

Transmission Business Line – Capital

Funding Schedule by Activity

(Accrued Expenditures)

(dollars in thousands)

	FY 2003	FY 2004	FY 2005	\$ Change	% Change
Main Grid	162,462	234,100	118,000	-116,100	-49.6%
Area & Customer Services	7,840	18,600	12,300	-6,300	-33.9%
Upgrades & Additions	79,051	53,400	64,100	+10,700	+20.0%
System Replacements	69,266	79,900	74,200	-5,700	-7.1%
Projects Funded in Advance	11,212	27,600	89,800	+62,200	+225.4%
Total, Trans Business Line - Capital	329,831	413,600	358,400	-55,200	-13.3%

Description

The Transmission Business Line (TBL) is responsible for about 75 percent of the Pacific Northwest’s high-voltage transmission. TBL provides for all additions, upgrades and replacements to the Federal transmission system, resulting in reliable service to northwest industrial users and utility customers. The transmission system also facilitates the sale and exchange of power to and from the region.

TBL plans to make significant improvements and additions to the system over the next several years to assure reliable transmission in the Northwest. These improvements and additions will help the Federal transmission system continue to comply with national reliability standards, replace aging equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system.

TBL has built no major transmission projects since 1987. Only incremental additions have been added to the system over the years. The system continues to show signs of stress as two close calls this summer demonstrate. On June 4, 2003, voltage instability in the Spokane area was arrested by quick operator action. Two weeks later the transmission path between Montana and Idaho was overloaded for two days, and operator adjustments prevented load loss.

The eastern blackout on August 14, 2003 alerted the nation to the lack of investment in utility infrastructure. BPA had its wakeup call with the August 10, 1996 West Coast disturbance that originated in Oregon. Investment was made and practices changed to strengthen the system. The West Coast energy crisis of 2000-2001 was a second red flag that triggered the need for the BPA transmission infrastructure program to shore up the grid.

In addition, about 15,000 megawatts of generation are under consideration for siting in the Northwest. The Transmission System will become even more stressed as generation is added if nothing is done to reinforce the existing network.

The first phase of Bonneville's infrastructure addition consists of the following projects:

(G1) Puget Sound Area Additions, (G2) North of Hanford/North of John Day, (G3) West of McNary (on hold), (G4) Starbuck Generation (on hold), (G5) Lower Monumental and McNary Area Generation (Phase II) (on hold), (G6) Cross Cascades North, (G7) Celilo Modernization, (G8) I-5 Corridor Generation Additions, (G9) Spokane Area and Western Montana Generation Additions, (G10) Portland Area Additions, (G12) Olympic Peninsula Additions, (G13) I-5 Corridor Generation Additions (Southwest Washington-Northwest Oregon) (on hold pending availability of third party funding). These projects are further described below.

The benefits of these projects will include relief from congestion, as well as restoring an adequate reliability margin back into the grid. This additional margin will be used to respond to a competitive market, meet regional load during outages, move power to meet changing loads, perform maintenance without harming the market, and allow the RTO West to start without the regional grid heavily congested.

Bonneville assumes that some generators will integrate their load into the Federal transmission system. Depending on which generators build on sites in the Northwest and the project locations, between 8,000 and 12,000 MW can be integrated with the completion of the above additions and improvements. Integration into the Federal transmission system will be consistent with FERC's recent generator interconnection ruling. As a means to sustain BPA's limited Treasury financing, third-party funding partnerships are currently being pursued for some of the infrastructure additions. For example, on projects associated with generation integration, the potential generation or transmission customers are being consulted regarding funding the construction of these projects. The Schultz-Wautoma 500kV transmission project in this FY 2005 budget is included under Capital Investments with Treasury financing assumed in order to assure funding availability; however, BPA hopes to fund this project through non-federal financing later this year.

The system replacement plan is to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: 1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; 2) replacing risky, outdated and obsolete control and communications equipment; and 3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such capacity can be made available to telecommunications providers and to non-profits to meet public benefit Internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will seek partnerships with fiber optic facility and service providers to meet its needs.

Detailed Justification

(dollars in thousands)

	FY 2003	FY 2004	FY 2005
Main Grid	162,462	234,100	118,000

Bonneville’s strategic objectives for Main Grid projects are to provide voltage support; provide a reliable transmission system for open access per FERC criteria; provide for relief of transmission system congestion; and to assure compliance with the Nuclear Energy Regulatory Commission (NERC), Western Electric Coordinating Council (WECC) and BPA reliability standards. During this budgeting period, projects are planned that will provide voltage support to major load areas that are primarily west of the Cascade mountains, and to provide for transmission access for new generation projects to the load center. Minor reinforcements in the Portland, OR/Seattle, WA corridor are also planned.

