

CIR Workshop: Investment Portfolio Optimization

March 10, 2014

Workshop Agenda

- Affordability Cap
 - Purpose
 - How the range was set
 - How it would work
- Proposed Capital Spending – Before and after reductions
- Prioritization of Investments
 - Goals
 - Purpose and scope
 - Design of new process
 - Analytical approach
 - Proposed portfolio results
 - Actions to continuously improve
- Capital Related Cost Analysis

Affordability Cap

Objectives

- BPA is seeking to optimize its investment portfolio in order to provide a reliable, adequate, efficient and economical power and transmission system and fulfill regional commitments in Energy Efficiency and Fish and Wildlife. This optimization must take into account not only investment needs but also rate, long-term cost structure, financing and other objectives.

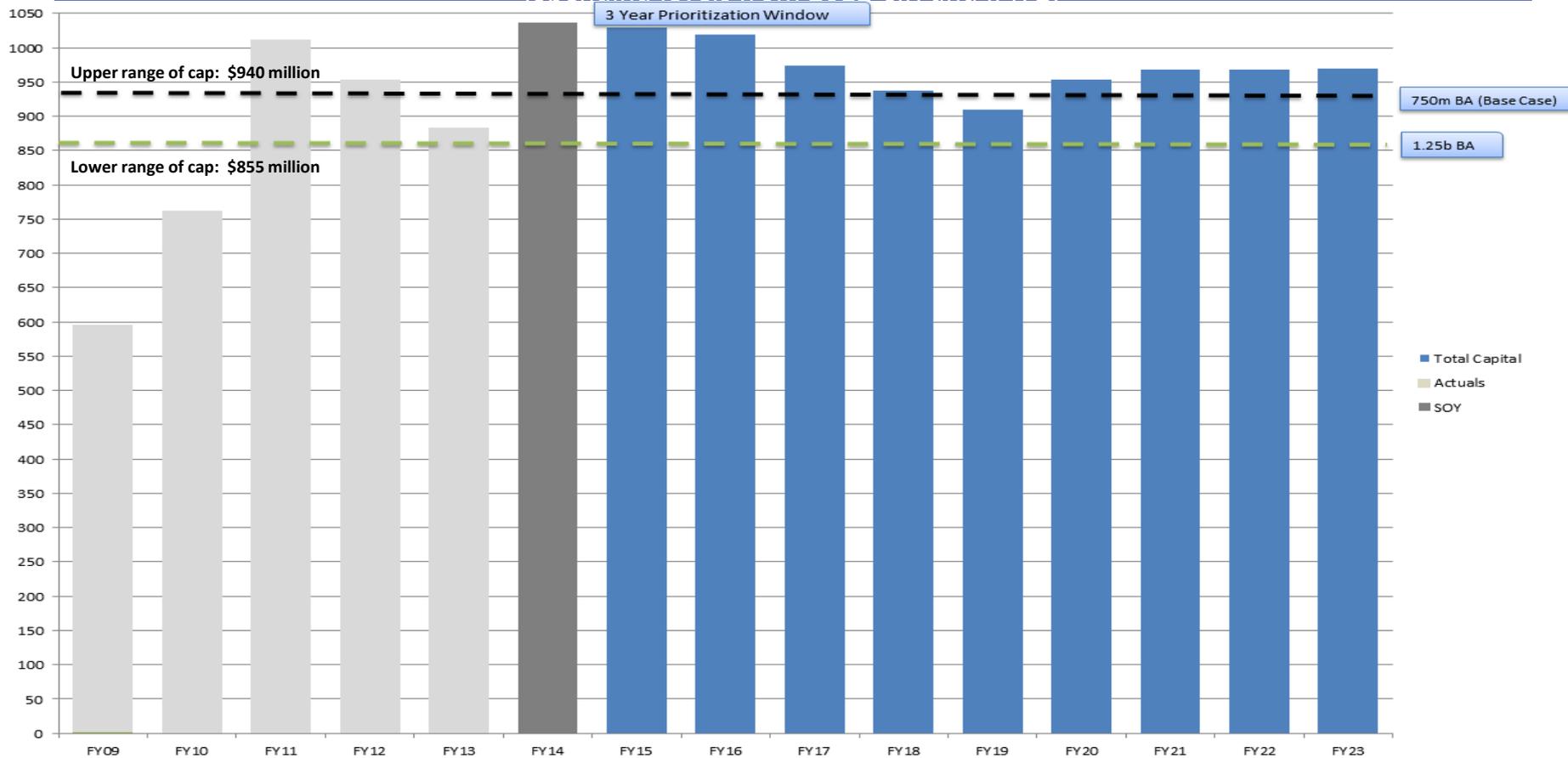
- To that end, the Affordability Cap, which works in conjunction with BPA's process of prioritizing investments and allocating capital, places a limit on planned cumulative capital expenditures and is integral to establishing an optimal investment portfolio. The Affordability Cap is designed to help:
 - Manage long-term capital-related costs and associated rate impacts;
 - Enable BPA to meet its long-term financing and debt management objectives; and
 - Retain the long-term support of the financial community, including rating agencies.

Affordability Cap – Why now?

- BPA and its FCRPS partners have been facing growing investment requirements to replace and modernize aging infrastructure, add capacity to meet loads and integrate new generating resources, and fulfill regional commitments for energy efficiency and fish and wildlife restoration.
- At the same time, BPA's access to low-cost sources of capital is constrained as Treasury borrowing is limited.
- BPA is implementing a capital investment prioritization process to ensure that its limited capital is deployed optimally. A necessary companion to investment prioritization is a constraint – a cap – on spending to stabilize long-term capital-related costs and associated rate impacts and ensure BPA access to capital over a rolling 10-year period.

Capital Spending Analysis

(Spending levels from 2012 CIR and IPR 2)



Scenario	FY15	FY16	FY17	3 yr Cap	9 yr Cap
9-Yr CIR/Debt Management Capital					8,727
Base Case Capital Cap	939	939	939	2,817	8,451
Delta from CIR/Debt Mgmt	90	79	34	203	276
\$1.25b Capital Cap	854	854	854	2,562	7,686
Delta from CIR/Debt Mgmt	175	164	119	458	1,041

Total capital spending amounts are based on the 2012 CIR/2013 Debt Management Process, Base Case capital spending represents a 9 year average of total capital costs between FY 2015-2023 less a \$35m reduction to capital spending beginning in FY 16 in lieu of revenue financing. Capital amounts are fully loaded and Fed Hydro and Transmission include a 5% lapse factor.

