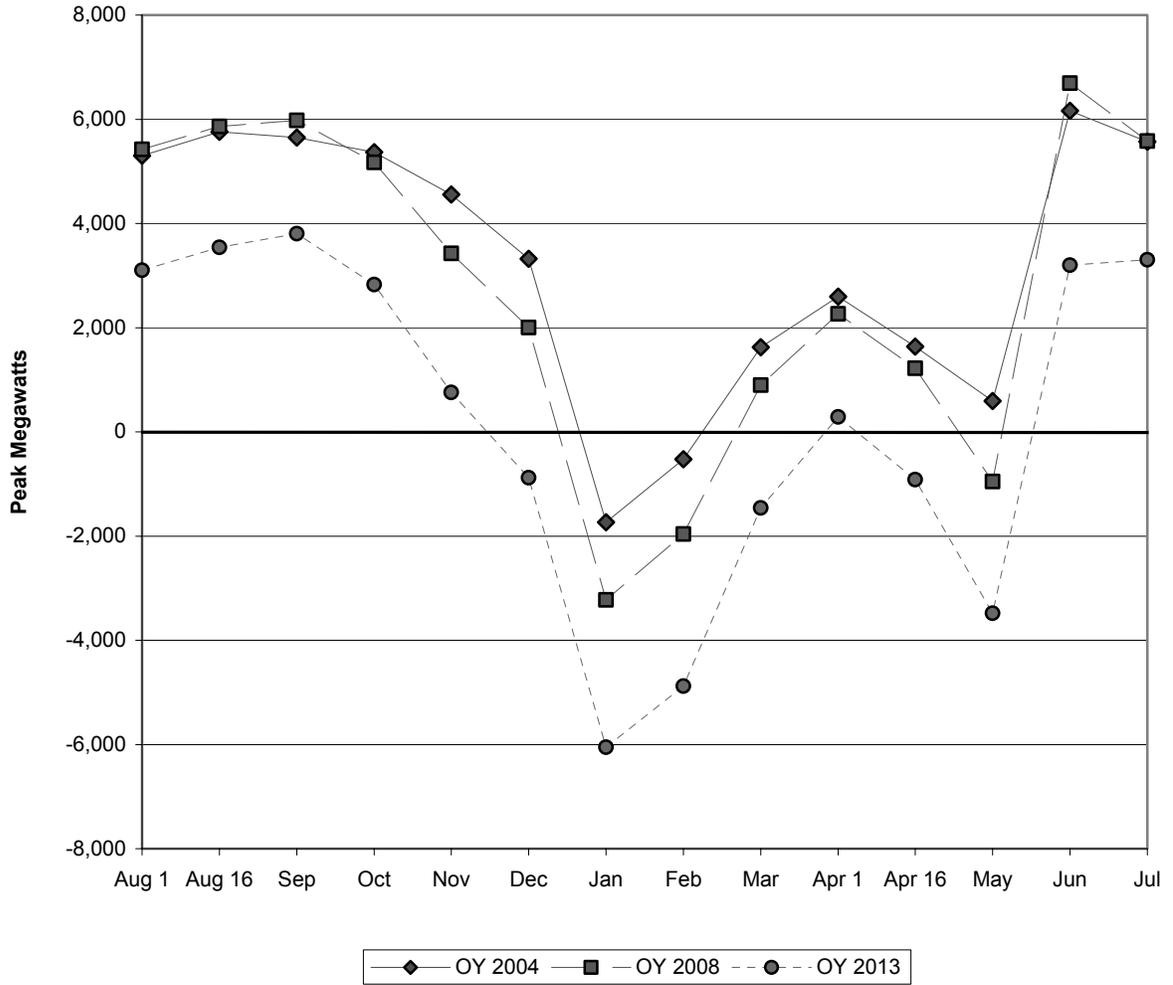
- Low nighttime regional loads;
- Minimum nighttime contract levels from contract purchases, peaking replacement, and exchange energy;
- The inability of regional non-hydroelectric resources to cycle to fit differing day to night load requirements; and
- Additional nonpower hydro requirements that dictate minimum streamflows.

