BP-14 Initial Rate Proposal

# Generation Inputs Study Documentation

November 2012

BP-14-E-BPA-05A

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## COMMONLY USED ACRONYMS AND SHORT FORMS

| | |
|---|---|
| AAC | Anticipated Accumulation of Cash |
| AGC | Automatic Generation Control |
| ALF | Agency Load Forecast (computer model) |
| aMW | average megawatt(s) |
| AMNR | Accumulated Modified Net Revenues |
| ANR | Accumulated Net Revenues |
| ASC | Average System Cost |
| BiOp | Biological Opinion |
| BPA | Bonneville Power Administration |
| Btu | British thermal unit |
| CDD | cooling degree day(s) |
| CDQ | Contract Demand Quantity |
| CGS | Columbia Generating Station |
| CHWM | Contract High Water Mark |
| COE, Corps, or USACE | U.S. Army Corps of Engineers |
| Commission | Federal Energy Regulatory Commission |
| Corps, COE, or USACE | U.S. Army Corps of Engineers |
| COSA | Cost of Service Analysis |
| COU | consumer-owned utility |
| Council or NPCC | Northwest Power and Conservation Council |
| CP | Coincidental Peak |
| CRAC | Cost Recovery Adjustment Clause |
| CSP | Customer System Peak |
| CT | combustion turbine |
| CY | calendar year (January through December) |
| DDC | Dividend Distribution Clause |
| *dec* | decrease, decrement, or decremental |
| DERBS | Dispatchable Energy Resource Balancing Service |
| DFS | Diurnal Flattening Service |
| DOE | Department of Energy |
| DSI | direct-service industrial customer or direct-service industry |
| DSO | Dispatcher Standing Order |
| EIA | Energy Information Administration |
| EIS | Environmental Impact Statement |
| EN | Energy Northwest, Inc. |
| EPP | Environmentally Preferred Power |
| ESA | Endangered Species Act |
| e-Tag | electronic interchange transaction information |
| FBS | Federal base system |
| FCRPS | Federal Columbia River Power System |
| FCRTS | Federal Columbia River Transmission System |
| FELCC | firm energy load carrying capability |
| FHFO | Funds Held for Others |
| FORS | Forced Outage Reserve Service |

| | |
|---|---|
| FPS | Firm Power Products and Services (rate) |
| FY | fiscal year (October through September) |
| GARD | Generation and Reserves Dispatch (computer model) |
| GEP | Green Energy Premium |
| GRSPs | General Rate Schedule Provisions |
| GTA | General Transfer Agreement |
| GWh | gigawatthour |
| HDD | heating degree day(s) |
| HLH | Heavy Load Hour(s) |
| HOSS | Hourly Operating and Scheduling Simulator (computer model) |
| HYDSIM | Hydrosystem Simulator (computer model) |
| ICE | IntercontinentalExchange |
| *inc* | increase, increment, or incremental |
| IOU | investor-owned utility |
| IP | Industrial Firm Power (rate) |
| IPR | Integrated Program Review |
| IRD | Irrigation Rate Discount |
| IRM | Irrigation Rate Mitigation |
| IRMP | Irrigation Rate Mitigation Product |
| JOE | Joint Operating Entity |
| kW | kilowatt (1000 watts) |
| kWh | kilowatthour |
| LDD | Low Density Discount |
| LLH | Light Load Hour(s) |
| LRA | Load Reduction Agreement |
| Maf | million acre-feet |
| Mid-C | Mid-Columbia |
| MMBtu | million British thermal units |
| MNR | Modified Net Revenues |
| MRNR | Minimum Required Net Revenue |
| MW | megawatt (1 million watts) |
| MWh | megawatthour |
| NCP | Non-Coincidental Peak |
| NEPA | National Environmental Policy Act |
| NERC | North American Electric Reliability Corporation |
| NFB | National Marine Fisheries Service (NMFS) Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp) |
| NLSL | New Large Single Load |
| NMFS | National Marine Fisheries Service |
| NOAA Fisheries | National Oceanographic and Atmospheric Administration Fisheries |
| NORM | Non-Operating Risk Model (computer model) |
| Northwest Power Act | Pacific Northwest Electric Power Planning and Conservation Act |
| NPCC or Council | Pacific Northwest Electric Power and Conservation Planning Council |

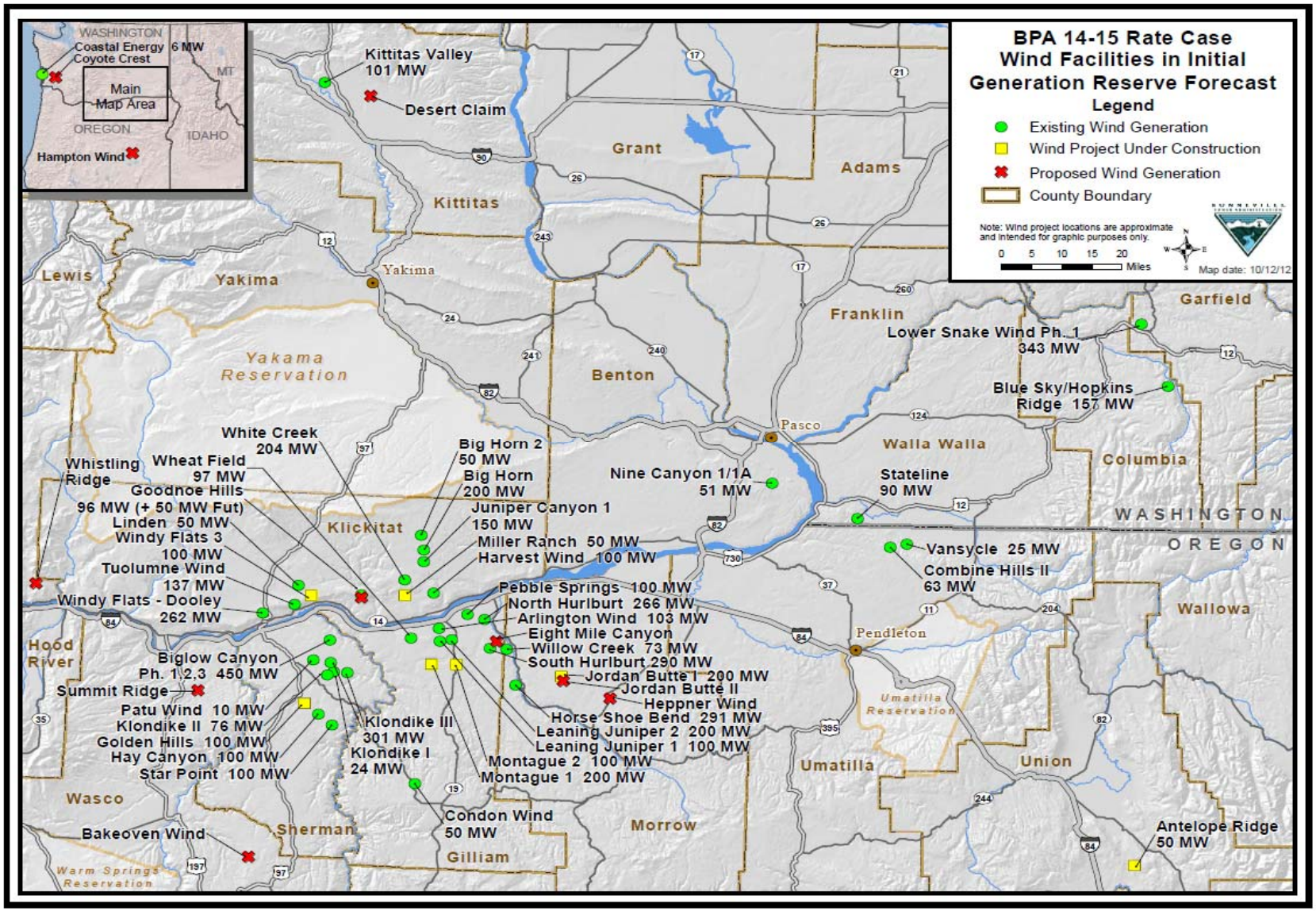
| | |
|---|---|
| NPV | net present value |
| NR | New Resource Firm Power (rate) |
| NT | Network Transmission |
| NTSA | Non-Treaty Storage Agreement |
| NUG | non-utility generation |
| NWPP | Northwest Power Pool |
| OATT | Open Access Transmission Tariff |
| O&M | operation and maintenance |
| OATI | Open Access Technology International, Inc. |
| OMB | Office of Management and Budget |
| OY | operating year (August through July) |
| PF | Priority Firm Power (rate) |
| PFp | Priority Firm Public (rate) |
| PFx | Priority Firm Exchange (rate) |
| PNCA | Pacific Northwest Coordination Agreement |
| PNRR | Planned Net Revenues for Risk |
| PNW | Pacific Northwest |
| POD | Point of Delivery |
| POI | Point of Integration or Point of Interconnection |
| POM | Point of Metering |
| POR | Point of Receipt |
| Project Act | Bonneville Project Act |
| PRS | Power Rates Study |
| PS | BPA Power Services |
| PSW | Pacific Southwest |
| PTP | Point to Point Transmission (rate) |
| PUD | public or people's utility district |
| RAM | Rate Analysis Model (computer model) |
| RAS | Remedial Action Scheme |
| RD | Regional Dialogue |
| REC | Renewable Energy Certificate |
| Reclamation or USBR | U.S. Bureau of Reclamation |
| REP | Residential Exchange Program |
| RevSim | Revenue Simulation Model (component of RiskMod) |
| RFA | Revenue Forecast Application (database) |
| RHWM | Rate Period High Water Mark |
| RiskMod | Risk Analysis Model (computer model) |
| RiskSim | Risk Simulation Model (component of RiskMod) |
| ROD | Record of Decision |
| RPSA | Residential Purchase and Sale Agreement |
| RR | Resource Replacement (rate) |
| RRS | Resource Remarketing Service |
| RSS | Resource Support Services |
| RT1SC | RHWM Tier 1 System Capability |
| RTO | Regional Transmission Operator |
| SCADA | Supervisory Control and Data Acquisition |

| | |
|---|---|
| SCS | Secondary Crediting Service |
| Slice | Slice of the System (product) |
| T1SFCO | Tier 1 System Firm Critical Output |
| TCMS | Transmission Curtailment Management Service |
| TOCA | Tier 1 Cost Allocator |
| TPP | Treasury Payment Probability |
| Transmission System Act | Federal Columbia River Transmission System Act |
| TRL | Total Retail Load |
| TRM | Tiered Rate Methodology |
| TS | BPA Transmission Services |
| TSS | Transmission Scheduling Service |
| UAI | Unauthorized Increase |
| ULS | Unanticipated Load Service |
| USACE, Corps, or COE | U.S. Army Corps of Engineers |
| USBR or Reclamation | U.S. Bureau of Reclamation |
| USFWS | U.S. Fish and Wildlife Service |
| VERBS | Variable Energy Resources Balancing Service (rate) |
| VOR | Value of Reserves |
| VR1-2014 | First Vintage rate of the BP-14 rate period |
| WECC | Western Electricity Coordinating Council (formerly WSCC) |
| WIT | Wind Integration Team |
| WSPP | Western Systems Power Pool |

| Table 2.1 | | | | | | |
|---|---|---|---|---|---|---|
| Forecast of Installed Generation Capacity for the FY 2014-2015 Balancing Reserve Capacity Quantity Forecast (Values in MW) | | | | | | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | FEDERAL THERMAL |
| | A | B | C | D | E | F |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 1,276 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 1,276 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 1,276 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 1,276 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 1,276 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 1,276 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 1,276 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 1,276 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 1,276 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 1,276 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 1,276 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 1,276 |
| 25 | BP-14 AVG | **4,871** | **15** | **2,527** | **5,192** | **1,276** |

**Table 2.2**

**Map of Wind Facilities in FY 2014-2015 Balancing Reserve Capacity Quantity Forecast**



| Table 2.3 | | | |
|---|---|---|---|
| **Wind Facilities in FY 2014-2015 Balancing Reserve Capacity Quantity Forecast** | | | |
| | **Project Name** | **Nameplate Capacity (MW)** | **Start Month and Year** |
| | **A** | **B** | **C** |
| 1 | Vansycle | 25 | Oct-98 |
| 2 | Stateline | 90 | Dec-01 |
| 3 | Klondike I | 24 | Jan-02 |
| 4 | Condon | 50 | Jun-02 |
| 5 | Klondike II | 76 | Jun-05 |
| 6 | Blue Sky/Hopkins Ridge | 157 | Nov-05 |
| 7 | Leaning Juniper I | 100 | Aug-06 |
| 8 | Big Horn | 200 | Oct-06 |
| 9 | White Creek | 204 | Oct-07 |
| 10 | Klondike 3 | 226 | Oct-07 |
| 11 | Goodnoe Hills | 96 | Apr-08 |
| 12 | Nine Canyon I-II | 51 | May-08 |
| 13 | Klondike 3A | 75 | Jun-08 |
| 14 | Arlington Wind | 103 | Dec-08 |
| 15 | Willow Creek | 73 | Jan-09 |
| 16 | Pebble Springs | 100 | Jan-09 |
| 17 | Hay Canyon | 100 | Feb-09 |
| 18 | Wheatfield Wind | 97 | Mar-09 |
| 19 | Toulumne | 137 | May-09 |
| 20 | Windy Flats Dooley | 262 | Nov-09 |
| 21 | Harvest-White Creek III | 100 | Dec-09 |
| 22 | Combine Hills | 63 | Jan-10 |
| 23 | Star Point | 100 | Jan-10 |
| 24 | Linden Ranch | 50 | Jun-10 |
| 25 | Coastal Energy Wind | 6 | Jun-10 |
| 26 | Biglow Canyon Phase 1 - 4 | 450 | Aug-10 |
| 27 | Big Horn Phase 2 | 50 | Oct-10 |
| 28 | Kittitas Valley | 101 | Nov-10 |
| 29 | Patu (Oregon Trail Wind) | 10 | Nov-10 |
| 30 | Leaning Juniper II | 200 | Dec-10 |
| 31 | Juniper Canyon 1 | 150 | Feb-11 |
| 32 | North Hurlburt | 266 | Aug-11 |
| 33 | Lower Snake Wind Phase 1 | 343 | Jan-12 |
| 34 | South Hurlburt | 290 | Jun-12 |
| 35 | HorseShoe Bend | 291 | Aug-12 |
| 36 | Miller Ranch Phase 1 | 50 | Jun-14 |

| Table 2.3 | | | |
|---|---|---|---|
| **Wind Facilities in FY 2014-2015<br>Balancing Reserve Capacity Quantity Forecast** | | | |
| | **Project Name** | **Nameplate Capacity (MW)** | **Start Month and Year** |
| | **A** | **B** | **C** |
| 37 | Eight Mile Canyon | 52 | Jun-14 |
| 38 | Montague 1 | 100 | Jun-14 |
| 39 | Antelope Ridge Wind | 50 | Dec-14 |
| 40 | Windy Flats 2 | 100 | Dec-14 |
| 41 | Coyote Crest Phase 1 | 128 | Mar-15 |
| 42 | Summit Ridge Wind | 100 | Jun-15 |

**Table 2.4**
**Wind Facility Correlation Matrix in FY 2014-2015 Balancing Reserve Capacity Quantity Forecast**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Project Name** | Vansycle | Stateline | Klondike I | Condon | Klondike II | Blue Sky/Hopkins Ridge | Leaning Juniper I | Big Horn | White Creek | Klondike 3 | Goodnoe Hills | Nine Canyon I-II | Klondike 3A | Arlington Wind | Willow Creek | Pebble Springs | Hay Canyon | Wheatfield Wind | Toulumne | Windy Flats Dooley | Harvest-White Creek III | Combine Hills | Star Point | Linden Ranch | Coastal Energy Wind | Biglow Canyon Phase 1 - 4 | Big Horn Phase 2 | Kittitas Valley | Patu (Oregon Trail Wind) | Leaning Juniper II | Juniper Canyon 1 | North Hurlburt | Lower Snake Wind Phase 1 | South Hurlburt | HorseShoe Bend | Miller Ranch Phase 1 | Eight Mile Canyon | Montague 1 | Antelope Ridge Wind | Windy Flats 2 | Coyote Crest Phase 1 | Summit Ridge Wind |
| 1 | Vansycle | 1.00 | 0.94 | 0.69 | 0.77 | 0.72 | 0.87 | 0.76 | 0.80 | 0.79 | 0.72 | 0.80 | 0.86 | 0.72 | 0.73 | 0.76 | 0.74 | 0.71 | 0.73 | 0.80 | 0.75 | 0.79 | 0.92 | 0.73 | 0.79 | 0.57 | 0.70 | 0.75 | 0.57 | 0.71 | 0.63 | 0.69 | 0.61 | 0.93 | 0.90 | 0.90 | 0.88 | 0.90 | 0.89 | 0.80 | 0.88 | 0.81 | 0.88 |
| 2 | Stateline | 0.94 | 1.00 | 0.71 | 0.77 | 0.75 | 0.88 | 0.80 | 0.83 | 0.81 | 0.75 | 0.83 | 0.90 | 0.74 | 0.78 | 0.81 | 0.79 | 0.73 | 0.77 | 0.82 | 0.79 | 0.83 | 0.93 | 0.77 | 0.82 | 0.54 | 0.75 | 0.78 | 0.60 | 0.75 | 0.69 | 0.73 | 0.65 | 0.94 | 0.93 | 0.92 | 0.91 | 0.92 | 0.91 | 0.80 | 0.90 | 0.81 | 0.89 |
| 3 | Klondike I | 0.69 | 0.71 | 1.00 | 0.67 | 0.94 | 0.71 | 0.87 | 0.77 | 0.79 | 0.96 | 0.83 | 0.65 | 0.96 | 0.87 | 0.86 | 0.86 | 0.91 | 0.87 | 0.84 | 0.88 | 0.81 | 0.70 | 0.92 | 0.84 | 0.41 | 0.92 | 0.65 | 0.73 | 0.89 | 0.80 | 0.64 | 0.61 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.79 | 0.94 | 0.80 | 0.95 |
| 4 | Condon | 0.77 | 0.77 | 0.67 | 1.00 | 0.67 | 0.77 | 0.72 | 0.79 | 0.75 | 0.68 | 0.77 | 0.78 | 0.69 | 0.70 | 0.69 | 0.69 | 0.72 | 0.70 | 0.72 | 0.68 | 0.75 | 0.75 | 0.72 | 0.74 | 0.61 | 0.65 | 0.78 | 0.52 | 0.68 | 0.63 | 0.72 | 0.65 | 0.90 | 0.90 | 0.89 | 0.91 | 0.89 | 0.90 | 0.85 | 0.91 | 0.87 | 0.89 |
| 5 | Klondike II | 0.72 | 0.75 | 0.94 | 0.67 | 1.00 | 0.74 | 0.89 | 0.79 | 0.81 | 0.98 | 0.86 | 0.68 | 0.97 | 0.88 | 0.89 | 0.89 | 0.90 | 0.88 | 0.89 | 0.92 | 0.84 | 0.72 | 0.93 | 0.87 | 0.43 | 0.95 | 0.67 | 0.76 | 0.95 | 0.80 | 0.65 | 0.62 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.79 | 0.94 | 0.80 | 0.96 |
| 6 | Blue Sky/Hopkins Ridge | 0.87 | 0.88 | 0.71 | 0.77 | 0.74 | 1.00 | 0.78 | 0.82 | 0.81 | 0.74 | 0.81 | 0.83 | 0.73 | 0.75 | 0.77 | 0.76 | 0.73 | 0.75 | 0.81 | 0.76 | 0.81 | 0.86 | 0.75 | 0.79 | 0.55 | 0.73 | 0.76 | 0.60 | 0.74 | 0.65 | 0.71 | 0.65 | 0.96 | 0.89 | 0.89 | 0.88 | 0.89 | 0.88 | 0.81 | 0.88 | 0.81 | 0.87 |
| 7 | Leaning Juniper I | 0.76 | 0.80 | 0.87 | 0.72 | 0.89 | 0.78 | 1.00 | 0.87 | 0.86 | 0.90 | 0.89 | 0.74 | 0.90 | 0.96 | 0.93 | 0.95 | 0.86 | 0.95 | 0.87 | 0.90 | 0.89 | 0.76 | 0.87 | 0.87 | 0.44 | 0.90 | 0.74 | 0.71 | 0.87 | 0.83 | 0.70 | 0.74 | 0.90 | 0.98 | 0.98 | 0.95 | 0.98 | 1.00 | 0.78 | 0.95 | 0.80 | 0.95 |
| 8 | Big Horn | 0.80 | 0.83 | 0.77 | 0.79 | 0.79 | 0.82 | 0.87 | 1.00 | 0.92 | 0.80 | 0.90 | 0.85 | 0.80 | 0.87 | 0.84 | 0.86 | 0.79 | 0.85 | 0.86 | 0.84 | 0.94 | 0.77 | 0.81 | 0.86 | 0.57 | 0.80 | 0.91 | 0.62 | 0.79 | 0.74 | 0.84 | 0.71 | 0.90 | 0.91 | 0.91 | 0.98 | 0.91 | 0.93 | 0.79 | 0.95 | 0.85 | 0.90 |
| 9 | White Creek | 0.79 | 0.81 | 0.79 | 0.75 | 0.81 | 0.81 | 0.86 | 0.92 | 1.00 | 0.82 | 0.94 | 0.83 | 0.83 | 0.87 | 0.86 | 0.87 | 0.81 | 0.87 | 0.92 | 0.88 | 0.97 | 0.79 | 0.83 | 0.89 | 0.55 | 0.83 | 0.85 | 0.63 | 0.82 | 0.74 | 0.80 | 0.70 | 0.90 | 0.93 | 0.93 | 1.00 | 0.93 | 0.95 | 0.80 | 0.97 | 0.86 | 0.93 |
| 10 | Klondike 3 | 0.72 | 0.75 | 0.96 | 0.68 | 0.98 | 0.74 | 0.90 | 0.80 | 0.82 | 1.00 | 0.87 | 0.68 | 0.98 | 0.90 | 0.90 | 0.90 | 0.92 | 0.90 | 0.89 | 0.93 | 0.85 | 0.74 | 0.94 | 0.88 | 0.43 | 0.96 | 0.68 | 0.75 | 0.94 | 0.80 | 0.65 | 0.64 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.79 | 0.94 | 0.80 | 0.96 |
| 11 | Goodnoe Hills | 0.80 | 0.83 | 0.83 | 0.77 | 0.86 | 0.81 | 0.89 | 0.90 | 0.94 | 0.87 | 1.00 | 0.79 | 0.87 | 0.88 | 0.87 | 0.87 | 0.84 | 0.88 | 0.93 | 0.90 | 0.93 | 0.79 | 0.86 | 0.91 | 0.52 | 0.86 | 0.80 | 0.66 | 0.85 | 0.75 | 0.76 | 0.70 | 0.89 | 0.96 | 0.96 | 0.94 | 0.96 | 0.97 | 0.79 | 0.95 | 0.81 | 0.96 |
| 12 | Nine Canyon I-II | 0.86 | 0.90 | 0.65 | 0.78 | 0.68 | 0.83 | 0.74 | 0.85 | 0.83 | 0.68 | 0.79 | 1.00 | 0.68 | 0.73 | 0.74 | 0.73 | 0.68 | 0.72 | 0.76 | 0.72 | 0.82 | 0.82 | 0.70 | 0.76 | 0.60 | 0.67 | 0.84 | 0.54 | 0.69 | 0.64 | 0.78 | 0.65 | 0.92 | 0.90 | 0.90 | 0.91 | 0.90 | 0.89 | 0.78 | 0.90 | 0.83 | 0.87 |
| 13 | Klondike 3A | 0.72 | 0.74 | 0.96 | 0.69 | 0.97 | 0.73 | 0.90 | 0.80 | 0.83 | 0.98 | 0.87 | 0.68 | 1.00 | 0.89 | 0.89 | 0.90 | 0.94 | 0.90 | 0.88 | 0.91 | 0.84 | 0.73 | 0.95 | 0.87 | 0.44 | 0.94 | 0.69 | 0.75 | 0.93 | 0.82 | 0.66 | 0.64 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.79 | 0.94 | 0.80 | 0.96 |
| 14 | Arlington Wind | 0.73 | 0.78 | 0.87 | 0.70 | 0.88 | 0.75 | 0.96 | 0.87 | 0.87 | 0.90 | 0.88 | 0.73 | 0.89 | 1.00 | 0.92 | 0.95 | 0.85 | 0.96 | 0.87 | 0.90 | 0.90 | 0.75 | 0.87 | 0.87 | 0.43 | 0.90 | 0.74 | 0.70 | 0.87 | 0.84 | 0.71 | 0.76 | 0.90 | 0.98 | 0.98 | 0.95 | 0.98 | 1.00 | 0.78 | 0.95 | 0.80 | 0.95 |
| 15 | Willow Creek | 0.76 | 0.81 | 0.86 | 0.69 | 0.89 | 0.77 | 0.93 | 0.84 | 0.86 | 0.90 | 0.87 | 0.74 | 0.89 | 0.92 | 1.00 | 0.94 | 0.85 | 0.91 | 0.87 | 0.90 | 0.87 | 0.78 | 0.88 | 0.87 | 0.43 | 0.90 | 0.71 | 0.72 | 0.88 | 0.82 | 0.68 | 0.70 | 0.91 | 1.00 | 1.00 | 0.93 | 1.00 | 0.97 | 0.76 | 0.93 | 0.78 | 0.93 |
| 16 | Pebble Springs | 0.74 | 0.79 | 0.86 | 0.69 | 0.89 | 0.76 | 0.95 | 0.86 | 0.87 | 0.90 | 0.87 | 0.73 | 0.90 | 0.95 | 0.94 | 1.00 | 0.85 | 0.94 | 0.87 | 0.90 | 0.89 | 0.76 | 0.88 | 0.87 | 0.43 | 0.90 | 0.74 | 0.72 | 0.87 | 0.86 | 0.72 | 0.75 | 0.90 | 0.98 | 0.98 | 0.95 | 0.98 | 0.99 | 0.77 | 0.95 | 0.79 | 0.95 |
| 17 | Hay Canyon | 0.71 | 0.73 | 0.91 | 0.72 | 0.90 | 0.73 | 0.86 | 0.79 | 0.81 | 0.92 | 0.84 | 0.68 | 0.94 | 0.85 | 0.85 | 0.85 | 1.00 | 0.86 | 0.83 | 0.86 | 0.82 | 0.73 | 0.96 | 0.84 | 0.44 | 0.87 | 0.69 | 0.68 | 0.86 | 0.78 | 0.65 | 0.61 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.80 | 0.94 | 0.80 | 0.96 |
| 18 | Wheatfield Wind | 0.73 | 0.77 | 0.87 | 0.70 | 0.88 | 0.75 | 0.95 | 0.85 | 0.87 | 0.90 | 0.88 | 0.72 | 0.90 | 0.96 | 0.91 | 0.94 | 0.86 | 1.00 | 0.86 | 0.90 | 0.89 | 0.74 | 0.88 | 0.88 | 0.43 | 0.91 | 0.73 | 0.70 | 0.88 | 0.84 | 0.70 | 0.73 | 0.90 | 0.98 | 0.98 | 0.95 | 0.98 | 1.00 | 0.78 | 0.95 | 0.80 | 0.95 |
| 19 | Toulumne | 0.80 | 0.82 | 0.84 | 0.72 | 0.89 | 0.81 | 0.87 | 0.86 | 0.92 | 0.89 | 0.93 | 0.76 | 0.88 | 0.87 | 0.87 | 0.87 | 0.83 | 0.86 | 1.00 | 0.95 | 0.91 | 0.80 | 0.86 | 0.93 | 0.51 | 0.88 | 0.76 | 0.70 | 0.88 | 0.75 | 0.72 | 0.67 | 0.89 | 0.93 | 0.93 | 0.96 | 0.93 | 0.95 | 0.80 | 1.00 | 0.85 | 0.95 |
| 20 | Windy Flats Dooley | 0.75 | 0.79 | 0.88 | 0.68 | 0.92 | 0.76 | 0.90 | 0.84 | 0.88 | 0.93 | 0.90 | 0.72 | 0.91 | 0.90 | 0.90 | 0.90 | 0.86 | 0.90 | 0.95 | 1.00 | 0.89 | 0.77 | 0.89 | 0.94 | 0.45 | 0.93 | 0.71 | 0.74 | 0.92 | 0.79 | 0.68 | 0.68 | 0.89 | 0.93 | 0.93 | 0.96 | 0.93 | 0.95 | 0.80 | 1.00 | 0.85 | 0.95 |
| 21 | Harvest-White Creek III | 0.79 | 0.83 | 0.81 | 0.75 | 0.84 | 0.81 | 0.89 | 0.94 | 0.97 | 0.85 | 0.93 | 0.82 | 0.84 | 0.90 | 0.87 | 0.89 | 0.82 | 0.89 | 0.91 | 0.89 | 1.00 | 0.78 | 0.84 | 0.90 | 0.53 | 0.85 | 0.84 | 0.66 | 0.84 | 0.77 | 0.80 | 0.74 | 0.89 | 0.97 | 0.97 | 0.95 | 0.97 | 0.99 | 0.77 | 0.95 | 0.79 | 0.95 |
| 22 | Combine Hills | 0.92 | 0.93 | 0.70 | 0.75 | 0.72 | 0.86 | 0.76 | 0.77 | 0.79 | 0.74 | 0.79 | 0.82 | 0.73 | 0.75 | 0.78 | 0.76 | 0.73 | 0.74 | 0.80 | 0.77 | 0.78 | 1.00 | 0.76 | 0.80 | 0.51 | 0.73 | 0.72 | 0.59 | 0.73 | 0.66 | 0.68 | 0.63 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.81 | 0.92 | 0.83 | 0.90 |
| 23 | Star Point | 0.73 | 0.77 | 0.92 | 0.72 | 0.93 | 0.75 | 0.87 | 0.81 | 0.83 | 0.94 | 0.86 | 0.70 | 0.95 | 0.87 | 0.88 | 0.88 | 0.96 | 0.88 | 0.86 | 0.89 | 0.84 | 0.76 | 1.00 | 0.86 | 0.45 | 0.90 | 0.71 | 0.71 | 0.89 | 0.79 | 0.67 | 0.62 | 0.89 | 0.96 | 0.96 | 0.93 | 0.96 | 0.97 | 0.80 | 0.94 | 0.80 | 0.96 |
| 24 | Linden Ranch | 0.79 | 0.82 | 0.84 | 0.74 | 0.87 | 0.79 | 0.87 | 0.86 | 0.89 | 0.88 | 0.91 | 0.76 | 0.87 | 0.87 | 0.87 | 0.87 | 0.84 | 0.88 | 0.93 | 0.94 | 0.90 | 0.80 | 0.86 | 1.00 | 0.52 | 0.89 | 0.76 | 0.70 | 0.88 | 0.77 | 0.71 | 0.69 | 0.89 | 0.93 | 0.93 | 1.00 | 0.93 | 0.95 | 0.79 | 0.97 | 0.84 | 0.93 |
| 25 | Coastal Energy Wind | 0.57 | 0.54 | 0.41 | 0.61 | 0.43 | 0.55 | 0.44 | 0.57 | 0.55 | 0.43 | 0.52 | 0.60 | 0.44 | 0.43 | 0.43 | 0.43 | 0.44 | 0.43 | 0.51 | 0.45 | 0.53 | 0.51 | 0.45 | 0.52 | 1.00 | 0.42 | 0.62 | 0.35 | 0.47 | 0.40 | 0.57 | 0.44 | 0.79 | 0.78 | 0.78 | 0.83 | 0.78 | 0.80 | 0.85 | 0.84 | 0.97 | 0.82 |
| 26 | Biglow Canyon Phase 1 - 4 | 0.70 | 0.75 | 0.92 | 0.65 | 0.95 | 0.73 | 0.90 | 0.80 | 0.83 | 0.96 | 0.86 | 0.67 | 0.94 | 0.90 | 0.90 | 0.90 | 0.87 | 0.91 | 0.88 | 0.93 | 0.85 | 0.73 | 0.90 | 0.89 | 0.42 | 1.00 | 0.67 | 0.77 | 0.95 | 0.82 | 0.64 | 0.65 | 0.89 | 0.96 | 0.96 | 0.94 | 0.96 | 0.97 | 0.80 | 0.95 | 0.81 | 0.96 |
| 27 | Big Horn Phase 2 | 0.75 | 0.78 | 0.65 | 0.78 | 0.67 | 0.76 | 0.74 | 0.91 | 0.85 | 0.68 | 0.80 | 0.84 | 0.69 | 0.74 | 0.71 | 0.74 | 0.69 | 0.73 | 0.76 | 0.71 | 0.84 | 0.72 | 0.71 | 0.76 | 0.62 | 0.67 | 1.00 | 0.53 | 0.67 | 0.64 | 0.86 | 0.69 | 0.90 | 0.91 | 0.91 | 0.98 | 0.91 | 0.93 | 0.79 | 0.95 | 0.85 | 0.90 |
| 28 | Kittitas Valley | 0.57 | 0.60 | 0.73 | 0.52 | 0.76 | 0.60 | 0.71 | 0.62 | 0.63 | 0.75 | 0.66 | 0.54 | 0.75 | 0.70 | 0.72 | 0.72 | 0.68 | 0.70 | 0.70 | 0.74 | 0.66 | 0.59 | 0.71 | 0.70 | 0.35 | 0.77 | 0.53 | 1.00 | 0.76 | 0.70 | 0.54 | 0.47 | 0.86 | 0.89 | 0.89 | 0.87 | 0.89 | 0.90 | 0.81 | 0.89 | 0.80 | 0.92 |
| 29 | Patu (Oregon Trail Wind) | 0.71 | 0.75 | 0.89 | 0.68 | 0.95 | 0.74 | 0.87 | 0.79 | 0.82 | 0.94 | 0.85 | 0.69 | 0.93 | 0.87 | 0.88 | 0.87 | 0.86 | 0.88 | 0.88 | 0.92 | 0.84 | 0.73 | 0.89 | 0.88 | 0.47 | 0.95 | 0.67 | 0.76 | 1.00 | 0.78 | 0.64 | 0.63 | 0.89 | 0.96 | 0.95 | 0.94 | 0.95 | 0.97 | 0.81 | 0.95 | 0.82 | 0.96 |
| 30 | Leaning Juniper II | 0.63 | 0.69 | 0.80 | 0.63 | 0.80 | 0.65 | 0.83 | 0.74 | 0.74 | 0.80 | 0.75 | 0.64 | 0.82 | 0.84 | 0.82 | 0.86 | 0.78 | 0.84 | 0.75 | 0.79 | 0.77 | 0.66 | 0.79 | 0.77 | 0.40 | 0.82 | 0.64 | 0.70 | 0.78 | 1.00 | 0.72 | 0.68 | 0.90 | 0.97 | 0.97 | 0.95 | 0.97 | 1.00 | 0.78 | 0.95 | 0.81 | 0.95 |
| 31 | Juniper Canyon 1 | 0.69 | 0.73 | 0.64 | 0.72 | 0.65 | 0.71 | 0.70 | 0.84 | 0.80 | 0.65 | 0.76 | 0.78 | 0.66 | 0.71 | 0.68 | 0.72 | 0.65 | 0.70 | 0.72 | 0.68 | 0.80 | 0.68 | 0.67 | 0.71 | 0.57 | 0.64 | 0.86 | 0.54 | 0.64 | 0.72 | 1.00 | 0.65 | 0.89 | 0.90 | 0.90 | 0.95 | 0.90 | 0.90 | 0.79 | 0.93 | 0.85 | 0.88 |
| 32 | North Hurlburt | 0.61 | 0.65 | 0.61 | 0.65 | 0.62 | 0.65 | 0.74 | 0.71 | 0.70 | 0.64 | 0.70 | 0.65 | 0.64 | 0.76 | 0.70 | 0.75 | 0.61 | 0.73 | 0.67 | 0.68 | 0.74 | 0.63 | 0.62 | 0.69 | 0.44 | 0.65 | 0.69 | 0.47 | 0.63 | 0.68 | 0.65 | 1.00 | 0.91 | 1.00 | 1.00 | 0.93 | 1.00 | 0.97 | 0.76 | 0.93 | 0.78 | 0.93 |
| 33 | Lower Snake Wind Phase 1 | 0.93 | 0.94 | 0.89 | 0.90 | 0.89 | 0.96 | 0.90 | 0.90 | 0.90 | 0.89 | 0.89 | 0.92 | 0.89 | 0.90 | 0.91 | 0.90 | 0.89 | 0.90 | 0.89 | 0.89 | 0.89 | 0.92 | 0.89 | 0.89 | 0.79 | 0.89 | 0.90 | 0.86 | 0.89 | 0.90 | 0.89 | 0.91 | 1.00 | 0.91 | 0.91 | 0.89 | 0.91 | 0.90 | 0.77 | 0.89 | 0.79 | 0.89 |
| 34 | South Hurlburt | 0.90 | 0.93 | 0.96 | 0.90 | 0.96 | 0.89 | 0.98 | 0.91 | 0.93 | 0.96 | 0.96 | 0.90 | 0.96 | 0.98 | 1.00 | 0.98 | 0.96 | 0.98 | 0.93 | 0.93 | 0.97 | 0.92 | 0.96 | 0.93 | 0.78 | 0.96 | 0.91 | 0.89 | 0.96 | 0.97 | 0.90 | 1.00 | 0.91 | 1.00 | 1.00 | 0.93 | 1.00 | 0.97 | 0.77 | 0.93 | 0.79 | 0.93 |
| 35 | HorseShoe Bend | 0.90 | 0.92 | 0.96 | 0.89 | 0.96 | 0.89 | 0.98 | 0.91 | 0.93 | 0.96 | 0.96 | 0.90 | 0.96 | 0.98 | 1.00 | 0.98 | 0.96 | 0.98 | 0.93 | 0.93 | 0.97 | 0.92 | 0.96 | 0.93 | 0.78 | 0.96 | 0.91 | 0.89 | 0.95 | 0.97 | 0.90 | 1.00 | 0.91 | 1.00 | 1.00 | 0.93 | 1.00 | 0.97 | 0.76 | 0.93 | 0.78 | 0.93 |
| 36 | Miller Ranch Phase 1 | 0.88 | 0.91 | 0.93 | 0.91 | 0.93 | 0.88 | 0.95 | 0.98 | 1.00 | 0.93 | 0.94 | 0.91 | 0.93 | 0.95 | 0.93 | 0.95 | 0.93 | 0.95 | 0.96 | 0.96 | 0.95 | 0.92 | 0.93 | 1.00 | 0.83 | 0.94 | 0.98 | 0.87 | 0.94 | 0.95 | 0.95 | 0.93 | 0.89 | 0.93 | 0.93 | 1.00 | 0.93 | 0.95 | 0.79 | 0.97 | 0.84 | 0.93 |
| 37 | Eight Mile Canyon | 0.90 | 0.92 | 0.96 | 0.89 | 0.96 | 0.89 | 0.98 | 0.91 | 0.93 | 0.96 | 0.96 | 0.90 | 0.96 | 0.98 | 1.00 | 0.98 | 0.96 | 0.98 | 0.93 | 0.93 | 0.97 | 0.92 | 0.96 | 0.93 | 0.78 | 0.96 | 0.91 | 0.89 | 0.95 | 0.97 | 0.90 | 1.00 | 0.91 | 1.00 | 1.00 | 0.93 | 1.00 | 0.97 | 0.76 | 0.93 | 0.78 | 0.93 |
| 38 | Montague 1 | 0.89 | 0.91 | 0.97 | 0.90 | 0.97 | 0.88 | 1.00 | 0.93 | 0.95 | 0.97 | 0.97 | 0.89 | 0.97 | 1.00 | 0.97 | 0.99 | 0.97 | 1.00 | 0.95 | 0.95 | 0.99 | 0.92 | 0.97 | 0.95 | 0.80 | 0.97 | 0.93 | 0.90 | 0.97 | 1.00 | 0.90 | 0.97 | 0.90 | 0.97 | 0.97 | 0.95 | 0.97 | 1.00 | 0.78 | 0.95 | 0.81 | 0.95 |
| 39 | Antelope Ridge Wind | 0.80 | 0.80 | 0.79 | 0.85 | 0.79 | 0.81 | 0.78 | 0.79 | 0.80 | 0.79 | 0.79 | 0.78 | 0.79 | 0.78 | 0.76 | 0.77 | 0.80 | 0.78 | 0.80 | 0.80 | 0.77 | 0.81 | 0.80 | 0.79 | 0.85 | 0.80 | 0.79 | 0.81 | 0.81 | 0.78 | 0.79 | 0.76 | 0.77 | 0.77 | 0.76 | 0.79 | 0.76 | 0.78 | 1.00 | 0.80 | 0.83 | 0.79 |
| 40 | Windy Flats 2 | 0.88 | 0.90 | 0.94 | 0.91 | 0.94 | 0.88 | 0.95 | 0.95 | 0.97 | 0.94 | 0.95 | 0.90 | 0.94 | 0.95 | 0.93 | 0.95 | 0.94 | 0.95 | 1.00 | 1.00 | 0.95 | 0.92 | 0.94 | 0.97 | 0.84 | 0.95 | 0.95 | 0.89 | 0.95 | 0.95 | 0.93 | 0.93 | 0.89 | 0.93 | 0.93 | 0.97 | 0.93 | 0.95 | 0.80 | 1.00 | 0.85 | 0.95 |
| 41 | Coyote Crest Phase 1 | 0.81 | 0.81 | 0.80 | 0.87 | 0.80 | 0.81 | 0.80 | 0.85 | 0.86 | 0.80 | 0.81 | 0.83 | 0.80 | 0.80 | 0.78 | 0.79 | 0.80 | 0.80 | 0.85 | 0.85 | 0.79 | 0.83 | 0.80 | 0.84 | 0.97 | 0.81 | 0.85 | 0.80 | 0.82 | 0.81 | 0.85 | 0.78 | 0.79 | 0.79 | 0.78 | 0.84 | 0.78 | 0.81 | 0.83 | 0.85 | 1.00 | 0.82 |
| 42 | Summit Ridge Wind | 0.88 | 0.89 | 0.95 | 0.89 | 0.96 | 0.87 | 0.95 | 0.90 | 0.93 | 0.96 | 0.96 | 0.87 | 0.96 | 0.95 | 0.93 | 0.95 | 0.96 | 0.95 | 0.95 | 0.95 | 0.95 | 0.90 | 0.96 | 0.93 | 0.82 | 0.96 | 0.90 | 0.92 | 0.96 | 0.95 | 0.88 | 0.93 | 0.89 | 0.93 | 0.93 | 0.93 | 0.93 | 0.95 | 0.79 | 0.95 | 0.82 | 1.00 |