The Affordability Cap

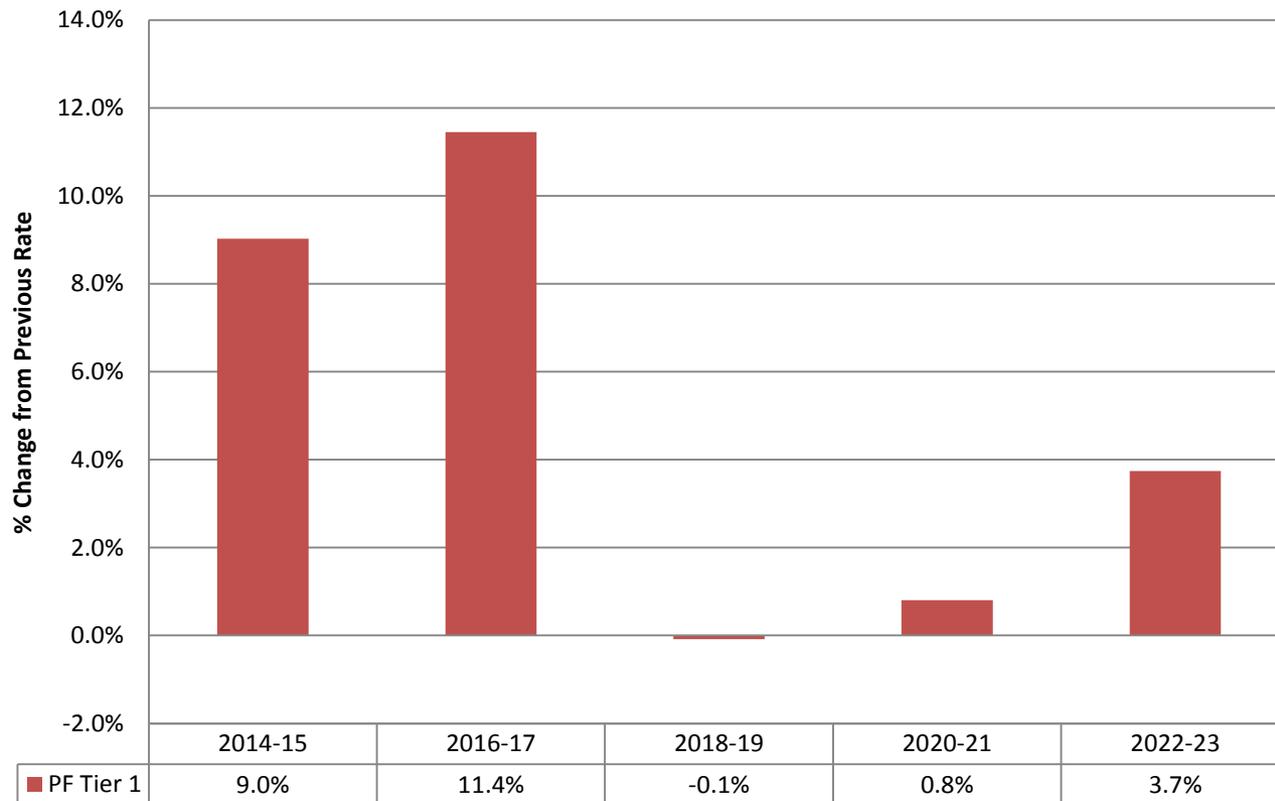
- BPA is proposing an Affordability Cap of \$855 million to \$940 million per year over the FY 2014-2023 period.
- This cap range is consistent with the objectives in slide 4 – manage capital costs, meet long-term financing and debt management objectives, and retain the long-term support of the financial community. This Affordability Cap also reflects a review of long-term capital-related costs and the implications of the costs for power and transmission rates.
- Additionally, BPA evaluated the cap range against its long-term debt management objectives to ensure capital financing needs were covered over a rolling ten year period. This is consistent with the objectives of BPA’s Access to Capital Strategy which are to ensure that capital needs are covered over a rolling 10 year period and that BPA is able to meet its capital requirements at low-cost.
 - Based on BPA’s financing assumptions, the \$940 million cap leaves \$750 million of U.S. Treasury Borrowing Authority at the end of FY 2023.
 - Based on BPA’s financing assumptions, the \$855 million cap leaves \$1.25 billion of U.S. Treasury Borrowing Authority at the end of FY 2023.

