

2011 Strategic Capital Discussions

Background Information

Purpose

Information provided in this package is a compilation of material previously released during prior public processes. Information and data within this package has not been updated and is intended to provide readers with an opportunity to review what has been discussed previously on Asset Management, Access to Capital, Lease Financing, Long Term Asset Strategies and forecasted capital spending.

Asset Management

From [May 2010 Quarterly Business Review](#)

History of Asset Management

- Asset management is a rigorous and systematic process whereby asset condition, performance, risks and lifecycle costs drive decisions on maintenance, operations and investments to continually improve efficiency and performance.
- Asset management is critical to the BPA's ability to fulfill its mission of creating and delivering an adequate, efficient, economical and reliable power supply and transmission system.
- Without an asset investment model, optimal investments may not be made, which can lead to higher costs borne by customers, higher risks, and more inefficient use of federal capital.
- A rigorous, well-informed and transparent process will enable the BPA to efficiently and effectively manage the performance of Federal Columbia River Power System (FCRPS) assets to deliver the greatest value for the region over the long term.
- BPA plans to continually improve asset management practices, processes and procedures with efforts led by the Asset Management Council (AMC); a cross-functional team of managers and employees representing asset categories and corporate functions that support asset management.

The FCRPS Asset Base

Primary assets are Federal Hydro and Transmission

- Federal hydro generation (power portion of Corps and Bureau-owned assets)
- Transmission assets

Other assets of the FCRPS include:

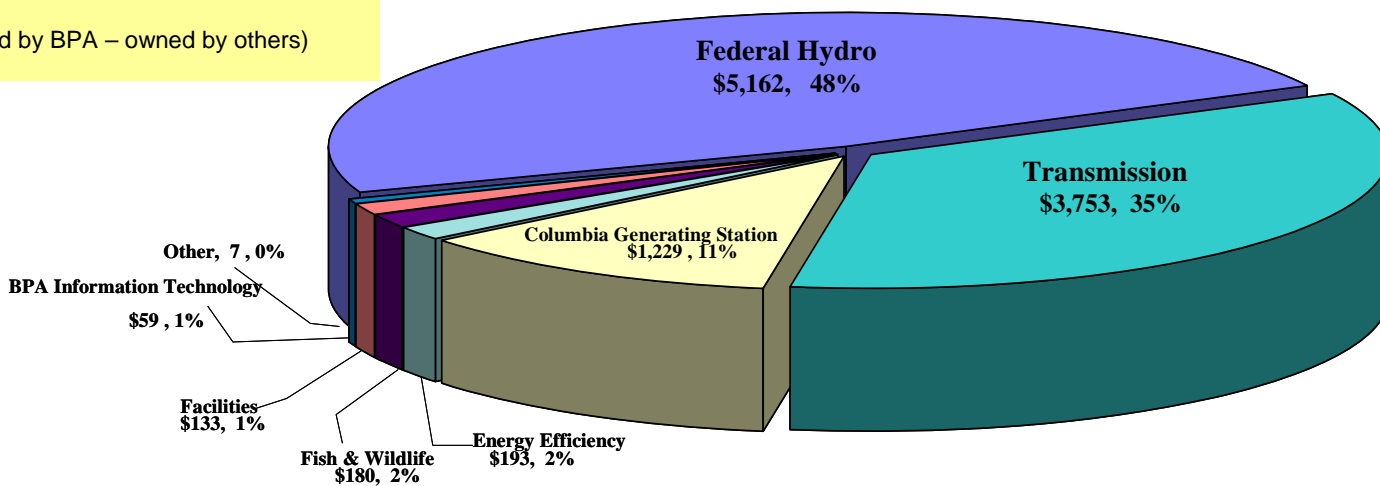
- Non electric plant: buildings, facilities and related equipment
- Information technology hardware and software (BPA owned)
- Energy efficiency investments (funded by BPA – owned by others)
- Columbia Generating Station (funded by BPA, owned by Energy Northwest);
- Fish and Wildlife assets (funded by BPA – owned by others)