**Table 2.5**
**Wind Facility Distance Matrix in FY 2014-2015 Balancing Reserve Capacity Quantity Forecast (Degrees of Lattitude/Longitude)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Project Name** | Vansycle | Stateline | Klondike I | Condon | Klondike II | Blue Sky/Hopkins Ridge | Leaning Juniper I | Big Horn | White Creek | Klondike 3 | Goodnoe Hills | Nine Canyon I-II | Klondike 3A | Arlington Wind | Willow Creek | Pebble Springs | Hay Canyon | Wheatfield Wind | Toulumne | Windy Flats Dooley | Harvest-White Creek III | Combine Hills | Star Point | Linden Ranch | Coastal Energy Wind | Biglow Canyon Phase 1 - 4 | Big Horn Phase 2 | Kittitas Valley | Patu (Oregon Trail Wind) | Leaning Juniper II | Juniper Canyon 1 | North Hurlburt | Lower Snake Wind Phase 1 | South Hurlburt | HorseShoe Bend | Miller Ranch Phase 1 | Eight Mile Canyon | Montague 1 | Antelope Ridge Wind | Windy Flats 2 | Coyote Crest Phase 1 | Summit Ridge Wind |
| 1 | Vansycle | 0.00 | 0.19 | 1.91 | 1.80 | 1.95 | 1.02 | 1.56 | 1.67 | 1.75 | 1.94 | 1.92 | 0.48 | 1.94 | 1.60 | 1.28 | 1.52 | 2.01 | 1.60 | 2.09 | 2.21 | 1.61 | 0.08 | 2.00 | 1.76 | 5.11 | 1.97 | 1.67 | 2.40 | 2.14 | 1.57 | 1.58 | 1.41 | 1.04 | 1.41 | 1.33 | 1.67 | 1.37 | 1.60 | 1.17 | 2.01 | 4.71 | 2.40 |
| 2 | Stateline | 0.19 | 0.00 | 1.77 | 1.68 | 1.80 | 1.14 | 1.41 | 1.50 | 1.59 | 1.79 | 1.77 | 0.29 | 1.79 | 1.46 | 1.14 | 1.37 | 1.86 | 1.46 | 1.93 | 2.06 | 1.45 | 0.12 | 1.86 | 1.60 | 4.93 | 1.82 | 1.50 | 2.21 | 1.99 | 1.43 | 1.42 | 1.27 | 1.13 | 1.27 | 1.20 | 1.52 | 1.22 | 1.46 | 1.35 | 1.85 | 4.53 | 2.25 |
| 3 | Klondike I | 1.91 | 1.77 | 0.00 | 0.40 | 0.03 | 2.91 | 0.35 | 0.40 | 0.28 | 0.05 | 0.19 | 1.54 | 0.05 | 0.31 | 0.64 | 0.39 | 0.11 | 0.31 | 0.26 | 0.34 | 0.35 | 1.83 | 0.10 | 0.21 | 3.31 | 0.09 | 0.40 | 1.56 | 0.24 | 0.35 | 0.45 | 0.50 | 2.88 | 0.50 | 0.60 | 0.29 | 0.54 | 0.32 | 2.76 | 0.22 | 2.97 | 0.49 |
| 4 | Condon | 1.80 | 1.68 | 0.40 | 0.00 | 0.42 | 2.81 | 0.41 | 0.67 | 0.59 | 0.44 | 0.57 | 1.51 | 0.44 | 0.42 | 0.57 | 0.45 | 0.40 | 0.42 | 0.65 | 0.70 | 0.54 | 1.72 | 0.41 | 0.51 | 3.61 | 0.49 | 0.67 | 1.93 | 0.58 | 0.36 | 0.67 | 0.54 | 2.81 | 0.49 | 0.49 | 0.53 | 0.54 | 0.36 | 2.50 | 0.61 | 3.30 | 0.75 |
| 5 | Klondike II | 1.95 | 1.80 | 0.03 | 0.42 | 0.00 | 2.94 | 0.39 | 0.42 | 0.30 | 0.03 | 0.18 | 1.58 | 0.03 | 0.34 | 0.67 | 0.42 | 0.08 | 0.34 | 0.24 | 0.31 | 0.37 | 1.86 | 0.07 | 0.24 | 3.27 | 0.07 | 0.42 | 1.56 | 0.20 | 0.38 | 0.47 | 0.53 | 2.91 | 0.54 | 0.63 | 0.32 | 0.58 | 0.35 | 2.79 | 0.20 | 2.93 | 0.45 |
| 6 | Blue Sky/Hopkins Ridge | 1.02 | 1.14 | 2.91 | 2.81 | 2.94 | 0.00 | 2.56 | 2.62 | 2.72 | 2.93 | 2.90 | 1.37 | 2.93 | 2.60 | 2.29 | 2.52 | 3.01 | 2.60 | 3.06 | 3.19 | 2.58 | 1.10 | 3.00 | 2.74 | 6.00 | 2.95 | 2.62 | 3.08 | 3.12 | 2.57 | 2.54 | 2.41 | 0.19 | 2.41 | 2.35 | 2.65 | 2.37 | 2.60 | 1.27 | 2.98 | 5.57 | 3.39 |
| 7 | Leaning Juniper I | 1.56 | 1.41 | 0.35 | 0.41 | 0.39 | 2.56 | 0.00 | 0.31 | 0.29 | 0.38 | 0.41 | 1.20 | 0.38 | 0.06 | 0.28 | 0.05 | 0.45 | 0.06 | 0.56 | 0.67 | 0.16 | 1.48 | 0.44 | 0.25 | 3.64 | 0.42 | 0.31 | 1.59 | 0.58 | 0.05 | 0.29 | 0.16 | 2.53 | 0.15 | 0.26 | 0.20 | 0.19 | 0.05 | 2.43 | 0.49 | 3.28 | 0.84 |
| 8 | Big Horn | 1.67 | 1.50 | 0.40 | 0.67 | 0.42 | 2.62 | 0.31 | 0.00 | 0.12 | 0.39 | 0.29 | 1.25 | 0.39 | 0.26 | 0.50 | 0.30 | 0.50 | 0.26 | 0.45 | 0.58 | 0.15 | 1.58 | 0.49 | 0.19 | 3.45 | 0.39 | 0.00 | 1.28 | 0.54 | 0.36 | 0.08 | 0.33 | 2.57 | 0.39 | 0.53 | 0.13 | 0.39 | 0.33 | 2.63 | 0.37 | 3.07 | 0.81 |
| 9 | White Creek | 1.75 | 1.59 | 0.28 | 0.59 | 0.30 | 2.72 | 0.29 | 0.12 | 0.00 | 0.27 | 0.18 | 1.35 | 0.27 | 0.24 | 0.54 | 0.30 | 0.38 | 0.24 | 0.34 | 0.47 | 0.16 | 1.67 | 0.37 | 0.08 | 3.38 | 0.27 | 0.12 | 1.34 | 0.43 | 0.33 | 0.19 | 0.37 | 2.68 | 0.41 | 0.55 | 0.10 | 0.43 | 0.30 | 2.69 | 0.26 | 3.01 | 0.69 |
| 10 | Klondike 3 | 1.94 | 1.79 | 0.05 | 0.44 | 0.03 | 2.93 | 0.38 | 0.39 | 0.27 | 0.00 | 0.15 | 1.57 | 0.00 | 0.34 | 0.67 | 0.42 | 0.11 | 0.34 | 0.21 | 0.30 | 0.36 | 1.86 | 0.10 | 0.21 | 3.27 | 0.05 | 0.39 | 1.52 | 0.20 | 0.38 | 0.45 | 0.53 | 2.90 | 0.53 | 0.64 | 0.30 | 0.57 | 0.35 | 2.80 | 0.17 | 2.92 | 0.46 |
| 11 | Goodnoe Hills | 1.92 | 1.77 | 0.19 | 0.57 | 0.18 | 2.90 | 0.41 | 0.29 | 0.18 | 0.15 | 0.00 | 1.52 | 0.15 | 0.35 | 0.68 | 0.43 | 0.25 | 0.35 | 0.17 | 0.29 | 0.32 | 1.84 | 0.24 | 0.17 | 3.23 | 0.12 | 0.29 | 1.37 | 0.25 | 0.42 | 0.37 | 0.52 | 2.85 | 0.55 | 0.67 | 0.25 | 0.57 | 0.39 | 2.83 | 0.08 | 2.87 | 0.51 |
| 12 | Nine Canyon I-II | 0.48 | 0.29 | 1.54 | 1.51 | 1.58 | 1.37 | 1.20 | 1.25 | 1.35 | 1.57 | 1.52 | 0.00 | 1.57 | 1.23 | 0.95 | 1.16 | 1.65 | 1.23 | 1.69 | 1.82 | 1.21 | 0.40 | 1.64 | 1.37 | 4.66 | 1.59 | 1.25 | 1.92 | 1.76 | 1.22 | 1.17 | 1.05 | 1.33 | 1.06 | 1.02 | 1.28 | 1.01 | 1.25 | 1.62 | 1.61 | 4.25 | 2.02 |
| 13 | Klondike 3A | 1.94 | 1.79 | 0.05 | 0.44 | 0.03 | 2.93 | 0.38 | 0.39 | 0.27 | 0.00 | 0.15 | 1.57 | 0.00 | 0.34 | 0.67 | 0.42 | 0.11 | 0.34 | 0.21 | 0.30 | 0.36 | 1.86 | 0.10 | 0.21 | 3.27 | 0.05 | 0.39 | 1.52 | 0.20 | 0.38 | 0.45 | 0.53 | 2.90 | 0.53 | 0.64 | 0.30 | 0.57 | 0.35 | 2.80 | 0.17 | 2.92 | 0.46 |
| 14 | Arlington Wind | 1.60 | 1.46 | 0.31 | 0.42 | 0.34 | 2.60 | 0.06 | 0.26 | 0.24 | 0.34 | 0.35 | 1.23 | 0.34 | 0.00 | 0.33 | 0.08 | 0.41 | 0.00 | 0.51 | 0.62 | 0.12 | 1.52 | 0.41 | 0.19 | 3.58 | 0.37 | 0.26 | 1.54 | 0.54 | 0.10 | 0.25 | 0.19 | 2.57 | 0.20 | 0.32 | 0.14 | 0.23 | 0.07 | 2.48 | 0.43 | 3.22 | 0.80 |
| 15 | Willow Creek | 1.28 | 1.14 | 0.64 | 0.57 | 0.67 | 2.29 | 0.28 | 0.50 | 0.54 | 0.67 | 0.68 | 0.95 | 0.67 | 0.33 | 0.00 | 0.25 | 0.73 | 0.33 | 0.84 | 0.95 | 0.38 | 1.20 | 0.72 | 0.51 | 3.91 | 0.70 | 0.50 | 1.71 | 0.87 | 0.29 | 0.44 | 0.17 | 2.27 | 0.13 | 0.09 | 0.44 | 0.11 | 0.32 | 2.15 | 0.76 | 3.55 | 1.12 |
| 16 | Pebble Springs | 1.52 | 1.37 | 0.39 | 0.45 | 0.42 | 2.52 | 0.05 | 0.30 | 0.30 | 0.42 | 0.43 | 1.16 | 0.42 | 0.08 | 0.25 | 0.00 | 0.49 | 0.08 | 0.59 | 0.70 | 0.15 | 1.44 | 0.49 | 0.26 | 3.66 | 0.45 | 0.30 | 1.57 | 0.62 | 0.09 | 0.26 | 0.11 | 2.49 | 0.12 | 0.25 | 0.20 | 0.15 | 0.09 | 2.40 | 0.51 | 3.30 | 0.88 |
| 17 | Hay Canyon | 2.01 | 1.86 | 0.11 | 0.40 | 0.08 | 3.01 | 0.45 | 0.50 | 0.38 | 0.11 | 0.25 | 1.65 | 0.11 | 0.41 | 0.73 | 0.49 | 0.00 | 0.41 | 0.26 | 0.30 | 0.45 | 1.93 | 0.02 | 0.32 | 3.24 | 0.13 | 0.50 | 1.62 | 0.18 | 0.44 | 0.55 | 0.60 | 2.98 | 0.60 | 0.68 | 0.40 | 0.64 | 0.41 | 2.83 | 0.25 | 2.91 | 0.40 |
| 18 | Wheatfield Wind | 1.60 | 1.46 | 0.31 | 0.42 | 0.34 | 2.60 | 0.06 | 0.26 | 0.24 | 0.34 | 0.35 | 1.23 | 0.34 | 0.00 | 0.33 | 0.08 | 0.41 | 0.00 | 0.51 | 0.62 | 0.12 | 1.52 | 0.41 | 0.19 | 3.58 | 0.37 | 0.26 | 1.54 | 0.54 | 0.10 | 0.25 | 0.19 | 2.57 | 0.20 | 0.32 | 0.14 | 0.23 | 0.07 | 2.48 | 0.43 | 3.22 | 0.80 |
| 19 | Toulumne | 2.09 | 1.93 | 0.26 | 0.65 | 0.24 | 3.06 | 0.56 | 0.45 | 0.34 | 0.21 | 0.17 | 1.69 | 0.21 | 0.51 | 0.84 | 0.59 | 0.26 | 0.51 | 0.00 | 0.13 | 0.48 | 2.01 | 0.25 | 0.33 | 3.07 | 0.17 | 0.45 | 1.38 | 0.14 | 0.57 | 0.53 | 0.68 | 3.02 | 0.71 | 0.82 | 0.42 | 0.74 | 0.54 | 2.99 | 0.08 | 2.72 | 0.37 |
| 20 | Windy Flats Dooley | 2.21 | 2.06 | 0.34 | 0.70 | 0.31 | 3.19 | 0.67 | 0.58 | 0.47 | 0.30 | 0.29 | 1.82 | 0.30 | 0.62 | 0.95 | 0.70 | 0.30 | 0.62 | 0.13 | 0.00 | 0.61 | 2.13 | 0.29 | 0.45 | 2.97 | 0.25 | 0.58 | 1.44 | 0.12 | 0.68 | 0.65 | 0.80 | 3.15 | 0.82 | 0.93 | 0.54 | 0.85 | 0.64 | 3.09 | 0.21 | 2.63 | 0.25 |
| 21 | Harvest-White Creek III | 1.61 | 1.45 | 0.35 | 0.54 | 0.37 | 2.58 | 0.16 | 0.15 | 0.16 | 0.36 | 0.32 | 1.21 | 0.36 | 0.12 | 0.38 | 0.15 | 0.45 | 0.12 | 0.48 | 0.61 | 0.00 | 1.52 | 0.44 | 0.15 | 3.54 | 0.37 | 0.15 | 1.43 | 0.54 | 0.21 | 0.13 | 0.21 | 2.55 | 0.25 | 0.39 | 0.07 | 0.27 | 0.19 | 2.53 | 0.40 | 3.17 | 0.81 |
| 22 | Combine Hills | 0.08 | 0.12 | 1.83 | 1.72 | 1.86 | 1.10 | 1.48 | 1.58 | 1.67 | 1.86 | 1.84 | 0.40 | 1.86 | 1.52 | 1.20 | 1.44 | 1.93 | 1.52 | 2.01 | 2.13 | 1.52 | 0.00 | 1.92 | 1.67 | 5.02 | 1.89 | 1.58 | 2.33 | 2.06 | 1.49 | 1.50 | 1.33 | 1.10 | 1.33 | 1.25 | 1.59 | 1.29 | 1.52 | 1.23 | 1.92 | 4.63 | 2.32 |
| 23 | Star Point | 2.00 | 1.86 | 0.10 | 0.41 | 0.07 | 3.00 | 0.44 | 0.49 | 0.37 | 0.10 | 0.24 | 1.64 | 0.10 | 0.41 | 0.72 | 0.49 | 0.02 | 0.41 | 0.25 | 0.29 | 0.44 | 1.92 | 0.00 | 0.31 | 3.24 | 0.12 | 0.49 | 1.60 | 0.17 | 0.44 | 0.54 | 0.60 | 2.97 | 0.59 | 0.68 | 0.39 | 0.63 | 0.41 | 2.83 | 0.24 | 2.91 | 0.40 |
| 24 | Linden Ranch | 1.76 | 1.60 | 0.21 | 0.51 | 0.24 | 2.74 | 0.25 | 0.19 | 0.08 | 0.21 | 0.17 | 1.37 | 0.21 | 0.19 | 0.51 | 0.26 | 0.32 | 0.19 | 0.33 | 0.45 | 0.15 | 1.67 | 0.31 | 0.00 | 3.40 | 0.22 | 0.19 | 1.42 | 0.39 | 0.27 | 0.24 | 0.35 | 2.70 | 0.38 | 0.51 | 0.09 | 0.41 | 0.24 | 2.66 | 0.25 | 3.04 | 0.66 |
| 25 | Coastal Energy Wind | 5.11 | 4.93 | 3.31 | 3.61 | 3.27 | 6.00 | 3.64 | 3.45 | 3.38 | 3.27 | 3.23 | 4.66 | 3.27 | 3.58 | 3.91 | 3.66 | 3.24 | 3.58 | 3.07 | 2.97 | 3.54 | 5.02 | 3.24 | 3.40 | 0.00 | 3.23 | 3.45 | 3.10 | 3.07 | 3.65 | 3.54 | 3.75 | 5.92 | 3.78 | 3.90 | 3.47 | 3.80 | 3.61 | 6.06 | 3.15 | 0.49 | 2.86 |
| 26 | Biglow Canyon Phase 1 - 4 | 1.97 | 1.82 | 0.09 | 0.49 | 0.07 | 2.95 | 0.42 | 0.39 | 0.27 | 0.05 | 0.12 | 1.59 | 0.05 | 0.37 | 0.70 | 0.45 | 0.13 | 0.37 | 0.17 | 0.25 | 0.37 | 1.89 | 0.12 | 0.22 | 3.23 | 0.00 | 0.39 | 1.49 | 0.17 | 0.42 | 0.45 | 0.55 | 2.92 | 0.57 | 0.67 | 0.31 | 0.60 | 0.39 | 2.84 | 0.13 | 2.88 | 0.44 |
| 27 | Big Horn Phase 2 | 1.67 | 1.50 | 0.40 | 0.67 | 0.42 | 2.62 | 0.31 | 0.00 | 0.12 | 0.39 | 0.29 | 1.25 | 0.39 | 0.26 | 0.50 | 0.30 | 0.50 | 0.26 | 0.45 | 0.58 | 0.15 | 1.58 | 0.49 | 0.19 | 3.45 | 0.39 | 0.00 | 1.28 | 0.54 | 0.36 | 0.08 | 0.33 | 2.57 | 0.39 | 0.53 | 0.13 | 0.39 | 0.33 | 2.63 | 0.37 | 3.07 | 0.81 |
| 28 | Kittitas Valley | 2.40 | 2.21 | 1.56 | 1.93 | 1.56 | 3.08 | 1.59 | 1.28 | 1.34 | 1.52 | 1.37 | 1.92 | 1.52 | 1.54 | 1.71 | 1.57 | 1.62 | 1.54 | 1.38 | 1.44 | 1.43 | 2.33 | 1.60 | 1.42 | 3.10 | 1.49 | 1.28 | 0.00 | 1.52 | 1.64 | 1.31 | 1.57 | 2.96 | 1.63 | 1.77 | 1.41 | 1.62 | 1.61 | 3.54 | 1.37 | 2.63 | 1.64 |
| 29 | Patu (Oregon Trail Wind) | 2.14 | 1.99 | 0.24 | 0.58 | 0.20 | 3.12 | 0.58 | 0.54 | 0.43 | 0.20 | 0.25 | 1.76 | 0.20 | 0.54 | 0.87 | 0.62 | 0.18 | 0.54 | 0.14 | 0.12 | 0.54 | 2.06 | 0.17 | 0.39 | 3.07 | 0.17 | 0.54 | 1.52 | 0.00 | 0.58 | 0.61 | 0.72 | 3.09 | 0.73 | 0.84 | 0.48 | 0.77 | 0.55 | 2.99 | 0.19 | 2.74 | 0.27 |
| 30 | Leaning Juniper II | 1.57 | 1.43 | 0.35 | 0.36 | 0.38 | 2.57 | 0.05 | 0.36 | 0.33 | 0.38 | 0.42 | 1.22 | 0.38 | 0.10 | 0.29 | 0.09 | 0.44 | 0.10 | 0.57 | 0.68 | 0.21 | 1.49 | 0.44 | 0.27 | 3.65 | 0.42 | 0.36 | 1.64 | 0.58 | 0.00 | 0.34 | 0.19 | 2.55 | 0.16 | 0.25 | 0.24 | 0.21 | 0.04 | 2.42 | 0.50 | 3.29 | 0.84 |
| 31 | Juniper Canyon 1 | 1.58 | 1.42 | 0.45 | 0.67 | 0.47 | 2.54 | 0.29 | 0.08 | 0.19 | 0.45 | 0.37 | 1.17 | 0.45 | 0.25 | 0.44 | 0.26 | 0.55 | 0.25 | 0.53 | 0.65 | 0.13 | 1.50 | 0.54 | 0.24 | 3.54 | 0.45 | 0.08 | 1.31 | 0.61 | 0.34 | 0.00 | 0.27 | 2.49 | 0.33 | 0.47 | 0.16 | 0.33 | 0.32 | 2.55 | 0.44 | 3.15 | 0.88 |
| 32 | North Hurlburt | 1.41 | 1.27 | 0.50 | 0.54 | 0.53 | 2.41 | 0.16 | 0.33 | 0.37 | 0.53 | 0.52 | 1.05 | 0.53 | 0.19 | 0.17 | 0.11 | 0.60 | 0.19 | 0.68 | 0.80 | 0.21 | 1.33 | 0.60 | 0.35 | 3.75 | 0.55 | 0.33 | 1.57 | 0.72 | 0.19 | 0.27 | 0.00 | 2.38 | 0.07 | 0.20 | 0.27 | 0.06 | 0.20 | 2.32 | 0.60 | 3.38 | 0.99 |
| 33 | Lower Snake Wind Phase 1 | 1.04 | 1.13 | 2.88 | 2.81 | 2.91 | 0.19 | 2.53 | 2.57 | 2.68 | 2.90 | 2.85 | 1.33 | 2.90 | 2.57 | 2.27 | 2.49 | 2.98 | 2.57 | 3.02 | 3.15 | 2.55 | 1.10 | 2.97 | 2.70 | 5.92 | 2.92 | 2.57 | 2.96 | 3.09 | 2.55 | 2.49 | 2.38 | 0.00 | 2.39 | 2.33 | 2.61 | 2.34 | 2.58 | 1.43 | 2.94 | 5.48 | 3.36 |
| 34 | South Hurlburt | 1.41 | 1.27 | 0.50 | 0.49 | 0.54 | 2.41 | 0.15 | 0.39 | 0.41 | 0.53 | 0.55 | 1.06 | 0.53 | 0.20 | 0.13 | 0.12 | 0.60 | 0.20 | 0.71 | 0.82 | 0.25 | 1.33 | 0.59 | 0.38 | 3.78 | 0.57 | 0.39 | 1.63 | 0.73 | 0.16 | 0.33 | 0.07 | 2.39 | 0.00 | 0.14 | 0.31 | 0.05 | 0.19 | 2.28 | 0.63 | 3.42 | 0.99 |
| 35 | HorseShoe Bend | 1.33 | 1.20 | 0.60 | 0.49 | 0.63 | 2.35 | 0.26 | 0.53 | 0.55 | 0.64 | 0.67 | 1.02 | 0.64 | 0.32 | 0.09 | 0.25 | 0.68 | 0.32 | 0.82 | 0.93 | 0.39 | 1.25 | 0.68 | 0.51 | 3.90 | 0.67 | 0.53 | 1.77 | 0.84 | 0.25 | 0.47 | 0.20 | 2.33 | 0.14 | 0.00 | 0.45 | 0.15 | 0.29 | 2.16 | 0.75 | 3.54 | 1.08 |
| 36 | Miller Ranch Phase 1 | 1.67 | 1.52 | 0.29 | 0.53 | 0.32 | 2.65 | 0.20 | 0.13 | 0.10 | 0.30 | 0.25 | 1.28 | 0.30 | 0.14 | 0.44 | 0.20 | 0.40 | 0.14 | 0.42 | 0.54 | 0.07 | 1.59 | 0.39 | 0.09 | 3.47 | 0.31 | 0.13 | 1.41 | 0.48 | 0.24 | 0.16 | 0.27 | 2.61 | 0.31 | 0.45 | 0.00 | 0.33 | 0.21 | 2.59 | 0.33 | 3.11 | 0.75 |
| 37 | Eight Mile Canyon | 1.37 | 1.22 | 0.54 | 0.54 | 0.58 | 2.37 | 0.19 | 0.39 | 0.43 | 0.57 | 0.57 | 1.01 | 0.57 | 0.23 | 0.11 | 0.15 | 0.64 | 0.23 | 0.74 | 0.85 | 0.27 | 1.29 | 0.63 | 0.41 | 3.80 | 0.60 | 0.39 | 1.62 | 0.77 | 0.21 | 0.33 | 0.06 | 2.34 | 0.05 | 0.15 | 0.33 | 0.00 | 0.23 | 2.26 | 0.66 | 3.44 | 1.03 |
| 38 | Montague 1 | 1.60 | 1.46 | 0.32 | 0.36 | 0.35 | 2.60 | 0.05 | 0.33 | 0.30 | 0.35 | 0.39 | 1.25 | 0.35 | 0.07 | 0.32 | 0.09 | 0.41 | 0.07 | 0.54 | 0.64 | 0.19 | 1.52 | 0.41 | 0.24 | 3.61 | 0.39 | 0.33 | 1.61 | 0.55 | 0.04 | 0.32 | 0.20 | 2.58 | 0.19 | 0.29 | 0.21 | 0.23 | 0.00 | 2.45 | 0.46 | 3.26 | 0.80 |
| 39 | Antelope Ridge Wind | 1.17 | 1.35 | 2.76 | 2.50 | 2.79 | 1.27 | 2.43 | 2.63 | 2.69 | 2.80 | 2.83 | 1.62 | 2.80 | 2.48 | 2.15 | 2.40 | 2.83 | 2.48 | 2.99 | 3.09 | 2.53 | 1.23 | 2.83 | 2.66 | 6.06 | 2.84 | 2.63 | 3.54 | 2.99 | 2.42 | 2.55 | 2.32 | 1.43 | 2.28 | 2.16 | 2.59 | 2.26 | 2.45 | 0.00 | 2.91 | 5.70 | 3.23 |
| 40 | Windy Flats 2 | 2.01 | 1.85 | 0.22 | 0.61 | 0.20 | 2.98 | 0.49 | 0.37 | 0.26 | 0.17 | 0.08 | 1.61 | 0.17 | 0.43 | 0.76 | 0.51 | 0.25 | 0.43 | 0.08 | 0.21 | 0.40 | 1.92 | 0.24 | 0.25 | 3.15 | 0.13 | 0.37 | 1.37 | 0.19 | 0.50 | 0.44 | 0.60 | 2.94 | 0.63 | 0.75 | 0.33 | 0.66 | 0.46 | 2.91 | 0.00 | 2.79 | 0.44 |
| 41 | Coyote Crest Phase 1 | 4.71 | 4.53 | 2.97 | 3.30 | 2.93 | 5.57 | 3.28 | 3.07 | 3.01 | 2.92 | 2.87 | 4.25 | 2.92 | 3.22 | 3.55 | 3.30 | 2.91 | 3.22 | 2.72 | 2.63 | 3.17 | 4.63 | 2.91 | 3.04 | 0.49 | 2.88 | 3.07 | 2.63 | 2.74 | 3.29 | 3.15 | 3.38 | 5.48 | 3.42 | 3.54 | 3.11 | 3.44 | 3.26 | 5.70 | 2.79 | 0.00 | 2.55 |
| 42 | Summit Ridge Wind | 2.40 | 2.25 | 0.49 | 0.75 | 0.45 | 3.39 | 0.84 | 0.81 | 0.69 | 0.46 | 0.51 | 2.02 | 0.46 | 0.80 | 1.12 | 0.88 | 0.40 | 0.80 | 0.37 | 0.25 | 0.81 | 2.32 | 0.40 | 0.66 | 2.86 | 0.44 | 0.81 | 1.64 | 0.27 | 0.84 | 0.88 | 0.99 | 3.36 | 0.99 | 1.08 | 0.75 | 1.03 | 0.80 | 3.23 | 0.44 | 2.55 | 0.00 |