Financing Assumptions

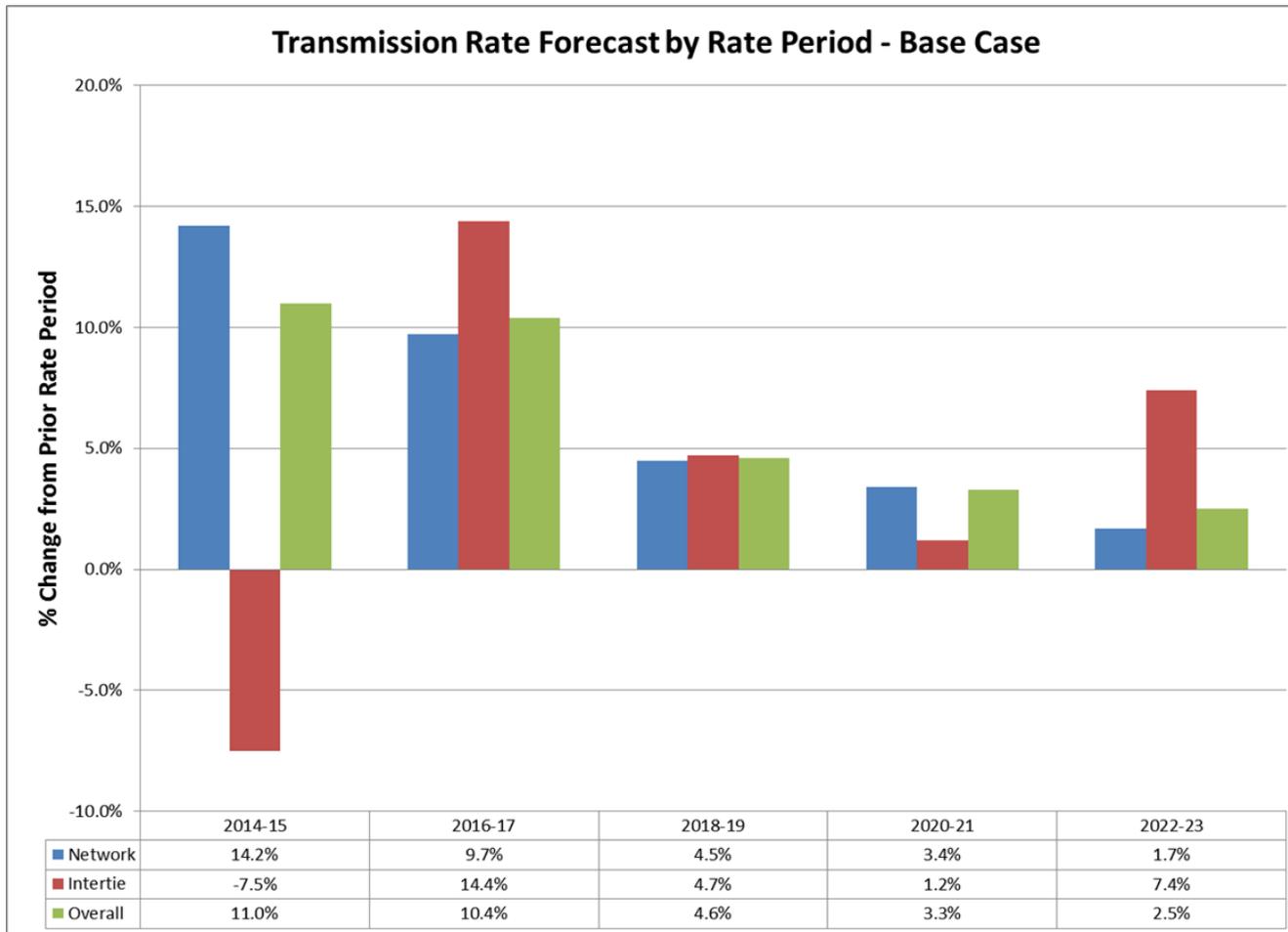
- The following financing assumptions were used to develop the affordability cap and are consistent with the updated 10-year Access to Capital Strategy (i.e., Revised FY13 Plan):
 - Lease Financing of Transmission Capital: Ongoing 50% starting in FY 2013
 - Power Prepays: \$340 million in FY 2013, \$160 million in FY 2016
 - Conservation Financing: 70% starting in FY 2016
 - Reserve Financing (Transmission): \$15 million per year through FY 2023
 - Capital reduction in lieu of Revenue Financing: \$35 million per year starting in FY 2016

Long-Term Rates Analysis – Power

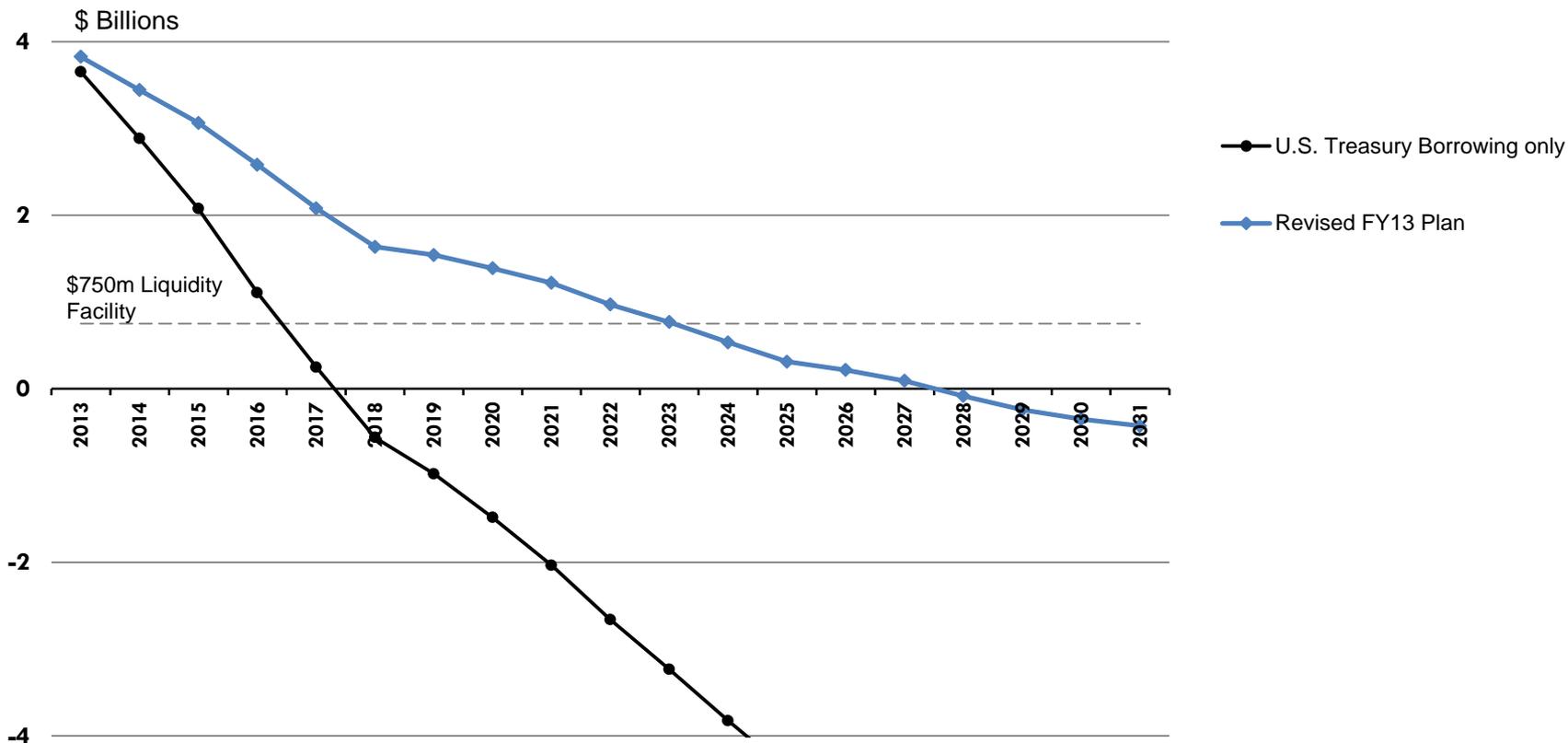
Power Rate Forecast by Rate Period - Base Case



Long-Term Rates Analysis – Transmission



Analysis of Remaining US Treasury Borrowing Authority (EOY)



**Revised FY 13 Plan refers to the updated 10-year Access to Capital Strategy (Fall 2013)*

The Affordability Cap

- The Affordability Cap range was examined in terms of internal constraints on BPA and its federal partners' ability to execute a large capital investment program, including labor, available outage time, and other constraints.
- Coincidentally, the cap range approximates the current capability of BPA and its partners' ability to successfully carry out a large investment program, as evidenced by the most recent 3 years of capital spending actuals (average \$914 million per year versus the \$855-\$940 million cap range).
- Effectively, the Affordability Cap would constrain cumulative future capital spending to the recent rate of investment in nominal dollar terms. In real dollar terms, the Cap would require that BPA and its FCRPS partners find productivity and other savings to offset the effects of future inflation.