Cumulative Historical Investment

Net of depreciation

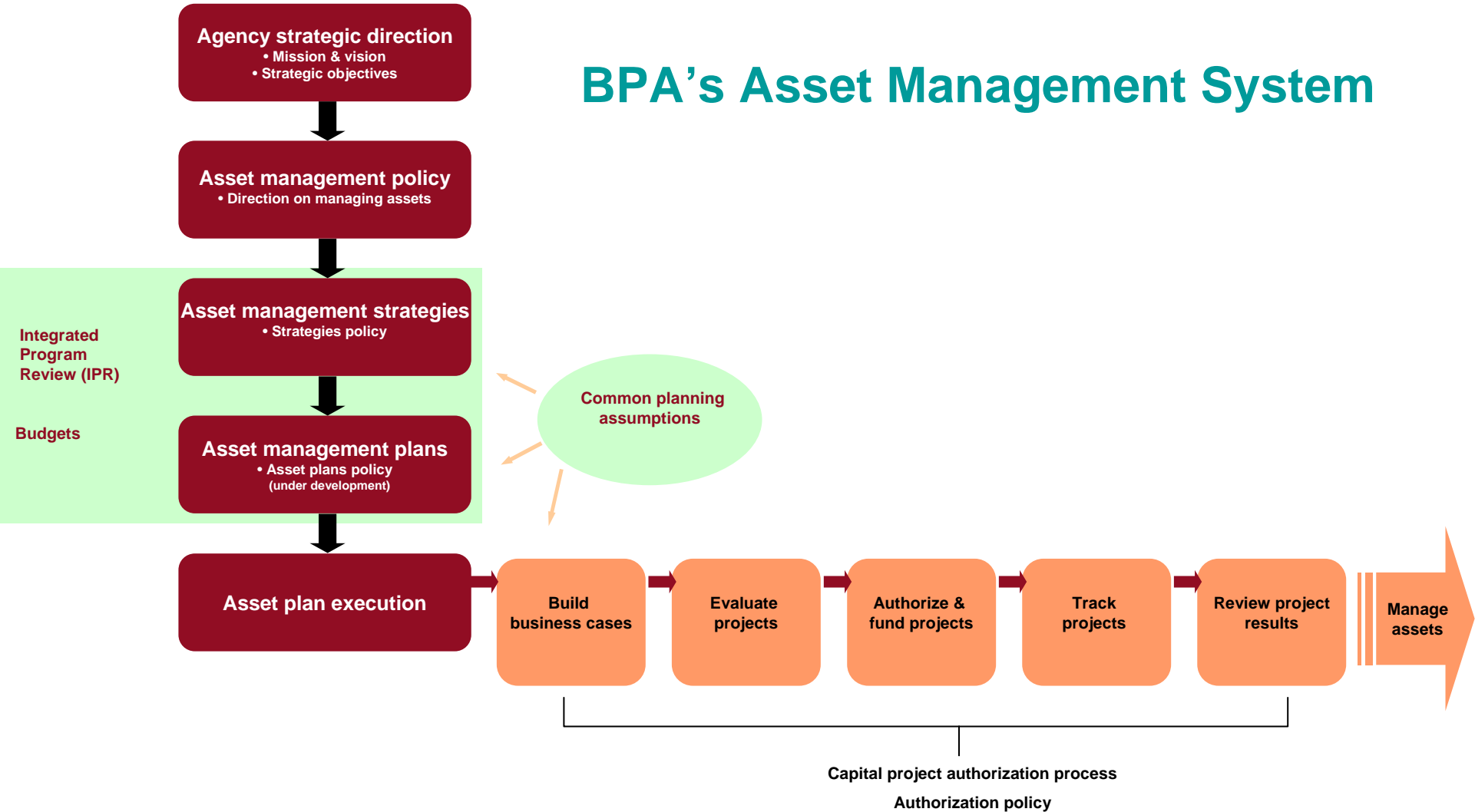
As of September 30, 2010

Total: \$10,716 million



Asset categories exclusively related to BPA include Transmission (including capital leases), BPA Information Technology, Facilities and Other. Gross plant assets exclusively related to BPA include Transmission, BPA IT, Facilities and Other. The total utility plant for the Federal Columbia River Power System FCRPS includes these asset categories plus Federal Hydro. Columbia Generating Station is owned by Energy Northwest, and the amounts shown are as of June 30, 2009 and consistent with that organization's Annual Report. Energy Efficiency and Fish and Wildlife assets are owned by other entities and are treated by BPA as regulatory assets. Columbia River Fish Mitigation plan costs are treated by BPA as regulatory assets and are not shown.

BPA's Asset Management System



Role of asset management strategies

- **Convert the agency's mission, vision, and strategic objectives into long-term investment and maintenance strategies**

- **Seek to . . .**
 - Ensure that critical assets operate reliably, meet availability requirements, and provide adequate capacity into the future

 - Long-term asset costs will be prudent and economic

- **Designed to answer these questions . . .**
 - *What objectives should be set for asset performance?*

 - *How are these assets performing today?*

 - *What are the risks to meeting the objectives?*

 - *What should investment and maintenance strategies be to meet the objectives?*

 - *What are the anticipated costs?*

Role of asset management strategies (2)

- **Span a 10-year (or longer) planning horizon**
 - Seven years for information technology assets
- **Integrate maintenance, replacements, and equipment sparing planning and implementation to minimize life cycle costs**
- **Directed at achieving asset performance objectives**
 - Reliability, adequacy, availability and other objectives
 - Metrics and “end-stage” targets
- **Assign priority to the most critical assets at greatest risk**
 - Operating failure, technological obsolescence, capacity adequacy, regulatory compliance and other risks
- **Focused on transmission, federal hydro, facilities and information technology assets this cycle**
- **Drive the development of:**
 - Planning levels for capital investment and maintenance
 - Detailed asset plans

Policy criteria for replace vs repair/maintain

Replacement of equipment and facilities should be considered if:

- Asset health poses an unacceptable risk of operating failure, and the life cycle cost of replacement is lower than the life cycle cost of repair;
- Asset capability does not meet acceptable performance standards due to premature wear, design problems, changed usage patterns, or changes in system operations;
- Asset technology is inferior or obsolete, and the life cycle savings from early replacement outweigh the cost of replacement;
- Replacement parts or technical expertise are no longer available to ensure asset performance to acceptable standards;
- Security risks, health and safety risks, or environmental risks are unacceptable, and the life cycle cost of replacement is lower than the life cycle cost of refurbishment, repair, or other, viable alternatives; or
- The agency's business continuity objectives would not otherwise be met, and the life cycle cost of replacement is lower than the life cycle cost of other, viable alternatives; or
- Risks to meeting statutory, regulatory or other legal obligations are unacceptable, and the life cycle cost of replacement is lower than the life cycle cost of other, viable alternatives.

Sample asset performance objectives

Wood line reliability

- | | |
|---|--|
| <p>Frequency
of unplanned outages</p> | <ul style="list-style-type: none"> • Performance objective: Minimize the number of unplanned transmission line outages on the most critical wood pole transmission lines (categories 1 through 4, 1 being most critical) • Measure: System Average Interruption Frequency Index (SAIFI) – average number of automatic outages by BPA Line Category • End-stage target: No more than 1 control chart violation per year for Wood Pole Transmission classified lines (typically line importance categories 3 and 4) |
| <p>Duration
of unplanned outages</p> | <ul style="list-style-type: none"> • <i>Performance objective:</i> Minimize the duration of unplanned transmission line outages on the most critical wood pole transmission lines (categories 1 through 4, 1 being most critical) • <i>Measure:</i> System Average Interruption Duration Index (SAIDI) – average number of automatic outage minutes by BPA Line Category • <i>End-stage target:</i> No more than 1 control chart violation per year for wood pole transmission classified lines (typically line importance categories 3 and 4) |

Sample asset performance objectives (2)