**Table 2.6**
**Wind Facility Time Offset Matrix in FY 2014-2015 Balancing Reserve Capacity Quantity Forecast (Minutes)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Project Name** | Vansycle | Stateline | Klondike I | Condon | Klondike II | Blue Sky/Hopkins Ridge | Leaning Juniper I | Big Horn | White Creek | Klondike 3 | Goodnoe Hills | Nine Canyon I-II | Klondike 3A | Arlington Wind | Willow Creek | Pebble Springs | Hay Canyon | Wheatfield Wind | Toulumne | Windy Flats Dooley | Harvest-White Creek III | Combine Hills | Star Point | Linden Ranch | Coastal Energy Wind | Biglow Canyon Phase 1 - 4 | Big Horn Phase 2 | Kittitas Valley | Patu (Oregon Trail Wind) | Leaning Juniper II | Juniper Canyon 1 | North Hurlburt | Lower Snake Wind Phase 1 | South Hurlburt | HorseShoe Bend | Miller Ranch Phase 1 | Eight Mile Canyon | Montague 1 | Antelope Ridge Wind | Windy Flats 2 | Coyote Crest Phase 1 | Summit Ridge Wind |
| 1 | Vansycle | 0 | 6 | 269 | 144 | 219 | -106 | 146 | 164 | 148 | 231 | 176 | 27 | 264 | 189 | 116 | 141 | 268 | 209 | 180 | 215 | 125 | -5 | 206 | 182 | 500 | 178 | 101 | 46 | 152 | 123 | 85 | 1 | -60 | 60 | 60 | 70 | 60 | 80 | 200 | 90 | 520 | 110 |
| 2 | Stateline | -6 | 0 | 235 | 169 | 188 | -98 | 122 | 128 | 133 | 206 | 163 | 21 | 227 | 154 | 98 | 115 | 245 | 171 | 175 | 186 | 108 | -8 | 195 | 166 | 500 | 161 | 103 | 20 | 136 | 98 | 76 | 35 | -60 | 60 | 60 | 70 | 60 | 80 | 310 | 90 | 470 | 130 |
| 3 | Klondike I | -269 | -235 | 0 | 36 | 0 | -331 | -30 | -13 | -28 | -2 | -15 | -168 | 0 | -27 | -57 | -48 | 2 | -19 | -26 | -4 | -31 | -274 | -3 | -3 | 500 | -4 | 61 | -10 | -3 | -67 | -106 | -59 | -180 | -20 | -20 | -10 | -20 | -10 | 60 | 0 | 380 | 20 |
| 4 | Condon | -144 | -169 | -36 | 0 | -102 | -303 | -72 | -52 | -62 | -62 | -62 | -125 | -38 | -55 | -94 | -71 | -24 | -56 | -94 | -100 | -92 | -194 | -33 | -69 | 446 | -71 | -19 | -136 | -121 | -97 | -81 | -191 | -290 | -30 | -30 | -30 | -30 | -20 | -30 | 0 | 170 | 0 |
| 5 | Klondike II | -219 | -188 | 0 | 102 | 0 | -258 | -25 | 0 | -17 | -1 | -8 | -143 | 1 | -19 | -54 | -35 | 3 | -13 | -9 | 3 | -22 | -209 | -1 | 3 | 500 | -2 | 67 | -2 | 0 | -59 | -93 | -52 | -160 | -20 | -20 | -10 | -20 | -10 | 70 | 0 | 390 | 20 |
| 6 | Blue Sky/Hopkins Ridge | 106 | 98 | 331 | 303 | 258 | 0 | 201 | 213 | 225 | 303 | 250 | 112 | 320 | 225 | 194 | 202 | 339 | 238 | 262 | 245 | 181 | 93 | 284 | 242 | 500 | 244 | 183 | 69 | 210 | 195 | 173 | 124 | 0 | 100 | 100 | 100 | 100 | 130 | 380 | 120 | 610 | 150 |
| 7 | Leaning Juniper I | -146 | -122 | 30 | 72 | 25 | -201 | 0 | 14 | 3 | 24 | 5 | -64 | 28 | 0 | -15 | -7 | 38 | 5 | 1 | 18 | 1 | -173 | 15 | 22 | 500 | 20 | 32 | 0 | 22 | -2 | -1 | -17 | -140 | -10 | -10 | 0 | -10 | 0 | 140 | 20 | 380 | 30 |
| 8 | Big Horn | -164 | -128 | 13 | 52 | 0 | -213 | -14 | 0 | 1 | 4 | 9 | -83 | 11 | -4 | -35 | -18 | 25 | -2 | -13 | 4 | -1 | -197 | -2 | 17 | 474 | 0 | 0 | -102 | 3 | -70 | -10 | -18 | -120 | 0 | 0 | 0 | 0 | 0 | 270 | 20 | 180 | 30 |
| 9 | White Creek | -148 | -133 | 28 | 62 | 17 | -225 | -3 | -1 | 0 | 19 | 10 | -88 | 26 | 0 | -19 | -7 | 37 | 2 | 5 | 16 | 0 | -133 | 18 | 19 | 500 | 5 | 1 | -8 | 5 | -3 | -4 | -12 | -130 | -10 | -10 | 0 | -10 | 0 | 190 | 10 | 160 | 20 |
| 10 | Klondike 3 | -231 | -206 | 2 | 62 | 1 | -303 | -24 | -4 | -19 | 0 | -8 | -146 | 1 | -20 | -54 | -42 | 5 | -15 | -17 | 1 | -23 | -234 | -3 | 4 | 500 | -1 | 83 | -6 | 1 | -70 | -103 | -50 | -150 | -20 | -20 | -10 | -20 | -10 | 80 | 0 | 400 | 20 |
| 11 | Goodnoe Hills | -176 | -163 | 15 | 62 | 8 | -250 | -5 | -9 | -10 | 8 | 0 | -106 | 15 | -1 | -42 | -21 | 18 | -1 | 3 | 9 | -8 | -170 | 4 | 13 | 500 | 5 | 7 | 7 | 5 | -12 | -13 | -26 | -140 | -20 | -20 | -10 | -20 | -10 | 100 | 0 | 380 | 20 |
| 12 | Nine Canyon I-II | -27 | -21 | 168 | 125 | 143 | -112 | 64 | 83 | 88 | 146 | 106 | 0 | 137 | 68 | 51 | 55 | 138 | 95 | 124 | 123 | 77 | -28 | 115 | 115 | 500 | 105 | 75 | -14 | 103 | -5 | 38 | -6 | -50 | 30 | 30 | 60 | 30 | 50 | 520 | 80 | 370 | 100 |
| 13 | Klondike 3A | -264 | -227 | 0 | 38 | -1 | -320 | -28 | -11 | -26 | -1 | -15 | -137 | 0 | -23 | -58 | -42 | 2 | -17 | -23 | -4 | -27 | -260 | -2 | -2 | 500 | -4 | 2 | -9 | -3 | -66 | -92 | -64 | -150 | -20 | -20 | -10 | -20 | -10 | 80 | 0 | 400 | 20 |
| 14 | Arlington Wind | -189 | -154 | 27 | 55 | 19 | -225 | 0 | 4 | 0 | 20 | 1 | -68 | 23 | 0 | -19 | -9 | 29 | 3 | -5 | 7 | 0 | -217 | 6 | 7 | 500 | 17 | 7 | 0 | 16 | -3 | -8 | -15 | -130 | -10 | -10 | 0 | -10 | 0 | 150 | 20 | 390 | 30 |
| 15 | Willow Creek | -116 | -98 | 57 | 94 | 54 | -194 | 15 | 35 | 19 | 54 | 42 | -51 | 58 | 19 | 0 | 6 | 78 | 24 | 45 | 62 | 14 | -117 | 56 | 64 | 500 | 43 | 82 | 5 | 47 | 8 | -16 | 0 | -120 | 0 | 0 | 10 | 0 | 10 | 190 | 30 | 490 | 50 |
| 16 | Pebble Springs | -141 | -115 | 48 | 71 | 35 | -202 | 7 | 18 | 7 | 42 | 21 | -55 | 42 | 9 | -6 | 0 | 50 | 14 | 10 | 34 | 7 | -148 | 20 | 35 | 500 | 35 | 8 | -8 | 40 | 1 | -10 | -4 | -130 | 0 | -10 | 0 | -10 | 0 | 150 | 20 | 380 | 30 |
| 17 | Hay Canyon | -268 | -245 | -2 | 24 | -3 | -339 | -38 | -25 | -37 | -5 | -18 | -138 | -2 | -29 | -78 | -50 | 0 | -22 | -36 | -16 | -37 | -264 | -4 | -12 | 464 | -6 | 3 | -11 | -10 | -77 | -91 | -132 | -160 | -20 | -20 | -10 | -20 | -10 | 70 | 0 | 380 | 20 |
| 18 | Wheatfield Wind | -209 | -171 | 19 | 56 | 13 | -238 | -5 | 2 | -2 | 15 | 1 | -95 | 17 | -3 | -24 | -14 | 22 | 0 | -8 | 7 | -1 | -217 | 5 | 6 | 500 | 13 | 35 | 0 | 15 | -7 | -40 | -19 | -130 | -10 | -10 | 0 | -10 | 0 | 150 | 20 | 390 | 30 |
| 19 | Toulumne | -180 | -175 | 26 | 94 | 9 | -262 | -1 | 13 | -5 | 17 | -3 | -124 | 23 | 5 | -45 | -10 | 36 | 8 | 0 | 7 | 0 | -159 | 11 | 7 | 401 | 5 | 64 | 3 | 3 | 0 | 4 | -2 | -140 | -30 | -30 | -10 | -30 | -10 | 80 | 0 | 130 | 10 |
| 20 | Windy Flats Dooley | -215 | -186 | 4 | 100 | -3 | -245 | -18 | -4 | -16 | -1 | -9 | -123 | 4 | -7 | -62 | -34 | 16 | -7 | -7 | 0 | -9 | -198 | -1 | 0 | 500 | -2 | 66 | 1 | -4 | -35 | 4 | -35 | -140 | -30 | -30 | -10 | -30 | -10 | 80 | 0 | 130 | 10 |
| 21 | Harvest-White Creek III | -125 | -108 | 31 | 92 | 22 | -181 | -1 | 1 | 0 | 23 | 8 | -77 | 27 | 0 | -14 | -7 | 37 | 1 | 0 | 9 | 0 | -126 | 8 | 17 | 500 | 12 | 4 | -7 | 10 | -2 | 0 | -8 | -130 | 0 | -10 | 0 | -10 | 0 | 150 | 20 | 380 | 30 |
| 22 | Combine Hills | 5 | 8 | 274 | 194 | 209 | -93 | 173 | 197 | 133 | 234 | 170 | 28 | 260 | 217 | 117 | 148 | 264 | 217 | 159 | 198 | 126 | 0 | 206 | 179 | 500 | 180 | 207 | 119 | 151 | 148 | 127 | 43 | -80 | 50 | 50 | 20 | 50 | 50 | 10 | 40 | 400 | 60 |
| 23 | Star Point | -206 | -195 | 3 | 33 | 1 | -284 | -15 | 2 | -18 | 3 | -4 | -115 | 2 | -6 | -56 | -20 | 4 | -5 | -11 | 1 | -8 | -206 | 0 | 1 | 487 | 1 | 4 | -2 | -8 | -65 | -69 | -102 | -160 | -20 | -20 | -10 | -20 | -10 | 70 | 0 | 380 | 20 |
| 24 | Linden Ranch | -182 | -166 | 3 | 69 | -3 | -242 | -22 | -17 | -19 | -4 | -13 | -115 | 2 | -7 | -64 | -35 | 12 | -6 | -7 | 0 | -17 | -179 | -1 | 0 | 497 | -3 | 32 | -7 | -4 | -23 | 0 | -40 | -120 | 0 | -10 | 0 | -10 | 0 | 220 | 10 | 170 | 30 |
| 25 | Coastal Energy Wind | -500 | -500 | -500 | -446 | -500 | -500 | -500 | -474 | -500 | -500 | -500 | -500 | -500 | -500 | -500 | -500 | -464 | -500 | -401 | -500 | -500 | -500 | -487 | -497 | 0 | -500 | -466 | -500 | -500 | -500 | -489 | -500 | -730 | -500 | -500 | -190 | -500 | -400 | -420 | -190 | -20 | -180 |
| 26 | Biglow Canyon Phase 1 - 4 | -178 | -161 | 4 | 71 | 2 | -244 | -20 | 0 | -5 | 1 | -5 | -105 | 4 | -17 | -43 | -35 | 6 | -13 | -5 | 2 | -12 | -180 | -1 | 3 | 500 | 0 | 65 | 2 | 1 | -33 | -76 | -41 | -150 | -20 | -20 | -10 | -20 | -10 | 80 | 0 | 370 | 20 |
| 27 | Big Horn Phase 2 | -101 | -103 | -61 | 19 | -67 | -183 | -32 | 0 | -1 | -83 | -7 | -75 | -2 | -7 | -82 | -8 | -3 | -35 | -64 | -66 | -4 | -207 | -4 | -32 | 466 | -65 | 0 | -177 | -80 | -79 | -6 | -81 | -120 | 0 | 0 | 0 | 0 | 0 | 270 | 20 | 180 | 30 |
| 28 | Kittitas Valley | -46 | -20 | 10 | 136 | 2 | -69 | 0 | 102 | 8 | 6 | -7 | 14 | 9 | 0 | -5 | 8 | 11 | 0 | -3 | -1 | 7 | -119 | 2 | 7 | 500 | -2 | 177 | 0 | -2 | -1 | 67 | 88 | -80 | 0 | 0 | 20 | 0 | 10 | -110 | 40 | 360 | 40 |
| 29 | Patu (Oregon Trail Wind) | -152 | -136 | 3 | 121 | 0 | -210 | -22 | -3 | -5 | -1 | -5 | -103 | 3 | -16 | -47 | -40 | 10 | -15 | -3 | 4 | -10 | -151 | 8 | 4 | 500 | -1 | 80 | 2 | 0 | -39 | -91 | -55 | -150 | -20 | -20 | -10 | -20 | -10 | 70 | 0 | 340 | 20 |
| 30 | Leaning Juniper II | -123 | -98 | 67 | 97 | 59 | -195 | 2 | 70 | 3 | 70 | 12 | 5 | 66 | 3 | -8 | -1 | 77 | 7 | 0 | 35 | 2 | -148 | 65 | 23 | 500 | 33 | 79 | 1 | 39 | 0 | 4 | -12 | -140 | -10 | -10 | 0 | -10 | 0 | 120 | 10 | 370 | 30 |
| 31 | Juniper Canyon 1 | -85 | -76 | 106 | 81 | 93 | -173 | 1 | 10 | 4 | 103 | 13 | -38 | 92 | 8 | 16 | 10 | 91 | 40 | -4 | -4 | 0 | -127 | 69 | 0 | 489 | 76 | 6 | -67 | 91 | -4 | 0 | -7 | -130 | 0 | 0 | 0 | 0 | 0 | 440 | 20 | 200 | 30 |
| 32 | North Hurlburt | -1 | -35 | 59 | 191 | 52 | -124 | 17 | 18 | 12 | 50 | 26 | 6 | 64 | 15 | 0 | 4 | 132 | 19 | 2 | 35 | 8 | -43 | 102 | 40 | 500 | 41 | 81 | -88 | 55 | 12 | 7 | 0 | -120 | 0 | 0 | 10 | 0 | 10 | 190 | 30 | 490 | 50 |
| 33 | Lower Snake Wind Phase 1 | 60 | 60 | 180 | 290 | 160 | 0 | 140 | 120 | 130 | 150 | 140 | 50 | 150 | 130 | 120 | 130 | 160 | 130 | 140 | 140 | 130 | 80 | 160 | 120 | 730 | 150 | 120 | 80 | 150 | 140 | 130 | 120 | 0 | 120 | 120 | 120 | 120 | 140 | 440 | 140 | 630 | 160 |
| 34 | South Hurlburt | -60 | -60 | 20 | 30 | 20 | -100 | 10 | 0 | 10 | 20 | 20 | -30 | 20 | 10 | 0 | 0 | 20 | 10 | 30 | 30 | 0 | -50 | 20 | 0 | 500 | 20 | 0 | 0 | 20 | 10 | 0 | 0 | -120 | 0 | 0 | 0 | 0 | 10 | 180 | 30 | 490 | 40 |
| 35 | HorseShoe Bend | -60 | -60 | 20 | 30 | 20 | -100 | 10 | 0 | 10 | 20 | 20 | -30 | 20 | 10 | 0 | 10 | 20 | 10 | 30 | 30 | 10 | -50 | 20 | 10 | 500 | 20 | 0 | 0 | 20 | 10 | 0 | 0 | -120 | 0 | 0 | 10 | 0 | 10 | 190 | 30 | 490 | 50 |
| 36 | Miller Ranch Phase 1 | -70 | -70 | 10 | 30 | 10 | -100 | 0 | 0 | 0 | 10 | 10 | -60 | 10 | 0 | -10 | 0 | 10 | 0 | 10 | 10 | 0 | -20 | 10 | 0 | 190 | 10 | 0 | -20 | 10 | 0 | 0 | -10 | -120 | 0 | -10 | 0 | -10 | 0 | 220 | 10 | 170 | 30 |
| 37 | Eight Mile Canyon | -60 | -60 | 20 | 30 | 20 | -100 | 10 | 0 | 10 | 20 | 20 | -30 | 20 | 10 | 0 | 10 | 20 | 10 | 30 | 30 | 10 | -50 | 20 | 10 | 500 | 20 | 0 | 0 | 20 | 10 | 0 | 0 | -120 | 0 | 0 | 10 | 0 | 10 | 190 | 30 | 490 | 50 |
| 38 | Montague 1 | -80 | -80 | 10 | 20 | 10 | -130 | 0 | 0 | 0 | 10 | 10 | -50 | 10 | 0 | -10 | 0 | 10 | 0 | 10 | 10 | 0 | -50 | 10 | 0 | 400 | 10 | 0 | -10 | 10 | 0 | 0 | -10 | -140 | -10 | -10 | 0 | -10 | 0 | 120 | 10 | 370 | 30 |
| 39 | Antelope Ridge Wind | -200 | -310 | -60 | 30 | -70 | -380 | -140 | -270 | -190 | -80 | -100 | -520 | -80 | -150 | -190 | -150 | -70 | -150 | -80 | -80 | -150 | -10 | -70 | -220 | 420 | -80 | -270 | 110 | -70 | -120 | -440 | -190 | -440 | -180 | -190 | -220 | -190 | -120 | 0 | -90 | 320 | -60 |
| 40 | Windy Flats 2 | -90 | -90 | 0 | 0 | 0 | -120 | -20 | -20 | -10 | 0 | 0 | -80 | 0 | -20 | -30 | -20 | 0 | -20 | 0 | 0 | -20 | -40 | 0 | -10 | 190 | 0 | -20 | -40 | 0 | -10 | -20 | -30 | -140 | -30 | -30 | -10 | -30 | -10 | 90 | 0 | 140 | 10 |
| 41 | Coyote Crest Phase 1 | -520 | -470 | -380 | -170 | -390 | -610 | -380 | -180 | -160 | -400 | -380 | -370 | -400 | -390 | -490 | -380 | -380 | -390 | -130 | -130 | -380 | -400 | -380 | -170 | 20 | -370 | -180 | -360 | -340 | -370 | -200 | -490 | -630 | -490 | -490 | -170 | -490 | -370 | -320 | -140 | 0 | -160 |
| 42 | Summit Ridge Wind | -110 | -130 | -20 | 0 | -20 | -150 | -30 | -30 | -20 | -20 | -20 | -100 | -20 | -30 | -50 | -30 | -20 | -30 | -10 | -10 | -30 | -60 | -20 | -30 | 180 | -20 | -30 | -40 | -20 | -30 | -30 | -50 | -160 | -40 | -50 | -30 | -50 | -30 | 60 | -10 | 160 | 0 |

**Table 2.7**
**Example of Load Net Wind Net Other Generation Types**

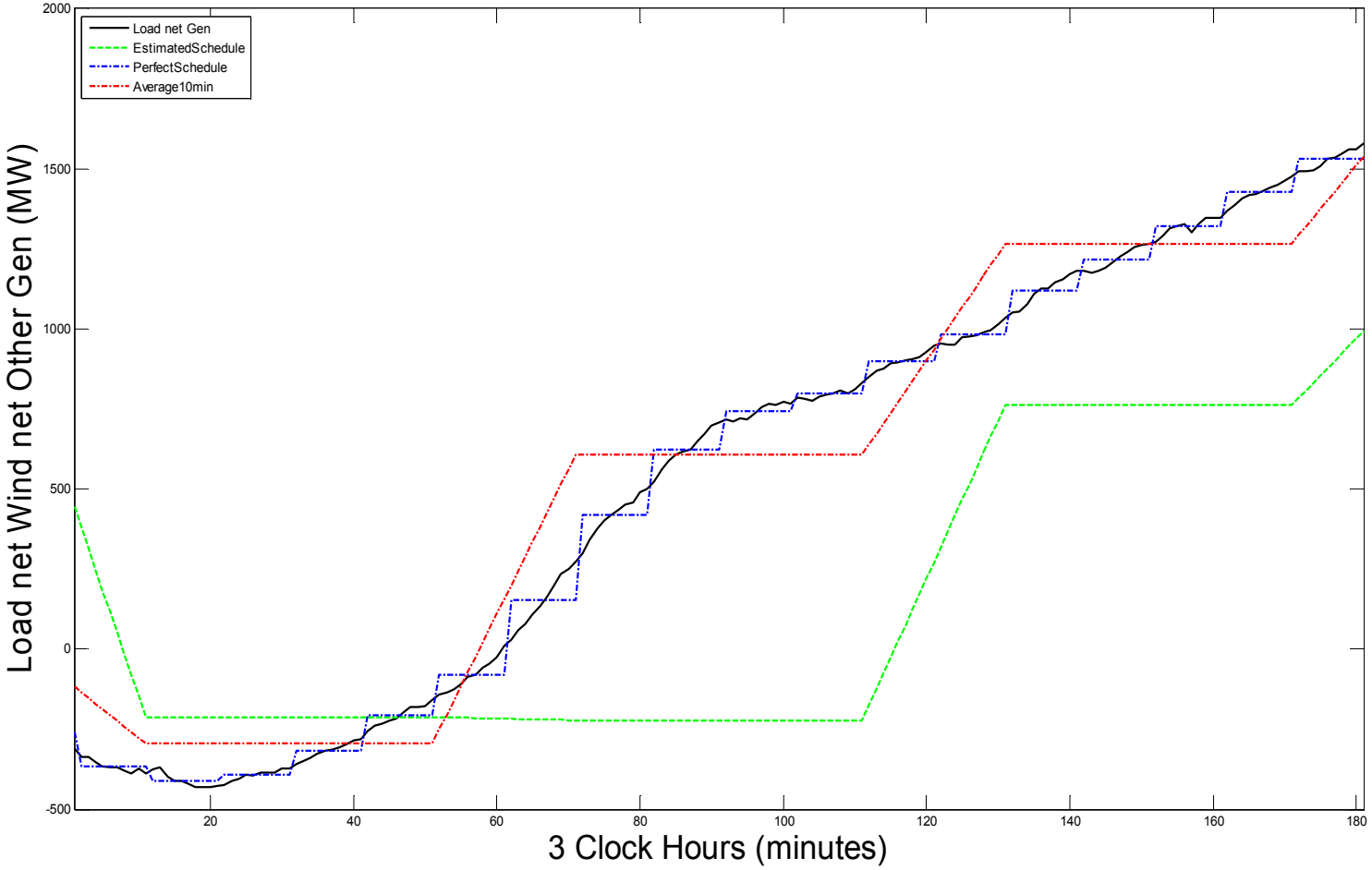


**Table 2.8**
**Incremental Standard Deviation Calculation Example**

$$\text{Reg } inc_{\text{Load HE1}} = \text{Total Reg } inc * R_{\text{Load Reg HE1, Total Reg HE1}} * S_{\text{Load Reg HE1}} / S_{\text{TotalReg HE1}}$$

$$\text{Reg } inc_{\text{Wind HE1}} = \text{Total Reg } inc * R_{\text{Wind Reg HE1, Total Reg HE1}} * S_{\text{Wind Reg HE1}} / S_{\text{TotalReg HE1}}$$

$$\text{Reg } inc_{\text{Solar HE1}} = \text{Total Reg } inc * R_{\text{Solar Reg HE1, Total Reg HE1}} * S_{\text{Solar Reg HE1}} / S_{\text{TotalReg HE1}}$$

$$\text{Reg } inc_{\text{Hydro HE1}} = \text{Total Reg } inc * R_{\text{Hydro Reg HE1, Total Reg HE1}} * S_{\text{Hydro Reg HE1}} / S_{\text{TotalReg HE1}}$$

$$\text{Reg } inc_{\text{Fed Thermal HE1}} = \text{Total Reg } inc * R_{\text{Fed Thermal Reg HE1, Total Reg HE1}} * S_{\text{Fed Thermal Reg HE1}} / S_{\text{TotalReg HE1}}$$

$$\text{Reg } inc_{\text{Non-Fed Thermal HE1}} = \text{Total Reg } inc * R_{\text{Non-Fed Thermal Reg HE1, Total Reg HE1}} * S_{\text{Non-Fed Thermal Reg HE1}} / S_{\text{TotalReg HE1}}$$

Where Total Reg *inc* is defined in Section 2.7.2

Reg is Regulating Reserves

HE1 is Hour Ending 1

$R_{\text{Load Reg HE1, Total Reg HE1}}$ = correlation between Load Reg HE1 and Total Reg HE1

$S_{\text{Load Reg HE1}}$ = standard deviation of Load Reg HE1

$S_{\text{Total Reg HE1}}$ = Standard deviation of Total Reg HE1

**Table 2.9**
**Load Regulation Incremental Reserves Example**

$$\text{Reg } inc_{\text{Load}} = \text{Total Reg } inc * \text{Reg } inc_{\text{Load Max24}} / \text{Reg } inc_{\text{Total Max24}}$$

Where Total Reg *inc* is defined in Section 2.7.2

Reg is Regulating Reserves

$$\text{Reg } inc_{\text{Load Max24}} = \text{MAX}(\text{Reg } inc_{\text{Load HE1}}, \text{Reg } inc_{\text{Load HE2}}, \ldots, \text{Reg } inc_{\text{Load HE24}})$$

$$\text{Reg } inc_{\text{Total Max24}} = \text{Reg } inc_{\text{Load Max24}} + \text{Reg } inc_{\text{Wind Max24}} + \text{Reg } inc_{\text{Solar Max24}} + \text{Reg } inc_{\text{Hydro Max24}} + \text{Reg } inc_{\text{Fed Thermal Max24}} + \text{Reg } inc_{\text{Non-Fed Thermal Max24}}$$

## Table 2.10
## Total Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | TOTAL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 540 | -759 | 1,028 | -1,254 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 572 | -798 | 1,075 | -1,309 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 572 | -798 | 1,075 | -1,309 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 572 | -798 | 1,075 | -1,309 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 572 | -798 | 1,075 | -1,309 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 127 | -126 | 379 | -387 | 571 | -797 | 1,076 | -1,310 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 127 | -126 | 379 | -387 | 571 | -797 | 1,076 | -1,310 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 587 | -817 | 1,100 | -1,339 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 587 | -817 | 1,100 | -1,339 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 587 | -817 | 1,100 | -1,339 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 586 | -819 | 1,099 | -1,341 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 586 | -819 | 1,099 | -1,341 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 586 | -819 | 1,099 | -1,341 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 129 | -128 | 390 | -401 | 603 | -844 | 1,122 | -1,372 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 129 | -128 | 390 | -401 | 603 | -844 | 1,122 | -1,372 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 132 | -131 | 393 | -404 | 608 | -850 | 1,133 | -1,385 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 132 | -131 | 393 | -404 | 608 | -850 | 1,133 | -1,385 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 126 | -125 | 377 | -387 | 571 | -798 | 1,074 | -1,310 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

## Table 2.11
## Load Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | LOAD* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 62 | -61 | 161 | -165 | 92 | -128 | 315 | -354 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 62 | -61 | 161 | -165 | 92 | -128 | 315 | -354 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 62 | -61 | 163 | -168 | 91 | -127 | 316 | -356 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 62 | -61 | 163 | -168 | 91 | -127 | 316 | -356 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 63 | -63 | 165 | -169 | 94 | -131 | 322 | -363 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 63 | -63 | 165 | -169 | 94 | -131 | 322 | -363 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 61 | -60 | 160 | -164 | 91 | -127 | 312 | -352 |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.12
## Wind Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | WIND* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 424 | -595 | 659 | -833 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 456 | -636 | 704 | -887 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 456 | -636 | 704 | -887 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 456 | -636 | 704 | -887 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 456 | -636 | 704 | -887 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 46 | -46 | 201 | -205 | 453 | -632 | 700 | -883 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 46 | -46 | 201 | -205 | 453 | -632 | 700 | -883 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -653 | 723 | -911 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -653 | 723 | -911 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -653 | 723 | -911 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -655 | 723 | -914 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -655 | 723 | -914 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 470 | -655 | 723 | -914 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 48 | -48 | 210 | -215 | 487 | -680 | 745 | -943 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 48 | -48 | 210 | -215 | 487 | -680 | 745 | -943 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 48 | -48 | 210 | -215 | 487 | -680 | 745 | -943 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 48 | -48 | 210 | -215 | 487 | -680 | 745 | -943 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 46 | -46 | 200 | -205 | 454 | -634 | 700 | -884 |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.13
## Non-Federal Thermal Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | NON-FEDERAL THERMAL* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 26 | -37 | 61 | -73 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 26 | -37 | 61 | -73 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 20 | -21 | 18 | -19 | 28 | -40 | 66 | -79 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 20 | -21 | 18 | -19 | 28 | -40 | 66 | -79 |
| 25 | **BP-14 AVG** | **4,871** | **15** | **2,527** | **5,192** | **19** | **-19** | **17** | **-18** | **26** | **-37** | **61** | **-74** |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.14
## Solar Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | SOLAR | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.15
## Federal Thermal Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)***

| | | INSTALLED CAPACITY | | | | FEDERAL THERMAL*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 25 | **BP-14 AVG** | **4,871** | **15** | **2,527** | **5,192** | **2** | **-2** | **2** | **-2** | **3** | **-4** | **7** | **-8** |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

***** Federal Thermal Balancing Reserve Requirements are included with Load (Table 2.11 BP-14-E-BPA-05A) and are listed here for acquisition cost allocation purposes only.**

## Table 2.16

## Non-AGC-Controlled Hydro Balancing Reserve Capacity Requirement (99.5% Reserves and No Self-Supply) (Values in MW)***

| | | INSTALLED CAPACITY | | | | Non-AGC-Controlled Hydro*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 6.20 | -6.13 | 2.22 | -2.27 | 17.91 | -24.96 | 26.33 | -33.36 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 6.20 | -6.13 | 2.22 | -2.27 | 17.91 | -24.96 | 26.33 | -33.36 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 25 | BP-14 AVG | **4,871** | **15** | **2,527** | **5,192** | **6.26** | **-6.19** | **2.26** | **-2.32** | **17.94** | **-25.07** | **26.46** | **-33.57** |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

***** Non-AGC Controlled Hydro Balancing Reserve Requirements are included with Load (Table 2.11 BP-14-E-BPA-05A) and are listed here for acquisition cost allocation purposes only.**

## Table 2.17

### Total Balancing Reserve Capacity, Total GI and Wind Total, Wind GI at 99.5% *with* Self-Supply
### (Values in MW)

| | | Installed Capacity | | SELF-SUPPLY WIND* | |
|---|---|---|---|---|---|
| | | WIND | | GI | |
| | | TOTAL | Self Supply | INC | DEC |
| | A | B | C | D | E |
| 1 | Oct-13 | 4,620 | 1,438 | 142 | -199 |
| 2 | Nov-13 | 4,620 | 1,438 | 142 | -199 |
| 3 | Dec-13 | 4,620 | 1,438 | 142 | -199 |
| 4 | Jan-14 | 4,620 | 1,438 | 142 | -199 |
| 5 | Feb-14 | 4,620 | 1,438 | 142 | -199 |
| 6 | Mar-14 | 4,620 | 1,438 | 142 | -199 |
| 7 | Apr-14 | 4,620 | 1,438 | 142 | -199 |
| 8 | May-14 | 4,620 | 1,438 | 142 | -199 |
| 9 | Jun-14 | 4,822 | 1,538 | 155 | -217 |
| 10 | Jul-14 | 4,822 | 1,538 | 155 | -217 |
| 11 | Aug-14 | 4,822 | 1,538 | 155 | -217 |
| 12 | Sep-14 | 4,822 | 1,538 | 155 | -217 |
| 13 | Oct-14 | 4,822 | 1,538 | 155 | -215 |
| 14 | Nov-14 | 4,822 | 1,538 | 155 | -215 |
| 15 | Dec-14 | 4,972 | 1,538 | 156 | -217 |
| 16 | Jan-15 | 4,972 | 1,538 | 156 | -217 |
| 17 | Feb-15 | 4,972 | 1,538 | 156 | -217 |
| 18 | Mar-15 | 5,100 | 1,538 | 155 | -217 |
| 19 | Apr-15 | 5,100 | 1,538 | 155 | -217 |
| 20 | May-15 | 5,100 | 1,538 | 155 | -217 |
| 21 | Jun-15 | 5,200 | 1,538 | 158 | -220 |
| 22 | Jul-15 | 5,200 | 1,538 | 158 | -220 |
| 23 | Aug-15 | 5,200 | 1,538 | 158 | -220 |
| 24 | Sep-15 | 5,200 | 1,538 | 158 | -220 |
| 25 | BP-14 AVG | **4,871** | **1,505** | **151** | **-211** |
| | NOTES: | | | | |
| | * | **Self-Supply Wind GI is the amount that Wind GI, Wind Total, Total GI and Total Balancing Reserves is reduced based on current Self-Supply participation.** | | | |

## Table 2.18
## Total Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | TOTAL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 123 | -122 | 365 | -373 | 398 | -560 | 886 | -1,055 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 416 | -582 | 919 | -1,093 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 416 | -582 | 919 | -1,093 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 416 | -582 | 919 | -1,093 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 126 | -125 | 377 | -386 | 416 | -582 | 919 | -1,093 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 127 | -126 | 379 | -387 | 417 | -582 | 922 | -1,095 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 127 | -126 | 379 | -387 | 417 | -582 | 922 | -1,095 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 431 | -600 | 943 | -1,121 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 431 | -600 | 943 | -1,121 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -394 | 431 | -600 | 943 | -1,121 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 431 | -602 | 944 | -1,125 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 431 | -602 | 944 | -1,125 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 128 | -127 | 385 | -395 | 431 | -602 | 944 | -1,125 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 129 | -128 | 390 | -401 | 445 | -623 | 964 | -1,152 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 129 | -128 | 390 | -401 | 445 | -623 | 964 | -1,152 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 132 | -131 | 393 | -404 | 450 | -630 | 975 | -1,165 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 132 | -131 | 393 | -404 | 450 | -630 | 975 | -1,165 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 126 | -125 | 377 | -387 | 419 | -587 | 923 | -1,099 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

## Table 2.19

### Load Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | LOAD * | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 60 | -60 | 157 | -160 | 90 | -127 | 307 | -346 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 60 | -60 | 159 | -163 | 90 | -126 | 309 | -348 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 62 | -61 | 161 | -165 | 92 | -128 | 315 | -354 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 62 | -61 | 161 | -165 | 92 | -128 | 315 | -354 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 92 | -127 | 316 | -355 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 62 | -61 | 162 | -166 | 91 | -127 | 315 | -355 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 62 | -61 | 163 | -168 | 91 | -127 | 316 | -356 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 62 | -61 | 163 | -168 | 91 | -127 | 316 | -356 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 63 | -63 | 165 | -169 | 94 | -131 | 322 | -363 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 63 | -63 | 165 | -169 | 94 | -131 | 322 | -363 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 61 | -60 | 160 | -164 | 91 | -127 | 312 | -352 |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.20
## Wind Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | WIND * | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 44 | -44 | 191 | -195 | 282 | -396 | 517 | -634 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 301 | -419 | 548 | -671 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 301 | -419 | 548 | -671 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 301 | -419 | 548 | -671 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 47 | -46 | 201 | -206 | 301 | -419 | 548 | -671 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 46 | -46 | 201 | -205 | 299 | -417 | 546 | -667 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 46 | -46 | 201 | -205 | 299 | -417 | 546 | -667 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 313 | -436 | 567 | -693 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 313 | -436 | 567 | -693 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 313 | -436 | 567 | -693 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 315 | -439 | 568 | -697 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 315 | -439 | 568 | -697 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 48 | -47 | 206 | -211 | 315 | -439 | 568 | -697 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 48 | -48 | 210 | -215 | 329 | -460 | 587 | -723 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 48 | -48 | 210 | -215 | 329 | -460 | 587 | -723 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 48 | -48 | 210 | -215 | 329 | -460 | 587 | -723 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 48 | -48 | 210 | -215 | 329 | -460 | 587 | -723 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 46 | -46 | 200 | -205 | 302 | -422 | 549 | -673 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

## Table 2.21
## Non-Federal Thermal Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | NON-FEDERAL THERMAL* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -38 | 62 | -74 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 26 | -37 | 61 | -73 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 26 | -37 | 61 | -73 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 19 | -19 | 16 | -17 | 25 | -36 | 60 | -73 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 20 | -21 | 18 | -19 | 28 | -40 | 66 | -79 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 20 | -21 | 18 | -19 | 28 | -40 | 66 | -79 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 19 | -19 | 17 | -18 | 26 | -37 | 61 | -74 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

## Table 2.22
## Solar Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)

| | | INSTALLED CAPACITY | | | | SOLAR | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.29 | 0.00 | -0.01 | 0.34 | -0.35 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 0.06 | -0.06 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 0.06 | -0.05 | 0.27 | -0.28 | 0.00 | -0.01 | 0.33 | -0.34 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 0.06 | -0.06 | 0.28 | -0.28 | 0.00 | -0.01 | 0.34 | -0.34 |

**NOTES:**

*** Load includes all Non-AGC-Controlled Hydro and Federal Thermal**

**** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity**

## Table 2.23
## Federal Thermal Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)***

| | | INSTALLED CAPACITY | | | | FEDERAL THERMAL*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 2 | -2 | 2 | -2 | 3 | -4 | 7 | -8 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

*** Federal Thermal Balancing Reserve Requirements are included with Load (Table 2.11 BP-14-E-BPA-05A) and are listed here for acquisition cost allocation purposes only.