How the Affordability Cap would work

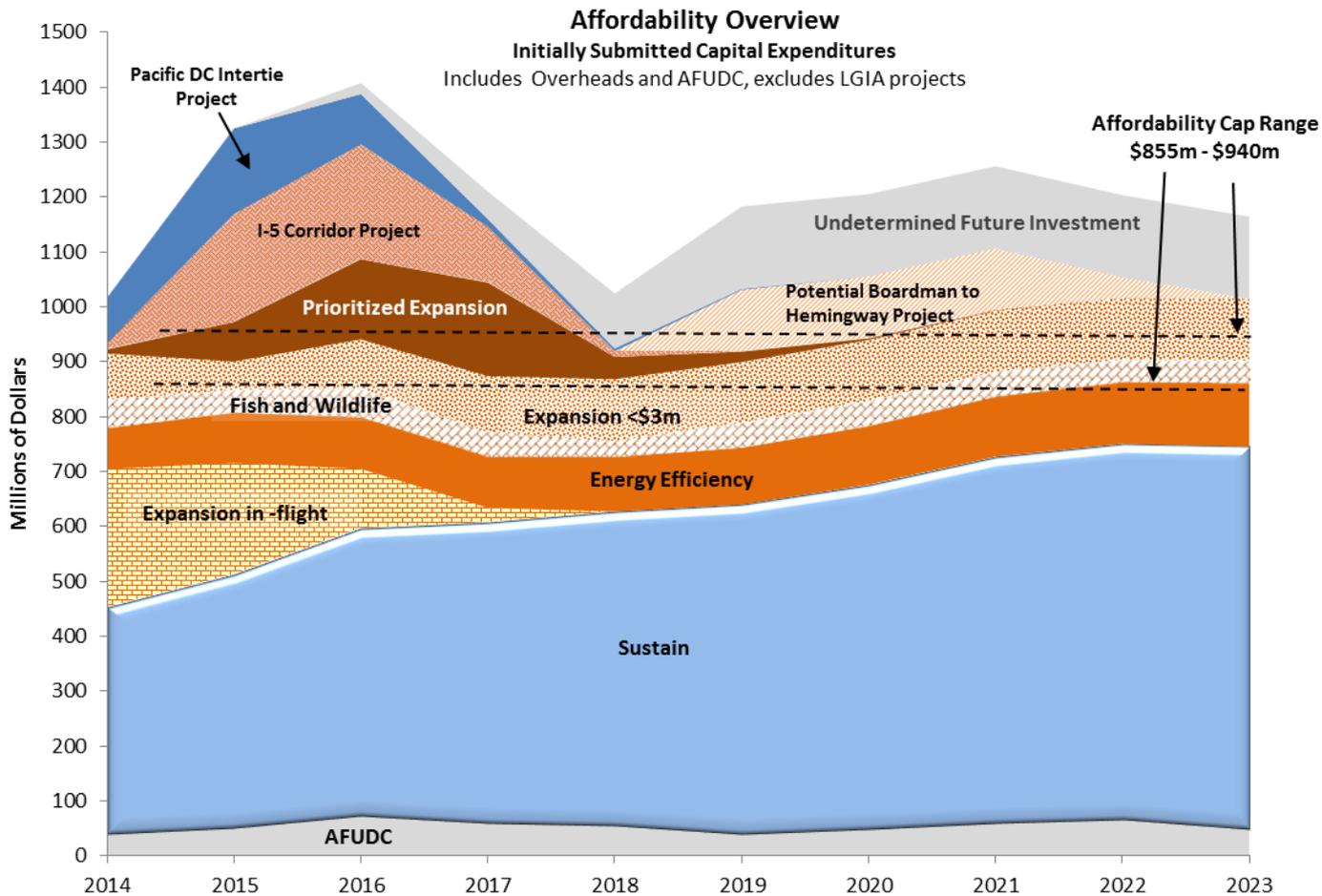
- The Affordability Cap would apply to the investment portfolio for Transmission, Federal Hydro, Facilities, Information Technology, Fish and Wildlife, Energy Efficiency, Security, Environment, and Fleet. The Affordability Cap would not apply to (1) Columbia Generating Station, (2) Columbia River Fish Mitigation, or (3) transmission projects that are tariff-driven and funded in advance by a customer.
- Performance in meeting the Affordability Cap would be measured on a cumulative basis over time. Annual overruns and underruns would be tracked, with future spending plans adjusted so that the cap range is not exceeded on a rolling 10-year basis.
- If conditions change, BPA intends to recalibrate the cap on a 2-year cycle prior to each Capital Investment Review. Any recalibration would be based on updated financial, rate, and related “affordability” factors.