Any of these factors can potentially restrict the ability to accept nighttime return energy, even though there may be surplus generating capability during the daytime. Any added capacity due to regional entities making additional market purchases will most likely increase the capacity available to the region.

Regional capacity surplus/deficit projections, assuming normal weather conditions and 1937-water conditions for OY 2004, 2008, and 2013, are shown in Exhibits 22 through 24, pages 99 through 101.

Figure 17

Regional Firm Monthly Capacity Surplus/Deficit Projections
Base Case: Assuming Normal Weather Conditions
Under 1937-Water Conditions
For OY 2004, 2008, and 2013



Regional Resource Adequacy

The combination of dampened regional load growth due to economic conditions and the addition of generating resources have improved the region's expected surplus/deficit position throughout the study horizon. Regional load deficits are not projected to be as large as in prior studies and in fact, the majority of the years now project a surplus. This analysis assumes regional hydroelectric generation under 1937-critical water conditions, regional non-hydro resources operate at expected generation levels, and that regional contractual obligations and purchases are delivered at their maximum contract levels.

The level of the regional surplus/deficit may change during the forecast period due to many factors. One factor is the actual level of operation of the DSIs, which are dependent on power prices and aluminum commodity prices. Also, the regional load resource balance can fluctuate widely due to the variability and duration of current and future economic conditions. Other factors that can affect the regional surplus/deficit position are as follows:

- Better than critical water conditions, which can increase water flow and water storage, thereby potentially increasing the output of the regional hydroelectric system to meet load;
- Power purchases from new merchant plants operating or under construction in the PNW. All of the new resources included in this study could be available to the PNW or they could be sold out-of-region as their owners' find markets. Generation from new projects in the PNW, not already reflected in this analysis, will be incorporated in future studies;
- Purchasing power from merchant plants operating or under construction outside the PNW region;
- The purchase of off-system storage and exchange agreements that allow for seasonal shaping of regional hydropower with other regions; and
- DSI load levels are assumed to be at 792 aMW throughout the study. The effects of various DSI load level assumptions in the region are presented in Table 8, page 37. The actual amount of load used by the DSIs could be different, based on economic conditions.

As the region contracts for power purchases or generation from new or existing resources, those amounts will be included in future analyses.

Section 6: Northwest Power and Conservation Council Comparison

Non-DSI Regional Loads Comparison: 2002 White Book to Council

Table 13, page 51, and Figure 18, page 52, compare the non-DSI regional firm total retail loads between BPA's 2002 White Book and the Northwest Power and Conservation Council's (formerly the Northwest Power Planning Council) Revised Draft Forecast of Electricity Demand for the Fifth Power Plan (2003). To provide consistency for this comparison, the DSI load components were removed from both forecasts.

2002 White Book Non-DSI Load Forecast: The 2002 White Book total retail load projections were initially estimated separately, by each individual entity and then grouped into the following categories: Federal agencies, public agencies, cooperatives, USBR, and IOUs. The non-DSI total retail load forecasts were finalized on June 30, 2003.

The total retail load forecasts for the Federal agencies, public agencies, cooperatives, and USBRs were developed using any combination of the following:

- Linear trending based on historical power consumption;
- Data obtained from the individual entity's 2001 power sales contracts' Exhibit C submittals; and
- Retail load forecasts sent directly to BPA through their PNUCC submittals.

The load forecasts for the IOUs were developed from both data submitted in their PNUCC submittals and load forecasts sent directly to BPA.

The load forecasts were lower compared to last year's analysis due to depressed economic conditions that are now reflected in the forecasts.

Council Non-DSI Load Forecast: The Council's Revised Draft Forecast of Electricity Demand for the Fifth Power Plan (2003) is based on the following:

- The Council's near-term regional load projections are based on actual loads through August 2001, reflecting the depressed levels of electricity demand at that time; and
- The Council's projections assume that the non-DSI loads will converge towards but not fully recover to the long-term load projections contained in their Fourth Regional Power Plan due to the following: 1) the rate of economic recovery has been slower than expected and 2) energy prices have increased again in OY 2003 after initially falling in OY 2002. This reduction is considered to be a permanent reduction in electricity demand.