- FY 2003: (1) Completed Environmental Impact Statement (EIS) and began construction of the Kangley-Echo Lake 500 KV line and substation addition at Echo Lake and the 500/230 KV transformer bank addition at SnoKing substation (G1) (Puget Sound Area Additions); (2) Began construction of the new Wautoma Substation. The Schultz-Wautoma 500 KV line construction was delayed to start in FY 2004 (G2) (North of Hanford/North of John Day); (3) Continued installation of the 500 KV series capacitor addition at Schultz Substation (G6) (Cross Cascades North); (4) Completed design and began construction of the Grand Coulee-Bell 500 KV line, construction start was delayed to FY 2004 for the 500 KV series capacitor additions at Bell and Dworshak substation, the 500 KV series capacitor and controls replacement at Garrison Substation, and the 500 KV shunt reactor addition at Grand Coulee (G9) (Spokane Area and Western Montana Generation Additions); (5) Continued the installation of the 500/230 KV transformer bank addition at Pearl substation (G10) (Portland Area Additions); (6) Began design for the Ostrander 500kV shunt capacitor group addition; (7) Continued planning studies and design to comply with the N-2 outage criteria; (8) Continued planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions; (9) Continued planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities; (10) Continued planning studies to identify and clarify needed infrastructure additions.
- FY 2004: (1) Complete construction of the Kangley-Echo Lake 500kV line and substation addition at Echo Lake, and the 500/230kV transformer bank addition at SnoKing Substation (G1) (Puget Sound Area Additions); (2) Begin construction of Schultz-Wautoma 500kV line and continue Wautoma Substation construction (G2) (North of Hanford/North of John Day); (3) Complete installation of the 500 KV series capacitor addition at Schultz substation (G6) (Cross Cascades North); (4) Complete Grand Coulee-Bell 500kV line and substation additions including 500 KV series capacitor additions at Bell and Dworshak

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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substation, 500 KV series capacitor and controls replacement at Garrison Substation, and the 500 KV shunt reactor addition at Grand Coulee (G9) (Spokane Area and Western Montana Generation Additions); (5) Complete the installation of the 500/230 KV transformer bank addition at Pearl Substation (G10) (Portland Area Additions); (6) Complete the Ostrander 500kV shunt capacitor group addition; (7) Begin environmental analysis, demand side management study, design and material acquisition for Olympic Peninsula Addition II (G12); (8) Begin preliminary design for the loop in of the Wautoma-Ostrander 500kV line to Big Eddy Substation (G14); (9) Continue studies for the Libby-Sand Spring-Bell 230kV project (G15 & G20); (10) Resume planning studies for the Monroe-Echo Lake 500kV line #2 (G8) (I-5 Corridor Additions); (11) Continue planning studies and design to comply with the N-2 outage reliability criteria; (12) Continue planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions; (13) Continue planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities; (14) Continue planning studies to identify and clarify needed infrastructure additions.

- FY 2005: (1) Complete construction of the Schultz-Wautoma 500kV line and Wautoma Substation (G2) (North of Hanford/North of John Day); (2) Continue planning studies for the Olympic Peninsula Addition II project (G12); (3) Continue studies for the Southwest Washington-Northwest Oregon generation integration project (G13); (4) Continue studies for the loop in of the Wautoma-Ostrander 500kV line to Big Eddy Substation (G14); (5) Continue planning studies for the Monroe-Echo Lake 500kV line #2 (G8) (I-5 Corridor Generation Additions); (6) Review and keep current studies for the integration of McNary area generation projects that would require (G3) West of McNary (on hold), (G4) Starbuck Generation (on hold), (G5) Lower Monumental and McNary Area Generation (Phase II) projects; (6) Continue planning studies and design to comply with the N-2 outage criteria; (7) Continue planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions; (8) Continue planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities; (9) Continue planning studies to identify and clarify needed infrastructure additions.

Area & Customer Service **7,840 18,600 12,300**

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets the reliability standards and the contractual obligations we have to our customers for serving load.

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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- FY 2003: (1) Completed construction on the Shelton-Kitsap line rebuild to double circuit to provide voltage stability and prevent transformer and line overloads in the Kitsap area; (2) Began the design, material acquisition, and construction to rebuild the Albany-Eugene 115kV line to double circuit from Eugene to the Alderwood Tap; (3) Began rebuild of Minidoka Substation; (4) Continued preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA’s service area.

- FY 2004: (1) Complete construction to rebuild the Albany-Eugene 115kV line to double circuit from Eugene to the Alderwood Tap; (2) Complete the rebuild of Minidoka Substation; (3) Add 115kV line sectionalizing switches at Victor Tap; (4) Retire low voltage facilities at Addy Substation; (5) Replace the 115-12.5kV transformer at Duckabush Substation; (6) Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA’s service area.