## Table 2.24

## Non-AGC-Controlled Hydro Balancing Reserve Capacity Requirement (99.5% Reserves with Self-Supply) (Values in MW)***

| | | INSTALLED CAPACITY | | | | Non-AGC-Controlled Hydro*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REG | | LF | | GI | | TOTAL | |
| | | WIND | SOLAR | HYDRO | NON-FEDERAL THERMAL | INC | DEC | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H | I | J | K | L | M |
| 1 | Oct-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 2 | Nov-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 3 | Dec-13 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 4 | Jan-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 5 | Feb-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 6 | Mar-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 7 | Apr-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 8 | May-14 | 4,620 | 15 | 2,527 | 5,153 | 6.31 | -6.24 | 2.33 | -2.38 | 18.25 | -25.61 | 26.89 | -34.23 |
| 9 | Jun-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 10 | Jul-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 11 | Aug-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 12 | Sep-14 | 4,822 | 15 | 2,527 | 5,153 | 6.32 | -6.24 | 2.28 | -2.33 | 18.03 | -25.14 | 26.63 | -33.71 |
| 13 | Oct-14 | 4,822 | 15 | 2,527 | 5,153 | 6.20 | -6.13 | 2.22 | -2.27 | 17.91 | -24.96 | 26.33 | -33.36 |
| 14 | Nov-14 | 4,822 | 15 | 2,527 | 5,153 | 6.20 | -6.13 | 2.22 | -2.27 | 17.91 | -24.96 | 26.33 | -33.36 |
| 15 | Dec-14 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 16 | Jan-15 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 17 | Feb-15 | 4,972 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.21 | -2.27 | 17.80 | -24.75 | 26.22 | -33.16 |
| 18 | Mar-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 19 | Apr-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 20 | May-15 | 5,100 | 15 | 2,527 | 5,153 | 6.19 | -6.13 | 2.21 | -2.27 | 17.67 | -24.64 | 26.07 | -33.04 |
| 21 | Jun-15 | 5,200 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 22 | Jul-15 | 5,200 | 15 | 2,527 | 5,153 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 23 | Aug-15 | 5,200 | 15 | 2,527 | 5,617 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 24 | Sep-15 | 5,200 | 15 | 2,527 | 5,617 | 6.21 | -6.14 | 2.20 | -2.26 | 17.56 | -24.52 | 25.97 | -32.92 |
| 25 | BP-14 AVG | 4,871 | 15 | 2,527 | 5,192 | 6.26 | -6.19 | 2.26 | -2.32 | 17.94 | -25.07 | 26.46 | -33.57 |

**NOTES:**

* Load includes all Non-AGC-Controlled Hydro and Federal Thermal

** Thermal includes new Thermal and Biomass as an allocated amount by nameplate capacity

*** Non-AGC Controlled Hydro Balancing Reserve Requirements are included with Load (Table 2.11 BP-14-E-BPA-05A) and are listed here for acquisition cost allocation purposes only.

## Table 2.25
## Impact of 30/30 Committed Scheduling on the Total Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 60 MINUTE SCHEDULING BAA TOTAL | | 30 MINUTE SCHEDULING BAA TOTAL | | DELTA BAA TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H |
| 1 | Oct-13 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 2 | Nov-13 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 3 | Dec-13 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 4 | Jan-14 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 5 | Feb-14 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 6 | Mar-14 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 7 | Apr-14 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 8 | May-14 | 4,620 | 1028 MW | -1254 MW | 854 MW | -1016 MW | -174 MW (-17%) | -238 MW (-19%) |
| 9 | Jun-14 | 4,822 | 1075 MW | -1309 MW | 888 MW | -1059 MW | -187 MW (-17%) | -250 MW (-19%) |
| 10 | Jul-14 | 4,822 | 1075 MW | -1309 MW | 888 MW | -1059 MW | -187 MW (-17%) | -250 MW (-19%) |
| 11 | Aug-14 | 4,822 | 1075 MW | -1309 MW | 888 MW | -1059 MW | -187 MW (-17%) | -250 MW (-19%) |
| 12 | Sep-14 | 4,822 | 1075 MW | -1309 MW | 888 MW | -1059 MW | -187 MW (-17%) | -250 MW (-19%) |
| 13 | Oct-14 | 4,822 | 1076 MW | -1310 MW | 889 MW | -1060 MW | -187 MW (-17%) | -250 MW (-19%) |
| 14 | Nov-14 | 4,822 | 1076 MW | -1310 MW | 889 MW | -1060 MW | -187 MW (-17%) | -250 MW (-19%) |
| 15 | Dec-14 | 4,972 | 1100 MW | -1339 MW | 906 MW | -1083 MW | -194 MW (-18%) | -255 MW (-19%) |
| 16 | Jan-15 | 4,972 | 1100 MW | -1339 MW | 906 MW | -1083 MW | -194 MW (-18%) | -255 MW (-19%) |
| 17 | Feb-15 | 4,972 | 1100 MW | -1339 MW | 906 MW | -1083 MW | -194 MW (-18%) | -255 MW (-19%) |
| 18 | Mar-15 | 5,100 | 1099 MW | -1341 MW | 906 MW | -1085 MW | -193 MW (-18%) | -256 MW (-19%) |
| 19 | Apr-15 | 5,100 | 1099 MW | -1341 MW | 906 MW | -1085 MW | -193 MW (-18%) | -256 MW (-19%) |
| 20 | May-15 | 5,100 | 1099 MW | -1341 MW | 906 MW | -1085 MW | -193 MW (-18%) | -256 MW (-19%) |
| 21 | Jun-15 | 5,200 | 1122 MW | -1372 MW | 921 MW | -1107 MW | -201 MW (-18%) | -265 MW (-19%) |
| 22 | Jul-15 | 5,200 | 1122 MW | -1372 MW | 921 MW | -1107 MW | -201 MW (-18%) | -265 MW (-19%) |
| 23 | Aug-15 | 5,200 | 1133 MW | -1385 MW | 931 MW | -1120 MW | -202 MW (-18%) | -265 MW (-19%) |
| 24 | Sep-15 | 5,200 | 1133 MW | -1385 MW | 931 MW | -1120 MW | -202 MW (-18%) | -265 MW (-19%) |
| 25 | **BP-14 AVG** | **4,871** | **1074 MW** | **-1310 MW** | **888 MW** | **-1060 MW** | **-187 MW (-17%)** | **-250 MW (-19%)** |

## Table 2.26
## Impact of 30/30 Committed Scheduling on the Wind Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 60 MINUTE SCHEDULING WIND TOTAL | | 30 MINUTE SCHEDULING WIND TOTAL | | DELTA WIND TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | DEC | E | F | G | H |
| 1 | Oct-13 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 2 | Nov-13 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 3 | Dec-13 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 4 | Jan-14 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 5 | Feb-14 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 6 | Mar-14 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 7 | Apr-14 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 8 | May-14 | 4,620 | 659 MW | -833 MW | 498 MW | -612 MW | -174 MW (-26%) | -238 MW (-29%) |
| 9 | Jun-14 | 4,822 | 704 MW | -887 MW | 530 MW | -653 MW | -187 MW (-27%) | -250 MW (-28%) |
| 10 | Jul-14 | 4,822 | 704 MW | -887 MW | 530 MW | -653 MW | -187 MW (-27%) | -250 MW (-28%) |
| 11 | Aug-14 | 4,822 | 704 MW | -887 MW | 530 MW | -653 MW | -187 MW (-27%) | -250 MW (-28%) |
| 12 | Sep-14 | 4,822 | 704 MW | -887 MW | 530 MW | -653 MW | -187 MW (-27%) | -250 MW (-28%) |
| 13 | Oct-14 | 4,822 | 700 MW | -883 MW | 527 MW | -649 MW | -187 MW (-27%) | -250 MW (-28%) |
| 14 | Nov-14 | 4,822 | 700 MW | -883 MW | 527 MW | -649 MW | -187 MW (-27%) | -250 MW (-28%) |
| 15 | Dec-14 | 4,972 | 723 MW | -911 MW | 543 MW | -671 MW | -194 MW (-27%) | -255 MW (-28%) |
| 16 | Jan-15 | 4,972 | 723 MW | -911 MW | 543 MW | -671 MW | -194 MW (-27%) | -255 MW (-28%) |
| 17 | Feb-15 | 4,972 | 723 MW | -911 MW | 543 MW | -671 MW | -194 MW (-27%) | -255 MW (-28%) |
| 18 | Mar-15 | 5,100 | 723 MW | -914 MW | 544 MW | -673 MW | -193 MW (-27%) | -256 MW (-28%) |
| 19 | Apr-15 | 5,100 | 723 MW | -914 MW | 544 MW | -673 MW | -193 MW (-27%) | -256 MW (-28%) |
| 20 | May-15 | 5,100 | 723 MW | -914 MW | 544 MW | -673 MW | -193 MW (-27%) | -256 MW (-28%) |
| 21 | Jun-15 | 5,200 | 745 MW | -943 MW | 557 MW | -693 MW | -201 MW (-27%) | -265 MW (-28%) |
| 22 | Jul-15 | 5,200 | 745 MW | -943 MW | 557 MW | -693 MW | -201 MW (-27%) | -265 MW (-28%) |
| 23 | Aug-15 | 5,200 | 745 MW | -943 MW | 557 MW | -693 MW | -202 MW (-27%) | -265 MW (-28%) |
| 24 | Sep-15 | 5,200 | 745 MW | -943 MW | 557 MW | -693 MW | -202 MW (-27%) | -265 MW (-28%) |
| 25 | BP-14 AVG | **4,871** | **700 MW** | **-884 MW** | **527 MW** | **-650 MW** | **-187 MW (-27%)** | **-250 MW (-28%)** |

## Table 2.27
## Impact of 30/15 Committed Scheduling on the Total Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 60 MINUTE SCHEDULING BAA TOTAL | | 15 MINUTE SCHEDULING BAA TOTAL | | DELTA BAA TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H |
| 1 | Oct-13 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 2 | Nov-13 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 3 | Dec-13 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 4 | Jan-14 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 5 | Feb-14 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 6 | Mar-14 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 7 | Apr-14 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 8 | May-14 | 4,620 | 1028 MW | -1254 MW | 781 MW | -897 MW | -247 MW (-24%) | -357 MW (-28%) |
| 9 | Jun-14 | 4,822 | 1075 MW | -1309 MW | 808 MW | -934 MW | -267 MW (-25%) | -375 MW (-29%) |
| 10 | Jul-14 | 4,822 | 1075 MW | -1309 MW | 808 MW | -934 MW | -267 MW (-25%) | -375 MW (-29%) |
| 11 | Aug-14 | 4,822 | 1075 MW | -1309 MW | 808 MW | -934 MW | -267 MW (-25%) | -375 MW (-29%) |
| 12 | Sep-14 | 4,822 | 1075 MW | -1309 MW | 808 MW | -934 MW | -267 MW (-25%) | -375 MW (-29%) |
| 13 | Oct-14 | 4,822 | 1076 MW | -1310 MW | 810 MW | -935 MW | -266 MW (-25%) | -375 MW (-29%) |
| 14 | Nov-14 | 4,822 | 1076 MW | -1310 MW | 810 MW | -935 MW | -266 MW (-25%) | -375 MW (-29%) |
| 15 | Dec-14 | 4,972 | 1100 MW | -1339 MW | 823 MW | -955 MW | -277 MW (-25%) | -384 MW (-29%) |
| 16 | Jan-15 | 4,972 | 1100 MW | -1339 MW | 823 MW | -955 MW | -277 MW (-25%) | -384 MW (-29%) |
| 17 | Feb-15 | 4,972 | 1100 MW | -1339 MW | 823 MW | -955 MW | -277 MW (-25%) | -384 MW (-29%) |
| 18 | Mar-15 | 5,100 | 1099 MW | -1341 MW | 824 MW | -957 MW | -275 MW (-25%) | -385 MW (-29%) |
| 19 | Apr-15 | 5,100 | 1099 MW | -1341 MW | 824 MW | -957 MW | -275 MW (-25%) | -385 MW (-29%) |
| 20 | May-15 | 5,100 | 1099 MW | -1341 MW | 824 MW | -957 MW | -275 MW (-25%) | -385 MW (-29%) |
| 21 | Jun-15 | 5,200 | 1122 MW | -1372 MW | 835 MW | -974 MW | -287 MW (-26%) | -398 MW (-29%) |
| 22 | Jul-15 | 5,200 | 1122 MW | -1372 MW | 835 MW | -974 MW | -287 MW (-26%) | -398 MW (-29%) |
| 23 | Aug-15 | 5,200 | 1133 MW | -1385 MW | 846 MW | -987 MW | -287 MW (-25%) | -398 MW (-29%) |
| 24 | Sep-15 | 5,200 | 1133 MW | -1385 MW | 846 MW | -987 MW | -287 MW (-25%) | -398 MW (-29%) |
| 25 | BP-14 AVG | **4,871** | **1074 MW** | **-1310 MW** | **808 MW** | **-935 MW** | **-266 MW (-25%)** | **-375 MW (-29%)** |

## Table 2.28
## Impact of 30/15 Committed Scheduling on the Wind Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 60 MINUTE SCHEDULING WIND TOTAL | | 15 MINUTE SCHEDULING WIND TOTAL | | DELTA WIND TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H |
| 1 | Oct-13 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 2 | Nov-13 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 3 | Dec-13 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 4 | Jan-14 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 5 | Feb-14 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 6 | Mar-14 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 7 | Apr-14 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 8 | May-14 | 4,620 | 659 MW | -833 MW | 432 MW | -508 MW | -247 MW (-38%) | -357 MW (-43%) |
| 9 | Jun-14 | 4,822 | 704 MW | -887 MW | 458 MW | -543 MW | -267 MW (-38%) | -375 MW (-42%) |
| 10 | Jul-14 | 4,822 | 704 MW | -887 MW | 458 MW | -543 MW | -267 MW (-38%) | -375 MW (-42%) |
| 11 | Aug-14 | 4,822 | 704 MW | -887 MW | 458 MW | -543 MW | -267 MW (-38%) | -375 MW (-42%) |
| 12 | Sep-14 | 4,822 | 704 MW | -887 MW | 458 MW | -543 MW | -267 MW (-38%) | -375 MW (-42%) |
| 13 | Oct-14 | 4,822 | 700 MW | -883 MW | 456 MW | -539 MW | -266 MW (-38%) | -375 MW (-43%) |
| 14 | Nov-14 | 4,822 | 700 MW | -883 MW | 456 MW | -539 MW | -266 MW (-38%) | -375 MW (-43%) |
| 15 | Dec-14 | 4,972 | 723 MW | -911 MW | 468 MW | -557 MW | -277 MW (-38%) | -384 MW (-42%) |
| 16 | Jan-15 | 4,972 | 723 MW | -911 MW | 468 MW | -557 MW | -277 MW (-38%) | -384 MW (-42%) |
| 17 | Feb-15 | 4,972 | 723 MW | -911 MW | 468 MW | -557 MW | -277 MW (-38%) | -384 MW (-42%) |
| 18 | Mar-15 | 5,100 | 723 MW | -914 MW | 469 MW | -559 MW | -275 MW (-38%) | -385 MW (-42%) |
| 19 | Apr-15 | 5,100 | 723 MW | -914 MW | 469 MW | -559 MW | -275 MW (-38%) | -385 MW (-42%) |
| 20 | May-15 | 5,100 | 723 MW | -914 MW | 469 MW | -559 MW | -275 MW (-38%) | -385 MW (-42%) |
| 21 | Jun-15 | 5,200 | 745 MW | -943 MW | 480 MW | -575 MW | -287 MW (-38%) | -398 MW (-42%) |
| 22 | Jul-15 | 5,200 | 745 MW | -943 MW | 480 MW | -575 MW | -287 MW (-38%) | -398 MW (-42%) |
| 23 | Aug-15 | 5,200 | 745 MW | -943 MW | 480 MW | -575 MW | -287 MW (-39%) | -398 MW (-42%) |
| 24 | Sep-15 | 5,200 | 745 MW | -943 MW | 480 MW | -575 MW | -287 MW (-39%) | -398 MW (-42%) |
| 25 | BP-14 AVG | **4,871** | **700 MW** | **-884 MW** | **455 MW** | **-540 MW** | **-266 MW (-38%)** | **-375 MW (-42%)** |

## Table 2.29
## Impact of 45/60 Scheduling on the Total Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 30 MINUTE PERSISTENCE 60 MINUTE SCHEDULING BAA TOTAL | | 45 MINUTE PERSISTENCE 60 MINUTE SCHEDULING BAA TOTAL | | DELTA BAA TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H |
| 1 | Oct-13 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 2 | Nov-13 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 3 | Dec-13 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 4 | Jan-14 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 5 | Feb-14 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 6 | Mar-14 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 7 | Apr-14 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 8 | May-14 | 4,620 | 1028 MW | -1254 MW | 1174 MW | -1464 MW | 145 MW (14%) | 209 MW (17%) |
| 9 | Jun-14 | 4,822 | 1075 MW | -1309 MW | 1226 MW | -1529 MW | 151 MW (14%) | 220 MW (17%) |
| 10 | Jul-14 | 4,822 | 1075 MW | -1309 MW | 1226 MW | -1529 MW | 151 MW (14%) | 220 MW (17%) |
| 11 | Aug-14 | 4,822 | 1075 MW | -1309 MW | 1226 MW | -1529 MW | 151 MW (14%) | 220 MW (17%) |
| 12 | Sep-14 | 4,822 | 1075 MW | -1309 MW | 1226 MW | -1529 MW | 151 MW (14%) | 220 MW (17%) |
| 13 | Oct-14 | 4,822 | 1076 MW | -1310 MW | 1227 MW | -1530 MW | 151 MW (14%) | 219 MW (17%) |
| 14 | Nov-14 | 4,822 | 1076 MW | -1310 MW | 1227 MW | -1530 MW | 151 MW (14%) | 219 MW (17%) |
| 15 | Dec-14 | 4,972 | 1100 MW | -1339 MW | 1254 MW | -1566 MW | 154 MW (14%) | 227 MW (17%) |
| 16 | Jan-15 | 4,972 | 1100 MW | -1339 MW | 1254 MW | -1566 MW | 154 MW (14%) | 227 MW (17%) |
| 17 | Feb-15 | 4,972 | 1100 MW | -1339 MW | 1254 MW | -1566 MW | 154 MW (14%) | 227 MW (17%) |
| 18 | Mar-15 | 5,100 | 1099 MW | -1341 MW | 1253 MW | -1567 MW | 154 MW (14%) | 226 MW (17%) |
| 19 | Apr-15 | 5,100 | 1099 MW | -1341 MW | 1253 MW | -1567 MW | 154 MW (14%) | 226 MW (17%) |
| 20 | May-15 | 5,100 | 1099 MW | -1341 MW | 1253 MW | -1567 MW | 154 MW (14%) | 226 MW (17%) |
| 21 | Jun-15 | 5,200 | 1122 MW | -1372 MW | 1278 MW | -1605 MW | 156 MW (14%) | 233 MW (17%) |
| 22 | Jul-15 | 5,200 | 1122 MW | -1372 MW | 1278 MW | -1605 MW | 156 MW (14%) | 233 MW (17%) |
| 23 | Aug-15 | 5,200 | 1133 MW | -1385 MW | 1289 MW | -1619 MW | 156 MW (14%) | 233 MW (17%) |
| 24 | Sep-15 | 5,200 | 1133 MW | -1385 MW | 1289 MW | -1619 MW | 156 MW (14%) | 233 MW (17%) |
| 25 | BP-14 AVG | **4,871** | **1074 MW** | **-1310 MW** | **1225 MW** | **-1531 MW** | **151 MW (14%)** | **220 MW (17%)** |

## Table 2.30
## Impact of 45/60 Scheduling on the Wind Balancing Reserve Capacity

| | | INSTALLED CAPACITY | 30 MINUTE PERSISTENCE 60 MINUTE SCHEDULING BAA TOTAL | | 45 MINUTE PERSISTENCE 60 MINUTE SCHEDULING BAA TOTAL | | DELTA WIND TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | | WIND | INC | DEC | INC | DEC | INC | DEC |
| | A | B | C | D | E | F | G | H |
| 1 | Oct-13 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 2 | Nov-13 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 3 | Dec-13 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 4 | Jan-14 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 5 | Feb-14 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 6 | Mar-14 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 7 | Apr-14 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 8 | May-14 | 4,620 | 659 MW | -833 MW | 805 MW | -1043 MW | 145 MW (22%) | 209 MW (25%) |
| 9 | Jun-14 | 4,822 | 704 MW | -887 MW | 857 MW | -1108 MW | 151 MW (22%) | 220 MW (25%) |
| 10 | Jul-14 | 4,822 | 704 MW | -887 MW | 857 MW | -1108 MW | 151 MW (22%) | 220 MW (25%) |
| 11 | Aug-14 | 4,822 | 704 MW | -887 MW | 857 MW | -1108 MW | 151 MW (22%) | 220 MW (25%) |
| 12 | Sep-14 | 4,822 | 704 MW | -887 MW | 857 MW | -1108 MW | 151 MW (22%) | 220 MW (25%) |
| 13 | Oct-14 | 4,822 | 700 MW | -883 MW | 853 MW | -1103 MW | 151 MW (22%) | 219 MW (25%) |
| 14 | Nov-14 | 4,822 | 700 MW | -883 MW | 853 MW | -1103 MW | 151 MW (22%) | 219 MW (25%) |
| 15 | Dec-14 | 4,972 | 723 MW | -911 MW | 879 MW | -1139 MW | 154 MW (21%) | 227 MW (25%) |
| 16 | Jan-15 | 4,972 | 723 MW | -911 MW | 879 MW | -1139 MW | 154 MW (21%) | 227 MW (25%) |
| 17 | Feb-15 | 4,972 | 723 MW | -911 MW | 879 MW | -1139 MW | 154 MW (21%) | 227 MW (25%) |
| 18 | Mar-15 | 5,100 | 723 MW | -914 MW | 880 MW | -1141 MW | 154 MW (21%) | 226 MW (25%) |
| 19 | Apr-15 | 5,100 | 723 MW | -914 MW | 880 MW | -1141 MW | 154 MW (21%) | 226 MW (25%) |
| 20 | May-15 | 5,100 | 723 MW | -914 MW | 880 MW | -1141 MW | 154 MW (21%) | 226 MW (25%) |
| 21 | Jun-15 | 5,200 | 745 MW | -943 MW | 904 MW | -1178 MW | 156 MW (21%) | 233 MW (25%) |
| 22 | Jul-15 | 5,200 | 745 MW | -943 MW | 904 MW | -1178 MW | 156 MW (21%) | 233 MW (25%) |
| 23 | Aug-15 | 5,200 | 745 MW | -943 MW | 904 MW | -1178 MW | 156 MW (21%) | 233 MW (25%) |
| 24 | Sep-15 | 5,200 | 745 MW | -943 MW | 904 MW | -1178 MW | 156 MW (21%) | 233 MW (25%) |
| 25 | BP-14 AVG | **4,871** | **700 MW** | **-884 MW** | **853 MW** | **-1105 MW** | **151 MW (22%)** | **220 MW (25%)** |

**Table 2.31**
**Calculation of the *Inc* Balancing Reserve Capacity Requirement for Each VERBS Component as a Percent of Nameplate for Wind Under Different Scheduling Elections and for Solar**

| | | ***inc* Reserve Requirement** | | |
|---|---|---|---|---|
| | | **VERBS Regulation Component** | **VERBS Following Component** | **VERBS Imbalance Component** |
| | | A | B | C |
| 1 | Wind 30/30 Committed Schedule | 1.00% | 4.10% | 5.80% |
| 2 | Wind 30/60 Committed Schedule | 1.00% | 4.10% | 9.30% |
| 3 | Wind Uncommitted Schedule | 1.00% | 4.10% | 12.40% |
| 4 | Solar | 0.40% | 1.80% | 0.00% |

**Table 3.1**
**Regulated Federal Hydro 120-Hour Peaking Capacity for FY 2014 and FY 2015 Adjusted for Transmission Losses**
**1958 Water Conditions**

| | | | Annual Average | Oct | Nov | Dec | Jan | Feb | Mar | 1-Apr | 16-Apr | May | Jun | Jul | 1-Aug | 16-Aug | Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| 1 | **FY 2014** | | | | | | | | | | | | | | | | |
| 2 | Regulated Hydro (120 Hr.) | Capacity | **10,685** | 7,174 | 9,095 | 9,915 | 12,531 | 11,321 | 12,242 | 11,547 | 11,807 | 13,508 | 13,631 | 10,852 | 9,641 | 8,258 | 7,323 |
| 3 | Regulated Hydro (120 Hr.) | Energy | **8,617** | 5,423 | 6,999 | 7,289 | 9,473 | 8,360 | 9,075 | 9,649 | 10,169 | 13,048 | 12,680 | 8,624 | 7,358 | 6,526 | 5,596 |
| 4 | **FY 2015** | | | | | | | | | | | | | | | | |
| 5 | Regulated Hydro (120 Hr.) | Capacity | **10,721** | 7,035 | 9,231 | 10,244 | 12,683 | 11,602 | 12,329 | 11,673 | 11,889 | 13,585 | 13,621 | 10,698 | 9,219 | 8,283 | 7,096 |
| 6 | Regulated Hydro (120 Hr.) | Energy | **8,633** | 5,328 | 6,994 | 7,507 | 9,614 | 8,562 | 9,292 | 9,729 | 10,196 | 13,065 | 12,679 | 8,428 | 6,942 | 6,575 | 5,430 |
| 7 | **Annual Average for FY 2014-2015** | | | | | | | | | | | | | | | | |
| 8 | Regulated Hydro (120 Hr.) | Capacity | **10,703** | **7,105** | **9,163** | **10,079** | **12,607** | **11,462** | **12,285** | **11,610** | **11,848** | **13,547** | **13,626** | **10,775** | **9,430** | **8,271** | **7,209** |
| 9 | Regulated Hydro (120 Hr.) | Energy | **8,625** | **5,375** | **6,996** | **7,398** | **9,543** | **8,461** | **9,183** | **9,689** | **10,182** | **13,056** | **12,679** | **8,526** | **7,150** | **6,550** | **5,513** |
| 10 | Transmission Losses at 3.35% Loss Factor | | **359** | | | | | | | | | | | | | | |
| 11 | Regulated Federal Hydro Projects 120-Hour Peaking Capacity Adjusted for Transmission Losses | | **10,345** | | | | | | | | | | | | | | |

**Table 3.2**
**Big 10 Hydro Projects as a Percent of Regulated Hydro Projects Based on Energy for FY 2014-2015**
**1958 Water Conditions**

| | Energy (aMW) | FY 2014 | FY 2015 | Average for FY 2014-2015 |
|---|---|---|---|---|
| | **Regulated Hydro Projects** | **A** | **B** | **C** |
| 1 | Albeni Falls | 49 | 49 | 49 |
| 2 | **Bonneville** | **1,114** | **1,110** | **1,112** |
| 3 | **Chief Joseph** | **2,695** | **2,697** | **2,696** |
| 4 | Dworshak | 426 | 426 | 426 |
| 5 | **Grand Coulee** | **4,804** | **4,828** | **4,816** |
| 6 | Hungry Horse | 196 | 196 | 196 |
| 7 | **Ice Harbor** | **559** | **559** | **559** |
| 8 | **John Day** | **2,202** | **2,208** | **2,205** |
| 9 | Libby | 444 | 444 | 444 |
| 10 | **Little Goose** | **588** | **588** | **588** |
| 11 | **Lower Granite** | **592** | **590** | **591** |
| 12 | **Lower Monumental** | **636** | **636** | **636** |
| 13 | **McNary** | **1,282** | **1,285** | **1,284** |
| 14 | **The Dalles** | **1,646** | **1,650** | **1,648** |
| 15 | **Total Regulated Hydro** | **17,233** | **17,266** | **17,250** |
| 16 | **Total Big 10 Hydro** | | | **16,135** |
| 17 | **Big 10 Hydro Projects as a percent of Regulated Hydro** | | | **94%** |

**Big 10 Hydro Projects shown in bold.**

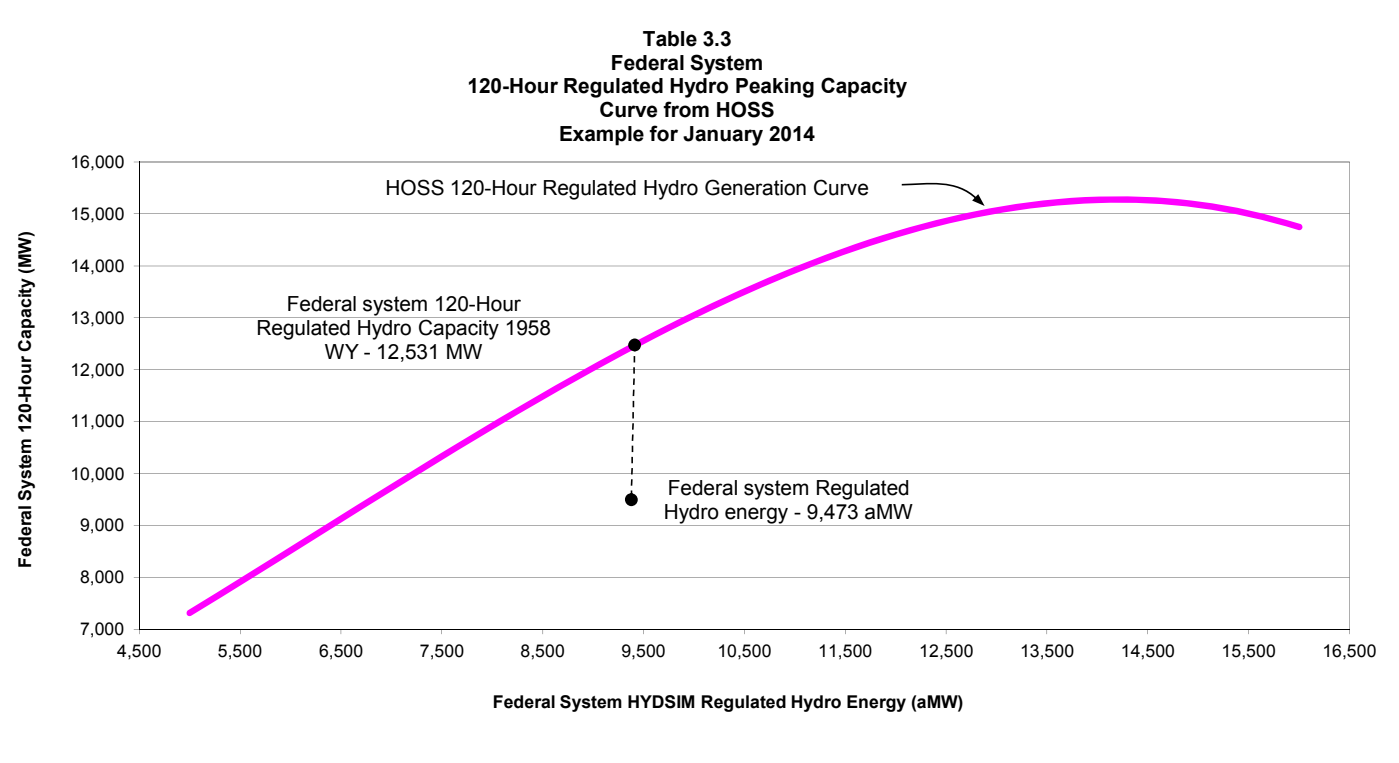


Table 3.3
Federal System
120-Hour Regulated Hydro Peaking Capacity
Curve from HOSS
Example for January 2014
HOSS 120-Hour Regulated Hydro Generation Curve
Federal system 120-Hour
Regulated Hydro Capacity 1958
WY - 12,531 MW
Federal system Regulated
Hydro energy - 9,473 aMW
Federal System 120-Hour Capacity (MW)
16,000
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
4,500
5,500
6,500
7,500
8,500
9,500
10,500
11,500
12,500
13,500
14,500
15,500
16,500
Federal System HYDSIM Regulated Hydro Energy (aMW)

**Table 3.4**
**Balancing Reserve Capacity Amounts Used as Inputs to HOSS**
**99.5% Level of Service with Self Supply of Generation Imbalance for 1505 MW of Installed Wind and 571 MW of Installed Wind Electing 30/30 Scheduling**

| | Month | Installed Wind Capacity (MW) | Total *Inc* (MW) | Total *Dec* (MW) |
|---|---|---|---|---|
| | A | B | C | D |
| 1 | Oct-13 | 4,620 | 863 | (1,024) |
| 2 | Nov-13 | 4,620 | 863 | (1,024) |
| 3 | Dec-13 | 4,620 | 863 | (1,024) |
| 4 | Jan-14 | 4,620 | 863 | (1,024) |
| 5 | Feb-14 | 4,620 | 863 | (1,024) |
| 6 | Mar-14 | 4,620 | 863 | (1,024) |
| 7 | Apr-14 | 4,620 | 863 | (1,024) |
| 8 | May-14 | 4,620 | 863 | (1,024) |
| 9 | Jun-14 | 4,822 | 892 | (1,059) |
| 10 | Jul-14 | 4,822 | 892 | (1,059) |
| 11 | Aug-14 | 4,822 | 892 | (1,059) |
| 12 | Sep-14 | 4,822 | 900 | (1,095) |
| 13 | Oct-14 | 4,822 | 900 | (1,100) |
| 14 | Nov-14 | 4,822 | 900 | (1,100) |
| 15 | Dec-14 | 4,972 | 900 | (1,100) |
| 16 | Jan-15 | 4,972 | 900 | (1,100) |
| 17 | Feb-15 | 4,972 | 900 | (1,100) |
| 18 | Mar-15 | 5,100 | 900 | (1,100) |
| 19 | Apr-15 | 5,100 | 900 | (1,100) |
| 20 | May-15 | 5,100 | 900 | (1,100) |
| 21 | Jun-15 | 5,200 | 900 | (1,100) |
| 22 | Jul-15 | 5,200 | 900 | (1,100) |
| 23 | Aug-15 | 5,200 | 900 | (1,100) |
| 24 | Sep-15 | 5,200 | 900 | (1,100) |
| 25 | BP-14 AVERAGE | 4,871 | 887 | -1,069 |