Comparison of the Non-DSI Load Forecast: The comparison of the Council and 2002 White Book non-DSI load forecasts shows that the average difference over the 10-years of the study is 1.8 percent. The maximum difference is 3.2 percent (730 aMW) in OY 2013.

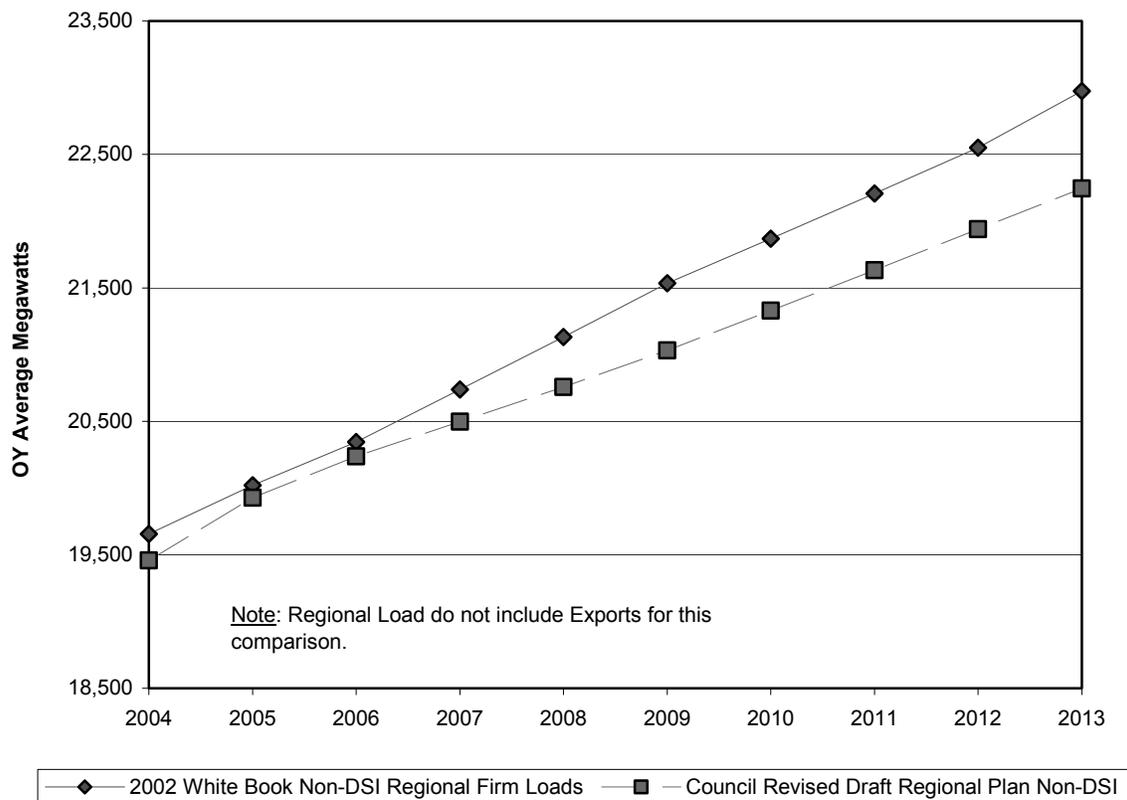
Table 13

**Non-DSI PNW Regional Firm Load Comparison
BPA's 2002 White Book Load Projections
and the Council's Revised Draft Fifth Power Plan
Annual Energy in Average Megawatts**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2002 White Book										
Regional Firm Loads	20,449	20,814	21,137	21,532	21,924	22,328	22,662	23,000	23,343	23,767
Regional DSI Loads	792	792	792	792	792	792	792	792	792	792
Non-DSI Regional Firm Loads	19,657	20,022	20,345	20,740	21,132	21,536	21,870	22,208	22,551	22,975
Council Revised Draft Fifth Plan										
Non-DSI Regional Firm Loads	19,459	19,928	20,238	20,497	20,759	21,033	21,331	21,632	21,941	22,245
Comparison: 2002 White Book - Council										
Difference	198	94	107	243	373	503	539	576	610	730
Percent Difference	1.0%	0.5%	0.5%	1.2%	1.8%	2.3%	2.5%	2.6%	2.7%	3.2%

