

*BPA Financial Information is provided for discussion purposes during this pre-rate case process.*



Pre-Decisional

# **WP-07 Power Rate Case Workshop**

**June 29, 2005**

**Load Resource Study**

**This Page Intentionally Left Blank**

## **Load Resource Study**

### **Changes and Updates from the 2002 Rate Case Analysis (May 2000)**

#### **1. Federal System Firm Sales and Obligations**

- Public load obligation forecast methodology
  - Full and partial customer forecasts
    - a. Linear trend by customer (regression with time as the independent variable, or growth rate)
    - b. Adjusted for customer resources
    - c. No weather adjustment
    - d. No price elasticity assumption
    - e. Load and sales projections reduced for assumed conservation (Approximately 21 aMW/year)
- Block and Slice obligation forecast
  - a. Sales are stepped up blocks from subscription contracts, adjusted
  - b. Sales have been reduced for assumed conservation decrements
- IOU obligation forecast
  - a. No physical power sales to IOUs, monetary benefits only
- DSI obligation forecast
  - a. No physical power sales to DSIs, monetary benefits only
- The Canadian Entitlement Return for the Columbia Storage Power Exchange (CSPE) and Supplemental & Entitlement contract obligations expired March 31, 2003
- Updated Federal system Intra-regional Out and Export contract obligations due to BPA trading floor and other marketing activities
- Federal System Sales Comparison

Table 1 shows the actual public sales for FY 2004. The Non-Generating Public sales total includes Federal agencies' sales. The Slice sales include both Non-Generating Public and Generating Public Utility Slice sales.

**TABLE 1**

**FY 2004  
Federal System Actual Public Sales**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Avg
Non-Generating Public	2,460	2,982	3,159	3,317	3,065	2,647	2,533	2,557	2,680	2,847	2,713	2,471	2,786
Generating Public	1,905	2,264	2,505	2,541	2,482	2,319	2,096	2,008	1,752	1,735	1,734	1,889	2,102
Slice	1,602	1,657	1,604	1,604	1,714	1,604	1,660	1,604	1,657	1,604	1,604	1,657	1,635

Table 2 shows a comparison of the data for the load-following customers for FY 2004. Since Block sales are equal to contractual amounts only, sales to load-following customers are compared.

**TABLE 2**

**FY 2004  
Comparison of Load-Following Customers  
Projected and Actual Sales**

	FY 2004 (aMW)	Forecast Delta (%)
Forecast	3,089	n/a
Actual Sales	3,047	-1.4%
Temperature Adjusted Sales	3,085	-0.1%

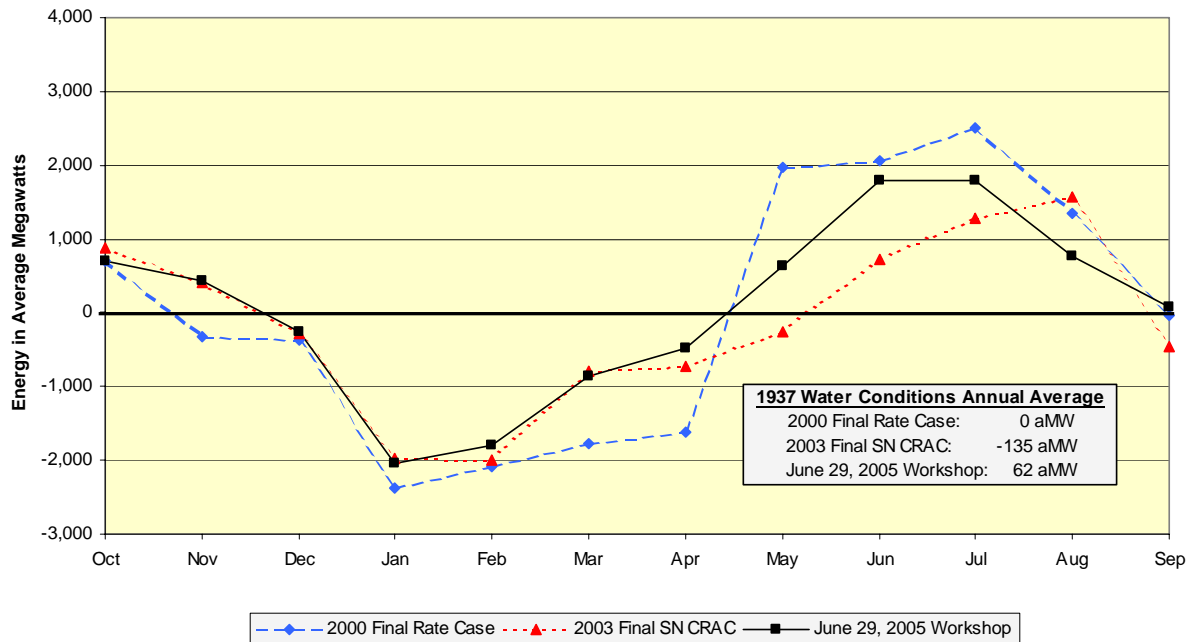
## 2. Federal System Resource Stack

- Updated Federal system Intra-regional In and Import contract purchases due to BPA trading floor and other marketing activities
- The Canadian Entitlement Return for the CSPE and Supplemental & Entitlement contract returns expired March 31, 2003
- Fourmile Hill geothermal plant was postponed from October 1, 2004, to October 1, 2008
- Generation purchased from the Elwah and Glines Canyon hydro projects have been extended from July 31, 2005 to September 30, 2009
- Includes generation from the Boise River Diversion Dam beginning August 1, 2004 and White Bluffs Solar projects through April 30, 2005
- Updated generation forecasts of renewable wind projects
- Updated the hydro regulation study for FY 2007 through 2009. Changes focus on removable spillway weirs and a Snake River Fall Chinook In-river vs. Transport study compared to previous rate case studies. See “Hydro Regulation Study”, page 16.)
- Updated hydro efficiency improvements increasing hydro generation by about 30 aMW under 1937-water conditions by FY 2009
- Updated the methodology for calculating the Federal system Sustained Peaking Adjustment for capacity. New method estimates the Federal hydro system monthly maximum operational capacity available to meet the 1-hour expected peak load for each water condition. (See “Federal Sustained Peaking Adjustment”, page 21.)

### 3. Federal System Energy Surplus Deficit

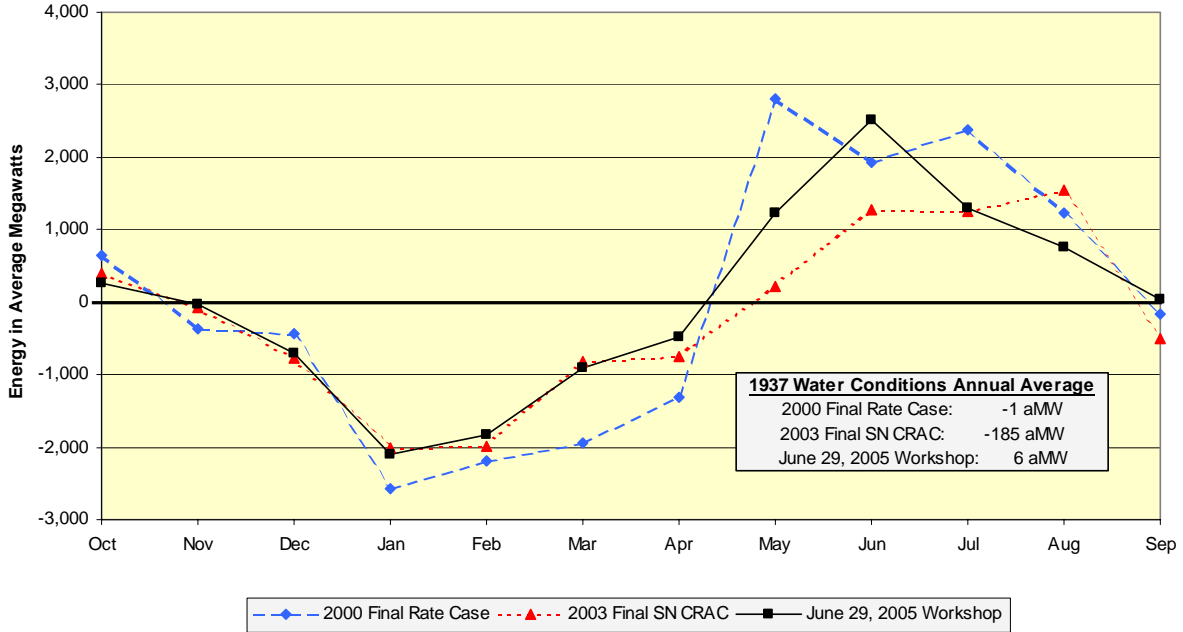
The following graphs illustrate the changes in the monthly shape and magnitude of the Federal system energy surplus/deficit due to updates to sales obligations, contract purchases, and resources. Figures 1 through 3 present the monthly FY 2007 through FY 2009 Federal system energy surplus/deficits under 1937-critical water conditions presented at the June 29, 2005 Workshop and comparisons to the 2003 Final SN CRAC and the 2000 Final Rate Case. Monthly Federal system energy and capacity surplus/deficit tables for FY 2007 through 2009 under 1937-critical water conditions are presented on pages 10 through 15.