System Protection Control

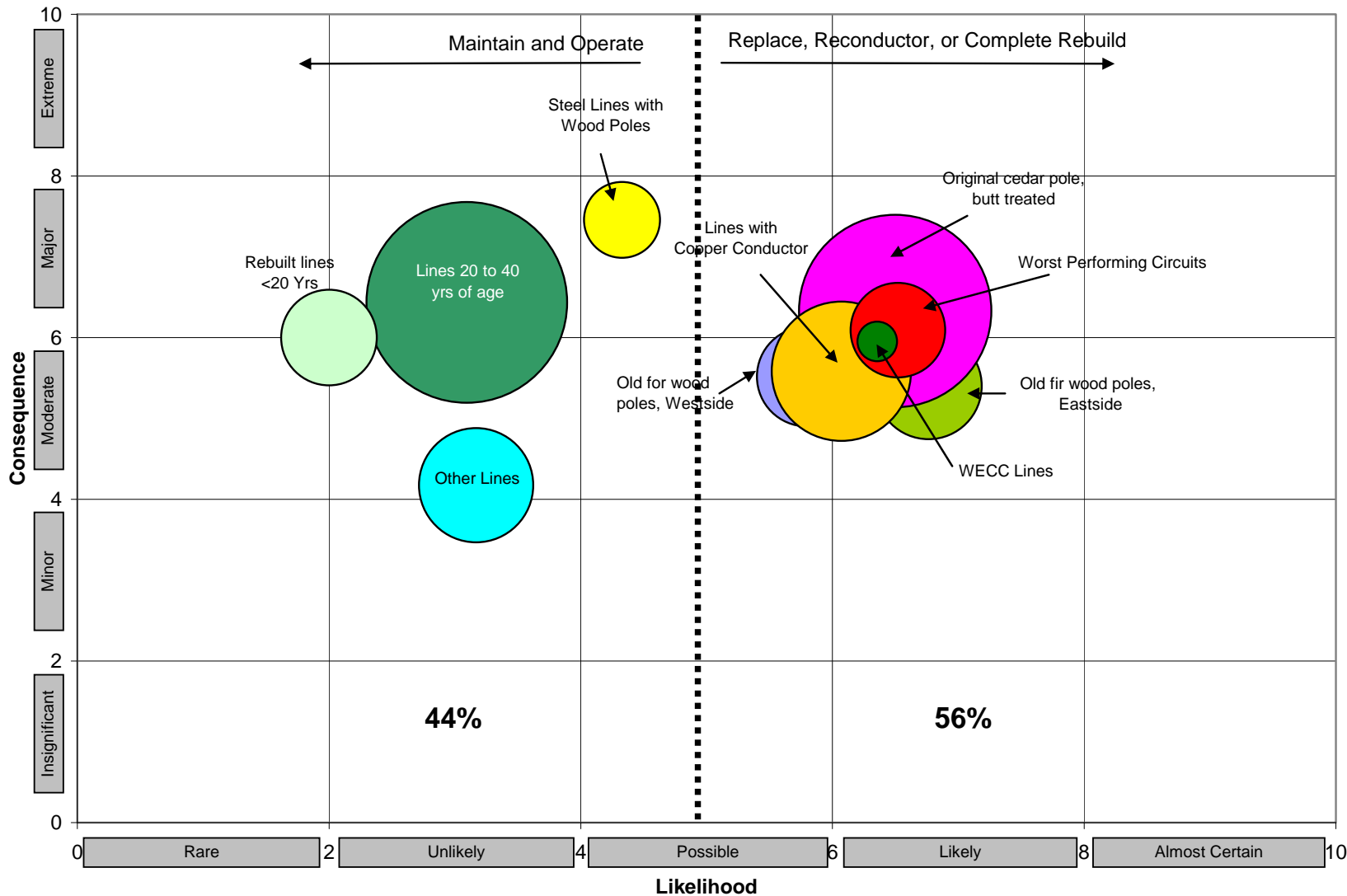
- **Performance objective:**
 - Relays and other critical System Protection Control equipment are at low risk of failure or obsolescence

- **Measures:**
 - Standardization and frequency of condition assessment for relays and sequential events recorders (SERS)
 - Percent of relays and SERS that are assessed to be in poor health condition based on maintainability and obsolescence

- **End-stage targets:**
 - Health condition of relays and SERS is assessed consistent with (1) condition-based standards, (2) standardized inspection protocols (including schedule), and (3) standardized risk assessment criteria
 - By the end of FY 2016, no more than 5 percent of total protective relays and no more than 20 percent of SERS are in poor health condition

Sample risk map

(Bubble size represents volume of poles in each grouping)



Sample financial risk map (Federal Hydro Projects)

Likelihood	Almost Certain	8 Station Service 1 Operations Support	4 Operations Support 2 Cranes 2 Infrastructure	17 Unit Reliability	5 Unit Reliability	0 to 0.9 1 to 1.9	Condition Index	
	Likely	1 Operations Support	2 Operations Support	9 Unit Reliability 2 Station Service 7 Operations Support 9 Cranes 3 Infrastructure	46 Unit Reliability 6 Station Service 1 Operations Support 1 Water Control 12 Cranes 2 Infrastructure	22 Unit Reliability		2 to 2.9 3 to 3.9
	Possible	7 Operations Support	3 Operations Support	9 Unit Reliability 7 Station Service 13 Operations Support 13 Water Control 17 Cranes 11 Infrastructure	219 Unit Reliability 17 Station Service 4 Water Control 14 Cranes	59 Unit Reliability		4 to 4.9 5 to 5.9
	Unlikely	26 Operations Support	55 Unit Reliability 37 Station Service 19 Operations Support 19 Infrastructure	153 Unit Reliability 26 Station Service 50 Operations Support 7 Water Control 41 Cranes 25 Infrastructure	469 Unit Reliability 71 Station Service 5 Operations Support 15 Water Control 36 Cranes 4 Infrastructure	84 Unit Reliability 7 Station Service 1 Water Control		6 to 6.9 7 to 7.9
	Rare	59 Operations Support 2 Infrastructure	369 Unit Reliability 83 Station Service 68 Operations Support 9 Water Control 3 Cranes 6 Infrastructure	425 Unit Reliability 184 Station Service 152 Operations Support 116 Water Control 47 Cranes 79 Infrastructure	1584 Unit Reliability 198 Station Service 20 Operations Support 74 Water Control 36 Cranes 6 Infrastructure	286 Unit Reliability 11 Station Service 4 Operations Support 7 Water Control		8 to 8.9 9 to 10
		Insignificant	Minor	Moderate	Major	Extreme		
		< \$ 10K	\$ 10K to \$ 100K	\$ 100K to \$ 1 M	\$ 1 M to \$ 10 M	> \$ 10 M		
Consequence								

Risk Level	Low	Medium	Medium High	High
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Asset Management Strategies