- FY 2005: (1) Add 230kV and 115kV terminal facilities at Vintage Valley Substation; (2) Add 115kV switches at Olympia Substation; (3) Add a 115kV terminal at McNary Substation; (4) Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA’s service area.

Upgrades & Additions **79,051 53,400 64,100**

Bonneville’s strategic objectives for Upgrades and Additions are to replace older communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and, to support communications and remedial action schemes, among other proposals. During this budget period, BPA will complete design, material acquisition, construction and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are becoming technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

- FY 2003: (1) Completed construction of 37 miles of fiber optic cable and terminations between Custer and Intalco; (2) Completed installation of 10 miles of fiber optic cable and terminations between Longview and Allston; (3) Continued material acquisition and began construction of the 12 mile fiber optic cable on the Raver-Echo Lake 500 kV line;

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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(4) Continued material acquisition and construction of the Kalispell-Hot Springs digital radio section of the Noxon-Hot Springs 200 mile fiber optic project; (5) Delayed design functions for the Thompson Falls to Taft section of the 175 mile Noxon-Hatwai fiber optic project; (6) Delayed design and material acquisition for 41 miles of fiber optic cable and terminations from Echo lake to Monroe to Snohomish; (7) Continued design, material acquisition and start construction of the Custer to Sumas digital radio project that replaces the 8 mile Bellingham-BC Hydro fiber optic project; (8) Continued design and construction of fiber related projects and digital radio system upgrades to improve the operational telecommunication system; (9) Continued replacement and upgrade of key operational and marketing business tools at the Dittmer and Munro control centers; (10) Continued planning, design, material acquisition, construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; (11) Continued planning, design, material acquisition, construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.

- FY 2004: (1) Complete construction of the 12 mile fiber optic cable on the Raver-Echo Lake 500 kV line; (2) Complete construction of the Kalispell-Hot Springs digital radio section of the Noxon-Hot Springs 200 mile fiber optic project; (3) Continue design functions for the Thompson Falls to Taft to Dworshak to Hatwai sections of the 175 mile Noxon-Hatwai fiber optic project; (4) Begin design, material acquisition construction of 41 miles of fiber optic cable and terminations from Echo lake to Monroe to Snohomish; (5) Begin design, material acquisition construction of 32 miles of fiber optic cable and terminations from Covington to Maple Valley to Echo Lake; (6) Continue construction of fiber projects and digital radio system upgrades to improve the operational telecommunication system and to meet rural needs; (7) Continue replacement and upgrade of operational and business tools at the Dittmer and Munro control centers; (8) Continue planning, design, material acquisition and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; (9) Continue planning, design, material acquisition and construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.
- FY 2005: (1) Complete the Thompson Falls to Taft to Dworshak to Hatwai sections of the 175 mile Noxon-Hatwai fiber optic project; (2) Complete construction of the 41 mile fiber optic Echo Lake-Monroe-Snohomish project; (3) Complete the design, material acquisition and start construction of the 32 mile Covington-Maple Valley-Echo Lake fiber optic project; (4) Design, material acquisition and start construction of the 45 mile Pearl-Troutdale fiber optic project; (5) Continue construction of fiber related projects and digital radio system upgrades to improve the operational telecommunication system; (6) Continue replacement

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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and upgrade of operational and marketing business tools at the Dittmer and Munro control centers; (7) Continue planning, design, material acquisition and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; (8) Continue planning, design, material acquisition and construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.

System Replacements **69,266 79,900 74,200**

Bonneville's strategic objectives for System Replacement are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: 1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; 2) replacing risky, outdated and obsolete control and communications equipment; and 3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system.

Non-Electric Replacements:

- FY 2003: (1) Completed various maintenance building and control house roof replacements; (2) Completed seismic upgrades to buildings; (3) Completed various Heating, Ventilation and Air Conditioning (HVAC) replacements; (4) Completed other non-electric replacements as necessary; (5) Completed the acquisition and construction of various new transmission system access roads as part of the new Access Road Program.
- FY 2004: (1) Complete various maintenance building and control house roof replacements; (2) Complete seismic upgrades to buildings; (3) Complete various HVAC replacements; (4) Complete other non-electric replacements as necessary; (5) Continue the design, material acquisition, and construction for the Access Road Program; (6) Design activities for the Dittmer Control Center expansion at the Ross Complex has been postponed due to funding limitations.
- FY 2005: (1) Complete various maintenance building and control house roof replacements; (2) Complete seismic upgrades to buildings; (3) Complete various HVAC replacements; (4) Complete other non-electric replacements as necessary; (5) Continue the design, material acquisition, and construction for the Access Road Program.