**Figure 1**  
**WP-07 Power Rate Case Workshop**  
**FY 2007**  
**Federal System Energy Surplus/Deficit**  
**Under 1937-Water Conditions**



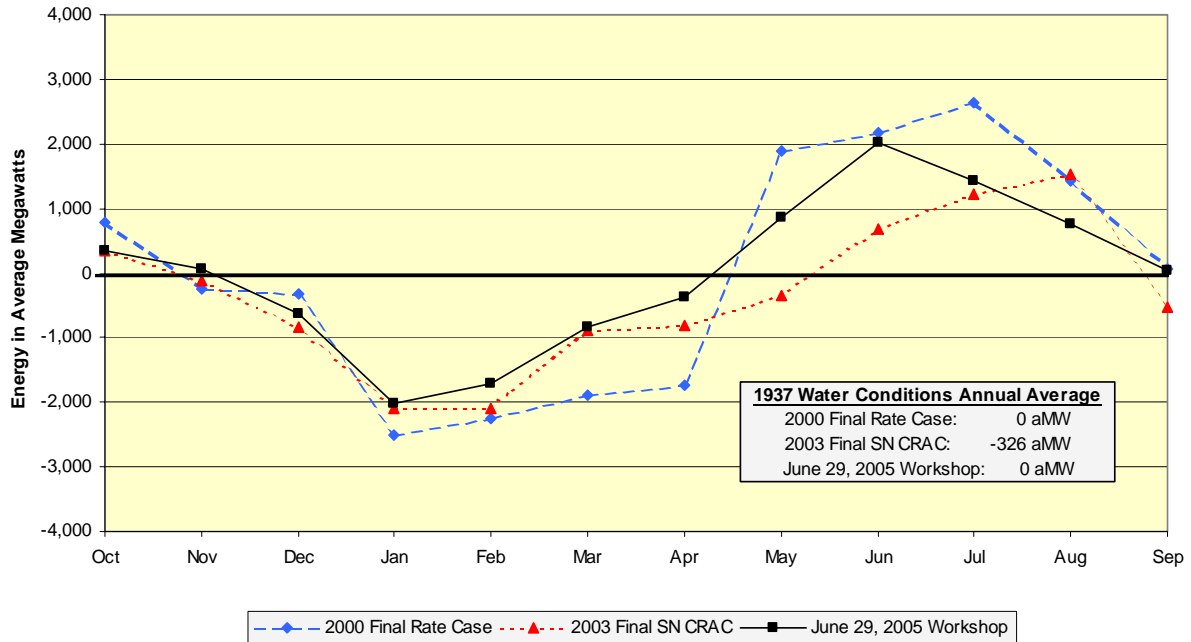
**Figure 2**

**WP-07 Power Rate Case Workshop  
FY 2008  
Federal System Energy Surplus/Deficit  
Under 1937-Water Conditions**



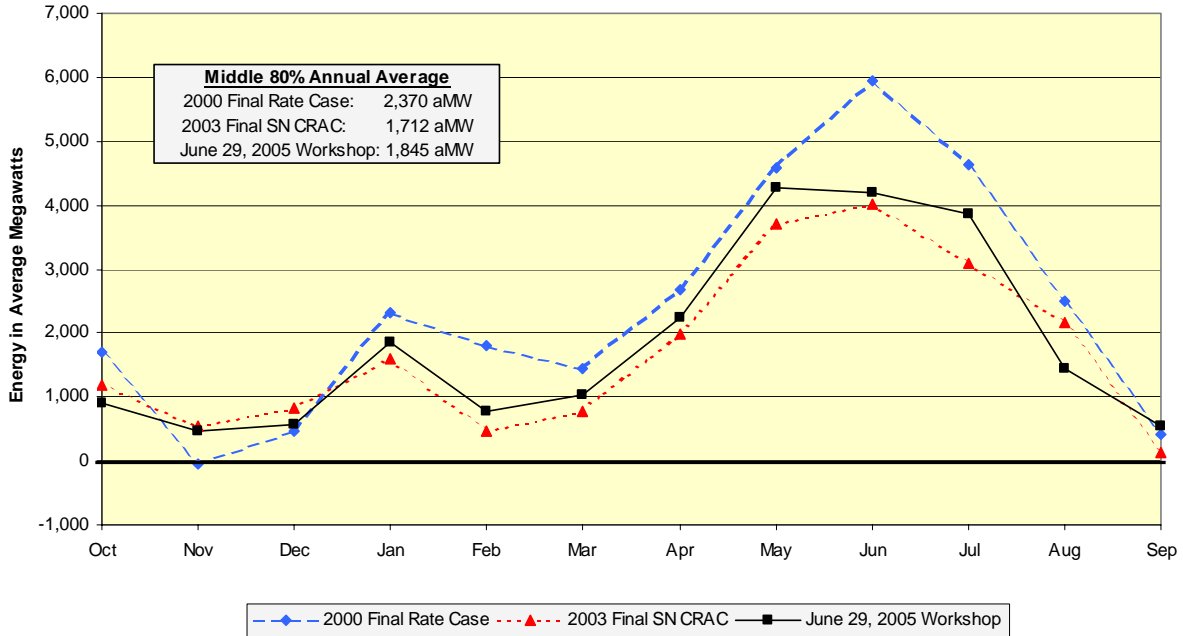
**Figure 3**

**WP-07 Power Rate Case Workshop  
FY 2009  
Federal System Energy Surplus/Deficit  
Under 1937-Water Conditions**



Figures 4 through 6 present the monthly FY 2007 through FY 2009 Federal system energy surplus/deficit averaged over the middle 80% of the 50-historical water conditions presented at the June 29, 2005 Workshop and comparisons to the 2003 Final SN CRAC and the 2000 Final Rate Case studies.

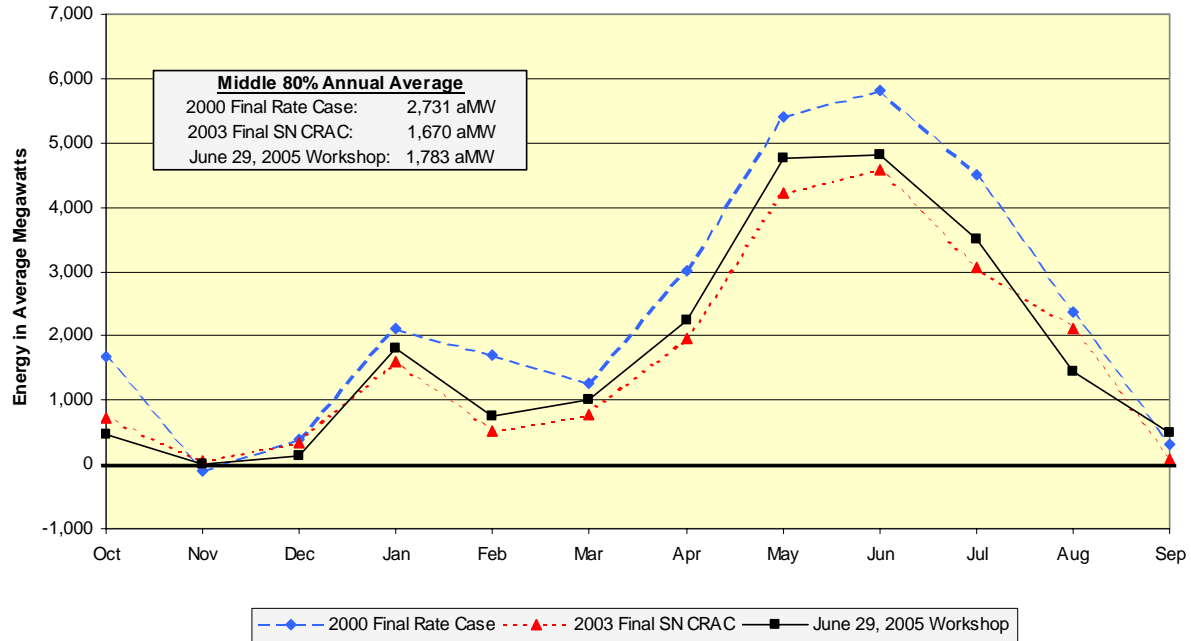
**Figure 4**  
**WP-07 Power Rate Case Workshop**  
**FY 2007**  
**Federal System Energy Surplus/Deficit**  
**Middle 80% Averaged Over the 50-Water Conditions**