Transmission Highlights

- **Asset health**
 - **Aging system**
 - Bulk of system built in 50's and 60's
 - For example, over 40 percent of AC power transformers are over 50 years of age with an expected life of 45 years, and over 40 percent of wood pole lines are over 50 years of age with an expected life of 60 years
 - **Some critical equipment at risk of operating failure and technological obsolescence**
 - Significant backlogs in upgrades, replacements and maintenance require ramp-up and a sustained effort over many years
 - For example, communications/power system control, system protection control, wood lines
 - **New capacity and operating requirements**
 - **Ramp-up in renewable resources requires upgrades and capacity additions to integrate the generation**
 - **Additional upgrades and additions needed to relieve congestion, improve load service, and improve system operations**
 - Several paths at or near their capacity limits
 - **New technologies present operational and economic opportunities**
- **Changing Regulatory Requirements**
 - **Increasing NERC/WECC regulatory requirements on asset reliability, adequacy, security**
- **Improvements in asset management practices**
 - **Continuing priorities: streamline and integrate business process and information systems**

Asset Management Strategies

Federal Hydro Highlights

- **Expanded condition assessments**
 - Before: power train equipment only
 - Now: most all power equipment
- **Some critical equipment at risk of operating failure**
 - Costly risk of lost generation
 - Need for replacements requires ramp-up and sustained effort over many years
- **Enhanced economic modeling and optimization of long-term investment program**
- **Strategy targets equipment for refurbishment/replacement if:**
 - High risk for safety or environment, or
 - Long-term costs would be minimized
- **Result:** long-term investment program that maintains the production capability of the FCRPS hydro system at a cost effective level of reliability

Asset Management Strategies

Facilities Highlights

- **Documented backlog of deferred maintenance on non-electric facilities (NEF) drives necessary repairs and upgrades in order to meet Transmission Services' business requirements.**
 - For example, systems with an expected life of 10 years are still in service 50 years later; many assets do not comply with current life safety codes; and some mechanical systems no longer meet operational needs.
- **Identification and condition assessment of other non-building NEF assets, such as septic systems, storm water drains, pavement, etc.**
- **Declining state of the asset category: All NEF fall well below a Facility Condition Index rating of "poor" and the cumulative costs of identified repairs and renewals approach 40% of the asset replacement value.**
- **Development of an integrated strategy to address the above themes. The strategy will:**
 - Improve investment decision-making, and set design and development standards
 - Correct facility systems reliability and life-safety deficiencies by implementing a risk-based prioritization methodology
 - Identify and set standards which integrates; responsible environmental stewardship, enhanced security and personnel safety into BPA's business processes
 - Identify and provide adequate implementation resources necessary for successful program execution
 - Optimize life-cycle management of facility assets through the identification and integration of industry best-practices, cost-effective solutions and operational and maintenance imperatives
 - Incorporate measurable sustainability targets that enhance energy efficiency in federal facilities
 - Analyze work practices and space needs in order to optimize requirements for major renovations or new building construction

Asset Management Strategies

Information Technology Highlights

- **The information technology strategy includes four asset classes:**
 - Network – Data, voice and video capability
 - Data Center – Servers, operating systems, and database management systems and tools
 - Office Automation – Desktops, laptops, printers and desktop software
 - Applications – Critical business systems, business systems, general purpose systems and general task systems
- **Objectives are focused on ensuring that assets are:**
 - Reliable and available when needed
 - Adequate in capacity
 - Interoperable and efficient
 - Compliant with regulatory (NERC CIP) and Federal agency (FISMA) standards
 - Maintained and supported within standards
- **Strategies cover:**
 - Information technology solutions that will enable:
 - efficiency improvements in business processes
 - implementation of wind integration strategy
 - implementation of regional dialogue commitments
 - compliance with regulatory and federal agency standards and requirements
 - Modernization of agency’s data center to increase efficiency and reduce total cost of ownership
 - Refresh cycles
 - Process improvements to improve service delivery, increase productivity and deliver efficiencies to control costs

Improvements Underway

For strategies to be presented in 2012 IPR

- **Improved risk assessments**
 - Refined methods for ranking the criticality of assets
 - Improved methods for assessing the condition of equipment and facilities
 - Improved methods for quantifying the impact of asset failure and other risks

- **Improved consideration of project constraints**
 - Goal is to develop ambitious but achievable strategies, and to improve our execution rate for capital programs
 - Constraints such as limits on available capital and maintenance funding, on staff and skills, and on available planned outage time
 - Also seeking creative solutions to help relieve the constraints

Improvements underway (2)

For strategies to be presented in 2012 IPR

Improved criteria for prioritizing and selecting investment

Highest priority assigned to investment in . . .

- The most critical facilities and equipment at greatest risk of operating failure; technological obsolescence; environmental damage or noncompliance; health issue or safety mishap (injury); or security breach or noncompliance
- Infrastructure and operating systems to integrate wind generation resources;
- Improvements in operating efficiency, when large FTE and cost savings would result; and
- Enhancements to enable fuller, more optimal use of existing assets
 - for example, equipment and software that enable grid operators to “see” the grid more accurately and control grid operations more precisely

Improved tracking: building and maintaining a multi-year, prioritized list of planned capital projects