Figure 18

**Comparison of Non-DSI Regional Firm Loads
BPA 2002 White Book Load Projections
and the Council's Revised Draft Fifth Power Plan
Under Normal Weather Conditions**



Comparison of Resource Assumptions: 2002 White Book to Council

A comparison of the resource assumptions between the 2002 White Book and the Council's Revised Draft Power Price Forecast for the Fifth Power Plan are listed below.

2002 White Book Resource Assumptions: The 2002 White Book resource assumptions were estimated on a unit basis. Revisions to current thermal plant operations are based on submittals by utilities either to the PNUCC or data submitted directly to BPA for the purpose of this study. New resources listed in this study represent plants that have been placed into operation or are currently in the construction process. The capacity and energy values have been estimated through information provided by PNUCC or through conversations with the plant managers.

Council Resource Assumptions: The Council's near-term regional resource assumptions for its wholesale power price forecast are based on projects under construction, similar to the process utilized by BPA. The Council diverges from BPA's treatment of future plant additions, including partially constructed projects for which construction has been suspended. BPA adds plants to the resources based on the operator's/developer's best estimate of completion, whereas the Council estimates operation dates for new resources based on economic competitiveness as estimated by the AURORA™ Electric Market Model. Therefore, the Council may delay an announced operational date of a future plant based on the perceived need for the plant as determined by their model.

The following compares the different assumptions used for BPA's 2002 White Book and the Council's estimation in constructing their new resource stack.

- BPA assumes that Satsop #1 (Grays Harbor Energy Facility Phase I) will be operational in 2005, as per discussion with the Energy Northwest Inc. The Council's price forecasting model does not add combined-cycle plants in the Northwest until 2007 other than those currently under active construction.
- The Council includes reciprocating diesel and natural gas peaking units for Grant County PUD #2, Grays Harbor PUD #1, Okanogan County PUD #1 and Springfield PUD. BPA does not include these resources in this study and will review them for potential inclusion in future studies.
- BPA includes PacifiCorp's share of the Jim Bridger coal plant in the regional resource stack. PacifiCorp's share of this resource was previously shown as a PacifiCorp (Wyoming) thermal import contract, which was eliminated. The Council includes only Idaho Power Company's Jim Bridger power plant shares in their regional resource stack. BPA is working with the Council to model PacifiCorp's share of Jim Bridger the same way in future Council studies.
- BPA includes only Pennsylvania Power & Light Company's (PPL Montana) resources that are dedicated to serve Northwestern Energy's (formally Montana Power Company) eastern Montana loads. The Council includes most of PPL Montana's generation in their regional resource stack, regardless of whether they are dedicated to serve PNW regional loads. BPA will review the status of these resources in a future study.
- BPA includes the Longview–Mint CCCT generating station, estimated to be operational in October 2005. The Council does not include this project. Both BPA and the Council will review the construction status of this plant for future studies.
- The Council includes the nameplate rating of the following self-generating units: BP Cherry Point, Georgia Pacific Bellingham, Sierra Pine Medite, and Wah Chang. In addition, the Council includes the reactivated Frontier Energy project. BPA does not include these plants and will review these plants for possible inclusion in future studies.
- In addition, BPA and the Council treat the wind projects differently. At this time, BPA only recognizes the average energy generation projections of wind projects and does not credit wind projects to be able to predictably meet peak loads. The Council models wind projects as predictable, shaped energy resources and credits wind with a capacity equivalent to the installed wind capacity times a capacity factor.

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