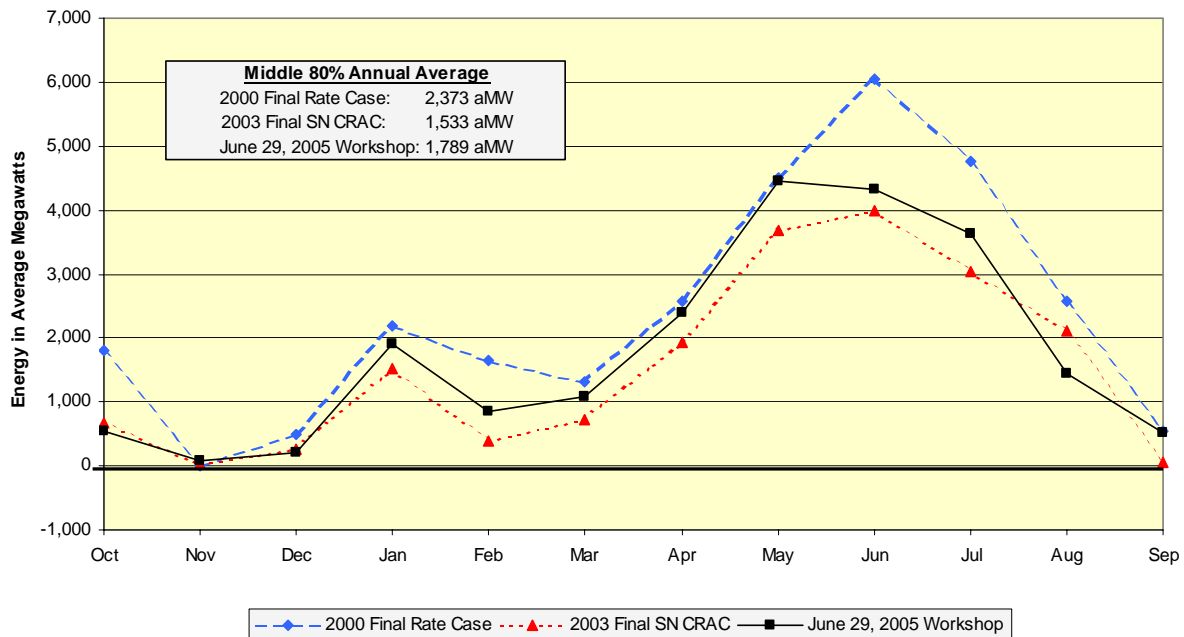
**Figure 5**

WP-07 Power Rate Case Workshop  
 FY 2008  
 Federal System Energy Surplus/Deficit  
 Middle 80% Averaged Over the 50-Water Conditions



**Figure 6**

WP-07 Power Rate Case Workshop  
 FY 2009  
 Federal System Energy Surplus/Deficit  
 Middle 80% Averaged Over the 50-Water Conditions



---

**LOAD RESOURCE STUDY  
APPENDIX**

---

**Monthly Federal Energy and Capacity Surplus/Deficit Tables for FY 2007 through 2009**

The following tables present the monthly Federal system energy and capacity surplus/deficit tables, under 1937-critical water conditions for FY 2007 through 2009.

**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2006 - 2007 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Average Energy in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep	Avg
<b>Non-Utility Obligations</b>															
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	114	132	143	146	140	129	115	114	110	112	122	123	123	111	125
USBR 2002 PSC Sale	129	0.1	0.1	0.1	0.9	20	248	311	263	299	331	314	280	171	149
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>243</b>	<b>132</b>	<b>143</b>	<b>146</b>	<b>141</b>	<b>149</b>	<b>362</b>	<b>425</b>	<b>374</b>	<b>411</b>	<b>453</b>	<b>437</b>	<b>403</b>	<b>283</b>	<b>274</b>
<b>Transfers Out</b>															
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	2652	2993	3333	3386	3280	2935	2766	2760	2748	2849	2972	2892	2892	2637	2953
GPU 2002 PSC Sale	2223	2607	2895	2923	2866	2668	2329	2322	2142	1884	1854	1959	1959	2165	2376
NGP Slice Sale	584	655	653	510	519	547	546	513	625	739	751	669	601	551	608
GPU Slice Sale	972	1091	1088	849	865	911	909	855	1040	1231	1251	1114	1001	917	1013
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	643	639	653	650	647	637	648	649	682	685	682	675	675	666	659
Intra-Regional Transfers (Out)	291	592	605	602	547	394	363	361	167	227	226	197	197	236	370
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Transfers Out</b>	<b>7364</b>	<b>8577</b>	<b>9226</b>	<b>8920</b>	<b>8723</b>	<b>8092</b>	<b>7561</b>	<b>7460</b>	<b>7404</b>	<b>7616</b>	<b>7738</b>	<b>7506</b>	<b>7326</b>	<b>7173</b>	<b>7980</b>
<b>Total Firm Obligations</b>	<b>7607</b>	<b>8709</b>	<b>9369</b>	<b>9066</b>	<b>8864</b>	<b>8241</b>	<b>7923</b>	<b>7885</b>	<b>7777</b>	<b>8027</b>	<b>8192</b>	<b>7943</b>	<b>7729</b>	<b>7455</b>	<b>8254</b>
<b>Hydro Resources</b>															
Regulated Hydro	6115	6918	6962	5289	5396	5649	5724	5309	7064	8644	8288	7286	6430	5777	6540
Independent Hydro	385	305	236	176	196	274	433	517	713	748	454	439	438	372	398
Sustained Peaking Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	136	136	136	136	136	136	132	132	132	132	132	132	132	132	134
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>6636</b>	<b>7358</b>	<b>7333</b>	<b>5600</b>	<b>5728</b>	<b>6059</b>	<b>6288</b>	<b>5957</b>	<b>7908</b>	<b>9523</b>	<b>8874</b>	<b>7857</b>	<b>7000</b>	<b>6281</b>	<b>7071</b>
<b>Other Resources</b>															
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27	29
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	250	318	377	300	255	224	227	187	102	123	154	134	134	165	217
Intra-Regional Transfers (In)	581	627	561	211	199	177	173	173	167	174	159	184	184	217	286
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1000	1000	1000	1000	1000	1000	1000	1000	355	167	1000	1000	1000	1000	877
Non-Utility Generation	62	79	80	76	70	97	100	100	95	81	68	71	69	53	78
Augmentation Purchases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1920</b>	<b>2053</b>	<b>2049</b>	<b>1619</b>	<b>1555</b>	<b>1529</b>	<b>1531</b>	<b>1490</b>	<b>746</b>	<b>572</b>	<b>1407</b>	<b>1416</b>	<b>1414</b>	<b>1462</b>	<b>1487</b>
<b>Total Resources</b>	<b>8556</b>	<b>9411</b>	<b>9383</b>	<b>7220</b>	<b>7283</b>	<b>7588</b>	<b>7819</b>	<b>7448</b>	<b>8654</b>	<b>10095</b>	<b>10281</b>	<b>9273</b>	<b>8414</b>	<b>7743</b>	<b>8558</b>
<b>Reserves &amp; Maintenance</b>															
Hydro Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Thermal & Misc. Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Hydro Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spinning Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Transmission Losses	-241	-265	-265	-204	-205	-214	-220	-210	-244	-285	-290	-261	-237	-218	-241
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-241</b>	<b>-265</b>	<b>-265</b>	<b>-204</b>	<b>-205</b>	<b>-214</b>	<b>-220</b>	<b>-210</b>	<b>-244</b>	<b>-285</b>	<b>-290</b>	<b>-261</b>	<b>-237</b>	<b>-218</b>	<b>-241</b>
<b>Total Net Resources</b>	<b>8314</b>	<b>9146</b>	<b>9118</b>	<b>7016</b>	<b>7078</b>	<b>7374</b>	<b>7598</b>	<b>7238</b>	<b>8410</b>	<b>9810</b>	<b>9991</b>	<b>9011</b>	<b>8177</b>	<b>7525</b>	<b>8316</b>
<b>Total Firm Surplus/Deficit</b>	<b>707</b>	<b>437</b>	<b>-251</b>	<b>-2050</b>	<b>-1786</b>	<b>-867</b>	<b>-325</b>	<b>-647</b>	<b>633</b>	<b>1783</b>	<b>1799</b>	<b>1068</b>	<b>448</b>	<b>69</b>	<b>62</b>