Prioritizing Investments and Allocating Capital

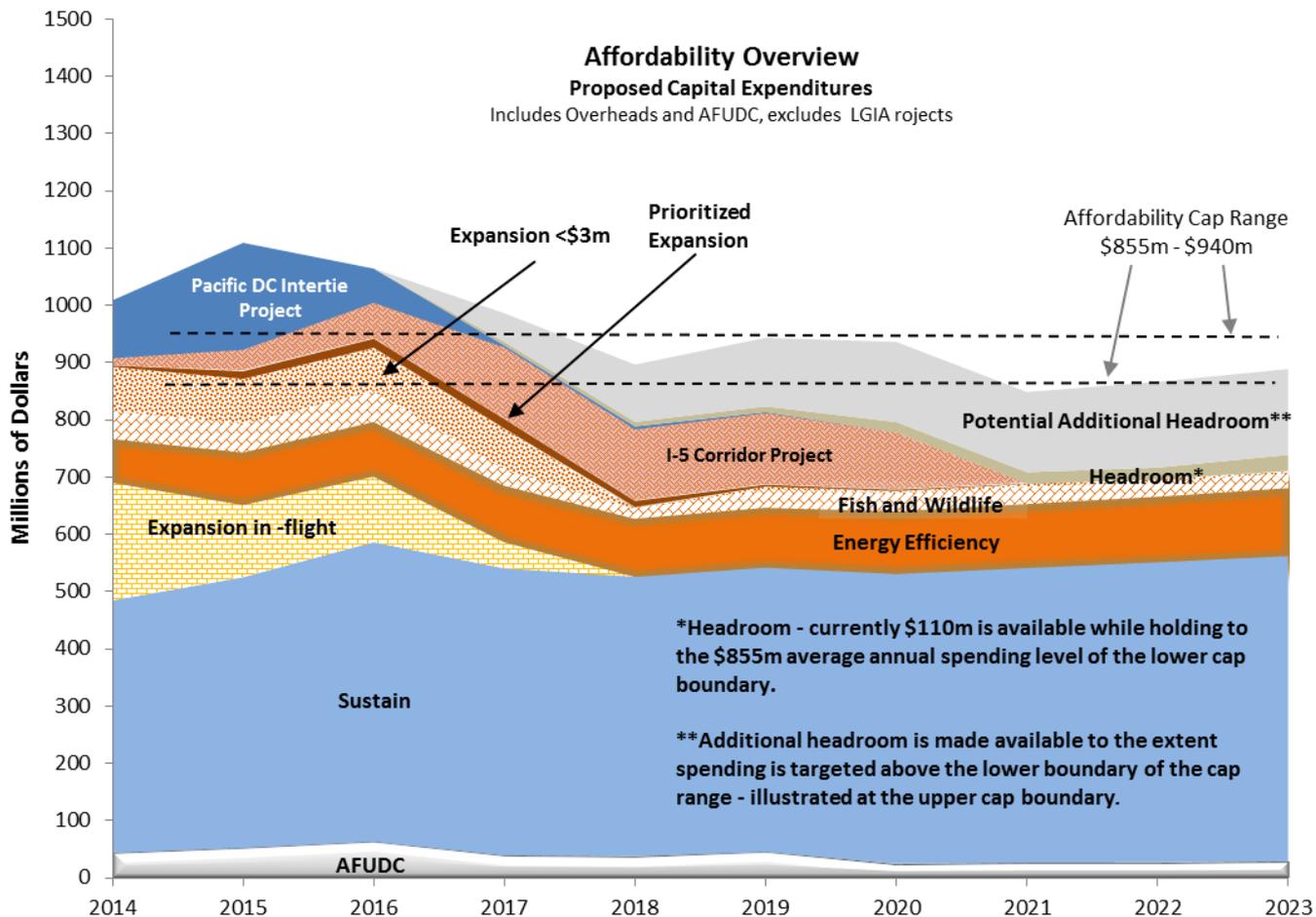
- The Affordability Cap works in conjunction with prioritizing investments to optimize the investment portfolio.
- While the Affordability Cap sets a ceiling on total planned capital spending, it does so without regard for the condition of assets nor capacity or other demands that are placed on the power and transmission system.
- Within the capital prioritization process the merits of potential investments are assessed and evaluated in order to select a portfolio of investments that maximizes value within the limits of the Affordability Cap.

Proposed Capital Spend – Before and After Reductions

Initially Submitted Capital Expenditures



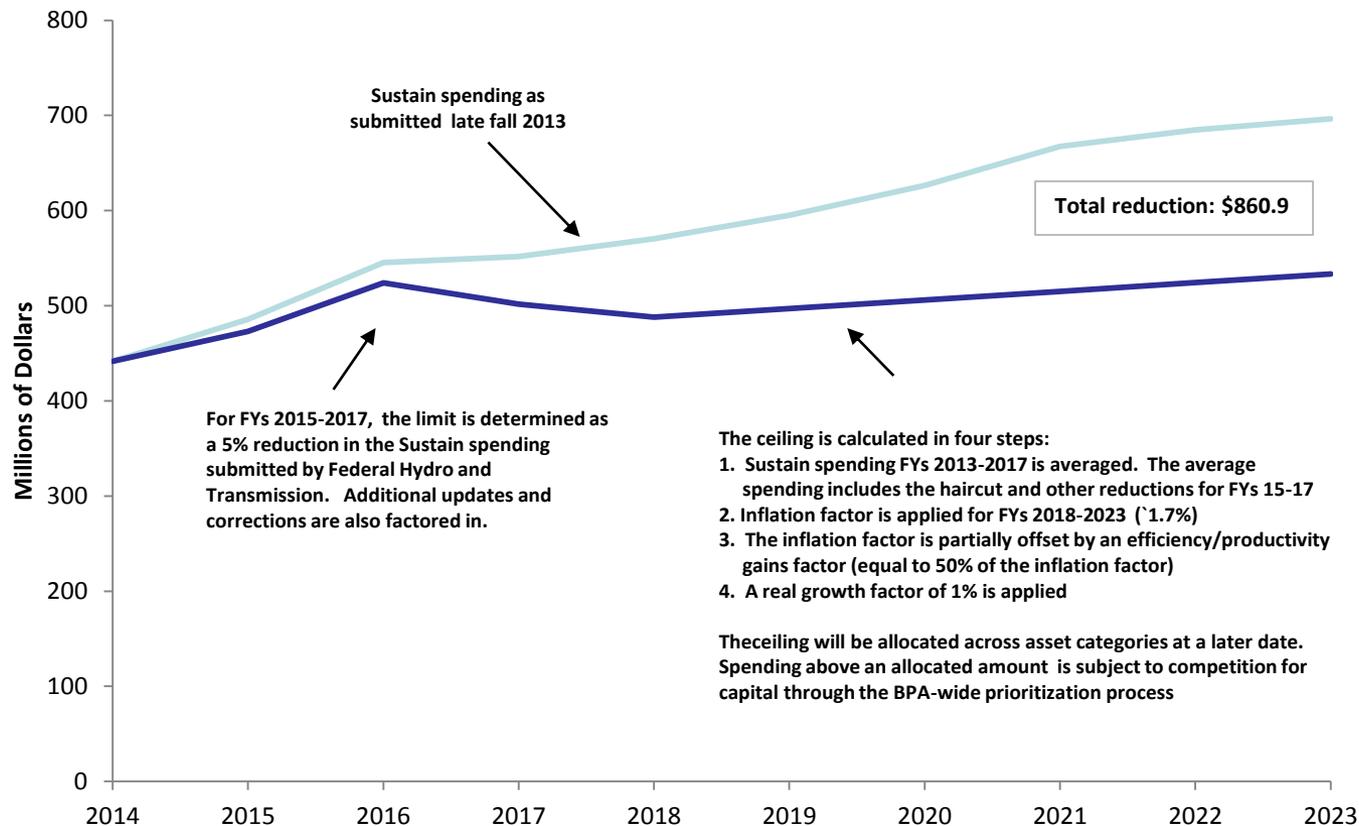
Proposed Capital Expenditures



See also page 31 of CIR Initial Publication

Sustain Capital Spending levels – before and after proposed reductions

(Excludes AFUDC and Overheads, Nominal \$)



Prioritization of Investments

Introduction

Why prioritize capital investments?