- For program management and reporting purposes

Access to Capital

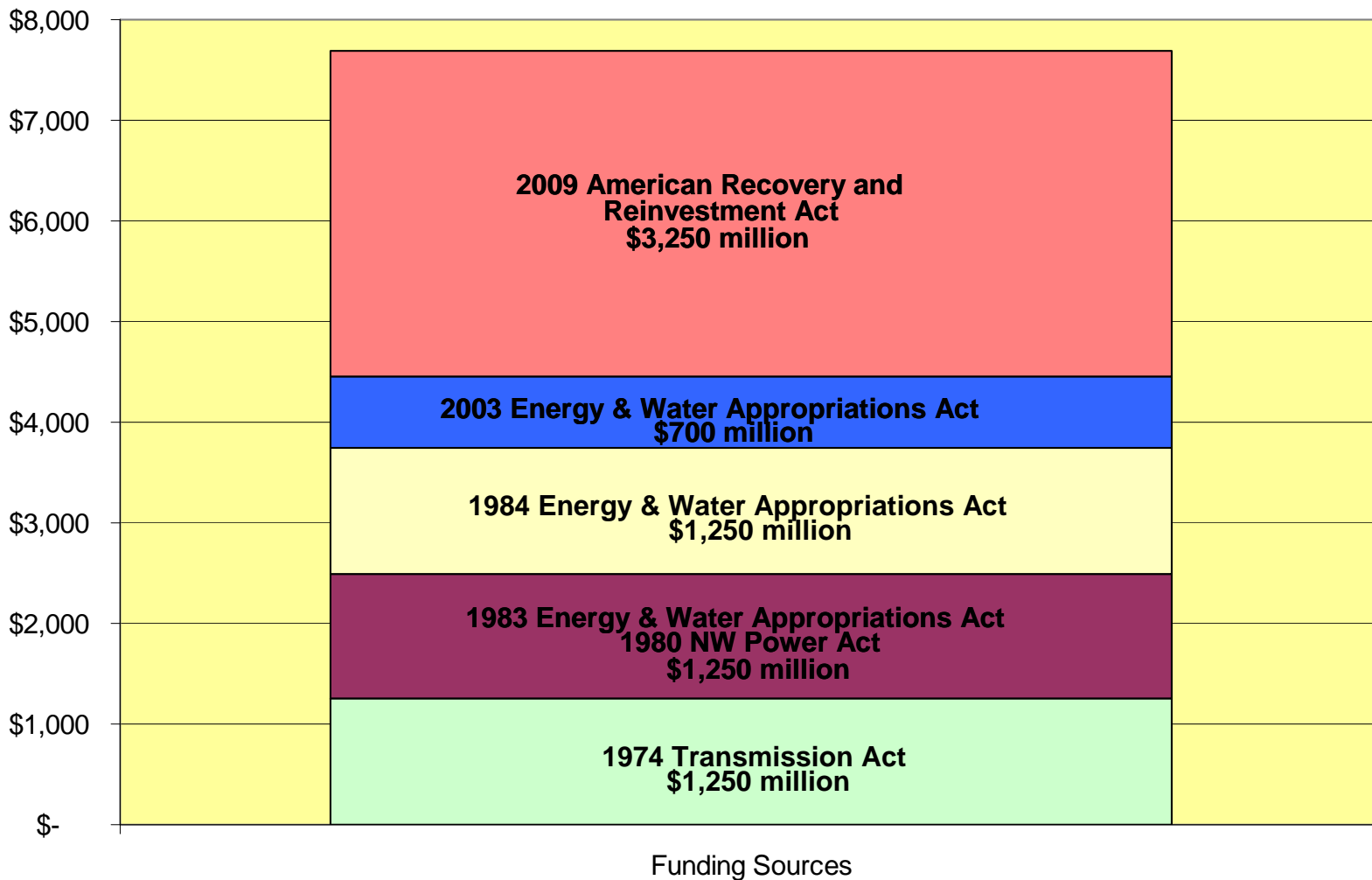
From [June 30, 2009 Workshop](#)

BPA Sources of Capital

- **BPA's principal source of capital financing is its Treasury borrowing authority, its line of credit with the U.S. Treasury. BPA is not authorized to borrow directly from any source other than the U.S. Treasury, but we have limited access to other funding sources for specific purposes and BPA may engage in lease financing.**
 - Limited BPA-backed municipal bonds: With congressional authorization, BPA backs roughly \$6 billion in municipal bonds issued by Energy Northwest for the Columbia Generating Station and related nuclear projects. BPA also backs about \$175 million in conservation and other bonds.
 - Third-party leasing: BPA has received congressional approval and administration direction to find non-federal methods to fund capital investments. Based on that direction, BPA has implemented third-party lease arrangements for transmission assets.
 - Corps and Reclamation appropriations: BPA recovers through its power rates the costs of Corps and Reclamation appropriated investments assigned to the Federal Columbia River Power System to repay.
 - Customer financed projects: BPA receives advances from customers to construct assets which either the customer or BPA may own.

Historical Sources of Borrowing Authority: 1974 - 2010

\$5.2 Billion Remaining Borrowing Authority as of the End of Fiscal Year 2010



Financial Plan

- In FY 2008, BPA updated its Financial Plan. Access to Capital was one of the main topics of this plan.
- BPA recognized the need to make access to capital planning an integral part of its strategic objectives and to reexamine and hone its capital access goals.
- In its Financial Plan, released July 2008, BPA outlined the following objectives:
 - Ensure that capital financing needs are covered over a rolling 10-year period.
 - Develop strategies and tools that will extend BPA's Treasury Borrowing Authority availability over a rolling 20-year period.
 - Ensure BPA is able to meet its capital requirements at least cost.
- Through the Financial Plan, BPA made a commitment to discuss Access to Capital issues with the region in FY 2009.

\$750 Million Note and ARRA

New Banking Arrangement with the US Treasury

- In April 2008, BPA and the U.S. Treasury formalized a new arrangement that provides BPA with a more flexible banking relationship that better meets the Agency's business needs.
- As part of this arrangement, BPA gained the ability to use part of its, then, \$4.45 billion line of credit with the U.S. Treasury to borrow for expenses. Formerly, BPA had no arrangement with Treasury to borrow for such costs.
 - BPA can now borrow up to \$750 million for Northwest Power Act-related operating expenses, with funds available the same day as the request is made.
 - The repayment period for these borrowings can range from three months to two years.
- When drawn on, this facility would be a use of Treasury borrowing authority.
- The new liquidity facility has enormous value to BPA and in order to assure the liquidity facility is available, BPA cannot plan to use borrowing authority to a zero balance for capital investments only.