**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2007 - 2008 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Average Energy in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep	Avg
<b>Non-Utility Obligations</b>															
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	120	138	150	152	147	135	120	120	116	117	127	129	129	116	131
USBR 2002 PSC Sale	129	0.1	0.1	0.1	0.9	20	248	311	263	299	331	314	280	171	149
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>249</b>	<b>138</b>	<b>150</b>	<b>153</b>	<b>148</b>	<b>155</b>	<b>367</b>	<b>430</b>	<b>379</b>	<b>416</b>	<b>459</b>	<b>442</b>	<b>408</b>	<b>288</b>	<b>280</b>
<b>Transfers Out</b>															
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	2689	3038	3383	3437	3327	2978	2805	2798	2785	2888	3015	2933	2933	2673	2996
GPU 2002 PSC Sale	2225	2608	2895	2923	2850	2668	2330	2323	2144	1887	1857	1961	1961	2167	2376
NGP Slice Sale	585	657	655	511	520	549	553	522	695	826	704	675	606	552	619
GPU Slice Sale	974	1094	1090	851	867	913	920	869	1157	1376	1172	1124	1010	920	1031
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	641	636	651	648	646	633	646	638	666	666	665	644	642	638	648
Intra-Regional Transfers (Out)	291	592	605	602	540	394	362	362	167	227	226	197	197	236	370
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Transfers Out</b>	<b>7405</b>	<b>8625</b>	<b>9278</b>	<b>8973</b>	<b>8749</b>	<b>8135</b>	<b>7616</b>	<b>7512</b>	<b>7614</b>	<b>7871</b>	<b>7639</b>	<b>7532</b>	<b>7349</b>	<b>7187</b>	<b>8040</b>
<b>Total Firm Obligations</b>	<b>7653</b>	<b>8763</b>	<b>9428</b>	<b>9125</b>	<b>8897</b>	<b>8290</b>	<b>7983</b>	<b>7942</b>	<b>7993</b>	<b>8287</b>	<b>8098</b>	<b>7975</b>	<b>7757</b>	<b>7474</b>	<b>8320</b>
<b>Hydro Resources</b>															
Regulated Hydro	6130	6934	6977	5303	5409	5664	5802	5407	7268	8861	7706	7337	6476	5780	6545
Independent Hydro	385	305	236	176	196	274	433	517	713	748	454	439	438	372	398
Sustained Peaking Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	132	132	132	132	132	132	130	130	130	130	130	130	130	130	131
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>6647</b>	<b>7370</b>	<b>7345</b>	<b>5610</b>	<b>5737</b>	<b>6070</b>	<b>6365</b>	<b>6054</b>	<b>8111</b>	<b>9739</b>	<b>8290</b>	<b>7907</b>	<b>7044</b>	<b>6282</b>	<b>7074</b>
<b>Other Resources</b>															
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27	29
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	200	268	326	299	254	225	225	173	83	101	132	109	111	145	195
Intra-Regional Transfers (In)	206	252	187	211	192	177	173	173	167	174	159	184	184	217	192
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Non-Utility Generation	62	79	80	76	70	97	100	100	95	81	68	71	69	53	77
Augmentation Purchases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1496</b>	<b>1628</b>	<b>1625</b>	<b>1619</b>	<b>1547</b>	<b>1530</b>	<b>1528</b>	<b>1476</b>	<b>1371</b>	<b>1383</b>	<b>1386</b>	<b>1391</b>	<b>1392</b>	<b>1442</b>	<b>1493</b>
<b>Total Resources</b>	<b>8142</b>	<b>8998</b>	<b>8970</b>	<b>7229</b>	<b>7284</b>	<b>7600</b>	<b>7893</b>	<b>7530</b>	<b>9482</b>	<b>11121</b>	<b>9675</b>	<b>9297</b>	<b>8435</b>	<b>7724</b>	<b>8567</b>
<b>Reserves &amp; Maintenance</b>															
Hydro Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Thermal & Misc. Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Hydro Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spinning Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Transmission Losses	-230	-254	-253	-204	-205	-214	-223	-212	-267	-314	-273	-262	-238	-218	-242
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-230</b>	<b>-254</b>	<b>-253</b>	<b>-204</b>	<b>-205</b>	<b>-214</b>	<b>-223</b>	<b>-212</b>	<b>-267</b>	<b>-314</b>	<b>-273</b>	<b>-262</b>	<b>-238</b>	<b>-218</b>	<b>-242</b>
<b>Total Net Resources</b>	<b>7913</b>	<b>8744</b>	<b>8717</b>	<b>7025</b>	<b>7079</b>	<b>7386</b>	<b>7671</b>	<b>7318</b>	<b>9214</b>	<b>10808</b>	<b>9403</b>	<b>9035</b>	<b>8197</b>	<b>7507</b>	<b>8326</b>
<b>Total Firm Surplus/Deficit</b>	<b>260</b>	<b>-18</b>	<b>-711</b>	<b>-2100</b>	<b>-1818</b>	<b>-904</b>	<b>-312</b>	<b>-625</b>	<b>1221</b>	<b>2521</b>	<b>1305</b>	<b>1061</b>	<b>440</b>	<b>32</b>	<b>5.7</b>

**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2008 - 2009 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Average Energy in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep	Avg
<b>Non-Utility Obligations</b>															
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	130	150	163	165	159	146	130	129	125	126	137	139	139	126	141
USBR 2002 PSC Sale	129	0.1	0.1	0.1	0.9	20	248	311	263	299	331	314	280	171	149
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>259</b>	<b>150</b>	<b>163</b>	<b>166</b>	<b>160</b>	<b>166</b>	<b>377</b>	<b>440</b>	<b>388</b>	<b>426</b>	<b>469</b>	<b>452</b>	<b>418</b>	<b>297</b>	<b>291</b>
<b>Transfers Out</b>															
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	2710	3062	3410	3465	3325	3002	2827	2820	2807	2911	3038	2955	2955	2695	3017
GPU 2002 PSC Sale	2223	2605	2891	2919	2841	2665	2328	2321	2142	1886	1857	1960	1960	2166	2373
NGP Slice Sale	591	663	660	517	526	554	560	532	652	769	714	672	604	549	615
GPU Slice Sale	984	1103	1100	861	876	923	933	885	1086	1281	1189	1120	1005	915	1024
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	578	572	581	579	578	571	590	590	618	619	613	712	712	709	610
Intra-Regional Transfers (Out)	291	592	605	602	547	394	362	362	167	227	226	197	197	236	370
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Transfers Out</b>	<b>7376</b>	<b>8597</b>	<b>9247</b>	<b>8943</b>	<b>8692</b>	<b>8109</b>	<b>7601</b>	<b>7510</b>	<b>7472</b>	<b>7693</b>	<b>7638</b>	<b>7616</b>	<b>7434</b>	<b>7270</b>	<b>8010</b>
<b>Total Firm Obligations</b>	<b>7635</b>	<b>8747</b>	<b>9410</b>	<b>9109</b>	<b>8852</b>	<b>8275</b>	<b>7978</b>	<b>7950</b>	<b>7860</b>	<b>8119</b>	<b>8107</b>	<b>8068</b>	<b>7852</b>	<b>7567</b>	<b>8300</b>
<b>Hydro Resources</b>															
Regulated Hydro	6134	6939	6982	5307	5413	5668	5821	5451	7320	8924	7759	7354	6490	5789	6566
Independent Hydro	385	305	236	176	196	274	433	517	713	748	454	439	438	372	398
Sustained Peaking Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	130	130	130	130	130	130	137	137	137	137	137	137	137	137	133
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>6649</b>	<b>7374</b>	<b>7349</b>	<b>5612</b>	<b>5739</b>	<b>6072</b>	<b>6391</b>	<b>6105</b>	<b>8170</b>	<b>9809</b>	<b>8349</b>	<b>7930</b>	<b>7064</b>	<b>6298</b>	<b>7097</b>
<b>Other Resources</b>															
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27	29
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	182	251	304	278	233	204	203	173	83	101	132	109	111	145	184
Intra-Regional Transfers (In)	206	252	187	211	199	177	173	173	167	174	159	184	184	217	192
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1000	1000	1000	1000	1000	1000	1000	1000	355	167	1000	1000	1000	1000	877
Non-Utility Generation	112	129	130	126	120	147	150	150	145	130	117	121	119	103	127
Augmentation Purchases	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1562</b>	<b>1695</b>	<b>1687</b>	<b>1682</b>	<b>1618</b>	<b>1593</b>	<b>1591</b>	<b>1560</b>	<b>810</b>	<b>634</b>	<b>1470</b>	<b>1475</b>	<b>1476</b>	<b>1526</b>	<b>1444</b>
<b>Total Resources</b>	<b>8211</b>	<b>9069</b>	<b>9036</b>	<b>7294</b>	<b>7357</b>	<b>7665</b>	<b>7981</b>	<b>7665</b>	<b>8980</b>	<b>10443</b>	<b>9819</b>	<b>9405</b>	<b>8540</b>	<b>7824</b>	<b>8541</b>
<b>Reserves &amp; Maintenance</b>															
Hydro Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Thermal & Misc. Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Hydro Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spinning Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Transmission Losses	-232	-256	-255	-206	-207	-216	-225	-216	-253	-294	-277	-265	-241	-221	-241
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-232</b>	<b>-256</b>	<b>-255</b>	<b>-206</b>	<b>-207</b>	<b>-216</b>	<b>-225</b>	<b>-216</b>	<b>-253</b>	<b>-294</b>	<b>-277</b>	<b>-265</b>	<b>-241</b>	<b>-221</b>	<b>-241</b>
<b>Total Net Resources</b>	<b>7980</b>	<b>8813</b>	<b>8781</b>	<b>7088</b>	<b>7149</b>	<b>7449</b>	<b>7756</b>	<b>7449</b>	<b>8727</b>	<b>10148</b>	<b>9542</b>	<b>9140</b>	<b>8299</b>	<b>7604</b>	<b>8300</b>
<b>Total Firm Surplus/Deficit</b>	<b>345</b>	<b>66</b>	<b>-629</b>	<b>-2021</b>	<b>-1703</b>	<b>-826</b>	<b>-222</b>	<b>-501</b>	<b>867</b>	<b>2029</b>	<b>1435</b>	<b>1071</b>	<b>447</b>	<b>37</b>	<b>0</b>