- BPA is proposing investment levels that are very high -- beyond what may be affordable
- Rate, long-term cost structure, and financing objectives will serve as a constraint on capital spending
- Until recently, BPA did not have value-based methodology for allocating capital across diverse investments
- Customers have rightly insisted that BPA adopt a systematic and transparent process to make trade-offs and ensure that capital is deployed optimally across the organization
- A systematic, value-based method for prioritizing capital investments across business units is a best practice among top performing utilities

Goals for new investment prioritization process

Create an agency-level process that:

- Furthers the agency's strategic priorities/objectives
- Provides a "level playing field" for projects with different risk/cost/benefit characteristics from various asset categories
- Optimizes the agency's investment portfolio within capital, labor, rate, and other constraints
- Ensures decision-making is risk-informed and supported by thorough analysis
- Provides transparency both internally and externally
- Enables efficient, timely decision making
- Enables BPA to track the performance and measure the realized value from investments

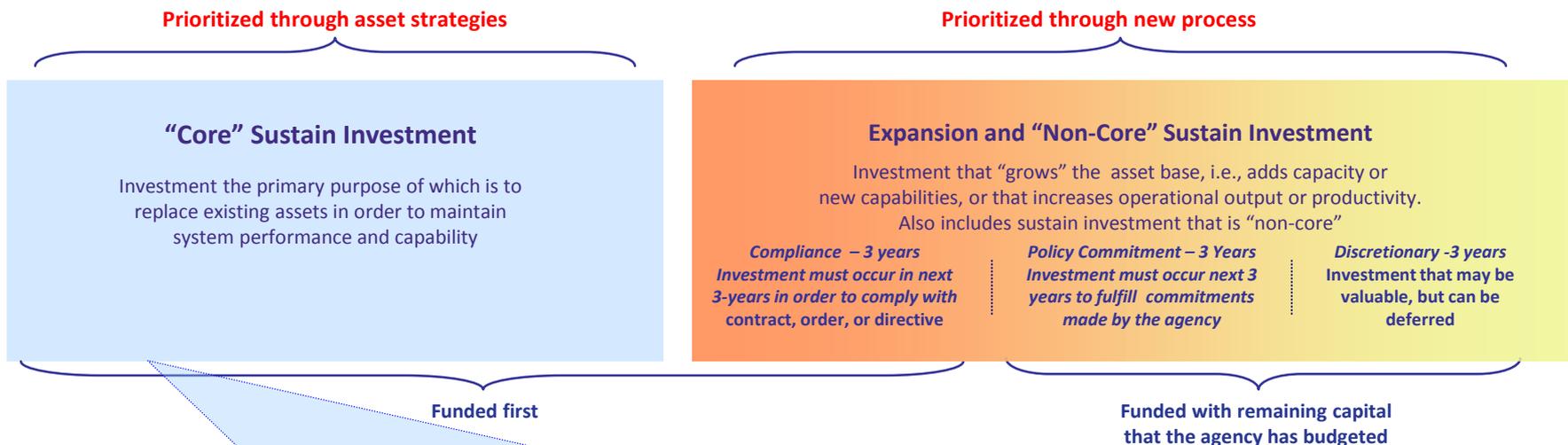
The methodology and process must be directed at maximizing the long-term operational and economic value of assets.

The new prioritization process is a significant change to BPA’s approach to investment decision-making

	Before	After
Prioritization of expansion investments	Prioritized within each asset category using a process and criteria unique to that asset category. The results of each asset category’s prioritization are then added together to form an investment portfolio	Expansion-type investments are prioritized using a single BPA-wide process. Each asset category nominates, assesses, and evaluates its proposed investments using a standardized value-based approach. The results are combined and then prioritized by the CAB to form the BPA investment portfolio
Prioritization criteria for expansion investments	Criteria for prioritizing expansion-type investments are often situational, tactical in nature, and consensus-driven, often without robust economic analysis	Metrics and modeling are based on leading practice economic and financial analysis. Metrics and modeling are standardized to provide efficiency, equitable treatment, and comparability of results
Benefit assessments	Benefits are described qualitatively, with limited quantification. The benefits are often limited to those that impact BPA. Benefit assessments rarely capture uncertainty ranges	All sources of value are captured quantitatively to the extent feasible, including benefits that are internal and external. Cost and benefit uncertainties are captured and modeled stochastically
Rebalancing the portfolio	Portfolio is re-balanced within each asset category, generally in conjunction with the BPA spending level review processes, every two years	Portfolio is re-balanced on a 6-month cycle by the CAB, with the results then entered into forecasts. The results of the re-balanced portfolio will be shared for public comment through the QBR process
Cap on capital expenditures	No formal long-term cap. Limits on rate period spending are established through CIR/IPR public process	Affordability Cap on capital expenditures is set by the CAB after customer comment in CIR. The cap applies to a 10-year planning horizon. Projected spending levels continue to be established through CIR/IPR process
Prioritization of Sustain investments	Asset strategies are used to prioritize Sustain investments within each asset category	Same, except that a portion of sustain investments will be subject to the new BPA-wide prioritization process beginning in FY 2018 (discussed later)
Governance	The Administrator consults with the CFO to approve the process. The Administrator and sponsoring VPs select the individual asset category portfolios. The portfolios are then aggregated up to the BPA level	The CAB oversees the prioritization process and collectively recommends the BPA portfolio to the Administrator for final decision

Capital Prioritization
Methodology and Process
Overview

Which investments are covered by the new prioritization process?