**Table 3.5**
**Balancing Reserve Capacity Reserve**
**Power Net Revenue Requirement for**
**Big 10 Projects in BPA Balancing Authority Area**
**($ in thousands)**

| | A | B | C | D |
|---|---|---|---|---|
| | | **FY 2014** | **FY 2015** | **Annual Average for FY 2014-FY 2015** |
| | | | | |
| 1 | **Big 10 Hydro Projects 1/** | | | |
| 2 | O&M | $ 256,216 | $ 263,137 | **$ 259,677** |
| 3 | Depreciation | $ 79,627 | $ 82,666 | **$ 81,147** |
| 4 | Net Interest | $ 112,224 | $ 116,789 | **$ 114,507** |
| 5 | Minimum Required Net Revenues | $ - | $ - | **$ -** |
| 6 | Planned Net Revenues for Risk | $ - | $ - | **$ -** |
| 7 | **Total Revenue Requirement** | $ 448,067 | $ 462,592 | **$ 455,330** |
| | | | | |
| 8 | **Fish & Wildlife** | | | |
| 9 | O&M | $ 320,779 | $ 327,467 | **$ 324,123** |
| 10 | Amortization/Depreciation | $ 50,375 | $ 54,085 | **$ 52,230** |
| 11 | Net Interest | $ 57,666 | $ 60,676 | **$ 59,171** |
| 12 | Minimum Required Net Revenues | $ - | $ - | **$ -** |
| 13 | Planned Net Revenues for Risk | $ - | $ - | **$ -** |
| 14 | **Subtotal** | $ 428,820 | $ 442,228 | **$ 435,524** |
| | | | | |
| 15 | **A&G Expense 2/** | $ 104,303 | $ 107,217 | **$ 105,760** |
| | | | | |
| 16 | **Total Revenue Requirement** | $ 981,190 | $ 1,012,037 | **$ 996,614** |
| 17 | **Revenue Credits** | | | |
| 18 | 4h10C (non-operations) | $ 65,878 | $ 63,265 | **$ 64,571** |
| 19 | Colville payment Treasury Credit | $ 4,600 | $ 4,600 | **$ 4,600** |
| 20 | Synchronous Condensing | $ 288 | $ 286 | **$ 287** |
| 21 | **Net Revenue Requirement** | $ 910,424 | $ 943,887 | $ 927,155 |

**1/** Excludes Boise, Minidoka-Palisades, Green Springs (Reclamation) and Lost Creek (COE).

**2/** Power Marketing Sales & Support, Power Scheduling, Generation Oversight, Corporate Expense and 1/2 Planning Council

| Table 3.6<br>Cost Allocation for Embedded Cost Portion of Balancing Reserve Capacity Reserves at 99.5% Level of Service with Self Supply of Generation Imbalance for VERBS | | |
|---|---|---|
| | **A** | **B** |
| | **Average water conditions (1958 water)** | **Annual Average of FY2014-FY2015** |
| | **Assumptions for Calculation:** | |
| 1 | Regulated Hydro Projects Adjusted for Transmission Losses (MW) | 10,345 |
| 2 | Regulating Reserve (MW) | 61 |
| 3 | Operating Reserve less Operating Reserve on rest of System (MW) 1/ | 534 |
| 4 | Following Capacity Reserve (MW) | 251 |
| 5 | Variable Energy Resource Balancing Service Reserve (MW) | 522 |
| 6 | Dispatchable Energy Resource Balancing Service Reserve (MW) | 61 |
| | **Forecast of Hydro Capacity System Uses:** | |
| 7 | Big 10 Hydro Projects Capacity<br>(Line 1 * .94) | 9,724 |
| 8 | Total PS Reserve Obligation<br>(Line 2+3+4+5+6) | 1,429 |
| 9 | Hydro Projects Capacity System Uses<br>(Line 7+8) | 11,153 |
| | **Adjusted Revenue Requirement:** | |
| 10 | PS Net Revenue Requirement for Big 10 Hydro Projects | $ 927,156,000 |
| 11 | Hydro Projects Capacity System Uses (Line 9) | 11,153 |
| 12 | Total kW/month/year Hydro Project Capacity System Uses<br>(Line 11 * 12 months * 1000 kW/MW) | 133,836,594 |
| 13 | **Unit Cost Allocation of Capacity System Uses $/kW/month<br>(Line 10 / Line 12)** | $ 6.93 |
| | **Revenue Forecast for Embedded Unit Cost by Balancing Reserve Capacity Service** | |
| 14 | Regulating Reserve<br>(Line 2 * Line 13 * 12 months * 1000 kW/MW ) | $ 5,072,760 |
| 15 | VERBS Reserve<br>(Line 5 * Line 13 * 12 months * 1000 kW/MW ) | $ 43,409,520 |
| 16 | DERBS Reserve (Line 6 * Line 13 * 12 months * 1000 kW/MW) | $ 5,072,760 |
| | **1/ The 558.9 MW for Operating Reserve is adjusted to account for 9% of the Non-Spinning portion (half of the total Operating Reserve) being supplied by the rest of the system. .** | |

**Table 3.7**
**Super Peak Market Prices for FY 2014 by Month and Water Year**
**($/MWh)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Water Year | Oct-13 | Nov-13 | Dec-13 | Jan-14 | Feb-14 | Mar-14 | Apr-14 | May-14 | Jun-14 | Jul-14 | Aug-14 | Sep-14 |
| 1 | 1929 | 31.45 | 35.02 | 43.73 | 42.47 | 43.58 | 36.58 | 32.37 | 28.16 | 29.11 | 35.01 | 35.97 | 34.64 |
| 2 | 1930 | 31.31 | 33.22 | 43.94 | 55.13 | 42.88 | 37.49 | 33.77 | 30.80 | 33.44 | 39.66 | 39.59 | 36.96 |
| 3 | 1931 | 33.84 | 37.74 | 45.46 | 46.96 | 45.87 | 35.41 | 33.77 | 28.32 | 31.90 | 38.27 | 41.65 | 36.47 |
| 4 | 1932 | 31.66 | 35.44 | 39.70 | 51.39 | 47.91 | 32.82 | 26.74 | 22.45 | 23.42 | 30.50 | 32.22 | 32.35 |
| 5 | 1933 | 29.18 | 30.72 | 33.71 | 36.69 | 34.86 | 31.17 | 29.25 | 27.73 | 24.93 | 27.71 | 32.29 | 35.65 |
| 6 | 1934 | 31.98 | 34.44 | 40.51 | 32.36 | 30.04 | 27.11 | 26.54 | 25.16 | 27.04 | 34.37 | 35.51 | 35.08 |
| 7 | 1935 | 31.66 | 34.33 | 43.13 | 37.41 | 35.33 | 32.82 | 30.86 | 28.16 | 29.57 | 34.74 | 34.12 | 38.25 |
| 8 | 1936 | 31.24 | 32.37 | 40.45 | 44.57 | 46.04 | 34.00 | 28.40 | 21.87 | 21.72 | 30.99 | 34.29 | 35.33 |
| 9 | 1937 | 29.35 | 35.11 | 38.35 | 45.71 | 55.46 | 35.15 | 31.90 | 27.19 | 28.86 | 33.65 | 34.76 | 32.49 |
| 10 | 1938 | 31.31 | 36.34 | 40.65 | 36.35 | 33.48 | 28.99 | 25.93 | 22.39 | 23.36 | 31.53 | 33.00 | 35.19 |
| 11 | 1939 | 31.60 | 33.52 | 38.88 | 40.00 | 37.90 | 33.40 | 29.56 | 27.42 | 28.57 | 36.88 | 38.80 | 35.31 |
| 12 | 1940 | 29.37 | 33.41 | 38.47 | 43.21 | 40.11 | 33.15 | 29.17 | 28.45 | 30.02 | 38.33 | 40.33 | 36.10 |
| 13 | 1941 | 29.47 | 33.28 | 35.17 | 41.82 | 40.39 | 34.12 | 30.89 | 27.37 | 28.75 | 33.14 | 36.67 | 34.66 |
| 14 | 1942 | 29.90 | 31.60 | 35.70 | 36.30 | 36.04 | 32.77 | 28.82 | 27.32 | 27.94 | 29.76 | 35.51 | 32.37 |
| 15 | 1943 | 29.98 | 32.90 | 39.98 | 35.32 | 32.25 | 28.93 | 19.98 | 16.61 | 19.52 | 27.51 | 31.53 | 33.99 |
| 16 | 1944 | 30.56 | 32.87 | 41.20 | 41.26 | 38.68 | 33.63 | 31.91 | 30.21 | 34.47 | 38.62 | 36.50 | 34.84 |
| 17 | 1945 | 31.13 | 32.94 | 37.43 | 41.01 | 38.39 | 34.50 | 34.32 | 26.21 | 25.63 | 33.78 | 33.84 | 32.77 |
| 18 | 1946 | 29.61 | 31.84 | 32.91 | 34.66 | 32.61 | 29.90 | 25.28 | 21.88 | 23.25 | 29.08 | 30.49 | 31.88 |
| 19 | 1947 | 26.36 | 28.61 | 31.58 | 33.79 | 30.34 | 28.10 | 26.35 | 23.64 | 23.66 | 27.61 | 31.25 | 31.70 |
| 20 | 1948 | 29.55 | 32.65 | 34.68 | 33.01 | 29.16 | 27.57 | 27.21 | 20.80 | 19.69 | 26.00 | 29.20 | 30.50 |
| 21 | 1949 | 30.18 | 32.41 | 35.86 | 35.18 | 33.96 | 28.53 | 25.22 | 21.05 | 22.07 | 33.23 | 35.09 | 34.43 |
| 22 | 1950 | 27.75 | 29.82 | 30.98 | 30.47 | 28.68 | 25.41 | 23.03 | 22.33 | 21.53 | 25.78 | 29.06 | 32.15 |
| 23 | 1951 | 25.90 | 29.09 | 34.89 | 31.11 | 28.41 | 24.55 | 22.46 | 21.51 | 23.56 | 28.93 | 30.51 | 33.50 |
| 24 | 1952 | 30.38 | 31.95 | 41.60 | 35.88 | 31.96 | 27.61 | 25.80 | 20.87 | 23.22 | 30.29 | 32.31 | 36.07 |
| 25 | 1953 | 29.26 | 31.74 | 33.95 | 36.90 | 34.33 | 30.18 | 28.57 | 26.61 | 23.56 | 25.98 | 30.78 | 32.06 |
| 26 | 1954 | 28.31 | 30.64 | 34.98 | 33.03 | 29.98 | 28.14 | 26.19 | 23.77 | 24.10 | 28.18 | 27.98 | 28.67 |
| 27 | 1955 | 29.02 | 29.98 | 33.32 | 36.84 | 38.40 | 34.80 | 29.96 | 27.41 | 24.08 | 27.47 | 30.51 | 34.73 |
| 28 | 1956 | 28.58 | 32.33 | 34.14 | 32.18 | 28.18 | 23.93 | 24.03 | 19.32 | 20.06 | 26.24 | 29.94 | 34.49 |
| 29 | 1957 | 29.96 | 34.43 | 39.76 | 34.98 | 33.80 | 29.33 | 26.68 | 21.15 | 22.42 | 31.83 | 33.30 | 34.52 |
| 30 | 1958 | 29.88 | 32.30 | 34.02 | 34.04 | 32.62 | 28.56 | 25.77 | 20.73 | 21.08 | 28.99 | 33.01 | 32.85 |
| 31 | 1959 | 26.16 | 28.10 | 32.92 | 34.62 | 30.96 | 29.14 | 27.92 | 26.97 | 26.60 | 30.84 | 32.52 | 29.57 |
| 32 | 1960 | 30.58 | 34.30 | 37.94 | 35.53 | 34.23 | 31.58 | 26.19 | 24.70 | 28.01 | 32.79 | 34.96 | 37.04 |
| 33 | 1961 | 31.79 | 34.38 | 40.52 | 36.73 | 32.54 | 27.75 | 26.94 | 25.89 | 25.39 | 31.55 | 36.20 | 36.73 |
| 34 | 1962 | 30.29 | 31.93 | 34.32 | 35.97 | 33.64 | 32.62 | 24.39 | 23.48 | 26.89 | 36.98 | 35.81 | 34.88 |
| 35 | 1963 | 30.25 | 33.89 | 38.31 | 36.18 | 32.30 | 30.62 | 28.35 | 27.49 | 27.29 | 31.33 | 34.25 | 34.06 |
| 36 | 1964 | 27.46 | 31.16 | 33.28 | 34.49 | 33.46 | 29.88 | 27.10 | 25.82 | 23.28 | 26.93 | 30.99 | 34.10 |
| 37 | 1965 | 30.78 | 33.26 | 38.81 | 31.56 | 28.05 | 25.38 | 26.05 | 24.33 | 24.99 | 32.10 | 30.33 | 34.86 |
| 38 | 1966 | 30.71 | 33.35 | 34.57 | 35.82 | 33.75 | 31.52 | 25.68 | 23.76 | 25.67 | 30.12 | 31.71 | 34.19 |
| 39 | 1967 | 30.40 | 33.49 | 37.18 | 33.39 | 29.35 | 26.24 | 26.77 | 26.31 | 22.50 | 27.52 | 34.41 | 36.81 |
| 40 | 1968 | 27.55 | 28.26 | 32.40 | 33.37 | 30.11 | 26.65 | 27.57 | 27.39 | 26.47 | 27.66 | 31.01 | 30.30 |
| 41 | 1969 | 27.80 | 29.01 | 35.73 | 32.30 | 30.98 | 26.97 | 23.85 | 14.51 | 17.87 | 26.77 | 28.90 | 32.59 |
| 42 | 1970 | 31.35 | 32.02 | 33.39 | 34.26 | 32.68 | 29.22 | 27.19 | 23.35 | 22.17 | 30.31 | 34.49 | 34.39 |
| 43 | 1971 | 26.56 | 29.53 | 32.99 | 29.95 | 27.48 | 22.48 | 21.13 | 17.87 | 16.22 | 23.50 | 26.66 | 29.63 |
| 44 | 1972 | 27.57 | 30.06 | 33.22 | 29.02 | 27.43 | 20.21 | 15.51 | 15.89 | 16.31 | 24.49 | 26.42 | 28.44 |
| 45 | 1973 | 30.05 | 32.70 | 31.28 | 31.52 | 30.61 | 30.69 | 30.03 | 25.34 | 25.20 | 32.87 | 34.26 | 33.05 |
| 46 | 1974 | 28.20 | 30.50 | 33.14 | 25.64 | 19.09 | 17.11 | 13.07 | 11.35 | 13.01 | 22.44 | 23.64 | 28.53 |
| 47 | 1975 | 28.08 | 28.21 | 29.82 | 29.80 | 27.90 | 24.63 | 23.42 | 18.26 | 18.40 | 25.20 | 29.80 | 31.65 |
| 48 | 1976 | 29.79 | 32.61 | 37.57 | 30.95 | 28.89 | 25.27 | 25.15 | 20.90 | 23.09 | 27.63 | 27.25 | 27.69 |
| 49 | 1977 | 31.11 | 34.13 | 35.75 | 41.29 | 40.89 | 36.41 | 33.04 | 31.15 | 34.81 | 37.00 | 36.38 | 35.84 |
| 50 | 1978 | 30.66 | 33.45 | 38.93 | 36.72 | 33.43 | 30.96 | 27.42 | 25.83 | 26.53 | 33.35 | 34.22 | 30.88 |
| 51 | 1979 | 31.36 | 33.68 | 40.80 | 41.26 | 40.70 | 32.66 | 31.42 | 28.99 | 29.68 | 37.43 | 39.33 | 37.17 |
| 52 | 1980 | 29.77 | 33.71 | 36.40 | 41.56 | 36.47 | 33.88 | 29.71 | 24.79 | 25.13 | 34.73 | 36.00 | 34.38 |
| 53 | 1981 | 30.05 | 32.13 | 35.47 | 35.09 | 31.50 | 30.62 | 28.09 | 25.39 | 24.70 | 28.67 | 30.56 | 33.52 |
| 54 | 1982 | 27.14 | 30.30 | 36.09 | 34.01 | 30.93 | 25.94 | 21.70 | 22.65 | 22.69 | 29.53 | 29.23 | 28.26 |
| 55 | 1983 | 28.91 | 28.67 | 34.59 | 35.19 | 31.33 | 27.84 | 24.07 | 24.81 | 24.34 | 29.91 | 31.39 | 33.43 |
| 56 | 1984 | 29.48 | 31.04 | 36.87 | 35.31 | 31.89 | 28.18 | 24.61 | 23.26 | 24.51 | 28.07 | 31.08 | 33.28 |
| 57 | 1985 | 31.03 | 30.02 | 34.79 | 39.47 | 36.32 | 30.97 | 28.12 | 25.30 | 25.77 | 39.56 | 40.21 | 37.18 |
| 58 | 1986 | 32.42 | 33.68 | 37.20 | 33.64 | 31.68 | 27.93 | 22.70 | 24.36 | 28.52 | 31.12 | 33.46 | 33.44 |
| 59 | 1987 | 32.73 | 34.53 | 40.07 | 39.36 | 37.49 | 30.68 | 29.36 | 26.93 | 27.58 | 35.18 | 40.12 | 34.40 |
| 60 | 1988 | 33.47 | 36.70 | 38.54 | 40.62 | 44.24 | 35.58 | 31.23 | 28.05 | 29.08 | 33.93 | 36.95 | 34.29 |
| 61 | 1989 | 34.06 | 33.90 | 36.60 | 36.81 | 38.37 | 31.17 | 26.30 | 25.64 | 27.05 | 33.54 | 36.16 | 35.68 |
| 62 | 1990 | 30.76 | 28.44 | 33.18 | 34.51 | 31.66 | 28.75 | 27.14 | 26.98 | 29.07 | 30.84 | 31.88 | 32.44 |
| 63 | 1991 | 30.48 | 32.87 | 39.61 | 34.10 | 31.89 | 28.39 | 27.22 | 25.72 | 27.46 | 30.89 | 29.74 | 33.85 |
| 64 | 1992 | 31.58 | 33.42 | 37.51 | 39.75 | 37.56 | 33.81 | 31.15 | 27.79 | 29.45 | 36.95 | 38.93 | 35.86 |
| 65 | 1993 | 33.44 | 33.35 | 41.75 | 41.19 | 41.28 | 32.99 | 29.64 | 26.68 | 26.64 | 32.68 | 34.76 | 35.03 |
| 66 | 1994 | 33.57 | 34.35 | 39.25 | 41.01 | 43.36 | 35.56 | 31.49 | 28.95 | 31.57 | 36.48 | 36.88 | 34.60 |
| 67 | 1995 | 31.02 | 31.95 | 32.70 | 38.37 | 35.48 | 31.58 | 29.19 | 28.23 | 28.85 | 31.34 | 37.89 | 35.89 |
| 68 | 1996 | 29.18 | 30.41 | 33.15 | 30.64 | 28.86 | 23.98 | 18.89 | 18.37 | 20.08 | 25.14 | 28.69 | 34.04 |
| 69 | 1997 | 25.76 | 30.12 | 34.52 | 27.84 | 26.68 | 22.57 | 21.24 | 22.70 | 23.75 | 27.06 | 29.48 | 32.12 |
| 70 | 1998 | 29.54 | 32.31 | 32.35 | 36.06 | 34.49 | 31.21 | 27.98 | 22.21 | 22.42 | 27.51 | 31.38 | 33.38 |
| 71 | 1999 | 30.27 | 32.23 | 36.08 | 32.57 | 30.31 | 25.76 | 23.20 | 25.22 | 23.30 | 27.72 | 28.82 | 29.96 |
| 72 | 2000 | 30.43 | 32.59 | 39.43 | 35.53 | 32.83 | 30.07 | 26.68 | 24.14 | 26.54 | 34.05 | 34.80 | 34.84 |
| 73 | 2001 | 32.99 | 34.34 | 38.82 | 40.48 | 38.73 | 35.95 | 33.34 | 31.05 | 37.00 | 41.84 | 39.17 | 36.53 |
| 74 | 2002 | 33.33 | 32.25 | 37.71 | 39.92 | 37.64 | 34.72 | 28.24 | 27.89 | 30.51 | 29.36 | 33.16 | 35.05 |
| 75 | 2003 | 32.13 | 35.22 | 39.30 | 37.48 | 38.18 | 30.06 | 28.62 | 27.53 | 27.74 | 33.23 | 39.17 | 36.85 |
| 76 | 2004 | 31.56 | 33.70 | 36.00 | 38.64 | 37.81 | 34.04 | 30.34 | 27.09 | 28.81 | 32.95 | 35.84 | 34.97 |
| 77 | 2005 | 31.85 | 34.11 | 37.66 | 36.61 | 34.68 | 34.93 | 32.48 | 29.51 | 28.75 | 33.93 | 36.19 | 35.70 |
| 78 | 2006 | 34.94 | 33.42 | 38.56 | 38.06 | 33.56 | 28.18 | 26.02 | 19.93 | 22.80 | 30.56 | 35.76 | 36.28 |
| 79 | 2007 | 30.32 | 32.44 | 36.19 | 36.75 | 32.65 | 27.89 | 24.67 | 25.18 | 25.39 | 31.46 | 34.27 | 35.91 |
| 80 | 2008 | 29.13 | 32.72 | 39.13 | 37.26 | 36.08 | 31.83 | 29.30 | 25.50 | 22.84 | 27.28 | 31.73 | 35.46 |

Super peak is the eight highest load hours of each day.

**Table 3.8**
**Super Peak Market Prices for FY 2015 by Month and Water Year**
**($/MWh)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Water Year | Oct-14 | Nov-14 | Dec-14 | Jan-15 | Feb-15 | Mar-15 | Apr-15 | May-15 | Jun-15 | Jul-15 | Aug-15 | Sep-15 |
| 1 | 1929 | 35.49 | 39.11 | 47.58 | 48.75 | 47.83 | 40.25 | 33.78 | 30.93 | 31.89 | 39.52 | 40.06 | 38.61 |
| 2 | 1930 | 36.06 | 39.42 | 45.38 | 52.70 | 44.05 | 37.35 | 31.36 | 31.02 | 35.29 | 38.20 | 39.51 | 36.89 |
| 3 | 1931 | 37.35 | 41.08 | 45.79 | 48.48 | 55.59 | 40.30 | 33.79 | 31.22 | 34.72 | 39.38 | 42.62 | 38.17 |
| 4 | 1932 | 32.80 | 38.14 | 43.52 | 52.54 | 46.35 | 33.19 | 26.17 | 21.42 | 23.93 | 31.16 | 35.79 | 37.21 |
| 5 | 1933 | 32.68 | 37.31 | 37.28 | 38.57 | 35.60 | 32.34 | 28.65 | 28.38 | 27.47 | 28.53 | 31.96 | 36.93 |
| 6 | 1934 | 35.03 | 38.94 | 40.46 | 36.43 | 34.27 | 30.13 | 25.42 | 26.01 | 28.73 | 33.96 | 38.44 | 36.12 |
| 7 | 1935 | 36.08 | 37.10 | 45.61 | 38.36 | 34.74 | 30.22 | 27.91 | 26.13 | 27.86 | 31.94 | 34.02 | 37.97 |
| 8 | 1936 | 33.06 | 37.55 | 44.30 | 52.93 | 47.06 | 37.23 | 29.57 | 22.16 | 24.64 | 33.38 | 37.55 | 36.60 |
| 9 | 1937 | 34.32 | 37.96 | 39.51 | 46.22 | 54.08 | 39.39 | 31.47 | 27.61 | 29.54 | 35.04 | 34.64 | 33.32 |
| 10 | 1938 | 34.10 | 39.92 | 43.06 | 40.64 | 35.05 | 31.40 | 25.40 | 21.71 | 24.44 | 31.36 | 36.14 | 36.79 |
| 11 | 1939 | 34.09 | 37.02 | 37.74 | 40.80 | 39.80 | 36.27 | 29.34 | 27.93 | 31.16 | 37.19 | 40.01 | 36.93 |
| 12 | 1940 | 35.04 | 38.81 | 42.27 | 39.12 | 37.38 | 28.68 | 25.00 | 26.55 | 29.30 | 34.80 | 37.82 | 35.61 |
| 13 | 1941 | 34.68 | 36.09 | 39.08 | 46.38 | 42.81 | 36.70 | 31.30 | 28.83 | 31.31 | 35.84 | 36.50 | 36.44 |
| 14 | 1942 | 32.97 | 36.22 | 36.08 | 38.97 | 35.58 | 32.00 | 27.23 | 25.54 | 27.20 | 29.29 | 31.75 | 32.03 |
| 15 | 1943 | 34.27 | 34.98 | 42.55 | 35.54 | 31.97 | 27.96 | 15.91 | 15.09 | 18.70 | 27.05 | 32.60 | 34.65 |
| 16 | 1944 | 34.21 | 37.70 | 43.45 | 44.39 | 41.47 | 36.69 | 32.45 | 31.95 | 34.34 | 37.29 | 37.25 | 37.46 |
| 17 | 1945 | 32.98 | 37.92 | 39.33 | 44.36 | 40.55 | 35.99 | 33.01 | 25.85 | 27.05 | 37.73 | 38.04 | 36.40 |
| 18 | 1946 | 33.04 | 36.85 | 37.57 | 35.14 | 34.07 | 30.08 | 21.43 | 17.49 | 20.44 | 26.05 | 30.01 | 32.08 |
| 19 | 1947 | 29.02 | 32.39 | 35.35 | 34.40 | 30.67 | 27.72 | 24.45 | 24.68 | 26.66 | 30.92 | 34.55 | 34.73 |
| 20 | 1948 | 30.86 | 35.16 | 37.03 | 37.06 | 32.55 | 30.78 | 25.95 | 19.21 | 19.96 | 25.48 | 28.68 | 31.23 |
| 21 | 1949 | 32.29 | 36.22 | 38.15 | 38.70 | 35.63 | 30.30 | 25.28 | 20.66 | 23.43 | 34.19 | 37.52 | 36.04 |
| 22 | 1950 | 31.45 | 32.84 | 34.14 | 34.29 | 30.49 | 26.29 | 21.68 | 20.98 | 22.09 | 26.56 | 30.69 | 33.98 |
| 23 | 1951 | 31.27 | 33.67 | 36.87 | 33.56 | 29.08 | 25.31 | 21.64 | 22.51 | 25.13 | 30.61 | 32.49 | 35.47 |
| 24 | 1952 | 34.35 | 37.76 | 44.82 | 37.01 | 32.84 | 29.92 | 25.30 | 19.24 | 24.41 | 30.69 | 34.66 | 36.31 |
| 25 | 1953 | 33.30 | 36.26 | 37.86 | 37.82 | 36.17 | 32.82 | 29.38 | 27.77 | 25.65 | 28.60 | 35.62 | 36.63 |
| 26 | 1954 | 30.12 | 33.58 | 35.85 | 36.65 | 32.21 | 28.84 | 26.23 | 24.44 | 25.95 | 29.25 | 29.68 | 31.74 |
| 27 | 1955 | 30.53 | 32.82 | 35.53 | 39.70 | 38.02 | 34.24 | 29.94 | 28.39 | 25.07 | 27.24 | 30.60 | 36.49 |
| 28 | 1956 | 32.76 | 37.41 | 39.42 | 33.69 | 29.50 | 26.18 | 22.35 | 20.25 | 22.52 | 28.55 | 32.80 | 37.07 |
| 29 | 1957 | 33.47 | 39.64 | 42.31 | 40.13 | 37.64 | 31.93 | 27.13 | 22.08 | 23.69 | 31.25 | 35.96 | 38.00 |
| 30 | 1958 | 31.97 | 34.36 | 35.51 | 38.25 | 36.15 | 30.68 | 26.49 | 20.95 | 24.14 | 31.82 | 36.09 | 36.13 |
| 31 | 1959 | 28.34 | 29.87 | 33.21 | 33.89 | 30.51 | 28.34 | 25.18 | 25.74 | 25.77 | 29.60 | 31.80 | 29.67 |
| 32 | 1960 | 35.60 | 38.55 | 38.49 | 35.96 | 33.26 | 31.83 | 23.57 | 23.75 | 28.33 | 30.41 | 33.76 | 37.20 |
| 33 | 1961 | 34.70 | 37.84 | 39.63 | 36.73 | 33.54 | 30.52 | 26.47 | 26.25 | 26.70 | 30.39 | 34.81 | 36.60 |
| 34 | 1962 | 33.49 | 36.60 | 37.26 | 36.82 | 34.68 | 32.93 | 21.12 | 20.89 | 25.85 | 33.67 | 36.42 | 37.08 |
| 35 | 1963 | 33.14 | 36.72 | 40.00 | 36.99 | 34.39 | 34.30 | 30.12 | 26.17 | 28.17 | 33.30 | 35.17 | 36.41 |
| 36 | 1964 | 32.33 | 36.04 | 37.99 | 38.29 | 37.81 | 35.67 | 29.75 | 28.15 | 25.47 | 27.54 | 31.65 | 36.45 |
| 37 | 1965 | 33.06 | 36.65 | 37.92 | 33.72 | 29.79 | 25.35 | 23.88 | 24.35 | 25.47 | 30.72 | 31.72 | 37.54 |
| 38 | 1966 | 33.72 | 37.86 | 36.92 | 38.78 | 37.43 | 34.16 | 25.12 | 25.08 | 28.31 | 32.44 | 34.25 | 36.43 |
| 39 | 1967 | 33.30 | 36.07 | 39.74 | 35.40 | 30.58 | 28.09 | 27.36 | 28.24 | 22.75 | 26.48 | 34.03 | 37.73 |
| 40 | 1968 | 30.84 | 32.43 | 33.99 | 38.52 | 34.52 | 30.62 | 29.37 | 30.30 | 29.98 | 30.84 | 34.59 | 33.13 |
| 41 | 1969 | 32.38 | 35.09 | 39.92 | 33.73 | 31.16 | 27.23 | 22.44 | 13.18 | 18.87 | 27.52 | 31.19 | 35.58 |
| 42 | 1970 | 33.76 | 34.93 | 36.94 | 36.48 | 33.65 | 30.37 | 26.17 | 25.34 | 25.59 | 31.24 | 39.62 | 37.49 |
| 43 | 1971 | 30.20 | 33.32 | 34.03 | 33.29 | 26.17 | 19.48 | 17.45 | 13.90 | 16.55 | 23.14 | 27.27 | 31.56 |
| 44 | 1972 | 30.79 | 36.17 | 35.24 | 31.73 | 28.45 | 21.62 | 13.90 | 15.07 | 16.89 | 23.82 | 26.63 | 28.46 |
| 45 | 1973 | 32.44 | 36.16 | 35.21 | 33.02 | 33.76 | 34.71 | 30.90 | 25.96 | 28.94 | 34.62 | 35.89 | 34.05 |
| 46 | 1974 | 30.63 | 34.23 | 34.85 | 24.87 | 19.63 | 15.49 | 9.74 | 11.24 | 13.23 | 21.20 | 22.13 | 29.83 |
| 47 | 1975 | 29.05 | 30.29 | 32.38 | 32.86 | 30.68 | 26.29 | 23.56 | 20.04 | 20.93 | 28.18 | 33.27 | 35.16 |
| 48 | 1976 | 30.28 | 34.17 | 37.41 | 31.94 | 29.31 | 25.30 | 23.35 | 21.19 | 25.56 | 28.31 | 28.34 | 28.04 |
| 49 | 1977 | 35.30 | 36.31 | 36.85 | 39.30 | 39.00 | 35.53 | 30.37 | 30.25 | 36.52 | 36.86 | 37.77 | 38.36 |
| 50 | 1978 | 32.41 | 35.07 | 37.60 | 39.15 | 35.67 | 32.57 | 27.04 | 25.16 | 28.14 | 33.03 | 34.01 | 33.33 |
| 51 | 1979 | 35.24 | 36.85 | 43.17 | 38.57 | 35.92 | 32.50 | 29.37 | 28.98 | 29.11 | 36.27 | 38.53 | 35.96 |
| 52 | 1980 | 33.14 | 37.49 | 39.40 | 38.59 | 37.70 | 35.39 | 29.66 | 23.87 | 25.79 | 34.24 | 38.53 | 36.52 |
| 53 | 1981 | 32.18 | 35.08 | 37.09 | 37.41 | 32.36 | 30.31 | 28.11 | 28.88 | 28.02 | 28.84 | 30.83 | 33.46 |
| 54 | 1982 | 29.60 | 34.37 | 37.81 | 36.11 | 32.31 | 25.29 | 18.40 | 21.95 | 24.84 | 29.67 | 29.38 | 30.99 |
| 55 | 1983 | 33.34 | 31.66 | 35.27 | 35.68 | 32.00 | 28.66 | 22.62 | 24.02 | 24.94 | 27.98 | 30.62 | 32.92 |
| 56 | 1984 | 32.10 | 34.46 | 37.10 | 37.08 | 34.20 | 30.51 | 23.81 | 23.08 | 25.20 | 26.52 | 29.04 | 33.06 |
| 57 | 1985 | 34.87 | 33.62 | 36.60 | 40.12 | 39.68 | 34.02 | 28.72 | 27.23 | 28.67 | 41.52 | 40.49 | 38.37 |
| 58 | 1986 | 33.95 | 38.05 | 38.79 | 35.32 | 33.06 | 27.31 | 20.75 | 23.46 | 29.36 | 32.93 | 36.74 | 37.03 |
| 59 | 1987 | 34.65 | 37.15 | 43.76 | 39.59 | 36.46 | 30.99 | 28.09 | 27.52 | 28.57 | 34.57 | 38.50 | 37.90 |
| 60 | 1988 | 34.54 | 38.52 | 39.84 | 42.09 | 45.97 | 37.95 | 30.89 | 29.46 | 32.56 | 34.29 | 35.67 | 37.19 |
| 61 | 1989 | 36.88 | 38.56 | 39.40 | 40.75 | 42.18 | 34.81 | 26.64 | 26.63 | 29.33 | 35.47 | 39.25 | 41.14 |
| 62 | 1990 | 33.20 | 30.79 | 34.83 | 38.40 | 34.79 | 31.69 | 28.16 | 27.82 | 30.78 | 32.04 | 33.95 | 36.02 |
| 63 | 1991 | 33.83 | 35.84 | 42.14 | 36.29 | 32.26 | 29.77 | 25.09 | 25.22 | 27.34 | 28.06 | 29.25 | 33.29 |
| 64 | 1992 | 34.49 | 38.38 | 39.88 | 41.69 | 39.59 | 36.80 | 31.81 | 30.70 | 33.49 | 40.12 | 40.79 | 37.86 |
| 65 | 1993 | 36.13 | 35.90 | 41.80 | 43.74 | 43.26 | 34.78 | 28.42 | 27.22 | 28.67 | 33.38 | 36.97 | 38.31 |
| 66 | 1994 | 35.34 | 40.49 | 39.74 | 43.55 | 41.16 | 36.11 | 30.55 | 28.96 | 30.59 | 34.05 | 38.94 | 38.35 |
| 67 | 1995 | 33.31 | 34.85 | 34.50 | 39.90 | 36.21 | 30.43 | 27.28 | 28.39 | 29.41 | 30.24 | 37.03 | 37.86 |
| 68 | 1996 | 34.22 | 35.85 | 37.02 | 30.26 | 26.67 | 20.71 | 14.86 | 16.46 | 20.39 | 22.20 | 26.12 | 33.88 |
| 69 | 1997 | 29.65 | 32.79 | 35.24 | 30.01 | 27.58 | 22.83 | 18.32 | 21.94 | 23.70 | 25.25 | 28.01 | 31.89 |
| 70 | 1998 | 33.45 | 38.87 | 34.79 | 34.73 | 33.39 | 30.91 | 26.56 | 22.02 | 24.15 | 28.28 | 31.57 | 35.74 |
| 71 | 1999 | 30.97 | 32.17 | 36.33 | 34.10 | 30.55 | 25.92 | 21.24 | 23.78 | 23.34 | 25.71 | 27.61 | 30.79 |
| 72 | 2000 | 34.64 | 35.78 | 42.05 | 37.05 | 33.60 | 30.44 | 24.18 | 23.93 | 28.12 | 32.82 | 34.77 | 37.60 |
| 73 | 2001 | 37.97 | 44.92 | 43.23 | 45.16 | 41.86 | 39.37 | 33.87 | 33.56 | 42.97 | 45.26 | 42.12 | 41.57 |
| 74 | 2002 | 36.38 | 38.19 | 43.03 | 42.25 | 38.58 | 34.61 | 24.97 | 27.12 | 29.53 | 27.18 | 32.95 | 35.58 |
| 75 | 2003 | 35.83 | 36.36 | 38.07 | 40.53 | 39.64 | 32.71 | 29.02 | 29.57 | 30.50 | 36.54 | 42.01 | 38.10 |
| 76 | 2004 | 34.85 | 38.47 | 38.74 | 37.89 | 40.63 | 34.20 | 28.96 | 27.36 | 30.06 | 33.39 | 38.41 | 36.87 |
| 77 | 2005 | 34.60 | 38.95 | 39.41 | 38.66 | 34.82 | 35.60 | 31.18 | 27.63 | 28.63 | 33.56 | 35.79 | 36.55 |
| 78 | 2006 | 37.28 | 34.82 | 38.27 | 37.93 | 33.67 | 30.68 | 24.40 | 18.34 | 23.52 | 30.82 | 37.40 | 38.86 |
| 79 | 2007 | 33.59 | 37.89 | 39.10 | 39.29 | 35.99 | 30.87 | 25.32 | 26.67 | 28.91 | 33.21 | 36.39 | 37.56 |
| 80 | 2008 | 34.56 | 38.99 | 42.79 | 40.78 | 38.24 | 35.10 | 29.95 | 27.02 | 23.73 | 27.42 | 32.94 | 38.21 |

Super peak is the eight highest load hours of each day.