**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2006 - 2007 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Capacity in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep
<b>Non-Utility Obligations</b>														
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	219	228	216	241	228	216	201	201	194	211	204	247	247	189
USBR 2002 PSC Sale	139	0.2	0.2	0.2	0.2	37	266	329	260	272	290	281	247	157
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>358</b>	<b>228</b>	<b>216</b>	<b>241</b>	<b>228</b>	<b>253</b>	<b>468</b>	<b>531</b>	<b>454</b>	<b>483</b>	<b>494</b>	<b>528</b>	<b>494</b>	<b>346</b>
<b>Transfers Out</b>														
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	4031	4233	4468	4735	4543	4151	3880	3880	3714	3701	3832	3764	3764	3552
GPU 2002 PSC Sale	2633	2971	3295	3311	3264	3053	2697	2697	2429	2086	2103	2195	2195	2449
NGP Slice Sale	992	1029	951	721	786	849	837	770	933	1177	1260	1184	1050	915
GPU Slice Sale	1652	1714	1583	1200	1308	1413	1394	1282	1554	1961	2099	1971	1749	1524
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	1553	1478	1495	1491	1491	1480	1484	1484	1574	1575	1587	1583	1583	1576
Intra-Regional Transfers (Out)	683	907	961	935	891	774	747	747	575	628	643	588	588	617
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	-843	-743	-559	-580	-562	-746	-704	-711	-792	-815	-836	-843	-839	-825
<b>Total Transfers Out</b>	<b>10702</b>	<b>11589</b>	<b>12194</b>	<b>11812</b>	<b>11720</b>	<b>10975</b>	<b>10334</b>	<b>10148</b>	<b>9987</b>	<b>10313</b>	<b>10688</b>	<b>10441</b>	<b>10090</b>	<b>9809</b>
<b>Total Firm Obligations</b>	<b>11060</b>	<b>11818</b>	<b>12411</b>	<b>12054</b>	<b>11948</b>	<b>11228</b>	<b>10802</b>	<b>10679</b>	<b>10440</b>	<b>10795</b>	<b>11182</b>	<b>10969</b>	<b>10584</b>	<b>10154</b>
<b>Hydro Resources</b>														
Regulated Hydro	20533	20746	20514	20506	20520	20294	19624	19353	19871	20406	20517	18525	17979	20437
Independent Hydro	747	711	673	644	760	820	845	848	887	889	765	748	760	742
Sustained Peaking Adjustment	-7679	-7535	-8242	-11074	-10383	-9401	-8696	-9213	-6798	-4237	-4168	-3243	-4426	-8523
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	234	234	234	234	234	234	228	228	228	228	228	228	228	228
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>13835</b>	<b>14156</b>	<b>13179</b>	<b>10311</b>	<b>11131</b>	<b>11947</b>	<b>12002</b>	<b>11217</b>	<b>14188</b>	<b>17286</b>	<b>17341</b>	<b>16259</b>	<b>14542</b>	<b>12883</b>
<b>Other Resources</b>														
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	204	257	311	235	191	163	166	166	76	94	110	89	89	118
Intra-Regional Transfers (In)	398	398	375	0	0	0	0	0	0	0	0	0	0	23
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1150	1150	1150	1150	1150	1150	1150	1150	0	0	1150	1150	1150	1150
Non-Utility Generation	32	41	32	32	32	32	32	32	49	32	29	34	34	17
Augmentation Purchases	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1813</b>	<b>1875</b>	<b>1899</b>	<b>1449</b>	<b>1404</b>	<b>1376</b>	<b>1378</b>	<b>1378</b>	<b>152</b>	<b>154</b>	<b>1316</b>	<b>1300</b>	<b>1300</b>	<b>1336</b>
<b>Total Resources</b>	<b>15648</b>	<b>16031</b>	<b>15078</b>	<b>11760</b>	<b>12535</b>	<b>13323</b>	<b>13380</b>	<b>12595</b>	<b>14340</b>	<b>17440</b>	<b>18657</b>	<b>17559</b>	<b>15841</b>	<b>14219</b>
<b>Reserves &amp; Maintenance</b>														
Hydro Reserves	-1064	-1073	-1059	-1058	-1064	-1056	-1023	-1010	-1038	-1065	-1064	-964	-937	-1059
Small Thermal & Misc. Reserves	-3	-3.5	-3.2	-3.2	-3.2	-3.2	-3.1	-3.1	-3.8	-3.0	-2.8	-3	-3	-2.2
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	-172	-172	-172	-172	-172	-172	-172	-172	0	0	-172	-172	-172	-172
Federal Hydro Maintenance	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785	-3263	-2761	-2770
Spinning Reserves	-280	-289	-286	-226	-234	-254	-253	-240	-281	-360	-367	-331	-301	-256
Federal Transmission Losses	-381	-395	-392	-298	-307	-332	-331	-314	-377	-482	-478	-430	-391	-334
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-4653</b>	<b>-4638</b>	<b>-3779</b>	<b>-3165</b>	<b>-3665</b>	<b>-3733</b>	<b>-3844</b>	<b>-3544</b>	<b>-3456</b>	<b>-3545</b>	<b>-4869</b>	<b>-5163</b>	<b>-4565</b>	<b>-4593</b>
<b>Total Net Resources</b>	<b>10995</b>	<b>11393</b>	<b>11299</b>	<b>8595</b>	<b>8870</b>	<b>9590</b>	<b>9536</b>	<b>9050</b>	<b>10883</b>	<b>13895</b>	<b>13788</b>	<b>12396</b>	<b>11276</b>	<b>9626</b>
<b>Total Firm Surplus/Deficit</b>	<b>-65</b>	<b>-425</b>	<b>-1111</b>	<b>-3458</b>	<b>-3078</b>	<b>-1638</b>	<b>-1266</b>	<b>-1628</b>	<b>443</b>	<b>3099</b>	<b>2606</b>	<b>1427</b>	<b>693</b>	<b>-528</b>

**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2007 - 2008 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Capacity in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep
<b>Non-Utility Obligations</b>														
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	232	242	228	256	241	228	212	212	202	223	216	266	266	199
USBR 2002 PSC Sale	139	0.2	0.2	0.2	0.2	37	266	329	260	272	290	281	247	157
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>371</b>	<b>242</b>	<b>228</b>	<b>256</b>	<b>242</b>	<b>265</b>	<b>478</b>	<b>541</b>	<b>462</b>	<b>495</b>	<b>506</b>	<b>546</b>	<b>512</b>	<b>356</b>
<b>Transfers Out</b>														
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	4106	4308	4550	4818	4619	4225	3948	3948	3781	3767	3902	3837	3837	3620
GPU 2002 PSC Sale	2624	2974	3297	3310	3266	3055	2681	2681	2433	2106	2094	2215	2215	2439
NGP Slice Sale	994	1031	952	722	787	849	846	783	1035	1278	1197	1189	1055	915
GPU Slice Sale	1656	1717	1585	1203	1310	1415	1409	1305	1724	2128	1993	1980	1758	1524
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	1554	1479	1497	1493	1493	1482	1485	1459	1523	1524	1536	1539	1539	1533
Intra-Regional Transfers (Out)	683	907	961	935	891	774	747	747	575	628	643	588	588	617
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	-852	-752	-565	-587	-569	-755	-711	-717	-801	-828	-845	-858	-853	-834
<b>Total Transfers Out</b>	<b>10765</b>	<b>11663</b>	<b>12277</b>	<b>11894</b>	<b>11797</b>	<b>11045</b>	<b>10405</b>	<b>10206</b>	<b>10269</b>	<b>10602</b>	<b>10519</b>	<b>10491</b>	<b>10139</b>	<b>9813</b>
<b>Total Firm Obligations</b>	<b>11136</b>	<b>11905</b>	<b>12505</b>	<b>12151</b>	<b>12039</b>	<b>11310</b>	<b>10883</b>	<b>10747</b>	<b>10731</b>	<b>11098</b>	<b>11025</b>	<b>11037</b>	<b>10652</b>	<b>10169</b>
<b>Hydro Resources</b>														
Regulated Hydro	20533	20746	20514	20506	20520	20294	19624	19353	19871	20406	20517	18525	17979	20437
Independent Hydro	747	711	673	644	760	820	845	848	887	889	765	748	760	742
Sustained Peaking Adjustment	-7651	-7515	-8223	-11049	-10364	-9389	-8582	-9039	-6491	-3952	-4963	-3167	-4352	-8519
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	228	228	228	228	228	228	225	225	225	225	225	225	225	225
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>13857</b>	<b>14170</b>	<b>13192</b>	<b>10329</b>	<b>11144</b>	<b>11953</b>	<b>12113</b>	<b>11388</b>	<b>14492</b>	<b>17568</b>	<b>16543</b>	<b>16331</b>	<b>14613</b>	<b>12885</b>
<b>Other Resources</b>														
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	154	207	261	235	191	163	166	166	76	94	110	89	89	118
Intra-Regional Transfers (In)	23	23	0	0	0	0	0	0	0	0	0	0	0	23
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150
Non-Utility Generation	32	41	32	32	32	32	32	32	49	32	29	34	34	17
Augmentation Purchases	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1388</b>	<b>1450</b>	<b>1474</b>	<b>1449</b>	<b>1404</b>	<b>1376</b>	<b>1378</b>	<b>1378</b>	<b>1302</b>	<b>1304</b>	<b>1316</b>	<b>1300</b>	<b>1300</b>	<b>1336</b>
<b>Total Resources</b>	<b>15244</b>	<b>15620</b>	<b>14666</b>	<b>11778</b>	<b>12548</b>	<b>13329</b>	<b>13491</b>	<b>12766</b>	<b>15794</b>	<b>18871</b>	<b>17859</b>	<b>17631</b>	<b>15913</b>	<b>14221</b>
<b>Reserves &amp; Maintenance</b>														
Hydro Reserves	-1064	-1073	-1059	-1058	-1064	-1056	-1023	-1010	-1038	-1065	-1064	-964	-937	-1059
Small Thermal & Misc. Reserves	-3	-3.5	-3.2	-3.2	-3.2	-3.2	-3.1	-3.1	-3.8	-3.0	-2.8	-3	-3	-2.2
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	-172	-172	-172	-172	-172	-172	-172	-172	-172	-172	-172	-172	-172	-172
Federal Hydro Maintenance	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785	-3263	-2761	-2770
Spinning Reserves	-281	-290	-287	-227	-235	-255	-256	-244	-323	-402	-347	-333	-303	-256
Federal Transmission Losses	-368	-381	-378	-299	-308	-333	-334	-319	-419	-522	-452	-432	-393	-334
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-4640</b>	<b>-4625</b>	<b>-3766</b>	<b>-3166</b>	<b>-3666</b>	<b>-3733</b>	<b>-3850</b>	<b>-3554</b>	<b>-3712</b>	<b>-3800</b>	<b>-4823</b>	<b>-5167</b>	<b>-4569</b>	<b>-4593</b>
<b>Total Net Resources</b>	<b>10605</b>	<b>10995</b>	<b>10900</b>	<b>8612</b>	<b>8882</b>	<b>9595</b>	<b>9640</b>	<b>9212</b>	<b>12082</b>	<b>15072</b>	<b>13036</b>	<b>12464</b>	<b>11343</b>	<b>9628</b>
<b>Total Firm Surplus/Deficit</b>	<b>-531</b>	<b>-910</b>	<b>-1604</b>	<b>-3538</b>	<b>-3157</b>	<b>-1715</b>	<b>-1243</b>	<b>-1535</b>	<b>1350</b>	<b>3974</b>	<b>2011</b>	<b>1427</b>	<b>692</b>	<b>-541</b>