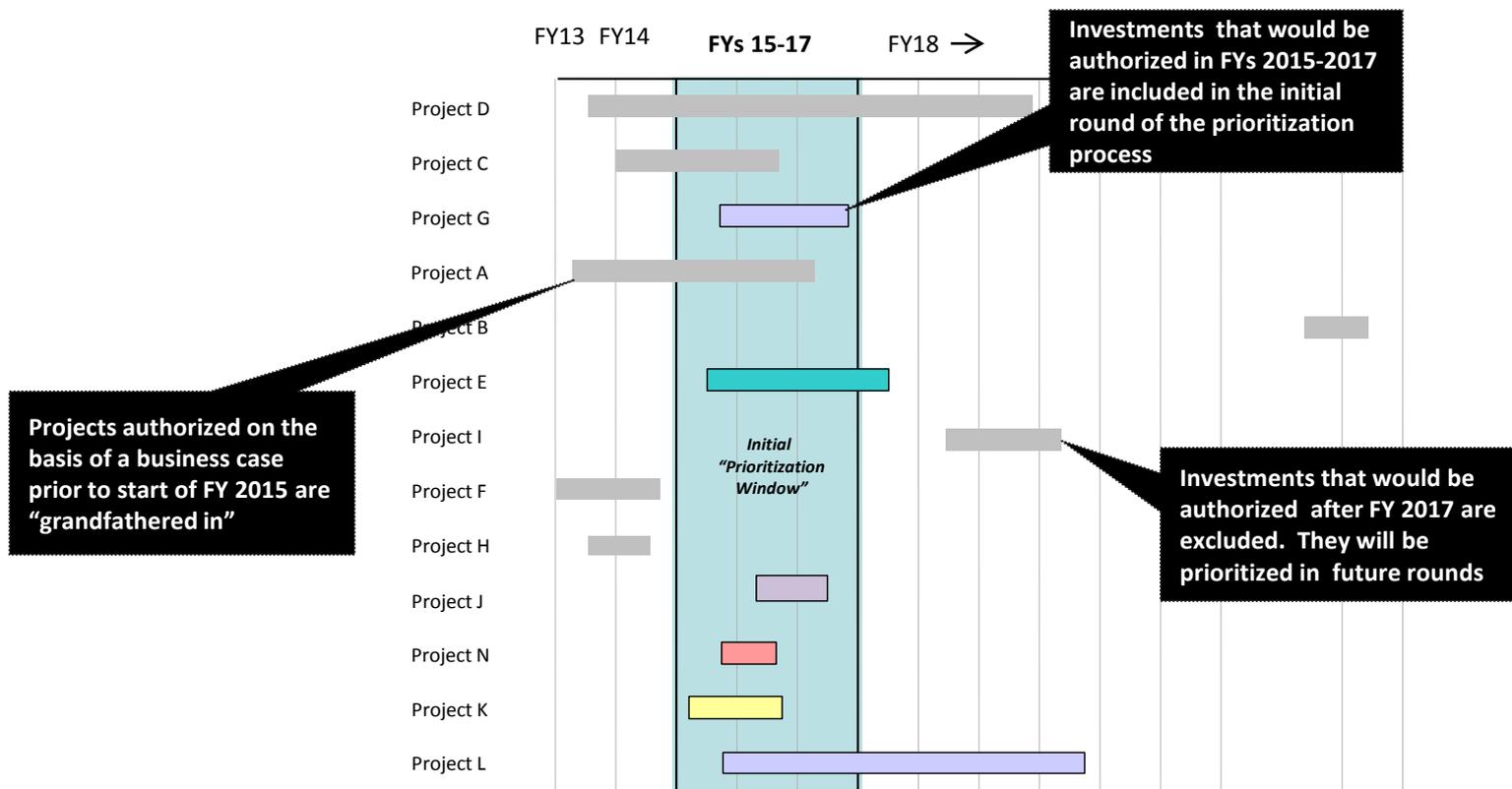
Core sustain investments are exempt from the process. The process covers expansion and “non –core” sustain investments only

“Core sustain” investment is prioritized through condition-based risk assessments, in which the highest priority is assigned to the most critical equipment and facilities at greatest risk of failure, obsolescence, safety issue, or other risk factor. Included are projects necessary to make core sustain investment viable, such as access roads that enable line replacements. Prioritization of core sustain investment occurs within the asset strategies that are developed by each asset category and approved by the CAB.

- For Transmission, Core Sustain investments include investments the primary purpose of which is to replace existing assets to manage failure, obsolescence, safety, and other risks. Investments the primary purpose of which is to upgrade or add capacity, flexibility, and other capabilities are classified as Expansion/Non-Core Sustain
- For Federal Hydro, Core Sustain investments include investments the primary purpose of which is to replace existing assets to manage failure, obsolescence, environmental, or safety risks. Investments the primary purpose of which is to improve generating efficiency or add generating capability are classified as Expansion/Non-Core Sustain
- For IT, Core Sustain investments include investments the primary purpose of which is to replace end-of-life cycle, failing, or technologically obsolete hardware. All other investment, including all software applications, are classified as Expansion/Non-Core Sustain.
- For Facilities, Core Sustain investments include investments, the primary purpose of which is, to replace existing assets to manage failure risks and functional obsolescence, and mitigate safety risks. Investments the primary purpose of which is to upgrade or add capacity, flexibility, and other capabilities are classified as Expansion/Non-Core Sustain.

Energy Efficiency capital spending that implements the power plan and Fish and Wildlife capital investments that implement the BIOp and current fish accords are generally prioritized by entities outside the FCRPS. These investments are excluded from the new prioritization process.

Initially, the new BPA-wide prioritization process covers large expansion investments in transmission , facilities, and IT that would start in FYs 2015-2017



Note: The term "investment" includes upfront capital expenditures and upfront expense expenditures to plan, design, and build or acquire equipment, facilities, or software applications

Beginning with new starts in FY 2018, small expansion projects and potentially a portion of sustain investments will be rolled into the new process

How are expansion and non-core sustain investments classified?