**Table 3.9**
**Graveyard Market Prices for FY 2014 by Month and Water Year**
**($/MWh)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Water Year | Oct-13 | Nov-13 | Dec-13 | Jan-14 | Feb-14 | Mar-14 | Apr-14 | May-14 | Jun-14 | Jul-14 | Aug-14 | Sep-14 |
| 1 | 1929 | 26.10 | 29.06 | 34.85 | 33.90 | 34.79 | 30.29 | 27.71 | 23.07 | 23.29 | 28.66 | 26.26 | 26.86 |
| 2 | 1930 | 25.31 | 27.71 | 34.80 | 37.21 | 35.10 | 31.80 | 28.97 | 25.37 | 27.96 | 29.53 | 29.06 | 28.52 |
| 3 | 1931 | 27.40 | 30.58 | 36.11 | 35.25 | 33.28 | 29.57 | 28.47 | 23.40 | 26.56 | 29.42 | 28.37 | 27.95 |
| 4 | 1932 | 26.30 | 29.04 | 31.46 | 36.13 | 35.08 | 27.47 | 14.95 | 9.46 | 10.99 | 27.09 | 24.88 | 25.68 |
| 5 | 1933 | 25.19 | 23.27 | 24.08 | 29.89 | 30.46 | 27.70 | 25.90 | 18.61 | 11.72 | 22.28 | 26.11 | 28.37 |
| 6 | 1934 | 26.48 | 28.30 | 32.04 | 19.50 | 20.87 | 22.51 | 16.23 | 15.41 | 22.56 | 27.25 | 26.49 | 26.56 |
| 7 | 1935 | 26.07 | 29.35 | 34.73 | 29.47 | 31.03 | 28.46 | 25.52 | 19.61 | 23.07 | 26.48 | 27.02 | 27.27 |
| 8 | 1936 | 24.71 | 27.93 | 32.89 | 35.38 | 34.30 | 29.12 | 22.22 | 6.80 | 12.11 | 26.50 | 25.24 | 25.34 |
| 9 | 1937 | 24.10 | 28.20 | 30.96 | 35.72 | 34.05 | 29.80 | 27.02 | 20.61 | 23.64 | 26.98 | 25.65 | 24.71 |
| 10 | 1938 | 25.88 | 30.18 | 32.66 | 28.96 | 29.14 | 25.29 | 12.41 | 7.30 | 18.12 | 24.68 | 25.51 | 25.93 |
| 11 | 1939 | 25.87 | 27.71 | 32.08 | 32.78 | 32.70 | 29.19 | 22.56 | 14.57 | 24.86 | 28.20 | 27.09 | 25.90 |
| 12 | 1940 | 24.17 | 26.96 | 31.31 | 34.24 | 33.46 | 28.02 | 21.92 | 19.31 | 24.01 | 30.98 | 27.69 | 26.61 |
| 13 | 1941 | 23.98 | 27.25 | 28.26 | 33.57 | 32.35 | 28.92 | 25.57 | 20.95 | 21.68 | 27.20 | 25.63 | 25.53 |
| 14 | 1942 | 24.06 | 25.93 | 29.52 | 28.94 | 31.66 | 27.72 | 22.98 | 18.25 | 12.18 | 24.05 | 26.41 | 24.74 |
| 15 | 1943 | 24.24 | 27.40 | 32.91 | 25.83 | 27.41 | 23.16 | 3.23 | 4.34 | 5.83 | 24.21 | 24.12 | 25.12 |
| 16 | 1944 | 24.44 | 27.24 | 33.07 | 32.20 | 32.51 | 29.01 | 26.73 | 24.88 | 27.28 | 28.34 | 25.83 | 26.08 |
| 17 | 1945 | 25.53 | 26.67 | 30.58 | 32.19 | 31.34 | 28.81 | 27.19 | 15.84 | 14.18 | 27.86 | 24.28 | 24.95 |
| 18 | 1946 | 24.33 | 26.35 | 23.87 | 28.06 | 29.22 | 25.59 | 10.26 | 7.07 | 11.86 | 23.34 | 23.68 | 24.45 |
| 19 | 1947 | 21.55 | 24.44 | 26.01 | 21.91 | 23.51 | 22.66 | 20.18 | 10.49 | 11.12 | 23.27 | 24.36 | 24.59 |
| 20 | 1948 | 24.34 | 26.74 | 28.62 | 21.54 | 26.37 | 24.95 | 18.46 | 6.13 | 6.42 | 21.82 | 22.32 | 24.85 |
| 21 | 1949 | 24.39 | 26.82 | 29.50 | 27.55 | 30.97 | 21.77 | 14.27 | 6.09 | 13.13 | 27.56 | 25.15 | 25.28 |
| 22 | 1950 | 22.88 | 23.02 | 22.17 | 21.39 | 24.97 | 16.05 | 12.49 | 7.90 | 9.02 | 21.36 | 22.30 | 24.66 |
| 23 | 1951 | 22.13 | 25.52 | 27.10 | 18.43 | 16.66 | 14.13 | 12.17 | 8.56 | 14.17 | 21.84 | 24.31 | 26.61 |
| 24 | 1952 | 24.60 | 27.74 | 34.02 | 24.98 | 27.83 | 23.93 | 11.76 | 5.78 | 12.73 | 25.83 | 25.36 | 25.95 |
| 25 | 1953 | 24.51 | 26.07 | 27.93 | 30.11 | 29.74 | 26.43 | 23.94 | 13.35 | 8.14 | 23.23 | 24.33 | 24.56 |
| 26 | 1954 | 25.29 | 26.28 | 30.13 | 23.62 | 25.25 | 22.59 | 19.90 | 8.93 | 11.05 | 16.27 | 22.07 | 23.16 |
| 27 | 1955 | 24.92 | 23.60 | 23.79 | 31.06 | 33.04 | 29.32 | 25.37 | 17.71 | 9.73 | 18.92 | 25.43 | 26.04 |
| 28 | 1956 | 24.06 | 26.81 | 26.91 | 18.34 | 19.84 | 16.11 | 8.89 | 6.03 | 6.50 | 21.97 | 23.32 | 25.60 |
| 29 | 1957 | 24.75 | 28.18 | 32.76 | 28.06 | 30.18 | 24.51 | 17.20 | 6.03 | 10.01 | 28.31 | 25.85 | 26.22 |
| 30 | 1958 | 24.27 | 25.90 | 25.46 | 27.90 | 28.41 | 24.13 | 18.44 | 5.00 | 8.63 | 25.79 | 25.06 | 24.75 |
| 31 | 1959 | 20.50 | 23.15 | 26.45 | 21.78 | 23.97 | 22.92 | 19.90 | 14.56 | 12.68 | 26.42 | 24.40 | 23.35 |
| 32 | 1960 | 25.49 | 28.64 | 31.17 | 26.18 | 30.05 | 27.02 | 13.87 | 16.52 | 16.53 | 27.45 | 27.42 | 27.34 |
| 33 | 1961 | 26.23 | 28.22 | 32.79 | 26.59 | 28.81 | 22.55 | 22.17 | 13.71 | 12.23 | 27.90 | 27.51 | 27.22 |
| 34 | 1962 | 25.35 | 26.32 | 27.09 | 29.56 | 29.48 | 29.04 | 10.35 | 11.88 | 12.66 | 31.14 | 26.67 | 26.22 |
| 35 | 1963 | 25.25 | 27.60 | 31.69 | 28.97 | 26.94 | 27.06 | 23.64 | 15.56 | 14.01 | 27.38 | 26.79 | 26.31 |
| 36 | 1964 | 23.61 | 26.13 | 23.01 | 29.19 | 30.17 | 26.89 | 20.84 | 14.36 | 8.50 | 19.71 | 24.98 | 26.46 |
| 37 | 1965 | 26.21 | 27.64 | 31.67 | 17.85 | 16.30 | 18.73 | 19.29 | 9.66 | 17.68 | 25.23 | 22.64 | 27.25 |
| 38 | 1966 | 25.74 | 27.36 | 28.64 | 28.45 | 30.90 | 27.89 | 17.19 | 16.75 | 19.66 | 23.31 | 25.27 | 26.31 |
| 39 | 1967 | 24.93 | 27.75 | 30.43 | 22.65 | 22.93 | 19.08 | 24.34 | 12.39 | 7.85 | 22.90 | 27.05 | 27.67 |
| 40 | 1968 | 23.60 | 22.88 | 26.33 | 25.62 | 24.98 | 22.56 | 24.34 | 21.57 | 12.65 | 23.68 | 24.38 | 25.12 |
| 41 | 1969 | 22.65 | 24.40 | 30.18 | 19.47 | 21.69 | 22.51 | 7.66 | 2.41 | 7.41 | 22.05 | 22.50 | 24.41 |
| 42 | 1970 | 24.75 | 26.16 | 27.88 | 25.40 | 26.89 | 23.49 | 22.02 | 9.53 | 7.93 | 26.47 | 25.41 | 25.55 |
| 43 | 1971 | 22.02 | 24.56 | 26.54 | 14.10 | 13.80 | 11.79 | 10.40 | 4.08 | 3.59 | 14.78 | 21.19 | 23.68 |
| 44 | 1972 | 22.80 | 24.98 | 26.88 | 14.32 | 15.40 | 4.83 | 8.65 | 3.73 | 2.54 | 15.71 | 20.01 | 23.06 |
| 45 | 1973 | 24.16 | 25.76 | 25.93 | 24.72 | 27.59 | 25.29 | 24.74 | 18.63 | 18.51 | 26.35 | 24.70 | 24.77 |
| 46 | 1974 | 23.06 | 25.01 | 27.55 | 3.90 | 5.72 | 4.80 | 1.78 | 0.99 | 1.91 | 9.25 | 18.52 | 23.76 |
| 47 | 1975 | 23.05 | 20.96 | 19.55 | 23.19 | 23.58 | 18.83 | 19.36 | 3.40 | 5.07 | 18.36 | 24.66 | 24.41 |
| 48 | 1976 | 24.70 | 27.41 | 31.24 | 20.42 | 21.26 | 18.65 | 13.15 | 8.29 | 9.35 | 19.95 | 20.20 | 21.74 |
| 49 | 1977 | 25.20 | 27.22 | 28.41 | 32.94 | 34.28 | 30.24 | 27.48 | 26.43 | 27.25 | 26.81 | 25.64 | 26.14 |
| 50 | 1978 | 26.81 | 28.33 | 31.41 | 27.79 | 29.59 | 25.74 | 15.85 | 12.95 | 23.07 | 25.00 | 25.46 | 24.41 |
| 51 | 1979 | 25.60 | 28.49 | 33.06 | 32.04 | 34.68 | 28.34 | 28.05 | 15.12 | 27.48 | 29.12 | 27.29 | 27.71 |
| 52 | 1980 | 25.23 | 27.93 | 25.93 | 31.47 | 31.13 | 29.35 | 20.99 | 9.45 | 16.70 | 29.98 | 27.24 | 26.16 |
| 53 | 1981 | 24.99 | 26.26 | 28.24 | 24.67 | 28.30 | 26.53 | 23.71 | 12.95 | 12.32 | 24.30 | 23.61 | 26.33 |
| 54 | 1982 | 23.66 | 25.89 | 28.19 | 21.71 | 17.48 | 9.19 | 16.73 | 6.05 | 10.86 | 24.48 | 22.36 | 23.34 |
| 55 | 1983 | 23.94 | 23.35 | 28.39 | 20.79 | 24.74 | 14.15 | 19.22 | 6.14 | 12.07 | 23.59 | 24.12 | 25.47 |
| 56 | 1984 | 24.55 | 26.67 | 30.51 | 22.98 | 27.37 | 25.25 | 13.04 | 13.96 | 11.29 | 23.61 | 24.54 | 25.34 |
| 57 | 1985 | 25.90 | 24.87 | 30.04 | 31.96 | 31.80 | 26.52 | 19.21 | 12.09 | 22.28 | 29.48 | 27.44 | 28.06 |
| 58 | 1986 | 26.80 | 27.40 | 29.92 | 25.04 | 27.17 | 9.08 | 18.33 | 19.68 | 15.74 | 27.89 | 25.07 | 25.95 |
| 59 | 1987 | 26.57 | 29.12 | 32.93 | 30.93 | 31.57 | 26.40 | 25.04 | 16.94 | 23.96 | 27.52 | 26.66 | 25.53 |
| 60 | 1988 | 26.95 | 29.49 | 31.30 | 33.09 | 33.23 | 29.48 | 25.98 | 23.54 | 22.77 | 26.81 | 26.23 | 25.67 |
| 61 | 1989 | 27.62 | 28.01 | 29.48 | 30.96 | 31.73 | 26.91 | 18.61 | 18.13 | 23.18 | 27.25 | 26.46 | 27.79 |
| 62 | 1990 | 25.24 | 23.91 | 26.82 | 26.38 | 27.17 | 24.68 | 19.80 | 19.53 | 17.56 | 25.48 | 25.00 | 25.74 |
| 63 | 1991 | 24.73 | 28.53 | 32.38 | 24.76 | 25.14 | 24.08 | 20.99 | 15.48 | 17.91 | 22.03 | 23.75 | 26.00 |
| 64 | 1992 | 25.91 | 27.83 | 30.82 | 31.75 | 31.44 | 29.54 | 26.78 | 20.29 | 25.55 | 28.69 | 26.60 | 26.84 |
| 65 | 1993 | 26.74 | 28.43 | 33.65 | 32.74 | 31.90 | 27.85 | 25.52 | 15.56 | 21.85 | 27.91 | 26.62 | 27.38 |
| 66 | 1994 | 27.13 | 27.96 | 32.25 | 33.35 | 32.72 | 29.80 | 27.20 | 23.29 | 26.61 | 29.77 | 26.66 | 26.53 |
| 67 | 1995 | 26.56 | 23.01 | 22.79 | 31.24 | 31.18 | 26.83 | 22.86 | 17.90 | 11.90 | 29.51 | 28.27 | 28.68 |
| 68 | 1996 | 24.00 | 25.14 | 26.25 | 15.46 | 14.74 | 5.12 | 7.00 | 3.85 | 6.31 | 17.79 | 22.27 | 25.45 |
| 69 | 1997 | 21.32 | 25.64 | 28.82 | 11.51 | 14.20 | 7.40 | 10.82 | 9.81 | 10.29 | 18.46 | 23.43 | 25.25 |
| 70 | 1998 | 24.11 | 26.32 | 27.59 | 28.76 | 29.53 | 27.22 | 22.35 | 4.74 | 8.67 | 25.02 | 24.08 | 25.36 |
| 71 | 1999 | 24.65 | 25.65 | 28.63 | 20.62 | 20.98 | 14.54 | 16.74 | 8.65 | 10.56 | 20.03 | 22.19 | 24.49 |
| 72 | 2000 | 25.20 | 27.66 | 32.26 | 26.20 | 28.19 | 25.16 | 12.31 | 14.79 | 20.93 | 27.66 | 26.67 | 26.15 |
| 73 | 2001 | 24.99 | 27.43 | 31.71 | 32.40 | 31.61 | 30.31 | 28.68 | 25.93 | 30.90 | 31.10 | 28.30 | 28.09 |
| 74 | 2002 | 26.30 | 27.40 | 31.07 | 31.74 | 32.09 | 30.18 | 19.94 | 22.58 | 15.78 | 22.98 | 26.86 | 26.53 |
| 75 | 2003 | 26.46 | 28.95 | 31.96 | 31.19 | 31.61 | 25.15 | 25.16 | 18.90 | 16.72 | 29.76 | 26.82 | 27.97 |
| 76 | 2004 | 27.08 | 27.64 | 29.62 | 32.42 | 32.69 | 29.09 | 26.08 | 19.59 | 22.41 | 27.92 | 25.99 | 28.17 |
| 77 | 2005 | 25.58 | 27.86 | 31.11 | 28.89 | 31.06 | 30.49 | 28.08 | 16.82 | 20.80 | 29.23 | 26.61 | 26.10 |
| 78 | 2006 | 28.12 | 28.58 | 31.85 | 27.67 | 26.43 | 24.60 | 8.35 | 6.16 | 11.17 | 26.89 | 26.50 | 27.79 |
| 79 | 2007 | 24.70 | 26.28 | 29.92 | 27.01 | 29.89 | 20.63 | 20.49 | 16.05 | 21.30 | 23.03 | 25.71 | 26.69 |
| 80 | 2008 | 24.59 | 27.79 | 32.08 | 30.09 | 30.37 | 27.81 | 25.37 | 11.90 | 12.76 | 23.85 | 25.35 | 26.64 |

Graveyard is the period of clock hours 01:00-04:00 each day.

**Table 3.10**
**Graveyard Market Prices for FY 2015 by Month and Water Year**
**($/MWh)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Water Year | Oct-14 | Nov-14 | Dec-14 | Jan-15 | Feb-15 | Mar-15 | Apr-15 | May-15 | Jun-15 | Jul-15 | Aug-15 | Sep-15 |
| 1 | 1929 | 28.78 | 32.60 | 35.99 | 38.50 | 38.26 | 33.40 | 28.31 | 25.20 | 25.41 | 30.94 | 28.89 | 28.75 |
| 2 | 1930 | 28.84 | 33.17 | 36.73 | 36.44 | 35.96 | 31.61 | 27.04 | 25.95 | 29.98 | 28.87 | 28.52 | 28.01 |
| 3 | 1931 | 29.94 | 32.71 | 36.65 | 37.39 | 36.74 | 32.94 | 28.86 | 23.91 | 29.16 | 29.94 | 29.07 | 28.82 |
| 4 | 1932 | 26.86 | 31.10 | 33.95 | 36.25 | 35.07 | 26.46 | 13.79 | 6.52 | 10.43 | 28.41 | 27.37 | 27.76 |
| 5 | 1933 | 27.51 | 26.67 | 25.01 | 31.48 | 30.17 | 28.75 | 24.83 | 17.46 | 12.82 | 22.55 | 26.51 | 28.77 |
| 6 | 1934 | 28.46 | 31.48 | 32.77 | 19.94 | 21.71 | 22.89 | 14.64 | 15.12 | 24.10 | 28.17 | 27.68 | 27.51 |
| 7 | 1935 | 28.47 | 31.76 | 35.85 | 30.05 | 29.98 | 26.23 | 24.78 | 16.42 | 21.75 | 23.92 | 27.27 | 27.57 |
| 8 | 1936 | 25.93 | 31.46 | 36.05 | 36.38 | 35.68 | 31.11 | 21.61 | 4.95 | 13.17 | 28.26 | 26.74 | 26.61 |
| 9 | 1937 | 27.21 | 30.88 | 30.67 | 37.80 | 37.08 | 32.25 | 25.84 | 20.60 | 24.25 | 27.95 | 25.59 | 24.29 |
| 10 | 1938 | 27.05 | 32.52 | 34.70 | 30.11 | 30.71 | 26.60 | 9.51 | 5.52 | 14.54 | 25.93 | 26.57 | 27.19 |
| 11 | 1939 | 27.07 | 29.92 | 30.91 | 32.93 | 34.35 | 31.44 | 21.47 | 13.30 | 27.19 | 27.96 | 28.14 | 27.16 |
| 12 | 1940 | 27.44 | 30.96 | 34.00 | 31.94 | 32.73 | 21.81 | 21.23 | 17.17 | 25.55 | 27.40 | 26.74 | 26.12 |
| 13 | 1941 | 26.18 | 28.68 | 30.74 | 34.99 | 34.27 | 30.83 | 25.38 | 20.09 | 25.38 | 27.08 | 25.80 | 25.71 |
| 14 | 1942 | 25.47 | 29.63 | 29.47 | 30.89 | 30.65 | 27.23 | 20.57 | 16.06 | 16.93 | 21.50 | 25.03 | 24.50 |
| 15 | 1943 | 26.09 | 29.55 | 34.35 | 26.81 | 25.62 | 22.28 | 1.31 | 2.68 | 4.81 | 23.39 | 24.69 | 25.72 |
| 16 | 1944 | 27.07 | 30.48 | 34.20 | 33.86 | 34.14 | 30.95 | 26.66 | 25.89 | 27.97 | 27.28 | 26.57 | 27.28 |
| 17 | 1945 | 25.07 | 30.01 | 31.52 | 34.48 | 32.85 | 29.95 | 25.97 | 12.95 | 12.43 | 30.35 | 26.60 | 27.02 |
| 18 | 1946 | 26.47 | 29.30 | 25.15 | 28.33 | 29.32 | 24.54 | 6.50 | 4.57 | 8.61 | 21.07 | 23.24 | 24.17 |
| 19 | 1947 | 22.68 | 27.14 | 28.97 | 23.29 | 22.92 | 20.01 | 18.65 | 8.33 | 11.26 | 25.22 | 26.26 | 26.33 |
| 20 | 1948 | 24.57 | 28.41 | 30.42 | 22.70 | 28.73 | 26.77 | 14.69 | 3.95 | 6.37 | 20.46 | 22.11 | 25.16 |
| 21 | 1949 | 25.44 | 29.52 | 30.85 | 29.47 | 31.26 | 22.01 | 12.04 | 4.98 | 11.02 | 28.98 | 26.15 | 26.19 |
| 22 | 1950 | 24.65 | 23.96 | 21.80 | 22.00 | 23.42 | 16.97 | 9.51 | 6.38 | 7.58 | 21.24 | 23.31 | 26.13 |
| 23 | 1951 | 24.77 | 28.96 | 27.91 | 18.65 | 14.14 | 14.40 | 8.92 | 6.94 | 15.78 | 20.70 | 26.32 | 27.60 |
| 24 | 1952 | 26.69 | 30.84 | 34.72 | 26.12 | 26.95 | 25.66 | 8.82 | 4.06 | 8.67 | 27.17 | 26.68 | 26.71 |
| 25 | 1953 | 26.48 | 28.97 | 30.53 | 29.42 | 31.24 | 28.31 | 24.03 | 10.56 | 8.65 | 24.93 | 27.81 | 27.32 |
| 26 | 1954 | 26.13 | 28.33 | 30.25 | 24.27 | 25.61 | 23.19 | 18.62 | 6.82 | 9.31 | 16.52 | 23.00 | 25.29 |
| 27 | 1955 | 25.54 | 25.28 | 24.86 | 32.29 | 33.05 | 29.65 | 24.80 | 17.55 | 8.28 | 17.06 | 25.95 | 27.63 |
| 28 | 1956 | 26.00 | 30.68 | 29.37 | 16.84 | 21.47 | 15.88 | 6.54 | 4.82 | 6.26 | 23.15 | 25.80 | 27.09 |
| 29 | 1957 | 27.52 | 31.77 | 34.95 | 31.39 | 32.81 | 26.16 | 15.89 | 4.88 | 10.99 | 28.32 | 28.23 | 28.26 |
| 30 | 1958 | 25.41 | 27.06 | 25.98 | 29.90 | 30.84 | 24.87 | 16.17 | 2.64 | 8.11 | 28.02 | 26.98 | 26.78 |
| 31 | 1959 | 21.51 | 23.86 | 26.63 | 20.73 | 22.16 | 22.68 | 16.91 | 11.39 | 10.50 | 25.86 | 23.93 | 23.14 |
| 32 | 1960 | 28.68 | 31.27 | 31.71 | 26.03 | 29.43 | 27.28 | 10.95 | 16.35 | 16.30 | 26.03 | 26.66 | 28.04 |
| 33 | 1961 | 27.80 | 30.56 | 32.44 | 26.23 | 28.75 | 23.76 | 22.32 | 12.40 | 12.38 | 27.20 | 27.16 | 27.17 |
| 34 | 1962 | 27.03 | 29.47 | 27.96 | 29.57 | 30.90 | 29.33 | 5.47 | 8.33 | 11.67 | 29.22 | 26.67 | 27.71 |
| 35 | 1963 | 26.67 | 29.78 | 32.34 | 28.23 | 27.86 | 29.10 | 25.01 | 14.56 | 19.45 | 26.21 | 28.18 | 27.95 |
| 36 | 1964 | 27.10 | 29.07 | 26.03 | 31.88 | 33.44 | 30.86 | 21.49 | 14.04 | 8.30 | 19.51 | 25.68 | 27.47 |
| 37 | 1965 | 27.63 | 29.57 | 31.00 | 15.24 | 14.62 | 17.71 | 16.73 | 7.13 | 17.88 | 23.92 | 23.34 | 28.95 |
| 38 | 1966 | 27.43 | 30.58 | 30.64 | 29.86 | 33.10 | 30.11 | 14.94 | 18.21 | 19.75 | 24.28 | 27.13 | 28.13 |
| 39 | 1967 | 26.42 | 29.34 | 32.55 | 22.53 | 22.74 | 20.11 | 24.16 | 9.02 | 5.81 | 21.37 | 27.02 | 27.45 |
| 40 | 1968 | 25.78 | 25.39 | 27.01 | 27.06 | 28.59 | 21.66 | 25.41 | 22.18 | 14.76 | 25.67 | 27.35 | 26.93 |
| 41 | 1969 | 25.26 | 27.90 | 32.18 | 19.34 | 21.12 | 22.96 | 4.77 | 0.99 | 4.74 | 22.32 | 23.29 | 25.47 |
| 42 | 1970 | 25.79 | 27.82 | 29.84 | 25.75 | 25.58 | 23.16 | 20.83 | 9.51 | 7.28 | 28.12 | 28.07 | 28.22 |
| 43 | 1971 | 24.19 | 27.01 | 27.36 | 14.21 | 9.54 | 8.95 | 7.02 | 2.30 | 2.57 | 12.77 | 21.50 | 24.33 |
| 44 | 1972 | 24.77 | 28.30 | 27.47 | 14.15 | 14.90 | 4.13 | 6.77 | 3.42 | 2.66 | 13.13 | 19.97 | 23.94 |
| 45 | 1973 | 25.13 | 27.84 | 26.03 | 24.40 | 29.10 | 27.53 | 24.28 | 17.52 | 24.04 | 26.42 | 25.41 | 24.86 |
| 46 | 1974 | 24.48 | 27.04 | 28.54 | 2.06 | 4.75 | 2.71 | 0.93 | 0.44 | 1.37 | 7.23 | 16.54 | 24.34 |
| 47 | 1975 | 23.29 | 21.49 | 19.12 | 24.80 | 24.24 | 19.94 | 18.45 | 2.35 | 4.16 | 18.81 | 27.32 | 27.34 |
| 48 | 1976 | 24.53 | 28.32 | 31.42 | 20.75 | 20.42 | 16.55 | 11.03 | 6.69 | 10.62 | 17.74 | 21.41 | 22.07 |
| 49 | 1977 | 27.01 | 28.88 | 28.73 | 30.94 | 32.42 | 30.31 | 25.76 | 26.05 | 28.45 | 27.03 | 26.25 | 27.63 |
| 50 | 1978 | 27.49 | 29.09 | 31.01 | 29.09 | 30.53 | 26.77 | 12.88 | 10.47 | 23.91 | 23.44 | 25.49 | 26.32 |
| 51 | 1979 | 28.34 | 30.99 | 34.41 | 30.27 | 31.42 | 28.02 | 25.94 | 12.78 | 26.91 | 28.23 | 27.38 | 26.98 |
| 52 | 1980 | 26.80 | 30.33 | 27.33 | 31.95 | 32.50 | 29.86 | 19.98 | 6.18 | 16.85 | 29.78 | 28.09 | 27.53 |
| 53 | 1981 | 25.92 | 28.32 | 28.57 | 25.80 | 25.18 | 25.31 | 23.95 | 16.77 | 14.65 | 24.83 | 23.97 | 26.26 |
| 54 | 1982 | 25.28 | 28.24 | 27.62 | 20.62 | 14.41 | 5.59 | 13.03 | 3.49 | 9.74 | 23.30 | 21.61 | 24.90 |
| 55 | 1983 | 26.14 | 24.45 | 28.41 | 19.54 | 24.42 | 13.42 | 18.17 | 6.44 | 9.88 | 20.36 | 23.52 | 25.80 |
| 56 | 1984 | 25.39 | 28.72 | 30.57 | 22.60 | 28.67 | 25.57 | 10.71 | 11.23 | 10.99 | 22.48 | 23.06 | 25.56 |
| 57 | 1985 | 27.68 | 27.91 | 31.43 | 32.32 | 33.99 | 29.17 | 18.47 | 11.26 | 25.43 | 30.56 | 27.49 | 28.55 |
| 58 | 1986 | 27.42 | 30.44 | 30.80 | 26.50 | 27.89 | 6.11 | 15.29 | 17.95 | 13.94 | 29.41 | 27.18 | 27.98 |
| 59 | 1987 | 27.47 | 31.06 | 34.28 | 30.58 | 31.25 | 26.34 | 23.99 | 18.08 | 24.34 | 27.07 | 26.34 | 27.95 |
| 60 | 1988 | 27.85 | 30.78 | 32.39 | 34.38 | 34.67 | 31.75 | 25.76 | 23.58 | 26.57 | 26.40 | 26.40 | 27.11 |
| 61 | 1989 | 29.78 | 31.32 | 31.80 | 33.74 | 33.71 | 28.84 | 16.17 | 17.14 | 24.52 | 28.85 | 28.13 | 31.16 |
| 62 | 1990 | 26.35 | 25.32 | 27.86 | 28.03 | 28.63 | 26.54 | 19.69 | 18.34 | 18.41 | 26.98 | 25.77 | 27.74 |
| 63 | 1991 | 26.42 | 30.10 | 33.83 | 25.57 | 24.99 | 24.36 | 19.03 | 14.35 | 17.09 | 19.58 | 23.58 | 26.18 |
| 64 | 1992 | 27.55 | 30.44 | 32.50 | 33.13 | 33.58 | 31.46 | 27.30 | 23.63 | 28.63 | 29.89 | 28.67 | 28.09 |
| 65 | 1993 | 29.38 | 30.04 | 34.24 | 33.97 | 32.99 | 28.80 | 24.30 | 13.73 | 22.41 | 29.62 | 27.90 | 29.02 |
| 66 | 1994 | 28.48 | 31.85 | 31.94 | 34.69 | 32.78 | 30.07 | 26.00 | 22.08 | 27.10 | 27.94 | 27.72 | 28.77 |
| 67 | 1995 | 27.19 | 24.28 | 22.37 | 31.71 | 30.14 | 23.24 | 22.99 | 18.55 | 12.24 | 28.62 | 28.83 | 29.33 |
| 68 | 1996 | 26.86 | 28.65 | 28.26 | 13.51 | 9.49 | 2.43 | 3.91 | 1.29 | 3.44 | 13.77 | 19.84 | 25.00 |
| 69 | 1997 | 22.49 | 27.10 | 29.21 | 10.14 | 13.04 | 6.57 | 8.73 | 7.75 | 9.46 | 15.97 | 22.39 | 25.46 |
| 70 | 1998 | 26.52 | 30.67 | 28.49 | 26.92 | 29.62 | 26.29 | 19.99 | 3.04 | 7.98 | 24.96 | 23.72 | 26.23 |
| 71 | 1999 | 24.94 | 25.33 | 27.78 | 20.11 | 19.63 | 12.00 | 15.54 | 5.98 | 8.58 | 16.92 | 20.92 | 25.08 |
| 72 | 2000 | 27.80 | 30.30 | 34.07 | 27.15 | 28.84 | 24.81 | 10.04 | 14.51 | 20.15 | 26.56 | 27.01 | 27.71 |
| 73 | 2001 | 28.71 | 34.18 | 33.27 | 35.43 | 33.92 | 33.13 | 29.20 | 27.92 | 33.35 | 32.34 | 30.04 | 29.19 |
| 74 | 2002 | 28.13 | 31.34 | 35.12 | 32.95 | 32.99 | 29.45 | 18.65 | 21.50 | 13.94 | 21.21 | 26.52 | 27.36 |
| 75 | 2003 | 29.09 | 30.16 | 30.46 | 33.16 | 33.13 | 27.43 | 25.45 | 18.23 | 16.00 | 32.05 | 28.43 | 28.42 |
| 76 | 2004 | 28.71 | 31.65 | 30.63 | 31.76 | 33.77 | 28.87 | 24.99 | 20.83 | 23.93 | 28.58 | 27.61 | 29.29 |
| 77 | 2005 | 27.37 | 30.85 | 32.01 | 30.40 | 30.66 | 30.65 | 27.06 | 15.39 | 21.43 | 28.86 | 25.43 | 26.86 |
| 78 | 2006 | 28.76 | 29.25 | 31.57 | 27.20 | 25.39 | 25.24 | 5.97 | 2.94 | 5.85 | 27.72 | 27.40 | 29.20 |
| 79 | 2007 | 26.63 | 30.14 | 31.42 | 26.63 | 31.88 | 19.82 | 20.20 | 15.46 | 23.81 | 23.96 | 27.04 | 27.73 |
| 80 | 2008 | 28.36 | 33.12 | 34.32 | 31.58 | 32.68 | 30.36 | 25.64 | 9.85 | 11.87 | 23.62 | 26.52 | 28.17 |