**Loads and Resources - Federal System  
PNW Loads and Resource Study  
2008 - 2009 Fiscal Year  
1937 Water Year  
[30] 2007 Initial Rate Case**

7/11/2005

Capacity in Megawatts	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr16	May	Jun	Jul	Aug1	Aug16	Sep
<b>Non-Utility Obligations</b>														
Federal Agencies 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USBR 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DSI 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Agencies 2002 PSC Sale	256	268	249	284	267	251	232	232	219	247	238	301	301	217
USBR 2002 PSC Sale	139	0.2	0.2	0.2	0.2	37	266	329	260	272	290	281	247	157
DSI 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Firm Non-Utility Obligations</b>	<b>395</b>	<b>268</b>	<b>249</b>	<b>284</b>	<b>267</b>	<b>288</b>	<b>498</b>	<b>561</b>	<b>479</b>	<b>519</b>	<b>528</b>	<b>582</b>	<b>548</b>	<b>374</b>
<b>Transfers Out</b>														
NGP 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOU 1981 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NGP 2002 PSC Sale	4149	4352	4597	4867	4670	4268	3988	3988	3820	3805	3941	3878	3878	3658
GPU 2002 PSC Sale	2625	2990	3273	3311	3267	3057	2681	2681	2449	2092	2095	2216	2216	2439
NGP Slice Sale	998	1035	956	726	791	853	853	794	968	1211	1207	1187	1053	912
GPU Slice Sale	1662	1723	1592	1209	1317	1420	1420	1322	1612	2017	2010	1977	1754	1519
IOU 2002 PSC Sale	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exports	1453	1402	1412	1410	1410	1404	1418	1418	1484	1485	1493	1599	1599	1595
Intra-Regional Transfers (Out)	683	907	961	935	891	774	747	747	575	628	643	588	588	617
Supp & Entitlement Capacity (Out)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSPE To West Group Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Diversity	-860	-761	-568	-592	-574	-761	-717	-723	-810	-834	-853	-868	-863	-841
<b>Total Transfers Out</b>	<b>10710</b>	<b>11648</b>	<b>12222</b>	<b>11865</b>	<b>11771</b>	<b>11014</b>	<b>10389</b>	<b>10227</b>	<b>10099</b>	<b>10404</b>	<b>10536</b>	<b>10576</b>	<b>10224</b>	<b>9898</b>
<b>Total Firm Obligations</b>	<b>11105</b>	<b>11916</b>	<b>12472</b>	<b>12150</b>	<b>12038</b>	<b>11302</b>	<b>10888</b>	<b>10788</b>	<b>10578</b>	<b>10923</b>	<b>11064</b>	<b>11158</b>	<b>10772</b>	<b>10272</b>
<b>Hydro Resources</b>														
Regulated Hydro	20533	20746	20514	20506	20520	20294	19624	19353	19871	20406	20517	18525	17979	20437
Independent Hydro	747	711	673	644	760	820	845	848	887	889	765	748	760	742
Sustained Peaking Adjustment	-7643	-7508	-8217	-11042	-10358	-9386	-8555	-8961	-6413	-3872	-4886	-3143	-4329	-8507
Non-Fed CER (CSPE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Fed CER (Canada)	225	225	225	225	225	225	236	236	236	236	236	236	236	236
Restoration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hydro Resources</b>	<b>13862</b>	<b>14174</b>	<b>13195</b>	<b>10334</b>	<b>11147</b>	<b>11953</b>	<b>12151</b>	<b>11477</b>	<b>14581</b>	<b>17659</b>	<b>16631</b>	<b>16367</b>	<b>14647</b>	<b>12908</b>
<b>Other Resources</b>														
Small Thermal & Misc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combustion Turbines	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewables	28	29	31	32	31	31	30	30	27	27	27	27	27	27
Cogeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	154	207	261	235	191	163	166	166	76	94	110	89	89	118
Intra-Regional Transfers (In)	23	23	0	0	0	0	0	0	0	0	0	0	0	23
Supp & Entitlement Capacity (In)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal	1150	1150	1150	1150	1150	1150	1150	1150	0	0	1150	1150	1150	1150
Non-Utility Generation	82	91	82	82	82	82	82	82	99	82	79	84	84	67
Augmentation Purchases	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Augmentation Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Other Resources</b>	<b>1472</b>	<b>1534</b>	<b>1559</b>	<b>1533</b>	<b>1488</b>	<b>1460</b>	<b>1462</b>	<b>1462</b>	<b>236</b>	<b>238</b>	<b>1400</b>	<b>1384</b>	<b>1384</b>	<b>1420</b>
<b>Total Resources</b>	<b>15334</b>	<b>15708</b>	<b>14754</b>	<b>11867</b>	<b>12635</b>	<b>13413</b>	<b>13613</b>	<b>12939</b>	<b>14817</b>	<b>17897</b>	<b>18031</b>	<b>17750</b>	<b>16031</b>	<b>14328</b>
<b>Reserves &amp; Maintenance</b>														
Hydro Reserves	-1064	-1073	-1059	-1058	-1064	-1056	-1023	-1010	-1038	-1065	-1064	-964	-937	-1059
Small Thermal & Misc. Reserves	-5.5	-6.0	-5.7	-5.7	-5.7	-5.6	-5.6	-5.6	-6.3	-5.5	-5.3	-5.5	-5.5	-4.7
Contract Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Large Thermal Reserves	-172	-172	-172	-172	-172	-172	-172	-172	0	0	-172	-172	-172	-172
Federal Hydro Maintenance	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785	-3263	-2761	-2770
Spinning Reserves	-282	-291	-288	-228	-236	-256	-258	-248	-292	-371	-350	-334	-305	-258
Federal Transmission Losses	-370	-384	-381	-301	-311	-335	-338	-325	-393	-496	-457	-436	-397	-337
<b>Total Reserves, Maintenance &amp; Losses</b>	<b>-4646</b>	<b>-4632</b>	<b>-3773</b>	<b>-3173</b>	<b>-3672</b>	<b>-3740</b>	<b>-3859</b>	<b>-3565</b>	<b>-3485</b>	<b>-3573</b>	<b>-4834</b>	<b>-5175</b>	<b>-4577</b>	<b>-4600</b>
<b>Total Net Resources</b>	<b>10688</b>	<b>11077</b>	<b>10981</b>	<b>8694</b>	<b>8963</b>	<b>9673</b>	<b>9754</b>	<b>9373</b>	<b>11332</b>	<b>14324</b>	<b>13197</b>	<b>12575</b>	<b>11453</b>	<b>9728</b>
<b>Total Firm Surplus/Deficit</b>	<b>-417</b>	<b>-840</b>	<b>-1490</b>	<b>-3456</b>	<b>-3075</b>	<b>-1629</b>	<b>-1133</b>	<b>-1415</b>	<b>754</b>	<b>3401</b>	<b>2133</b>	<b>1417</b>	<b>681</b>	<b>-544</b>

## **Hydro Regulation Study**

*Modeling the Biological Opinion:* For each year of the 2007-2009 Rate Case period, BPA modeled the operation of the Federal Columbia River Power System to project the energy production level of the hydro system. The HYDSIM monthly model was used to simulate the operation of the FCRPS under 50-historical water conditions (1929-1978) while providing the 2004 Biological Opinion measures for fish and all other non-power requirements (i.e. flood control, navigation, recreation and irrigation).

There were few differences in the assumed operations for the three years. All were related to juvenile bypass spill operations for fish.

In the analysis for 2007, removable spillway weirs (RSW) were assumed to be fully functional at Lower Granite (LWG) and Ice Harbor (IHR) with an RSW in test mode at Lower Monumental (LMN) and a behavioral guidance system (BGS) in test mode at The Dalles (TDA).