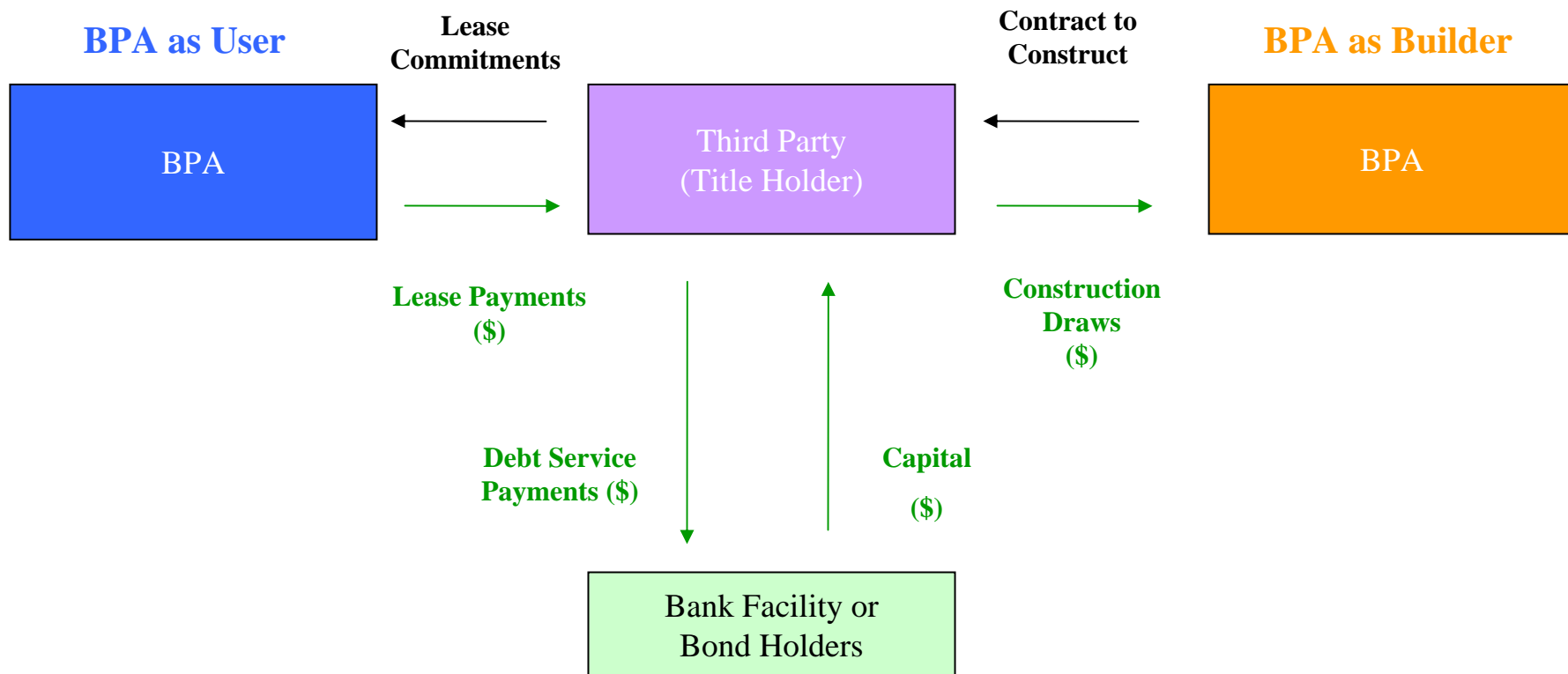
American Recovery and Reinvestment Act (ARRA)

- In the fall of 2008, representatives of regional utilities, regulatory commissions, the Northwest congressional delegation and the press urged Congress and the public to support an increase in BPA's borrowing authority availability as part of a federal economic stimulus program.
- In February 2009, the President approved the \$787 billion American Recovery and Reinvestment Act. The Act provides BPA with an additional increment of \$3.25 billion in Treasury Borrowing Authority.

Previous Access to Capital Actions

- 2001: Initiated the Debt Optimization program
- 2002: Requested a \$2 billion increase in Treasury borrowing authority
- 2003: Congress granted BPA a \$700 million increase in Treasury borrowing authority and encouraged BPA to seek non-Federal financing
- 2004: Developed the Lease Financing Model and secured non-Federal financing and entered into a lease agreement for Schultz- Wautoma Transmission Line
- 2007: Furthered evolved the Lease Financing Model into the Master Lease Model

Lease Financing Structure Review



Lease Financing Program Status

- BPA entered into its first lease agreement in 2004.
- Currently, BPA has financed 49 projects.
- Approximately \$450M of borrowing authority will be preserved because of these leasing facilities.
- Assets not leased become a permanent lost opportunity for preserving borrowing authority.
- BPA continues to use the Lease Financing Program when it is cost effective.

Risks Associated with Variables

- **Operating Costs:**
 - PricewaterhouseCoopers, Delap, US Bank fees could go up.
 - Fees associated with future Special Purpose Entities (SPEs) such as Northwest Infrastructure Financing Corporation (NIFC) could go up.
 - The number of SPE's required could vary and each SPE is associated with a specific bank.

- **Incremental Interest Rate Above Agency**
 - Interest rate spreads are a function of the market. In this analysis we have assumed 125 bps on the short-term financing and 75 bps on the long-term financing. Historically, the short-term spread has been between 40-60 bps, but the spread was increased to reflect the new credit market.

- **Property Tax:**
 - It is unclear how each state will assess the tax value since this program is new.
 - Future tax rates in all states may go up.
 - Assessment value methodology for Oregon and Idaho may change (no more 45 year depreciation).
 - Washington may change its rules on tax exemption for third party assets.

2010 Integrated Program Review – Capital Overview

From [2010 IPR Overview](#)