Graveyard is the period of clock hours 01:00-04:00 each day.

| Table 3.11<br>Variable Costs Sub-Categories of<br>Stand Ready and Deployment Costs from the GARD Model | | | |
|---|---|---|---|
| | **A** | **B** | **C** |
| | | **Annual Average $** | **Annual Average MWh** |
| 1 | Energy Shift *dec* | 7,580,882 | -1,347,394 |
| 2 | Energy Shift Non-Spinning *inc* | 1,291,032 | -77,198 |
| 3 | Energy Shift Spinning *inc* | 3,112,698 | -420,463 |
| 4 | Efficiency Loss *dec* | -1,057,444 | 31,858 |
| 5 | Efficiency Loss Non-Spinning | -316,044 | 11,222 |
| 6 | Efficiency Loss Spinning | 444,251 | -5,448 |
| 7 | Cycling Loss *dec* | 101,331 | -3,029 |
| 8 | Cycling Loss Non-Spinning | 2,110 | -63 |
| 9 | Cycling Loss Spinning | 67,362 | -2,390 |
| 10 | Spill Losses Non-Spinning | 551,611 | -24,821 |
| 11 | Spill Losses Spinning | 893,044 | -39,129 |
| 12 | Deployment Response Losses *inc* | 449,880 | -15,016 |
| 13 | Deployment Response Losses *dec* | 922,307 | -27,381 |
| 14 | Deployment cycling Loss *inc* | 107,292 | -3,296 |
| 15 | Deployment cycling Loss *dec* | 50,337 | -1,501 |
| 16 | Deployment Spill Loss *dec* | 2,223 | -79 |
| 17 | Total | 14,202,873 | -1,924,130 |

**Table. 3.12**
**Variable Costs by Service Under 99.5% Level of Service with Self Supply of Generation Imbalance**

| | Service | $ |
|---|---|---|
| | A | B |
| 1 | Regulating Reserve | -910,042 |
| 2 | VERBS Reserve | -7,013,678 |
| 3 | Operating Reserve - Spinning | -2,247,867 |
| 4 | DERBS Reserve | -830,820 |
| 5 | Load Following and Energy Imbalance | -3,200,466 |
| 6 | **Total Variable Costs** | -14,202,873 |

**Table. 3.13**
**Variable Costs Components for VERBS Under 99.5% Level of Service with Self Supply of Generation Imbalance**

| | Component | MW | $ | $/kW/month of balancing reserve capacity |
|---|---|---|---|---|
| | A | B | C | D |
| 1 | Regulating Reserve *inc* | 46 | -372,429 | |
| 2 | Regulating Reserve *dec* | -46 | -316,593 | |
| 3 | Following Reserve *inc* | 200 | -1,173,148 | |
| 4 | Following Reserve *dec* | -205 | -1,417,186 | |
| 5 | Imbalance reserve *inc* | 282 | -813,608 | |
| 6 | Imbalance reserve *dec* | -395 | -2,920,714 | |
| 7 | Total reserve *inc* | 529 | -2,359,185 | $ 0.37 |
| 8 | Total reserve *dec* | -646 | -4,654,493 | $ 0.60 |

**Table. 3.14**
**Variable Costs Components for DERBS Under 99.5% Level of Service with Self Supply of Generation Imbalance**

| | Component | MW | $ |
|---|---|---|---|
| | A | B | C |
| 1 | Regulating Reserve *inc* | 19 | -151,528 |
| 2 | Regulating Reserve *dec* | -19 | -132,579 |
| 3 | Following Reserve *inc* | 17 | -98,240 |
| 4 | Following Reserve *dec* | -18 | -122,143 |
| 5 | Imbalance reserve *inc* | 26 | -69,498 |
| 6 | Imbalance reserve *dec* | -37 | -256,832 |
| 7 | **Total Reserve *inc*** | 61 | -319,266 |
| 8 | **Total Reserve *dec*** | -74 | -511,554 |

| Table 3.15<br>Cost Allocation for Embedded Cost Portion of Balancing Reserve Capacity Reserves at 99.5% Level of Service with No Self Supply of Generation Imbalance for VERBS | | |
|---|---|---|
| | **A** | **B** |
| | **Average water conditions (1958 water)** | **Annual Average of FY2014-FY2015** |
| | **Assumptions for Calculation:** | |
| 1 | Regulated Hydro Projects Adjusted for Transmission Losses (MW) | 10,345 |
| 2 | Regulating Reserve (MW) | 61 |
| 3 | Operating Reserve less Operating Reserve on rest of System (MW) 1/ | 534 |
| 4 | Following Capacity Reserve (MW) | 251 |
| 5 | Variable Energy Resource Balancing Service Reserve (MW) | 527 |
| 6 | Dispatchable Energy Resource Balancing Service Reserve (MW) | 61 |
| | **Forecast of Hydro Capacity System Uses:** | |
| 7 | Big 10 Hydro Projects Capacity<br>(Line 1 * .94) | 9,724 |
| 8 | Total PS Reserve Obligation<br>(Line 2+3+4+5+6) | 1,434 |
| 9 | Hydro Projects Capacity System Uses<br>(Line 7+8) | 11,158 |
| | **Adjusted Revenue Requirement:** | |
| 10 | PS Net Revenue Requirement for Big 10 Hydro Projects | $ 927,156,000 |
| 11 | Hydro Projects Capacity System Uses (Line 9) | 11,158 |
| 12 | Total kW/month/year Hydro Project Capacity System Uses<br>(Line 11 * 12 months * 1000 kW/MW) | 133,896,594 |
| 13 | **Unit Cost Allocation of Capacity System Uses $/kW/month<br>(Line 10 / Line 12)** | $ 6.92 |
| | **Revenue Forecast for Embedded Unit Cost by Balancing Reserve Capacity Service** | |
| 14 | Regulating Reserve<br>(Line 2 * Line 13 * 12 months * 1000 kW/MW ) | $ 5,065,440 |
| 15 | VERBS Reserve<br>(Line 5 * Line 13 * 12 months * 1000 kW/MW ) | $ 43,762,080 |
| 16 | DERBS Reserve (Line 6 * Line 13 * 12 months * 1000 kW/MW) | $ 5,065,440 |
| | **1/ The 558.9 MW for Operating Reserve is adjusted to account for 9% of the Non-Spinning portion (half of the total Operating Reserve) being supplied by the rest of the system. .** | |

**Table. 3.16**
**Variable Costs Components for VERBS Under 99.5% Level of Service without Self Supply of Generation Imbalance**

| | Component | MW | $ |
|---|---|---|---|
| | A | B | C |
| 1 | Regulating Reserve *inc* | 46 | -374,207 |
| 2 | Regulating Reserve *dec* | -46 | -270,714 |
| 3 | Following Reserve *inc* | 200 | -1,130,372 |
| 4 | Following Reserve *dec* | -205 | -1,211,814 |
| 5 | Imbalance reserve *inc* | 454 | -986,811 |
| 6 | Imbalance reserve *dec* | -634 | -3,747,929 |

## Table 3.17
## Type 1 Purchase Forecasts Under Three Assumption Scenarios

| | | 30/60 committed scheduling with self supply of generation imbalance adjusted for 900 MW *inc* limit and 1100 MW *dec* limit (MW) | | | | | | 30/60 committed scheduling with self supply of generation imbalance and 571 MW of 30/30 committed scheduling adjusted for 900 MW inc limit and 1100 MW dec limit (MW) | | | | 30/60 committed scheduling without self supply of generation imbalance adjusted for 900 MW *inc* limit and 1100 MW *dec* limit (MW) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30/60committed scheduling with self supply of generation imbalance from Balancing Reserve Capacity Quantity Forecast (MW) | | 30/60 committed scheduling with self supply of generation imbalance adjusted for 900 MW *inc* limit and 1100 MW *dec* limit (MW) | | Type 1 Planned Acquisition recovered through Type 1 Purchases charge. (MW) | | 30/60 committed scheduling with self supply of generation imbalance and 571 MW of 30/30 committed scheduling adjusted for 900 MW inc limit and 1100 MW dec limit (MW) | | Type 1 Planned Acquisition recovered through Type 1 Purchases charge. (MW) | | 30/60 committed scheduling without self supply of generation imbalance from Balancing Reserve Capacity Quantity Forecast (MW) | | 30/60 committed scheduling without self supply of generation imbalance adjusted for 900 MW *inc* limit and 1100 MW *dec* limit (MW) | | Type 1 Planned Acquisition recovered through Type 1 Purchases charge. (MW) | |
| | | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* | *inc* | *dec* |
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| 1 | Oct-13 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 2 | Nov-13 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 3 | Dec-13 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 4 | Jan-14 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 5 | Feb-14 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 6 | Mar-14 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 7 | Apr-14 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 8 | May-14 | 886 | -1,055 | 886 | -1,055 | 0 | 0 | 865 | -1,055 | 0 | 0 | 1,028 | -1,254 | 900 | -1,100 | 128 | 0 |
| 9 | Jun-14 | 919 | -1,093 | 900 | -1,093 | 19 | 0 | 897 | -1,093 | 0 | 0 | 1,075 | -1,309 | 900 | -1,100 | 175 | 0 |
| 10 | Jul-14 | 919 | -1,093 | 900 | -1,093 | 19 | 0 | 897 | -1,093 | 0 | 0 | 1,075 | -1,309 | 900 | -1,100 | 175 | 0 |
| 11 | Aug-14 | 919 | -1,093 | 900 | -1,093 | 19 | 0 | 897 | -1,093 | 0 | 0 | 1,075 | -1,309 | 900 | -1,100 | 175 | 0 |
| 12 | Sep-14 | 919 | -1,093 | 900 | -1,093 | 19 | 0 | 897 | -1,093 | 0 | 0 | 1,075 | -1,309 | 900 | -1,100 | 175 | 0 |
| 13 | Oct-14 | 922 | -1,095 | 900 | -1,095 | 22 | 0 | 900 | -1,095 | 0 | 0 | 1,076 | -1,310 | 900 | -1,100 | 176 | 0 |
| 14 | Nov-14 | 922 | -1,095 | 900 | -1,095 | 22 | 0 | 900 | -1,095 | 0 | 0 | 1,076 | -1,310 | 900 | -1,100 | 176 | 0 |
| 15 | Dec-14 | 943 | -1,121 | 900 | -1,100 | 43 | 0 | 922 | -1,100 | 22 | 0 | 1,100 | -1,339 | 900 | -1,100 | 200 | 0 |
| 16 | Jan-15 | 943 | -1,121 | 900 | -1,100 | 43 | 0 | 922 | -1,100 | 22 | 0 | 1,100 | -1,339 | 900 | -1,100 | 200 | 0 |
| 17 | Feb-15 | 943 | -1,121 | 900 | -1,100 | 43 | 0 | 922 | -1,100 | 22 | 0 | 1,100 | -1,339 | 900 | -1,100 | 200 | 0 |
| 18 | Mar-15 | 944 | -1,125 | 900 | -1,100 | 44 | 0 | 922 | -1,100 | 22 | 0 | 1,099 | -1,341 | 900 | -1,100 | 199 | 0 |
| 19 | Apr-15 | 944 | -1,125 | 900 | -1,100 | 44 | 0 | 922 | -1,100 | 22 | 0 | 1,099 | -1,341 | 900 | -1,100 | 199 | 0 |
| 20 | May-15 | 944 | -1,125 | 900 | -1,100 | 44 | 0 | 922 | -1,100 | 22 | 0 | 1,099 | -1,341 | 900 | -1,100 | 199 | 0 |
| 21 | Jun-15 | 964 | -1,152 | 900 | -1,100 | 64 | 0 | 942 | -1,100 | 42 | 0 | 1,122 | -1,372 | 900 | -1,100 | 222 | 0 |
| 22 | Jul-15 | 964 | -1,152 | 900 | -1,100 | 64 | 0 | 942 | -1,100 | 42 | 0 | 1,122 | -1,372 | 900 | -1,100 | 222 | 0 |
| 23 | Aug-15 | 975 | -1,165 | 900 | -1,100 | 75 | 0 | 954 | -1,100 | 54 | 0 | 1,133 | -1,385 | 900 | -1,100 | 233 | 0 |
| 24 | Sep-15 | 975 | -1,165 | 900 | -1,100 | 75 | 0 | 954 | -1,100 | 54 | 0 | 1,133 | -1,385 | 900 | -1,100 | 233 | 0 |
| 25 | **BP-14 Average** | **923** | **-1,099** | **895** | **-1083** | **27** | **0** | **901** | **-1083** | **13** | **0** | **1,074** | **-1,310** | **900** | **-1100** | **174** | **0** |

571 MW of installed wind capacity in 30/30 committed scheduling is a reduction in balancing reserve capacity need of 571 * 14% * 27% =
21.6

## Table 3.18
## Cost Allocation for VERBS Solar Rate

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Installed Capacity Forecast for Solar (MW) | 15 | | | | | |
| | | Balancing Reserve Quantity Forecast | Embedded Cost Allocation * | Direct Assignment Cost Allocation ** | Variable Cost Allocation *** | Total Cost Allocation | VERBS Solar Rate |
| | | A | B | C | D | E | F |
| 1 | Regulating *inc* | 0.06 | 4,990 | 273 | 483 | | |
| 2 | Regulating *dec* | 0.06 | 0 | 273 | 415 | | |
| 3 | Regulating Component | | | | | | 0.04 |
| 4 | Following *inc* | 0.28 | 23,285 | 5533 | 1641 | | |
| 5 | Following *dec* | 0.28 | 0 | 5671 | 1936 | | |
| 6 | Following Component | | | | | | 0.21 |
| 7 | Total *inc* | 0.34 | | | | | |
| 8 | Total *dec* | 0.34 | | | | | |
| 9 | Total | | 28,274 | 11,750 | 4,475 | 44,499 | |

* Embedded cost allocated at $6/93/kW/month of balancing reserve capacity.

** Direct assignment cost allocated by proportion of balancing reserve capacity quantity forecast.

*** Variable cost allocated by the proportional results of the GARD model.

Table 3.19

Type 1 Purchases Allocation Methodology

| | | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| | **Self Supply of Generation Imbalance for 1505 MW of installed wind capacity** | | | | | | | |
| 1 | Average Planned FCRPS-sourced Capacity (MW)[/3] | | 895 | Remaining FCRPS after first allocation (MW) | | | 349 | |
| 2 | Use Category | Nameplate or Equivalent (MW) | Balancing Need (MW) | Balancing Need as a % of Nameplate | 1st FCRPS Cost Allocation (MW) | Remaining Need (MW) | 2nd FCRPS Cost Allocation (MW) | Planned Balancing Capacity Acquisition Cost Allocation (MW) |
| 3 | Load | 11,499 | 279 | 2.4% | 279 | 0 | 0 | **0** |
| 4 | VER[/1] | 4,886 | 549 | 11.2% | 172 | 377 | 349 | **27** |
| 5 | DER[/2] | 8,995 | 95 | 1.1% | 95 | 0 | 0 | **0** |
| 6 | Total | 25,380 | 923 | 3.6% | 546 | 377 | 349 | 27 |
| 7 | | Average FCRPS Planned Capability | | 3.5% | | | | |
| 8 | **No Self-Supply of Generation Imbalance for VERBS** | | | | | | | |
| 9 | Average Planned FCRPS-sourced Capacity (MW) | | 900 | Remaining FCRPS after first allocation (MW) | | | 353 | |
| 10 | Use Category | Nameplate or Equivalent (MW) | Balancing Need (MW) | Balancing Need as a % of Nameplate | 1st FCRPS Cost Allocation (MW) | Remaining Need (MW) | 2nd FCRPS Cost Allocation (MW) | Planned Balancing Capacity Acquisition Cost Allocation (MW) |
| 11 | Load | 11,499 | 279 | 2.4% | 279 | 0 | 0 | **0** |
| 12 | VER[/1] | 4,886 | 701 | 14.3% | 173 | 527 | 353 | **174** |
| 13 | DER[/2] | 8,995 | 95 | 1.1% | 95 | 0 | 0 | **0** |
| 14 | Total | 25,380 | 1,074 | 4.2% | 547 | 527 | 353 | 174 |
| 15 | | Average FCRPS Planned Capability | | 3.5% | | | | |
| 16 | Equations | [A] | [B] | [C] = [B]/[A] | [D] = Minimum of [B] or [A]/[A Total] X FCRPS Planned Capability (MW) | [E] = [B] - [D] | there is remaining need then [A]/[Sum of A with remaining need] X Remaining FCRPS after first allocation | [G] = [B] - [D] - [F] |

[/1] Includes solar.

[/2] Includes CGS and non-AGC controlled hydro.

[/3] This value is less than 900 MW because the FCRPS does not reach the 900 MW limit until several months into the rate period

Table 3.20
Expanded Example of Type 1 Purchases Allocation Methodology

| | | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Average Planned FCRPS-sourced Capacity (MW)[/3] | | 895 | Remaining FCRPS after 1st allocation (MW) | | | | 350 | | | |
| 2 | | | | Remaining FCRPS after 2nd allocation (MW) | | | | 97 | | | |
| 3 | Use Category | Nameplate or Equivalent (MW) | Balancing Need before Self-Supply (MW) | Self-Supply/ CSGI (MW) | Balancing Need as a % of Nameplate | 1st FCRPS Cost Allocation (MW) | Remaining Need after 1st Allocation (MW) | 2nd FCRPS Cost Allocation (MW) | Remaining Need after 2nd Allocation (MW) | 3rd FCRPS Cost Allocation (MW) | Planned Balancing Capacity Acquisition Cost Allocation (MW) |
| 4 | Load | 11,499 | 279 | 0 | 2.4% | 279 | 0 | 0 | 0 | 0 | **0** |
| 5 | Solar | 15 | 0.3 | 0 | 2.0% | 0.3 | 0 | 0 | 0 | 0 | **0** |
| 6 | CSGI | 1,505 | 216 | 151 | 4.3% | 53 | 12 | 12 | 0 | 0 | **0** |
| 7 | Uncommitted Wind | 688 | 121 | 0 | 17.6% | 24 | 97 | 49 | 47 | 24 | **23** |
| 8 | 30/60 Committed Wind | 2,107 | 303 | 0 | 14.4% | 74 | 229 | 151 | 77 | 73 | **4** |
| 9 | 30/30 Committed Wind | 571 | 60 | 0 | 10.5% | 20 | 40 | 40 | 0 | 0 | **0** |
| 10 | DER[/2] | 8,995 | 95 | 0 | 1.1% | 95 | 0 | 0 | 0 | 0 | **0** |
| 11 | Total | 25,380 | 1,074 | 151 | 3.6% | 546 | 377 | 253 | 124 | 97 | 27 |
| 12 | | Average FCRPS Planned Capability | | | 3.5% | | | | | | |
| 13 | | | Net Need (MW) | | 923 | | | | | | |
| 14 | [/2] Includes CGS and non-AGC controlled hydro. | | | | | | | | | | |
| 15 | [/3] This value is less than 900 MW because the FCRPS does not reach the 900 MW limit until several months into the rate period. | | | | | | | | | | |
| 16 | Balancing reserve capacity requirement for wind at 30/60 committed scheduling is 14% of nameplate. | | | | | | | | | | |
| 17 | 40/60 scheduling is a 22% premium. 30/30 committed scheduling is a 27% discount. | | | | | | | | | | |

Table 3.21
Estimate of VERBS Credit for an Adjustment to the Generation Inputs Revenue Forecast for FY 2014-2015

| | | Balancing Reserve Capacity Availability from the FCRPS | Balancing Reserve Capacity Unavailability from the FCRPS | VERBS Credit Rate ($/kW of balancing reserve capacity/month) | kW/MW | Months/Year | Balancing Reserve Capacity Provided by the FCRPS | VERBS Credit Adjustment to Rev Forecast |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| 1 | VERBS Credit inc | 98% | 2% | $ 7.30 | 1000 | 12 | 895 | $1,568,040 |
| 2 | VERBS Credit dec | 98% | 2% | $ 0.60 | 1000 | 12 | 895 | $ 128,880 |
| 3 | Total | | | | | | | $1,696,920 |

**Table 4.1**
**Calculation of Total Balancing Authority Reserve Obligation**
**Proposed WECC OR Standard BAL-002-WECC-1**

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| | **Fiscal Year** | **BPA Area Load (MW)** | **Total System Generation (MW)** | **3% BA Load (MW)** | **3% BA Generation (MW)** | **Total BPA BAA Reserve Obligation (MW)** |
| 1 | 2005 | 5,289 | 11,523 | | | |
| 2 | 2006 | 5,441 | 12,200 | | | |
| 3 | 2007 | 5,752 | 11,869 | | | |
| 4 | 2008 | 6,429 | 12,593 | | | |
| 5 | 2009 | 6,099 | 11,848 | | | |
| 6 | 2010 | 5,945 | 11,631 | | | |
| 7 | 2011 | 6,218 | 13,132 | | | |
| 8 | 2012 Forecast | 6,341 | 13,315 | | | |
| 9 | 2013 Forecast | 6,414 | 13,188 | | | |
| 10 | 2014 Forecast | 6,535 | 13,436 | 196 | 403 | 599.2 |
| 11 | 2015 Forecast | 6,675 | 13,725 | 200 | 412 | 612.0 |
| 12 | **FY 2014-2015 Average** | **6,605** | **13,580** | | | **605.6** |

BPA area load from RODS (account 242200) from FY 2005 through June FY 2012. July FY 2012 through FY 2015 is forecast of BPA area load provided by BPA Agency Load forecast.

BPA total system generation (account 202100) from FY 2005 through June FY 2012. The forecast BPA system generation is based on a historical three year average (FY 2010 - 2012) of BPA generation to BPA load ratio of 2.06:1.

**Table 4.2**
**Total BPA Balancing Authority Area Reserve Obligation**
**Proposed WECC OR Standard BAL-002-WECC-1**

| | A | B | C | D |
|---|---|---|---|---|
| | | **Total BPA BAA Reserve Obligation (MW)** | **Total Third-Party Supply/Self-Supply Reserve Obligation (MW)** | **Total BPA BAA Reserve Obligation Provided by BPA PS (MW)** |
| 1 | FY 2014 | 599.2 | 46.7 | 552.4 |
| 2 | FY 2015 | 612.0 | 46.7 | 565.3 |
| 3 | **Annual Average of FY 2014-2015** | **605.6** | **46.7** | **558.9** |

**Column C:** Total Third Party and Self-Supply is based on customer election effective May 1, 2011, and adjusted for historical usage.

**Column D:** BPA Power Services share of the Reserve Obligation is Column B minus Column C.

**Table 4.3**
**Balancing Authority Reserve Obligation Provided by BPA PS by Month**

| | A | B | C | D |
|---|---|---|---|---|
| | | **FY 2014 (MW)** | **FY 2015 (MW)** | **FY 2014-2015 Average** |
| 1 | Oct | 481.8 | 493.0 | 487.4 |
| 2 | Nov | 525.6 | 537.9 | 531.7 |
| 3 | Dec | 598.7 | 612.7 | 605.7 |
| 4 | Jan | 603.9 | 618.1 | 611.0 |
| 5 | Feb | 574.0 | 587.5 | 580.7 |
| 6 | Mar | 559.8 | 572.9 | 566.3 |
| 7 | Apr | 554.3 | 567.2 | 560.8 |
| 8 | May | 558.1 | 571.0 | 564.6 |
| 9 | Jun | 598.6 | 612.4 | 605.5 |
| 10 | Jul | 573.1 | 586.4 | 579.8 |
| 11 | Aug | 524.7 | 537.0 | 530.9 |
| 12 | Sep | 476.5 | 487.6 | 482.1 |
| 13 | **FY Average** | **552.4** | **565.3** | **558.9** |

Assumes BAL-002-WECC-1 is effective for the entire FY 2014-2015 rate period.

**Table 4.4**
**Total Regulated Hydro and Independent Hydro Projects in BPA Balancing Authority Area Capable of Supplying Operating Reserves Adjusted for Transmission Losses**
**1958 Water Conditions**

| | | | Capacity Averaged for FY 2014-2015 | Oct | Nov | Dec | Jan | Feb | Mar | 1-Apr | 16-Apr | May | Jun | Jul | 1-Aug | 16-Aug | Sep |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| 1 | Regulated Hydro (120 Hr.) | Capacity | 10,703 | 7,105 | 9,163 | 10,079 | 12,607 | 11,462 | 12,285 | 11,610 | 11,848 | 13,547 | 13,626 | 10,775 | 9,430 | 8,271 | 7,209 |
| 2 | Transmission Losses at 3.35% Loss Factor | | 359 | | | | | | | | | | | | | | |
| 3 | Regulated Federal Hydro Projects 120-Hour Capacity Adjusted for Transmission Losses | | 10,345 | | | | | | | | | | | | | | |
| 4 | Big Cliff | Capacity | 10 | 9 | 15 | 19 | 19 | 14 | 4 | 6 | 9 | 10 | 6 | 5 | 4 | 5 | 7 |
| 5 | Chandler | Capacity | 5 | 6 | 6 | 2 | 7 | 10 | 9 | 6 | 6 | 5 | 4 | 0 | 2 | 2 | 4 |
| 6 | Cougar | Capacity | 17 | 27 | 25 | 23 | 23 | 25 | 9 | 19 | 8 | 17 | 10 | 5 | 6 | 13 | 16 |
| 7 | Detroit | Capacity | 80 | 88 | 90 | 98 | 103 | 95 | 96 | 94 | 90 | 94 | 98 | 10 | 7 | 9 | 86 |
| 8 | Dexter | Capacity | 10 | 9 | 16 | 16 | 16 | 16 | 5 | 2 | 7 | 13 | 11 | 5 | 6 | 7 | 7 |
| 9 | Foster | Capacity | 10 | 10 | 10 | 14 | 16 | 18 | 5 | 13 | 12 | 2 | 7 | 4 | 6 | 6 | 11 |
| 10 | Green Peter | Capacity | 47 | 6 | 15 | 91 | 92 | 92 | 10 | 91 | 92 | 92 | 11 | 13 | 8 | 6 | 42 |
| 11 | Hills Creek | Capacity | 30 | 34 | 34 | 34 | 34 | 33 | 6 | 4 | 34 | 34 | 29 | 32 | 33 | 31 | 33 |
| 12 | Lookout Point | Capacity | 110 | 110 | 116 | 137 | 138 | 138 | 15 | 4 | 123 | 122 | 131 | 125 | 111 | 110 | 113 |
| 13 | Roza | Capacity | 7 | - | 1 | 3 | 5 | 9 | 10 | 12 | 12 | 11 | 10 | 11 | 11 | 11 | 3 |
| 14 | Total Independent Hydro Capable of Providing Operating Reserve | | 325 | | | | | | | | | | | | | | |
| 15 | Transmission Losses at 3.35% Loss Factor | | 11 | | | | | | | | | | | | | | |
| 16 | Total Independent Hydro Capable of Providing Operating Reserve Adjusted for Transmission Losses | | 314 | | | | | | | | | | | | | | |
| 17 | Total Regulated Hydro and Independent Hydro Capable of Providing Operating Reserve Adjusted for Transmission Losses (Line 3 + Line 16) | Capacity | 10,659 | | | | | | | | | | | | | | |

**Table 4.5**
**Operating Reserve**
**Power Revenue Requirement for**
**All Hydroelectric Projects in BPA Balancing Authority Area**
**($ in thousands)**

| | | FY 2014 | FY 2015 | Annual Average for FY 2014-FY 2015 |
|---|---|---|---|---|
| | A | B | C | D |
| 1 | **All Hydro Projects 1/** | | | |
| 2 | O&M | $ 321,949 | $ 332,465 | **$ 327,207** |
| 3 | Depreciation | $ 96,901 | $ 100,372 | **$ 98,637** |
| 4 | Net Interest | $ 140,098 | $ 143,668 | **$ 141,883** |
| 5 | Minimum Required Net Revenues | $ - | $ - | **$ -** |
| 6 | Planned Net Revenues for Risk | $ - | $ - | **$ -** |
| 7 | **Total Revenue Requirement** | $ 558,948 | $ 576,505 | **$ 567,726** |
| | | | | |
| 8 | **Fish & Wildlife** | | | |
| 9 | O&M | $ 331,016 | $ 337,918 | **$ 334,467** |
| 10 | Amortization/Depreciation | $ 51,983 | $ 55,812 | **$ 53,897** |
| 11 | Net Interest | $ 59,507 | $ 62,613 | **$ 61,060** |
| 12 | Minimum Required Net Revenues | $ - | $ - | **$ -** |
| 13 | Planned Net Revenues for Risk | $ - | $ - | **$ -** |
| 14 | **Subtotal** | $ 442,506 | $ 456,342 | **$ 449,424** |
| | | | | |
| 15 | **A&G Expense 2/** | $ 107,632 | $ 110,639 | **$ 109,135** |
| | | | | |
| 16 | **Total Revenue Requirement** | $ 1,109,086 | $ 1,143,485 | **$ 1,126,286** |
| 17 | **Revenue Credits** | | | |
| 18 | 4h10C (non-operations) | $ 67,981 | $ 65,284 | **$ 66,632** |
| 19 | Colville Payment Treasury Credit | $ 4,600 | $ 4,600 | **$ 4,600** |
| 20 | Synchronous Condensing | $ 288 | $ 286 | **$ 287** |
| 21 | **Net Revenue Requirement** | $ 1,036,217 | $ 1,073,315 | **$ 1,054,766** |
| 1/ | Excludes Boise, Minidoka-Palisades, Green Springs (USBR) and Lost Creek (COE). | | | |
| 2/ | Power Marketing Sales & Support, Power Scheduling, Generation Oversight, Corporate Expense and 1/2 Planning Council | | | |

**Table 4.6**
**Cost Allocation for Embedded Cost Portion of Operating Reserve**

| | A | B |
|---|---|---|
| | **Average water conditions (1958 water)** | Annual Average of FY2014-2015 |
| | **Assumptions for Calculation:** | 3%/3% |
| 1 | Regulated + Independent Hydro Projects Adjusted for Transmission Losses (MW) | 10,659 |
| 2 | Regulating Reserve (MW) | 61 |
| 3 | Operating Reserve (MW) | 558.9 |
| 4 | Following Capacity Reserve (MW) | 251 |
| 5 | Variable Energy Resource Balancing Service Reserve (MW) | 522 |
| 6 | Dispatchable Energy Resource Balancing Service Reserve (MW) | 61 |
| | **Forecast of Hydro Capacity System Uses:** | |
| 7 | Regulated + Independent Hydro Projects Capacity (Line 1) | 10,659 |
| 8 | Total PS Reserve Obligation (Line 2+3+4+5+6) | 1,454 |
| 9 | Regulated + Independent Hydro Projects Capacity System Uses (Line 7+8) | 12,113 |
| | **Adjusted Revenue Requirement:** | |
| 10 | PS Net Revenue Requirement for Regulated + Independent Hydro Projects | $ 1,054,766,000 |
| 11 | Regulated + Independent Hydro Projects Capacity System Uses (Line 9) | 12,113 |
| 12 | Total kW/month/year Hydro Project Capacity System Uses (Line 11 * 12 months * 1000 kW/MW) | 145,354,800 |
| 13 | **Unit Cost Allocation of Capacity System Uses $/kW/month (Line 10 / Line 12)** | $ 7.26 |
| | **Revenue Forecast for Embedded Cost Portion of Operating Reserve:** | |
| 14 | Operating Reserve Embedded Cost (Line 3 * Line 13 * 12 months * 1000 kW/MW) | $ 48,691,368 |

**Table 5.1**
**Synchronous Condenser Projected Motoring Hours, Hourly Energy Consumption and Energy Costs**

| | Generating Project | Nameplate rating (MW/unit) | Motoring power consumption (MW/unit) | Projected Units to be used | Condensing Hours FY 2007 | Condensing Hours FY 2008 | Condensing Hours FY 2009 | Average Annual Condensing hours/year [(E+F+G)/3] | Energy Consumption MWhrs/year [H * C ] | Total Cost of Energy [I * Market Price Forecast of energy] |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J |
| 1 | John Day, units 11-14 | 155 | 3.0 | units 11-14 | 2,697 | 4,005 | 4,127 | 3,610 | 10,829 | $ 315,124 |
| 2 | The Dalles, units 15-20 | 99 | 1.5 | units 15-20 | 3,006 | 2433 | 3,085 | 2,841 | 4,262 | $ 124,024 |
| 3 | | | | | | | | SUBTOTAL - SOUTHERN INTERTIE* | 15,091 | $ 439,148 |
| 4 | Grand Coulee, units 19-24 | 690 (units 19-21)<br>805 (units 22-24) | 11.0 | units 19-21 | 2,240 | 2,848 | 2,376 | 2,488 | 27,368 | $ 796,409 |
| 5 | Dworshak (small units) | 103 | 4.0 | units 1-2 | 25 | 6 | 10 | 14 | 55 | $ 1,591 |
| 6 | Dworshak (big unit) | 259 | 8.0 | unit 3 | 154 | 15 | 142 | 104 | 829 | $ 24,134 |
| 7 | Palisades, units 1-4 | 44 | 0.6 | units 1-4 | 2320 | 1,773 | 1,177 | 1,757 | 1,054 | $ 30,671 |
| 8 | Detroit, units 1-2 | 58 | 2.0 | units 1-2 | NA | NA | NA | 0 | 0 | $ - |
| 9 | Green Peter, units 1-2 | 46 | 1.2 | units 1-2 | NA | NA | NA | 0 | 0 | $ - |
| 10 | Lookout Point, units 1-3 | 46 | 1.1 | units 1-3 | NA | NA | NA | 0 | 0 | $ - |
| 11 | Hungry Horse, units 1-4 | 107 | 2.5 | units 1-4 | 0 | 0 | 0 | 0 | 0 | $ - |
| 12 | | | | | | | | SUBTOTAL - NETWORK* | 29,306 | $ 852,805 |
| 13 | | | | | | | | TOTAL ENERGY COST | 44,397 | $ 1,291,953 |
| 14 | Market Price Forecast of energy ($/MWh) | $ 29.10 | | | | | | | | |

*Synchronous condensing costs for the John Day and The Dalles projects are allocated to the Southern Intertie segment. Costs of all other projects are allocated to the Network segment.

**Table 5.2**
**Determination of Synchronous Condenser Plant Modification Costs***
**($ thousands)**

| | A | B | C | D |
|---|---|---|---|---|
| | | **FY 2014** | **FY 2015** | **Annual Average of FY 2014 - FY2015** |
| 1 | **Synchronous Condensers Net Plant** | 6,216 | 6,113 | 6,165 |
| 2 | Total Corps/Reclamation Average Net Plant | 6,252,937 | 6,463,665 | 6,358,301 |
| 3 | **percent** | 0.10% | 0.09% | 0.10% |
| 4 | Corps/Reclamation Net Interest | 186,608 | 193,209 | 189,909 |
| 5 | **Sync Cond Net Interest** | 185 | 183 | 184 |
| 6 | Corps/Reclamation MRNR | 30,295 | 10,693 | 20,494 |
| 7 | **Sync Cond MRNR** | 32 | 11 | 22 |
| 8 | **Sync Cond Depreciation** | 103 | 103 | 103 |
| 9 | **Total Sync Cond Plant Modification Costs** | **288** | **286** | 287 |

* These are costs for plant modifications at John Day and The Dalles to enable synchronous condenser operation. These costs are allocated to the Southern Intertie segment.