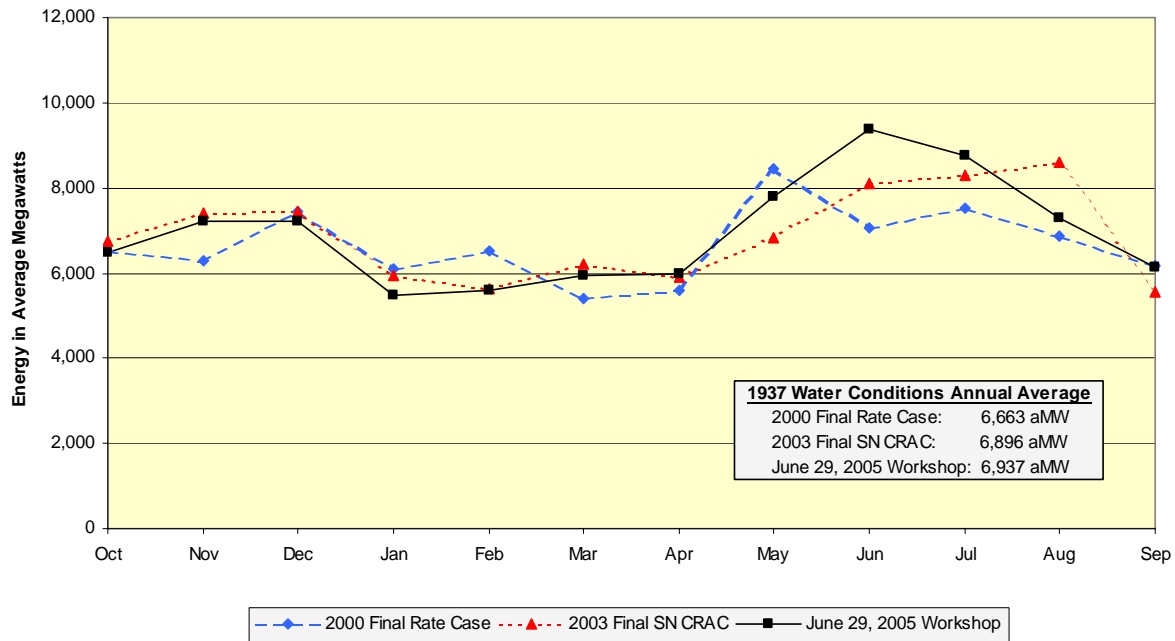
In the analysis for 2008, RSWs were assumed to be fully functional at LWG and IHR with an RSW in test mode at LMN and McNary (MCN) and a barrier guidance system (BGS) in test mode at TDA. In addition, spill was provided in summer months at the collector projects (LWG, LGS, LMN, and MCN) to include a Snake River fall Chinook transport vs. in-river passage study.

In the analysis for 2009, RSWs were assumed to be fully functional at LWG, LMN, and IHR and the BGS fully functional at TDA. At MCN, an RSW was shown in test mode. In addition, spill was provided in summer months at the collector projects (LWG, LGS, LMN, and MCN) to include a Snake River fall Chinook transport vs. in-river passage study.

Federal System Hydro Comparison with Other Rate Cases: The following graphs illustrate the changes in the monthly shape and magnitude of the Federal hydro system due to updates to Biological Opinion flow requirements and dam improvements for fish. Figures 7 through 9 present the monthly FY 2007 through FY 2009 Federal system hydro energy under 1937-critical water conditions presented at the June 29 Workshop and comparisons to the 2003 Final SN CRAC and the 2000 Final Rate Case.

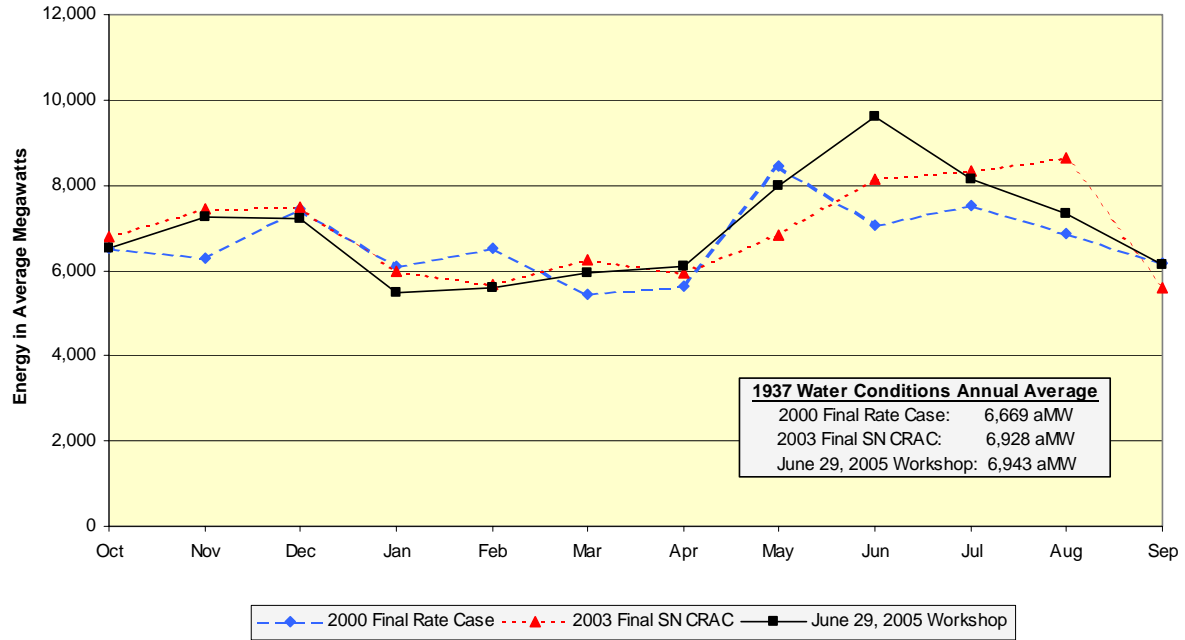
**Figure 7**

**WP-07 Power Rate Case Workshop  
FY 2007  
Federal System Regulated Plus Independent Hydro Comparison  
Under 1937-Water Conditions**



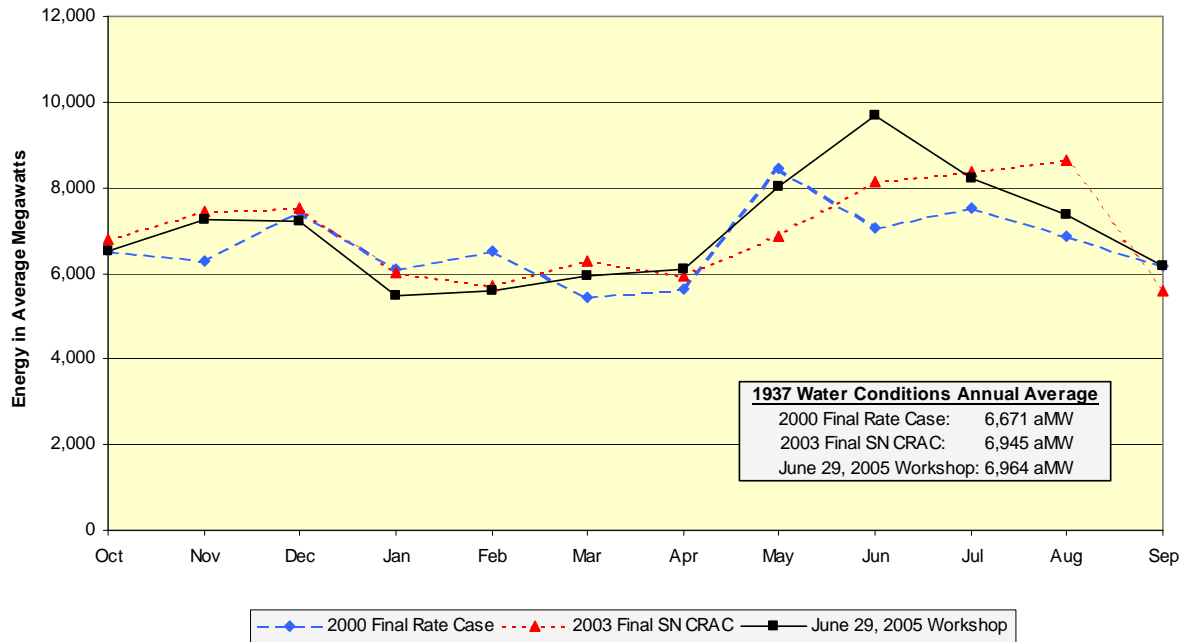
**Figure 8**

**WP-07 Power Rate Case Workshop  
FY 2008  
Federal System Regulated Plus Independent Hydro Comparison  
Under 1937-Water Conditions**



**Figure 9**

**WP-07 Power Rate Case Workshop  
FY 2009  
Federal System Regulated Plus Independent Hydro Comparison  
Under 1937-Water Conditions**

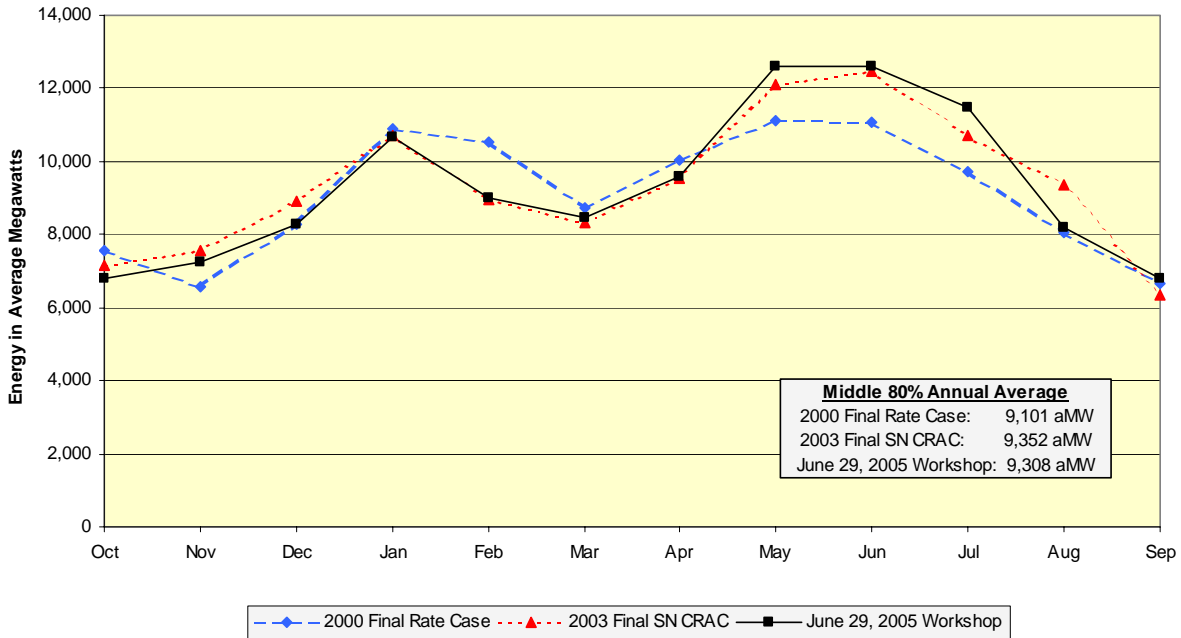


Figures 10 through 12 present the monthly FY 2007 through FY 2009 Federal system hydro energy averaged over the middle 80% of the 50-historical water conditions presented at the June 29, 2005 Workshop and comparisons to the 2003 Final SN CRAC and the 2000 Final Rate Case studies.