Capital Lapse Factor

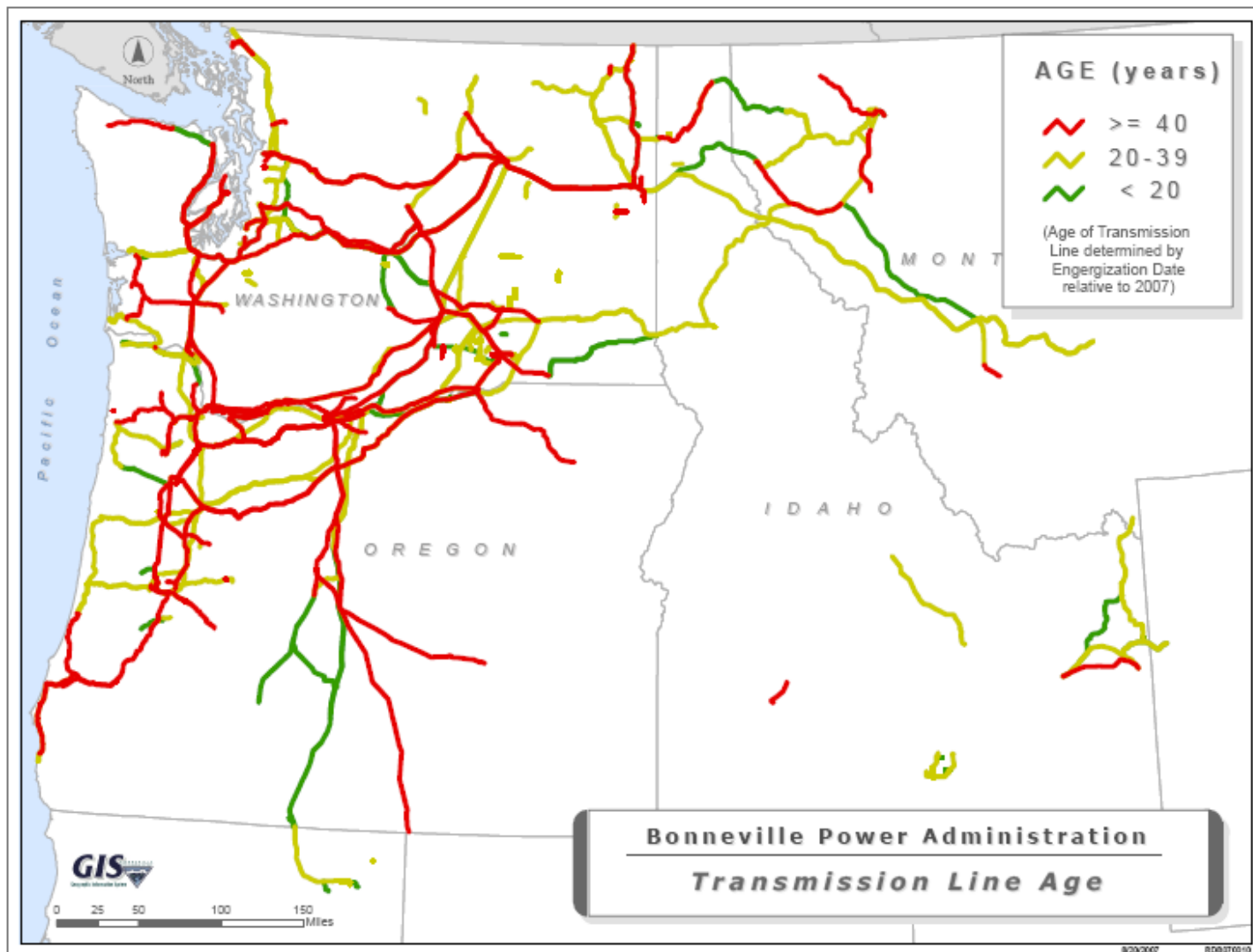
- In the 2008 IPR BPA began applying a ‘lapse factor’ to specific capital programs. Lapse factor reflects an assumption that a percentage of planned capital investment will be delayed into the subsequent rate period. The following lapse factors were used in the 2008 IPR process and applied to proposed capital spending for FY 2009-13.
 - Transmission ~ 17%
 - Federal Hydro ~ 15%
 - Conservation/Energy Efficiency ~ 15%
 - Information Technology ~ 15%
 - Facilities ~ 15%

- BPA is assuming continued use of a lapse factor with some minor modifications from the 2008 IPR.
 - Transmission ~ 15%
 - Actual Transmission capital spending is occurring at levels closer to planned spending.
 - Federal Hydro ~ 15%
 - Conservation/Energy Efficiency ~ none
 - The 6th Power Plan requires larger investments in energy efficiency and higher \$/Mw targets.
 - Information Technology ~ none
 - IT is ramping up significantly to support efforts across the agency and all planned spending is expected to be implemented.
 - Facilities ~ 15%

Drivers of Investment

- BPA sees the need for increased capital investment across the system. Key drivers of investment for Transmission, Federal Hydro, Facilities and IT include:
 - Transmission
 - Aging system (some equipment has exceeded expected lives).
 - Critical equipment at risk of failure.
 - Ramp up in wind and other generating resources.
 - Compliance requirements.
 - Advances in technology/efficiency opportunities.
 - Federal Hydro
 - Deteriorating conditions of assets.
 - Critical equipment at risk of failure.
 - Expanded assessments of equipment.
 - Needed equipment refurbishment/replacement.
 - Facilities
 - Assessment of all-BPA owned buildings began in April 2007.
 - Significant amounts of deferred maintenance resulting in non-compliance with safety codes.
 - Non-electric facilities rated in poor condition.
 - Information Technology (IT)
 - Consists of Network, Data Center, Office Automation and Applications.
 - Ensure reliable and available resources.
 - Maintain compliance with North American Electric Reliability Corporation (NERC), Critical Infrastructure Protection (CIP) and Financial Services and Markets Act (FSMA).

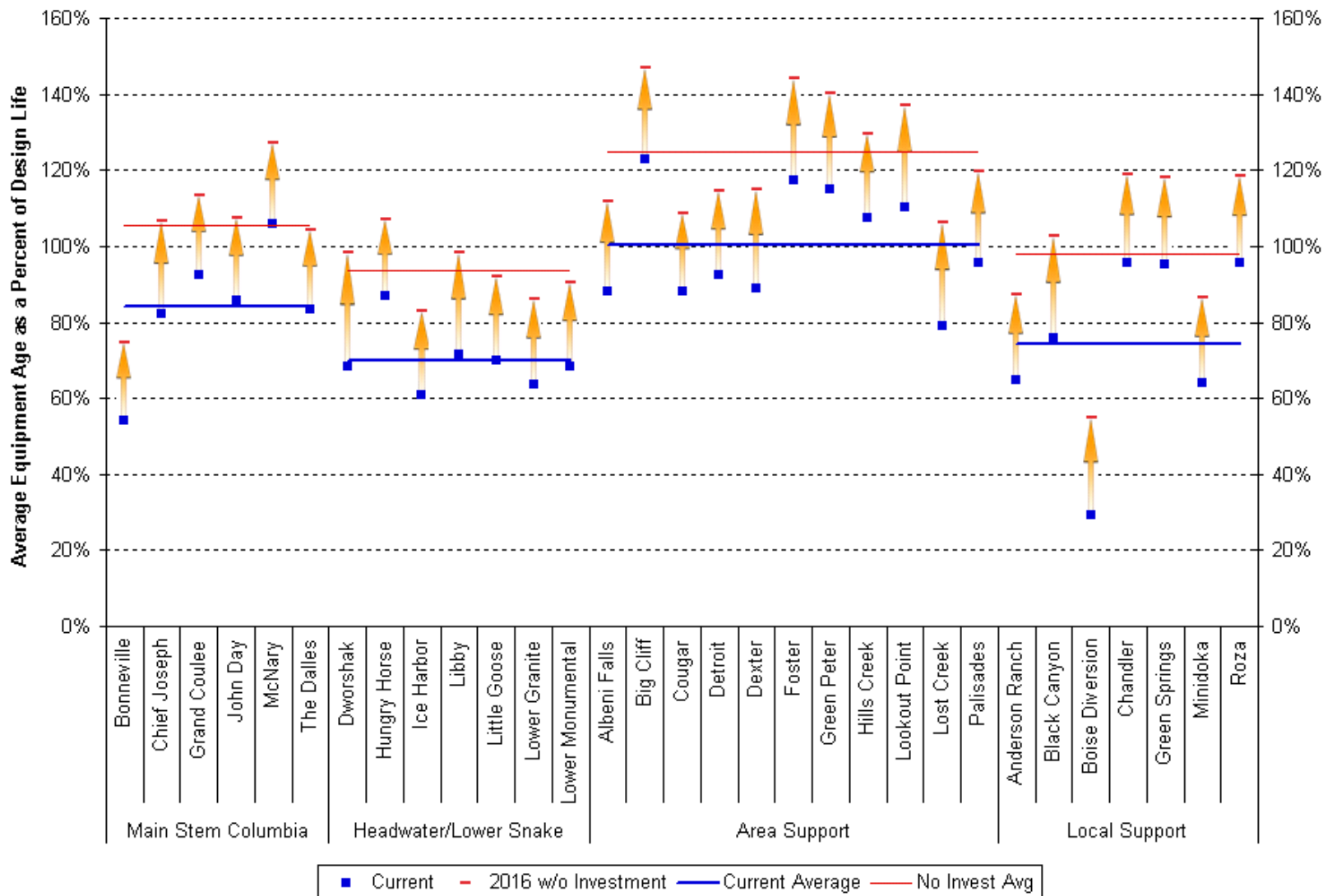
Aging Infrastructure – Transmission Lines