**Table 5.3**
**Summary of Synchronous Condenser Costs**
**($ thousands)**

| | | FY 2014 | FY 2015 | Annual Average of FY 2014 - FY2015 |
|---|---|---|---|---|
| | A | B | C | D |
| 1 | Modifications at John Day and The Dalles* | $ 288 | $ 286 | $ 287 |
| 2 | **Energy Consumption - John Day and The Dalles** | $ 439 | $ 439 | $ 439 |
| 3 | **Subtotal - Southern Intertie** | **$ 727** | **$ 725** | **$ 726** |
| 4 | **Energy Consumption - Network** | $ 853 | $ 853 | $ 853 |
| 5 | **Total Synchronous Condenser Costs** | **$ 1,580** | **$ 1,578** | **1,579** |

* These are costs for plant modifications at John Day and The Dalles to enable synchronous condenser operation. These costs are allocated to the Southern Intertie segment.

**Table 6.1**
**ESTIMATED COSTS OF "GENERATION DROP" OF UNIT 22, 23, OR 24 AT THE GRAND COULEE THIRD POWERHOUSE**

| | Equipment | Incremental Equipment Deterioration, Replacement or Overhaul Costs | | | Incremental Routine Operation and Maintenance Costs | | | Incremental Lost Revenue In The Event of Replacement or Overhaul | | | | Total Cost Per Drop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % Life Reduction Per Drop | Cost of Major Overhaul (1) | Cost/Drop | % Increase O&M Per Drop | Annual O&M Cost | Cost/Drop | Probability of Failure | Months of Downtime | Downtime Cost (2) | Cost/Drop | |
| | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** |
| 1 | 550kV Circuit Breaker (50% of replacement) | 0.04% | $ 730,000 | $ 292 | 0.04% | $ 4,941 | $ 2 | 0.04% | 1 | $ 1,398,546 | $ 559 | **$ 853** |
| 2 | Main Power Transformer (equal to replacement) | 0.015% | $ 8,332,074 | $ 1,250 | 0.015% | $ 57,069 | $ 9 | 0.018% | 1 | $ 1,398,546 | $ 252 | **$ 1,510** |
| 3 | Generator (rewinding) | 0.71% | $ 18,542,000 | $ 131,648 | 0.71% | $ 450,000 | $ 3,195 | 0.71% | 18 | $ 25,173,828 | $ 178,734 | **$ 313,577** |
| 4 | Turbine (refurbished) | 0.24% | $ 1,460,000 | $ 3,504 | 0.24% | $ 450,000 | $ 1,080 | 0.05% | 16 | $ 22,376,736 | $ 11,188 | **$ 15,772** |
| 5 | 500 kV Cable (replacement) | 0.055% | $ 3,762,000 | $ 2,069 | 0.055% | $ 281,779 | $ 155 | 0.055% | 1 | $ 1,398,546 | $ 769 | **$ 2,993** |
| 6 | **Total Cost Per Drop** | | | **$ 138,763** | | | **$ 4,441** | | | | **$ 191,503** | **$ 334,707** |

(1) Updated to FY2014-FY2015 from original Harza Engineering Company study using the Handy-Whitman Index to calculate cost multiplier

**1.46**

(2) The downtime cost from last unit out at Coulee analysis, assumes normal unit availability at Coulee and then the loss of an additional big unit. The current Value of Availability is adjusted to forecasted cost of energy during the FY 2014-2015 rate period. This analysis includes a planned overhaul of one big unit at Grand Coulee starting in 2013.

**Table 7.1**
**Discretionary Redispatch Under Attachment M**
**October 2009 through September 2011**

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| | **Location** | **Amount Requested (MWh or MW)*** | **Amount Delivered (MWh)** | **Total Cost** | **$/MWh** | **Duration of Redispatch Event (Hours)**** | **Units Incremented** | **Units Decremented** | **Cause** |
| 1 | **North of Hanford Flow Gate:** | | | | | | | | |
| 2 | 1/18/2011 | 150 | 80 | $ 800 | $ 10.00 | 0.6 | CHJ | LWG, LGS | Flows exceed Maximum System Operating Level |
| 3 | 8/25/2011 | 100 | 33 | $ 567 | $ 17.18 | 0.5 | JDA | CHJ | Flow gate flows over System Operating Limit |
| 4 | **North of John Day Flow Gate:** | | | | | | | | |
| 5 | 6/21/2010 | 133 | 133 | $ 1,333 | $ 10.00 | 2 | JDA | GCL | Path 73 over SOL |
| 6 | 9/27/2010 | 458 | 458 | $ 11,458 | $ 25.00 | 5 | GCL | TDA | |
| 7 | 7/1/2011 | 100 | 27 | $ 133 | $ 4.93 | 0.4 | JDA, TDA | CHJ | Flows exceed System Operating Level |
| 8 | 7/1/2011 | 100 | 43 | $ 217 | $ 5.05 | 0.6 | JDA, TDA | CHJ | Flows exceed System Operating Level |
| 9 | 7/1/2011 | 100 | 27 | $ 133 | $ 4.93 | 0.4 | JDA, TDA | CHJ | Flows exceed System Operating Level |
| 10 | **North of John Day/Raver Paul Flowgates:** | | | | | | | | |
| 11 | 7/2/2011 | 50 | 17 | $ 417 | $ 24.53 | 0.5 | JDA | CHJ | Flows exceed System Operating Level |
| 12 | 7/2/2011 | 50 | 10 | $ 250 | $ 25.00 | 0.4 | JDA | CHJ | Flows exceed System Operating Level |
| 13 | **Ice Harbor Area:** | | | | | | | | |
| 14 | 10/13/2009 | 20 | 12 | $ 308 | $ 25.67 | 1 | IHR | GCL | Overloading of Franklin Bank #4 |
| 15 | **Cross Cascades North Flow Gate:** | | | | | | | | |
| 16 | 5/18/2010 | 459 | 343 | $ 4,465 | $ 13.00 | 2 | MCN, JDA, TDA | GCL | Cross Cascades North over SOL |
| 17 | 5/19/2010 | 1368 | 1368 | $ 13,683 | $ 10.00 | 8 | MCN, JDA, TDA | GCL | Cross Cascades North over SOL |
| 18 | **South of Allston Flow Gate:** | | | | | | | | |
| 19 | 3/18/2011 | 150 | 119 | $ 4,050 | $ 34.03 | 1.6 | CHJ | TDA | South of Allston South to North System Operating Level Exceeded |
| 20 | 3/20/2011 | 304 | 127 | $ 4,053 | $ 31.91 | 0.8 | GCL,CHJ | JDA,TDA,BON | South of Allston South to North System Operating Level Exceeded |
| 21 | 3/20/2011 | 105 | 27 | $ 735 | $ 27.22 | 0.5 | GCL, CHJ | TDA, BON | South of Allston South to North System Operating Level Exceeded |
| 22 | **Paul-Allston Flow Gate:** | | | | | | | | |
| 23 | 4/18/2010 | 793 | 793 | $ 7,917 | $ 9.98 | 2 | MCN, JDA,TDA, BON | GCL | |
| 24 | 4/19/2010 | 244 | 244 | $ 2,442 | $ 10.00 | 2 | MCN, JDA, TDA | GCL | |
| 25 | **McNary Area:** | | | | | | | | |
| 26 | 4/5/2010 | 483 | 483 | $ 4,833 | $ 10.01 | 5 | MCN | GCL | |
| 27 | | | | | | | | | |
| 28 | **FY 2010 Total:** | | | $ 46,439 | | | | | |
| 29 | **FY 2011 Total:** | | | $ 11,355 | | | | | |
| 30 | **Discretionary Redispatch Total:** | | | $ 57,794 | | | | | |
| 31 | *Units are MWh for 2010 and MW for 2011.<br>**For 2010, duration is rounded to the nearest whole hour. | | | | | | | | |

**Table 7.2**
**NT Firm Redispatch Resulting from the Purchase of Energy or Transmission for Planned and Unplanned Outages**
**October 2009 through September 2011**

| | | A | B | C | D |
|---|---|---|---|---|---|
| | | **MWh** | **Cost** | **$/MWh** | **Constrained Path(s)/Cause** |
| 1 | Oct-09 | 716 | $ 1,202 | $ 1.68 | LaGrande Outage |
| 2 | Nov-09 | - | | | |
| 3 | Dec-09 | 330 | $ 1,765 | $ 5.35 | BPA network stranded load |
| 4 | Jan-10 | - | | | |
| 5 | Feb-10 | 4,240 | $ 14,546 | $ 3.43 | LaGrande Outage/Malin-Hilltop outage |
| 6 | Mar-10 | 572 | $ 364 | $ 0.64 | LaGrande Outage |
| 7 | Apr-10 | - | | | |
| 8 | May-10 | 5,204 | $ 15,030 | $ 2.89 | Malin-Hilltop outage/Stranded Load/Vera Outage |
| 9 | Jun-10 | 7 | $ 40 | $ 5.71 | LaGrande Outage |
| 10 | Jul-10 | 305 | $ 7,653 | $ 25.09 | Backup Svc Sched Outage |
| 11 | Aug-10 | 1,501 | $ 8,661 | $ 5.77 | LaGrande Outage |
| 12 | Sep-10 | - | | | |
| 13 | Oct-10 | 912 | $ 11,353 | $ 12.45 | LaGrande Outage |
| 14 | Nov-10 | 141,004 | $ 414,655 | $ 2.94 | LaGrande/VERA Outage |
| 15 | Dec-10 | - | | | |
| 16 | Jan-11 | 648 | $ 3,165 | $ 4.89 | RATS |
| 17 | Feb-11 | 92 | $ 320 | $ 3.48 | COI outage in Cali. prevented deliveries to RATS |
| 18 | Mar-11 | 479 | $ 1,904 | $ 3.97 | LaGrande |
| 19 | Apr-11 | 1,627 | $ 4,874 | $ 3.00 | LaGrande and Hamey |
| 20 | May-11 | 4,478 | $ 28,038 | $ 6.26 | LaGrande and Kalispell-Elmo |
| 21 | Jun-11 | - | | | |
| 22 | Jul-11 | 555 | $ 3,202 | $ 5.77 | LaGrande |
| 23 | Aug-11 | 518 | $ 2,989 | $ 5.77 | LaGrande |
| 24 | Sep-11 | - | | | |
| 25 | **Total** | **$ 163,188** | **$ 519,761** | | |
| 26 | **FY 2010 Total** | **$ 12,875** | **$ 49,261** | | |
| 27 | **FY 2011 Total** | **$ 150,313** | **$ 470,500** | | |

**Table 8.1**
**COE Transmission Segmentation as of 9/30/2011**
**BONNEVILLE DAM**

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Prop ID** 1/ | **Plant Item** | **Book Cost** | **Generation Integration** | **Integrated Network** |
| 2 | BONNE-13361 | Power transformers | $ 28,239,329 | 28,239,329 | 0 |
| 3 | BONNE-13358 | Switchyard circuit breaker 2/ | 1,499,685 | 599,874 | 899,811 |
| 4 | BONNE-13559 | Switchyard circuit breaker 2/ | 1,499,961 | 599,984 | 899,976 |
| 5 | BONNE-13360 | Switchyard circuit breaker 2/ | 1,500,514 | 600,206 | 900,308 |
| 6 | | **Total:** | **$ 32,739,488** | **30,039,393** | **2,700,096** |
| 7 | **Notes:** | | | | |
| 8 | 1/ Investment from Corps of Engineers records | | | | |
| 9 | 2/ (6 ea) 115 kV PCBs; supporting 2 Generation Integration terminals, and 3 Network terminals. | | | | |
| 10 | Total PCB cost allocated 2/5 to GI and 3/5 to Network. | | | | |

| | Table 8.2<br>COLUMBIA BASIN (GRAND COULEE) COST SUMMARY | | |
|---|---|---|---|
| | **A** | **B** | **C** |
| **1** | **As of 9/30/2011** | | |
| **2** | **Segment** | **Investment** | **Percent** |
| **3** | **TOTAL TRANSMISSION** | | |
| **4** | Network | 71,345,014 | 31.13% |
| **5** | Generation Integration | 155,382,130 | 67.80% |
| **6** | Delivery | 2,449,904 | 1.07% |
| **7** | **Total** | **229,177,047** | **100.00%** |
| **8** | **THIRD POWERHOUSE (500 kV Facilities)** | | |
| **9** | Network | 43,686,672 | 28.60% |
| **10** | Generation Integration | 109,041,548 | 71.40% |
| **11** | **Total** | **152,728,220** | **100.00%** |
| **12** | **FIRST & SECOND POWERHOUSE & OTHERS** | | |
| **13** | Network | 27,658,342 | 36.18% |
| **14** | Generation Integration | 46,340,581 | 60.62% |
| **15** | Delivery | 2,449,904 | 3.20% |
| **16** | **Total** | **76,448,827** | **100.00%** |
| **17** | Investment includes Interest During Construction (IDC). | | |

**Table 8.3**
**COLUMBIA BASIN COSTS (Grand Coulee)**
**Bureau of Reclamation data for investments (in $) as of 9/30/2011**

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | **Segment** | | |
| 2 | | **Value** | **Integrated Network** | **Generation Integration** | **Utility Delivery** | **Source** |
| 3 | **Total Electric Plant 1/** | 1,284,454,226 | | | | USBR Schedule 1, pg 10 |
| 4 | Interest During Construction (IDC) | 133,829,807 | | | | USBR Schedule 1, pg 10 |
| 5 | Ratio of IDC to total plant | 11.6% | | | | |
| 6 | **13.031 Pump Generator Switchyard** | 4,742,053 | | | | USBR Schedule 1, pg 10 |
| 7 | Add: Interest During Construction | 551,551 | | | | Applied IDC ratio |
| 8 | Subtotal times percent allocation 2/ | 5,293,605 | 0.0% | 100.0% | 0.0% | All Generation Integration |
| 9 | Equals: Amount Allocated | | 0 | 5,293,605 | 0 | |
| 10 | **13.034 500kV & Other Switchyard** | 136,575,003 | | | | USBR Schedule 1, pg 10 |
| 11 | Add: 500 kV Switchyard Roof | 176,899 | | | | USBR Schedule 1, pg 4 |
| 12 | Add: 500 kV & Other Switchyard Land | 70,623 | 0.03% | | | USBR Schedule 1, pg 4 |
| 13 | Less: Reactive Equipment 3/ | (7,181,279) | | | | USBR records |
| 14 | Less: 500kV cables 4/ | (22,789,063) | | | | USBR records |
| 15 | Subtotal and percent allocation 5/ | 106,852,183 | 29.9% | 70.1% | 0.0% | Table 8.4 |
| 16 | Equals: Amount Allocated | | 31,955,793 | 74,896,390 | 0 | |
| 17 | Add back: Reactive (Network); Cables (GI) | | 7,181,279 | 22,789,063 | 0 | Lines 13 & 14 |
| 18 | Subtotal | | 39,137,072 | 97,685,453 | 0 | |
| 19 | Add: Interest During Construction 6/ | | 4,549,599 | 11,356,095 | 0 | Applied IDC ratio |
| 20 | Equals: Amount Allocated | | 43,686,672 | 109,041,548 | 0 | |
| 20 | **13.035 Modified Left Switchyard** | 60,775,966 | | | | 4/ USBR Schedule 1, pg 10 |
| 21 | Less: Lines 4/ | (7,199,787) | | | | USBR records |
| 22 | Subtotal and percent allocation 7/ | 56,541,633 | 43.8% | 52.3% | 3.9% | Table 8.4 |
| 23 | Equals: Amount Allocated | | 24,776,565 | 29,570,425 | 2,194,643 | |
| 25 | Add back: Lines (all GI) | | 0 | 7,199,787 | 0 | Line 21 |
| 26 | Subtotal | | 24,776,565 | 36,770,212 | 2,194,643 | |
| 27 | Add: Interest During Construction | | 2,881,777 | 4,276,765 | 255,260 | Applied IDC ratio |
| 28 | Equals: Amount Allocated | | 27,658,342 | 41,046,977 | 2,449,904 | |
| 30 | **Total allocation by segment** | | **71,345,014** | **155,382,130** | **2,449,904** | |
| 31 | Percentage allocation | | 31.1% | 67.8% | 1.1% | |

32 **NOTES:**

33 1/ Assume all transmission costs to be segmented are included in the USBR Schedule 1 for the Columbia Basin (Grand Coulee) project.

34 2/ Pump generator switchyard and power plant all allocated to Generation Integration; average IDC included.

35 3/ Assume (a) Job 1990000 Misc Equipment refers to the Reactive Equipment costs and (b) Reactive equipment is all Network

36 4/ Assume (a) cables, Job 1840000 and 1850000, are all underground feeds and (b) these cables are part of Generation Integration.

37 5/ All 500 kV line and substation costs, plus Roof Replacement costs and Land, less direct assigned cables; 6 of 12 terminals to Power Hou

38 6/ Reclamation does not accrue IDC on Electric Land in Service. These calculations therefore do not apply IDC on Land investments.

39 7/ Assume this includes all 230 kV, 115 kV, and low voltage equipment, less direct assigned cables; IDC not included.

**Table 8.4**
**GRAND COULEE NETWORK INVESTMENT RATIO-ASSIGNMENT**
**Based on BPA Typical Costs of Facilities 1/**

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Items** | **Integrated Network** | **Generation Integration** | **Utility Delivery** | **Total** | **Typical Cost 1/** |
| 2 | **500 kV Switchyard items** | | | | | |
| 3 | 500 kV terminal | 6 | 6 | 0 | 12 | |
| 4 | Step-ups 7-800 MVA | 0 | 6 | 0 | 6 | |
| 5 | Reactive Equipment | 1 | 0 | 0 | 1 | |
| 6 | **Allocated Costs ($000)** | | | | | |
| 7 | 500 kV terminal | 27,000 | 27,000 | 0 | 54,000 | 4,500 |
| 8 | Step-ups 7-800 MVA | 0 | 48,000 | 0 | 48,000 | 8,000 |
| 9 | Reactive Equipment | 5,000 | 0 | 0 | 5,000 | 5,000 |
| 10 | **Total** | **32,000** | **75,000** | **0** | **107,000** | |
| 11 | Percent Allocation | 29.9% | 70.1% | 0.0% | 100.0% | |
| 12 | **Left Switchyard (includes 230kV, 115kV & 12kV yards) items** | | | | | |
| 13 | 230 kV PCB | 17 | 5 | 0 | 22 | |
| 14 | 500/230 tx 1200MVA | 1 | 0 | 0 | 1 | |
| 15 | 230/287kV tx | 1 | 0 | 0 | 1 | |
| 16 | 230/115 tx 230MVA | 1 | 0 | 0 | 1 | |
| 17 | 115kV PCB | 5 | 2 | 2 | 9 | |
| 19 | 12kV PCB 2/ | 0 | 24 | 6 | 30 | |
| 18 | Delivery - 20 MVA tx | 0 | 3.2 | 0.8 | 4 | |
| 20 | Step-ups 1-125MVA | 0 | 18 | 0 | 18 | |
| 21 | **Allocated Costs ($000)** | | | | | |
| 22 | 230 kV PCB | 9,520 | 2,800 | 0 | 12,320 | 560 |
| 23 | 500/230 tx 1200MVA | 9,800 | 0 | 0 | 9,800 | 9,800 |
| 24 | 230/287kV tx | 2,600 | 0 | 0 | 2,600 | 2,600 |
| 25 | 230/115 tx 230MVA | 2,600 | 0 | 0 | 2,600 | 2,600 |
| 26 | 115kV PCB | 1,875 | 750 | 750 | 3,375 | 375 |
| 28 | 12kV PCB | 0 | 3,120 | 780 | 3,900 | 130 |
| 27 | Delivery - 20 MVA tx | 0 | 3,232 | 808 | 4,040 | 1,010 |
| 29 | Step-ups 1-125MVA | 0 | 21,600 | 0 | 21,600 | 1,200 |
| 30 | **Total** | **26,395** | **31,502** | **2,338** | **60,235** | |
| 31 | Percent Allocation | 43.8% | 52.3% | 3.9% | 100.0% | |
| 32 | 1/ Typical average unit costs are from 1998 Segmentation Study. | | | | | |
| 33 | 2/ 16 ea PCBs in 11.95 kV yard, assume only 6 used to serve Delivery. Rest are assumed to serve USBR. | | | | | |
| 34 | 3/ Delivery transformers allocated according to 12kV PCB allocation | | | | | |

**TABLE 8.5**
**USBR SEGMENTATION - OTHER PROJECTS**
As of 9/30/2011 - Based on data from USBR

| | A | B | C | D | E |
|---|---|---|---|---|---|
| | **PROJECT** | **TRANSMISSION INVESTMENT 1/** | **INTEGRATED NETWORK** | **INTEGRATION** | **LAND IN SERVICE /2** |
| 1 | Hungry Horse (see below | 9,662,518 | 2,019,034 | 7,643,485 | |
| 2 | Boise 3/ | 1,844,220 | 0 | 1,844,220 | 2,928 |
| 3 | Yakima 4/ | 3,353,824 | 0 | 3,353,824 | 7,216 |
| 4 | Green Springs 5/ | 178,988 | 0 | 178,988 | |
| 5 | Minidoka (see below) | 1,700,557 | 925,653 | 774,904 | 314 |
| 6 | Palisades (see below) | 2,197,305 | 467,733 | 1,729,572 | |
| 7 | **Total** | **18,937,411** | **3,412,419** | **15,524,992** | **10,458** |
| 8 | Total less Land | **18,926,953** | | | |
| 9 | **SEGMENT PERCENTAGES FOR MULTI-SEGMENT PLANTS** | | | | |
| 10 | Item | Cost 6/ | Network | Gen Int | Total |
| 11 | **Hungry Horse** 7/ | | | | |
| 12 | 230kV PCBs (4 ea) | 560,000 | 1,120,000 | 1,120,000 | 2,240,000 |
| 13 | 180MVA step-ups (2 ea) | 1,560,000 | 0 | 3,120,000 | 3,120,000 |
| 14 | | | 1,120,000 | 4,240,000 | 5,360,000 |
| 15 | *Percent of total* | | 20.9% | 79.1% | 100.0% |
| 16 | **Minidoka** 8/ | | | | |
| 17 | 138kV PCBs (7 ea) | 375,000 | 1,750,000 | 875,000 | 2,625,000 |
| 18 | Step-up to 138kV | 590,000 | 0 | 590,000 | 590,000 |
| 19 | *Total* | | 1,750,000 | 1,465,000 | 3,215,000 |
| 20 | *Percent of total* | | 54.4% | 45.6% | 100.0% |
| 21 | **Palisades** 9/ | | | | |
| 22 | 115kV PCBs (9 ea) | 375,000 | 1,446,429 | 1,928,571 | 3,375,000 |
| 23 | 35MVA step-ups (4 ea) | 590,000 | 0 | 2,360,000 | 2,360,000 |
| 24 | 10MVA 115/12.5kV 10/ | 1,060,000 | 0 | 1,060,000 | 1,060,000 |
| 25 | *Total* | | 1,446,429 | 5,348,571 | 6,795,000 |
| 26 | *Percent of total* | | 21.3% | 78.7% | 100.0% |
| 27 | **NOTES:** | | | | |
| 28 | 1/ Data from Bureau of Reclamation Transmission Plant In Service details (incl. IDC allocation) | | | | |
| 29 | 2/ Land in service is subset of total Transmission Investment; Land specifically for transmission facilities | | | | |
| 30 | 3/ Includes Anderson Ranch and Black Canyon | | | | |
| 31 | 4/ Includes the Roza and Kennewick divisions | | | | |
| 32 | 5/ does not include Construction in Progress | | | | |
| 33 | 6/ Typical average unit costs are from 1998 segmentation study | | | | |
| 34 | 7/ Hungry Horse: 2 GI & 2 Network terminals with 4 breakers; step-up transformers uses 230/69kV 75 MVA c | | | | |
| 35 | 8/ Minidoka: 2 GI & 4 Network terminals with 7 breakers; step-up xfmr uses 115/34.5kV 25 MVA cost | | | | |
| 36 | 9/ Palisades: 4 GI & 3 Network terminals with 9 breakers; 4 step-up transformers use 115/34.5kV 25 MVA cos | | | | |
| 37 | 10/ Palisades 12.5kV - Lower Valley provides station service to USBR - no delivery feed to Lower Valley | | | | |

**Table 8.6**
**Segmentation Summary -- All COE and Reclamation Projects**

| | A | B | C | D |
|---|---|---|---|---|
| | | **Generation Integration** | **Integrated Network** | **Utility Delivery** |
| **1** | **Reclamation Projects:** | | | |
| **2** | Columbia Basin (Grand Coulee) Project | 155,382,130 | 71,345,014 | 2,449,904 |
| **3** | Other Projects | 15,524,992 | 3,412,419 | 0 |
| **4** | **Total Reclamation Projects** | **170,907,122** | **74,757,433** | **2,449,904** |
| **5** | **COE Projects:** | | | |
| **6** | **Total COE (Bonneville) Project** | **30,039,393** | **2,700,096** | **0** |
| **7** | **TOTAL ALL PROJECTS:** | **200,946,514** | **77,457,529** | **2,449,904** |
| **8** | **TOTAL TRANSMISSION ALLOCATION:** | **79,907,432** | (Network plus Utility Delivery) | |

| Table 9.1<br>Load Factor Calculation for Station Service Energy Use Analysis | | | | |
|---|---|---|---|---|
| | Substation Name | Installed Transformation (kVA) | Historical Average Monthly Use (kWh) | Calculated Load Factor |
| | A | B | C | D |
| 1 | **Large** | | | |
| 2 | Alvey | 2,267 | 96,923 | |
| 3 | Bell | 2,250 | 149,000 | |
| 4 | Snohomish | 1,250 | 78,000 | |
| 5 | Olympia | 1,100 | 132,738 | |
| 6 | Covington | 946 | 108,333 | |
| 7 | Pearl | 875 | 28,067 | |
| 8 | Longview | 825 | 38,317 | |
| 9 | McNary | 800 | 108,717 | |
| 10 | Chemawa | 725 | 18,140 | |
| 11 | Anaconda | 600 | 42,910 | |
| 12 | Columbia | 600 | 18,292 | |
| 13 | John Day | 500 | 65,896 | |
| 14 | Santiam | 400 | 25,740 | |
| 15 | St. Johns | 310 | 15,858 | |
| 16 | Port Angeles | 300 | 49,920 | |
| 17 | Valhalla | 300 | 17,592 | |
| 18 | Fairview | 300 | 12,560 | |
| 19 | **Subtotal** | 14,348 | 1,007,003 | |
| | | | | |
| 20 | **Medium** | | | |
| 21 | Oregon City | 225 | 13,663 | |
| 22 | Walla Walla | 150 | 6,919 | |
| 23 | LaGrande | 150 | 5,663 | |
| 24 | Ellensburg | 100 | 3,897 | |
| 25 | Roundup | 75 | 5,708 | |
| 26 | Boardman | 75 | 1,595 | |
| 27 | Drain | 65 | 1,654 | |
| 28 | Reedsport | 55 | 3,922 | |
| 29 | **Subtotal** | 895 | 43,021 | |

**Table 9.1**
**Load Factor Calculation for Station Service Energy Use Analysis**

| | Substation Name | Installed Transformation (kVA) | Historical Average Monthly Use (kWh) | Calculated Load Factor |
|---|---|---|---|---|
| | A | B | C | D |
| | | | | |
| 30 | **Small** | | | |
| 31 | Sappho | 45 | 2,363 | |
| 32 | Lookout Point | 40 | 3,387 | |
| 33 | The Dalles | 38 | 2,657 | |
| 34 | Bandon | 25 | 1,746 | |
| 35 | Gardiner | 25 | 1,402 | |
| 36 | Creston | 15 | 1,122 | |
| 37 | Hauser | 10 | 1,525 | |
| 38 | Duckabush | 10 | 1,192 | |
| 39 | Ione | 5 | 1,028 | |
| 40 | **Subtotal** | 213 | 16,422 | |
| 41 | **TOTAL** | **15,456** | **1,066,446** | **9.45%** |

Load factor calculation is the Historical Average Monthly Use divided by Installed Transformation divided by 730 average hours in the month.
D = C / B / 730.

**Table 9.2**
**Calculation of Station Service Use and Cost**

| | Facility Type | Installed Transformation (kVA) | Average Monthly Use[1] (kWh) | Annual Station Service Use[2] (kWh) | Annual Average Market Price Forecast ($/MWh) | Cost Allocation for Station Service per Year[3] ($) |
|---|---|---|---|---|---|---|
| | A | B | D | E | F | G |
| 1 | Large | 40,128 | 2,768,230 | | | |
| 2 | Medium | 4,673 | 322,367 | | | |
| 3 | Small | 1,413 | 97,476 | | | |
| 4 | Big Eddy/Celilo Complex | | 1,822,937 | | | |
| 5 | Ross Complex | | 1,749,300 | | | |
| **6** | **Total** | **46,214** | **6,760,310** | **82,665,068** | **$ 29.10** | **$ 2,405,552** |

1/ For Large, Medium and Small substations, the calculated average monthly use is installed transformation times 9.45% average calculated load factor times 730 average hours in month (D = B * 9.45% * 730). Historical usage is metered for Big Eddy/Celilo and Ross Complexes.

2/ Annual Station Service Use is the monthly use times 12 months plus BPA Transmission Network Losses (1.9%, or 1,541,351 kWh)

3/ Cost Allocation for Station Service per Year is the amount of Station Service Energy Forecasted per Year times the Annual Average Market Price Forecast (G = E * F)

**Table 10.1**
**Persistent Deviation Summary by Type (October 2010 - September 2012)**

| | | Wind | | | | Load | | | | Thermal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Month | Number of Events | Penalized PD Hours | Penalized PD Hours as a Percentage of Total Plant Hours* | Number of Wind Plants** | Number of Events | Penalized PD Hours | Penalized PD Hours as a Percentage of Total Plant Hours* | Number of Load Customers | Number of Events | Penalized PD Hours | Penalized PD Hours as a Percentage of Total Plant Hours* | Number of Thermal Customers | Hours in Month |
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| 1 | Oct-10 | 8 | 34 | 0.25% | 18 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 2 | Nov-10 | 8 | 35 | 0.27% | 18 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 3 | Dec-10 | 4 | 19 | 0.13% | 20 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 4 | Jan-11 | 7 | 35 | 0.24% | 20 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 5 | Feb-11 | 8 | 36 | 0.27% | 20 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 672 |
| 6 | Mar-11 | 13 | 60 | 0.40% | 20 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 7 | Apr-11 | 9 | 43 | 0.30% | 20 | 1 | 4 | 0.03% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 8 | May-11 | 13 | 58 | 0.39% | 20 | 0 | 0 | 0.00% | 20 | 1 | 4 | 0.03% | 21 | 744 |
| 9 | Jun-11 | 5 | 25 | 0.17% | 20 | 0 | 0 | 0.00% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 10 | Jul-11 | 8 | 34 | 0.23% | 20 | 1 | 4 | 0.03% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 11 | Aug-11 | 3 | 12 | 0.08% | 20 | 1 | 6 | 0.04% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 12 | Sep-11 | 16 | 156 | 1.08% | 20 | 1 | 9 | 0.06% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 13 | | Total | Total | Average | | Total | Total | Average | | Total | Total | Average | | |
| 14 | **FY 2011** | **102** | **547** | **0.32%** | | **4** | **23** | **0.01%** | | **1** | **4** | **0.00%** | | |
| 15 | Oct-11 | 4 | 15 | 0.10% | 20 | 13 | 477 | 3.21% | 20 | 0 | 0 | 0.00% | 21 | 744 |
| 16 | Nov-11 | 8 | 31 | 0.22% | 20 | 4 | 76 | 0.53% | 20 | 1 | 36 | 0.24% | 21 | 720 |
| 17 | Dec-11 | 3 | 9 | 0.06% | 21 | 5 | 62 | 0.42% | 20 | 2 | 96 | 0.61% | 21 | 744 |
| 18 | Jan-12 | 10 | 30 | 0.20% | 21 | 3 | 21 | 0.14% | 20 | 1 | 24 | 0.15% | 21 | 744 |
| 19 | Feb-12 | 17 | 54 | 0.39% | 21 | 2 | 15 | 0.11% | 20 | 3 | 97 | 0.66% | 21 | 696 |
| 20 | Mar-12 | 22 | 82 | 0.55% | 22 | 1 | 12 | 0.08% | 20 | 1 | 6 | 0.04% | 21 | 744 |
| 21 | Apr-12 | 14 | 47 | 0.33% | 23 | 6 | 125 | 0.87% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 22 | May-12 | 44 | 165 | 1.11% | 23 | 5 | 154 | 1.03% | 20 | 1 | 4 | 0.03% | 21 | 744 |
| 23 | Jun-12 | 45 | 139 | 0.97% | 24 | 3 | 42 | 0.29% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 24 | Jul-12 | 45 | 124 | 0.83% | 24 | 1 | 5 | 0.03% | 20 | 1 | 3 | 0.02% | 21 | 744 |
| 25 | Aug-12 | 42 | 101 | 0.68% | 24 | 6 | 60 | 0.40% | 20 | 1 | 14 | 0.09% | 21 | 744 |
| 26 | Sep-12 | 23 | 66 | 0.46% | 24 | 1 | 68 | 0.47% | 20 | 0 | 0 | 0.00% | 21 | 720 |
| 27 | | Total | Total | Average | | Total | Total | Average | | Total | Total | Average | | |
| 28 | **FY 2012** | **277** | **863** | **0.49%** | | **50** | **1117** | **0.63%** | | **11** | **280** | **0.15%** | | |

*Hours exclude exempt hours that meet 30-minute persistence criterion and those that were granted waiver.
** Customer-Supplied Generation Imbalance (CSGI) is counted as a single plant

| Table 10.2<br>Wind Ramp Meeting 3-Hour Persistent Deviation Criteria | | | | | |
|---|---|---|---|---|---|
| Count of events by duration in consecutive hours | | | | | |
| | Month | 2 Hours | 3 Hours | Number of Plants* | Hours in Month |
| | A | B | C | D | E |
| 1 | Oct-10 | 157 | 34 | 17 | 744 |
| 2 | Nov-10 | 162 | 33 | 17 | 720 |
| 3 | Dec-10 | 130 | 39 | 19 | 744 |
| 4 | Jan-11 | 201 | 39 | 19 | 744 |
| 5 | Feb-11 | 214 | 42 | 19 | 672 |
| 6 | Mar-11 | 291 | 64 | 19 | 744 |
| 7 | Apr-11 | 273 | 66 | 19 | 720 |
| 8 | May-11 | 305 | 71 | 19 | 744 |
| 9 | Jun-11 | 241 | 62 | 19 | 720 |
| 10 | Jul-11 | 244 | 55 | 19 | 744 |
| 11 | Aug-11 | 218 | 50 | 19 | 744 |
| 12 | Sep-11 | 145 | 44 | 19 | 720 |
| 13 | Oct-11 | 142 | 46 | 19 | 744 |
| 14 | Nov-11 | 214 | 42 | 19 | 720 |
| 15 | Dec-11 | 173 | 38 | 20 | 744 |
| 16 | Jan-12 | 270 | 43 | 20 | 744 |
| 17 | Feb-12 | 244 | 46 | 20 | 696 |
| 18 | Mar-12 | 473 | 107 | 21 | 744 |
| 19 | Apr-12 | 400 | 103 | 22 | 720 |
| 20 | May-12 | 373 | 89 | 22 | 744 |
| 21 | Jun-12 | 409 | 103 | 23 | 720 |
| 22 | Jul-12 | 414 | 98 | 23 | 744 |
| 23 | Aug-12 | 371 | 109 | 23 | 744 |
| 24 | Sep-12 | 230 | 83 | 23 | 720 |
| 25 | Total Events | 6,294 | 1,506 | | |
| 26 | Percent of hours per plant | 1.80% | 0.43% | | 350,184 plant hours |
| 27 | *Customer-Supplied Generation Imbalance (CSGI) plants are not included | | | | |

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