**Figure 10**

WP-07 Power Rate Case Workshop  
FY 2007

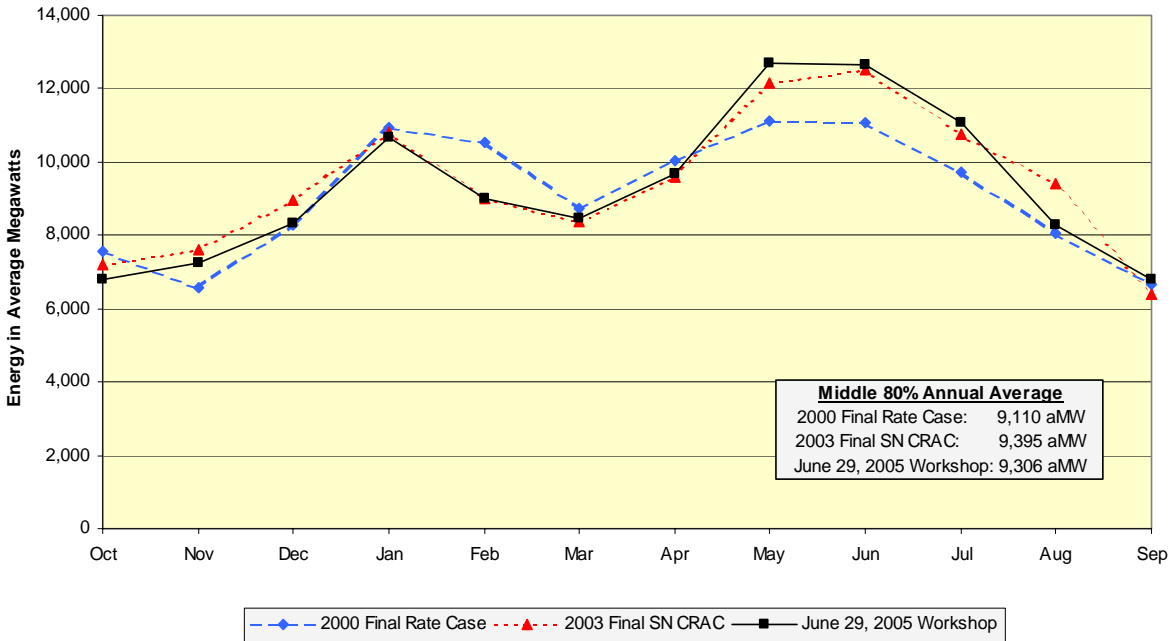
Federal System Regulated Plus Independent Hydro Comparison  
Middle 80% Averaged Over the 50-Water Conditions



**Figure 11**

WP-07 Power Rate Case Workshop  
FY 2008

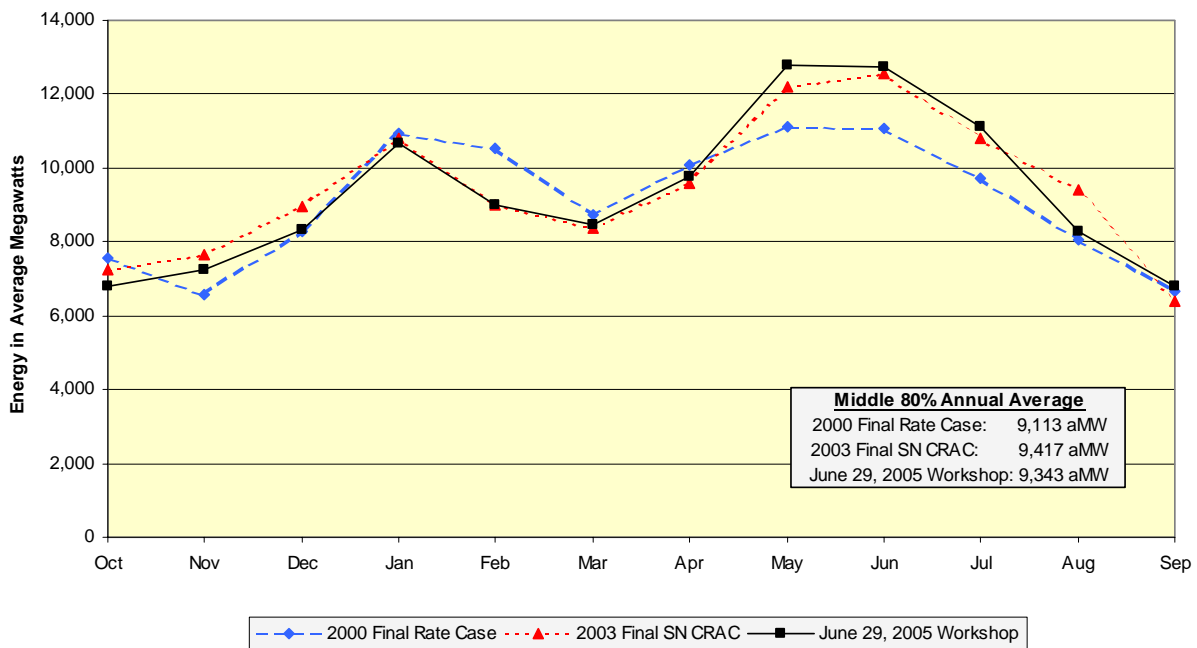
Federal System Regulated Plus Independent Hydro Comparison  
Middle 80% Averaged Over the 50-Water Conditions



**Figure 12**

WP-07 Power Rate Case Workshop  
FY 2009

Federal System Regulated Plus Independent Hydro Comparison  
Middle 80% Averaged Over the 50-Water Conditions



## **Federal Sustained Peaking Adjustment**

*Purpose of the Sustained Peaking Adjustment:* A sustained peaking adjustment is necessary because the Federal Columbia River Basin hydro projects have more generating units than hydro fuel available to operate all units on a continuous basis. Therefore, the instantaneous capability of the Federal hydro projects overstates the amount of Federal hydro capacity actually available to meet firm load obligations, month after month, year after year.

In prior studies, BPA reduced the Federal hydro instantaneous capacity using a sustained peaking adjustment that was formulated in the early 1990s using an hourly hydro simulator. This adjustment reduced the instantaneous Federal system hydro capacity to simulate the Federal hydro meeting an additional 50-hours per week capacity sale. The 50-hour capacity sale assumed 10 Heavy Load Hour (HLH) weekday deliveries, for a total of 50-hours per week. Peaking replacement, associated with the capacity sale, was assumed delivered on Light Load Hours (LLHs). This capacity sale stressed Federal system hydro operations by increasing HLH obligations. Conversely, peaking replacement energy, from the capacity sale, decreased the need for LLH Federal system hydro generation by reducing LLH obligations.

In early 2000, the electricity industry deregulation, changes in electricity marketing methods and changes in Biological Opinion fish requirements created conditions that led BPA to reevaluate its existing sustained peaking methodology. The change in methodology was made to better reflect the Federal hydro system monthly operation to meet normal peak load obligations. This method estimates the Federal hydro system monthly maximum operational capacity that is available to meet the 1-hour expected peak load for each of the 1929 through 1978 historical water conditions. This revised methodology of calculating firm capacity provides a better measure of the Federal system and PNW resource peaking capability for BPA planning purposes. The sustained peaking adjustment takes into account hydro maintenance, spinning reserves, and forced outage reserves, which are netted out for reporting purposes.

*Sustained Peaking Methodology:* The new sustained peaking adjustment was developed using a series of Hourly Operating and Scheduling Simulator (HOSS) studies. The HOSS model simulated the hourly Federal system operations needed to meet Federal system obligations using a combination of Federal system hydro, thermal, miscellaneous resources, and contract purchases for each of the 50-historical water conditions. The HOSS model maximized Federal system hydro generation by selling surplus energy in better than average water conditions. In low water conditions, HOSS maximized hydro generation and purchased energy to meet the monthly peak load demands.

The HOSS studies produced an hourly matrix of Federal system hydro generation by month, by water condition. Monthly relationships between the Federal system hydro energy and the Federal system hydro maximum 1-hour generation were developed for each water condition. This relationship reflects the monthly Federal hydro maximum operational capacity that is available to meet expected 1-hour peak load obligations and provides a better measure of the Federal system and PNW resource peak capability. The hydro generation is also adjusted for scheduled hydro maintenance, spinning reserves, and forced outages.