- 15,300 circuit mile
- >70,000 cable miles
- ~90k Structures
- ~5.3M insulators
- Average Age
 - 45 years
- 50% Built
 - Prior 1962

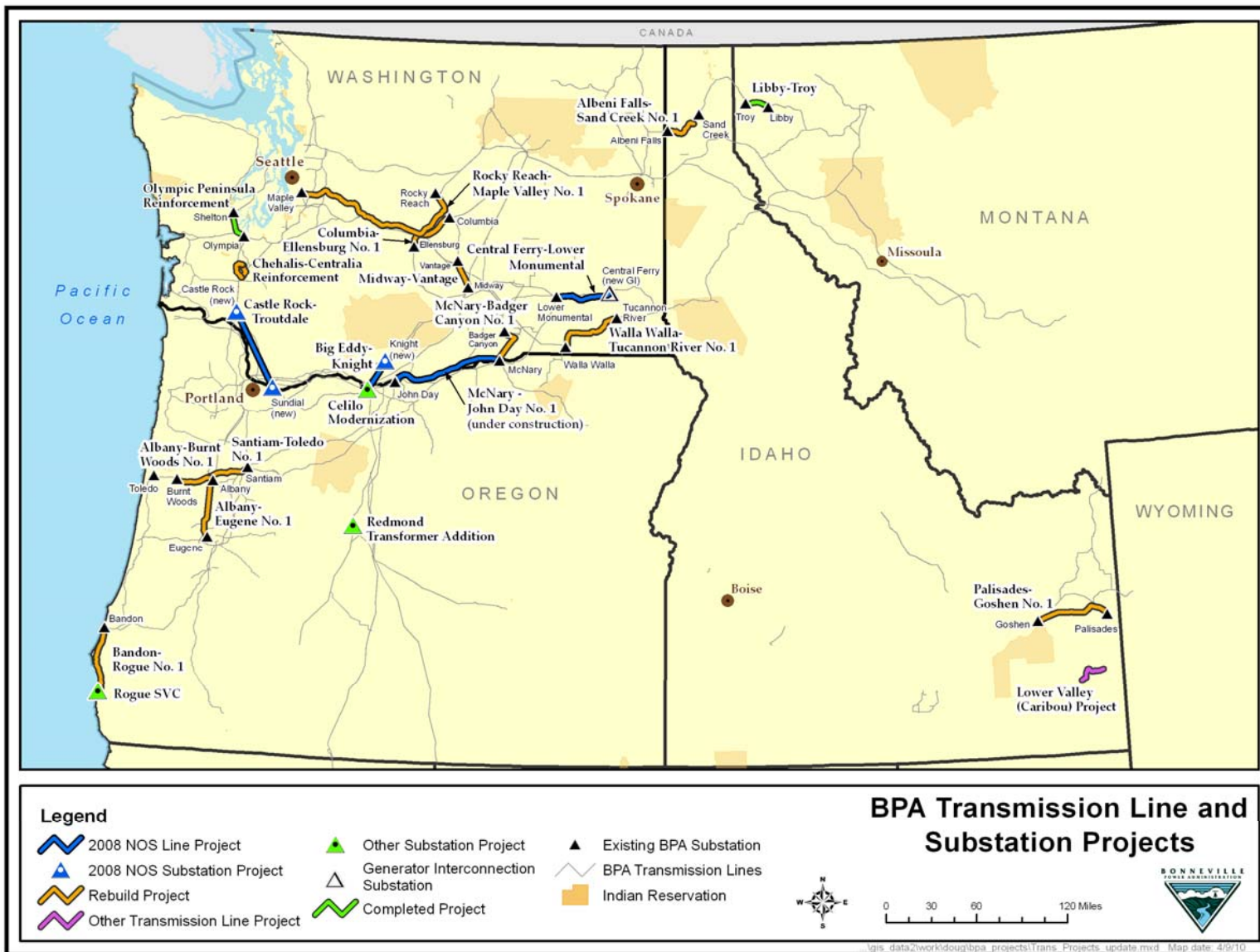
Last updated 2008

Current and Projected Average Hydro Equipment age, by Plant



Last updated 2008

Key Transmission Capital Projects



Transmission Capital Strategic Objectives

Transmission Services will prioritize capital projects and programs in accordance with our Asset Management Strategy and Customer Requests.

- On-going assessment of Transmission system against system performance metrics.
- Assess current condition of assets.
- Identify risks to BPA's long term outcomes from identified asset performance/condition gaps.
- Identify projects/programs with associated costs, to mitigate risks to long term outcomes.
- Analyze and update critical system spares.
- Comply with NERC Reliability Standards.
- Meet Contractual and Tariff obligations to provide interconnections, firm point-to-point, and network transmission service.