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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Electric Replacements:

- FY 2003: (1) Continued replacing aged AC-DC converter valves and control systems at the Celilo Converter Station necessary to continue operation of 3100 MW of DC transmission capability (G7); (2) Began design and material acquisition for reconductoring approximately 22 miles of the John Day-Big Eddy 500kV Line; (3) Continued replacement of PCB-contaminated capacitors at various locations; (4) Continued replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment and SCADA equipment; (5) Continued replacement of under-rated and high maintenance substation equipment; (6) Completed replacement of critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers; (7) Continued the replacement of deteriorating wood pole transmission line structures.

- FY 2004: (1) Complete replacement of aged AC-DC converter valves and control systems at the Celilo Converter Station necessary to continue operation of 3100 MW of DC transmission capability (G7); (2) Complete the reconductor of approximately 22 miles of the John Day-Big Eddy 500kV Line; (3) Continue replacement of PCB-contaminated capacitors at various locations; (4) Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment and SCADA equipment; (5) Continue replacement of under-rated and high maintenance substation equipment; (6) Replace spacer dampers on various 500kV lines; (7) Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers; (8) Continue replacing deteriorating wood pole transmission line structures.

- FY 2005: (1) Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment and SCADA equipment; (2) Continue replacement of under-rated and high maintenance substation equipment; (3) Replace spacer dampers on various 500kV lines; (4) Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers; (5) Continue replacing deteriorating wood pole transmission line structures.

(dollars in thousands)

FY 2003	FY 2004	FY 2005
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Projects Funded in Advance **11,212 27,600 89,800**

This category includes those facilities and/or equipment where BPA retains ownership but which are funded by a third party, either in total or in part.

- FY 2003: (1) Completed the construction of transmission facilities needed to integrate 248 MW generation capacity near Goldendale into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (the generator construction is currently on-hold waiting for market conditions to improve); (2) Continued work to integrate 225 MW generation capacity near Goldendale into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (BPA work on this project is now on-hold while the generator waits for market conditions to improve); (3) Completed the integration of new 600 MW generation capacity near Chehalis into the BPA transmission grid per Transmission Service Request via the Open Access Tariff; (4) Completed engineering and environmental analysis to integrate new 1300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (the generator construction is currently on hold waiting for market conditions to improve) (G5) (on hold); (5) Completed construction of the transmission facilities needed to integrate 600 MW generation capacity near Satsop into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (the generator construction is currently on-hold waiting for market conditions to improve); (6) Continued the integration of new 290 MW generation capacity near Longview into the BPA transmission grid per Transmission Service Request via the Open Access Tariff; (7) Continued to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the Open Access Tariff; (8) Performed studies to identify system impacts and needs regarding proposed new generation projects; (9) Performed environmental cleanup and other work necessary for the sale of BPA facilities; (10) Completed other projects as requested by customers.

- FY 2004: (1) Continue work to integrate new 1300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (G5) (on hold); (2) Design, material acquisition and construction of the Southwest Washington-Northwest Oregon 500 KV line addition (G13) (on hold); (3) Complete the integration of new 290 MW generation capacity near Longview into the BPA transmission grid per Transmission Service Request via the Open Access Tariff; (4) Start planning to integrate new 1300 MW generation capacity near Wanapa into the BPA transmission grid per Transmission Service Request via the Open Access Tariff; (5) Continue to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the Open Access Tariff; (6) Perform studies to identify system impacts and needs regarding proposed new generation projects; (7) Perform environmental cleanup and other work necessary for the sale of BPA facilities; (8) Complete other projects as requested by customers.

- FY 2005: (1) Complete work to integrate new 1300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (G5) (on hold); (2) Continue design, material acquisition and construction of the Southwest Washington-Northwest Oregon 500 KV line addition (G13) (on hold); (3) Complete design, acquire materials, and begin construction to integrate new 1300 MW generation capacity near Wanapa into the BPA transmission grid per Transmission Service Request via the Open Access Tariff (pending generator funding); (4) Continue to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the Open Access Tariff; (5) Perform studies to identify system impacts and needs regarding proposed new generation projects; (6) Perform environmental cleanup and other work necessary for the sale of BPA facilities; (7) Complete other projects as requested by customers

Total Transmission Business Line – Capital	329,831	413,600	358,400
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Explanation of Funding Changes

	FY 2005 vs. FY 2004 (\$000)
Main Grid	
▪ Reflects fiscal year shifts in materials and construction costs to accommodate updated power flow study results	-116,100
Area & Customer Services	
▪ Reflects less emphasis on customer service projects.	-6,300
Upgrades & Additions	
▪ Reflects increased emphasis on both system wide communications upgrades and improvements and additions to other transmission facilities	+10,700
System Replacements	
▪ Reflects less emphasis on system replacements, except for the Celilo project . . .	-5,700
Projects Funded in Advance	
▪ Reflects emphasis on completion of large customer funded or third party funded projects related to generation integration	+62,200
Total Funding Change, Transmission Business Line - Capital	-55,200