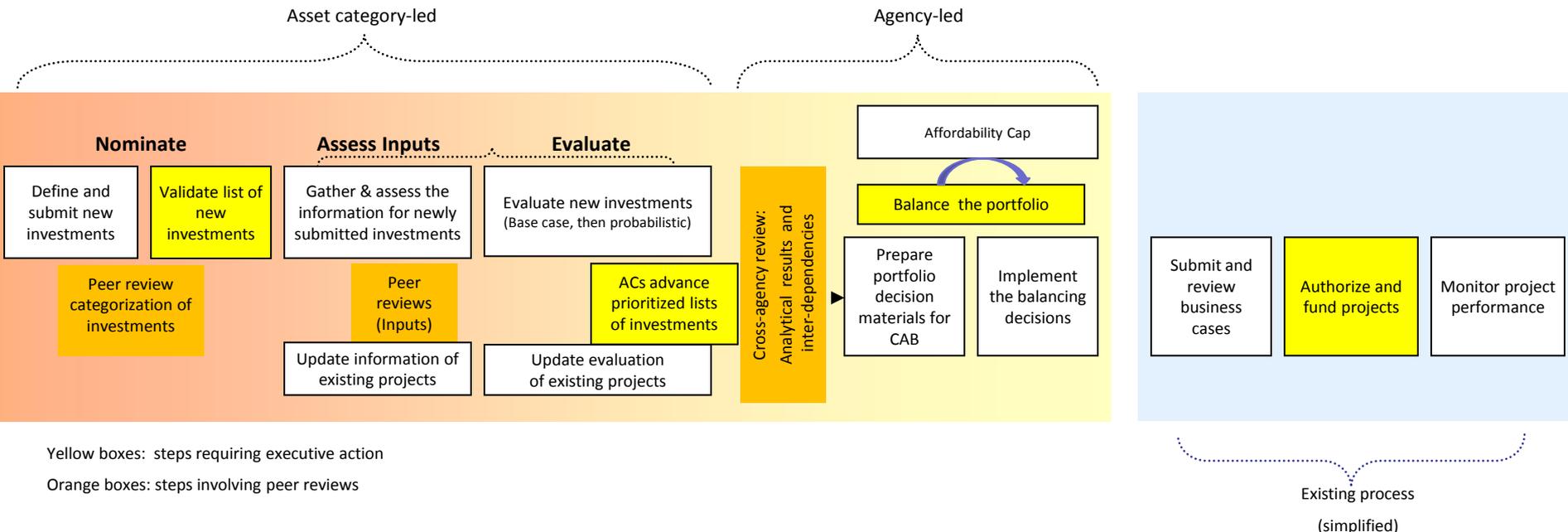
Expansion and “Non-Core” Sustain Investment

Investment that “grows” the asset base, i.e., adds capacity or new capabilities, or that increases operational output or productivity.

	Compliance Investment must be authorized during the 3-year prioritization window in order to comply with contracts, orders, directives	Policy Commitment Investment must be authorized during 3-year window to fulfill commitments made by the agency	Discretionary May be preferable that investment start during the 3-year window, but it can be deferred
Driver of investment	Investments in the Compliance classification are essential to the agency’s ability to comply with a signed contract, regulatory directive, or an executive or judicial branch order or directive. The contract, order or directive must compel BPA to make an investment -- failure to make the investment timely would result in a violation. To be eligible, the investment must be authorized and work must begin by no later than the end of the 3-year prioritization window.	Investments in this category are essential to meeting commitments made by the agency. The commitments require that BPA invest to meet tariff provisions, NOS policy commitments, and load service obligations. The commitments require that investments be authorized and that investment begins by no later than the end of the 3-year window. A failure to make the investment during the window would result in serious reputational risks and legal risks	Expansion and “non-core” sustain investments that may be highly valuable, but that may be deferred beyond the 3-year prioritization window Includes economic opportunity investments to reduce operating costs, enhance revenue, improve internal efficiency Also includes “Compliance” and “Policy Commitment” investments if the investment can be deferred to year 4 or later. (Investments can move from the discretionary category to the categories at left over time)
Discretion on whether and how to invest?	Little or no discretion on whether an investment needs to be made. The purpose and nature of the investment are largely mandated	Little or no discretion on whether an investment needs to be made, although changes in customer needs, market conditions, and other external factors can cause shifts in the composition and timing of the investment. Discretion is normally available on investment alternatives	Discretion on whether to invest and on investment alternatives
Discretion on timing of investment?	Little or no discretion on timing of the investment. Often the investment is mandated by a certain date. Investment must be authorized and work must begin by no later than the end of the 3-year prioritization window in order to comply	Some discretion on timing of the investment. Timeline for completion is driven by agency commitments – must begin during the 3-year window to avoid reputational and legal risks	Yes
Examples	LGIA agreement, if the agreement requires investment during the 3-year prioritization window Investment in new security equipment to meet NERC CIP, if investment is required during the 3 years	Investment to meet load service obligations, if necessary during the 3-year window Network open season-driven investment, if necessary during the 3 years Information systems to meet regional dialogue commitments SLICE application	New or expanded maintenance headquarters or new office building Addition of a hydro generation turbine, turbine runner replacements when efficiency is a primary driver New IT applications driven by business process efficiencies such as TAS, EE Central Acceleration of a transmission sustain investment program
Treatment in prioritization process	For these investments, the strategic fit test is deemed to be met. While capital costs are estimated and vetted, the economic value test is not required, but may be useful in choosing the best alternative. Investments in this category are not priority ranked based on economic value. Like Core Sustain, these investments are funded ahead of Policy Commitment and Discretionary investments.	Strategic fit test is deemed to be met. Economic value test applies. These investments are priority ranked along with discretionary investments based on economic value. They are flagged, however, and the CAB will likely fund these investments ahead of discretionary investments	Strategic fit and economic value tests apply. These investments are priority ranked along with Policy Commitment investments based on economic value. They are funded after investments in the Core Sustain, Compliance, and Policy Commitment classifications

For purposes of the 2013 process, “Investment must be authorized during the 3-year window” means the project must be proposed and approved on the basis of a business case at the agency level (ACPRT, CAB) during the FY 2015-2017 period. Projects authorized before October 1, 2014 are exempt from the 2013 process.

Sequence of steps in the capital investment prioritization process



The process is repeated on a 6-month cycle – to consider updates and new investment proposals.

Investment nominations address these key questions

- What is the proposed investment?
- Why is this investment needed?
- What assumptions are behind the investment need?
- What actions would we take if this investment were not made?
- What investment alternatives should be considered?
- Who would benefit from this investment?
- Descriptive information, such as investment name, type of investment, range of costs, key dates, etc.

Developing creative alternatives for each investment considered

Questions that are posed when developing investment alternatives:

- (Always required) A status quo case -- as a reference case for evaluating the merits of investment alternatives. What would happen if this investment were not approved?
- (Always required) a 2-year delay in the project start/completion date from what is proposed (this alternative will be automated)
- Are there viable alternatives that would cost, say, 70 percent of the proposed spending? If the budget were reduced by 30 percent from the proposed spending level, what action would you take?
- What would the investment alternative be if there were no funding, resource, outage and other constraints?
- What alternatives are there that would originate outside your asset category? For example: non-wires alternatives to transmission expansion including energy efficiency, generation re-dispatch, or distributed generation?
- Could the business process be re-engineered without automation (IT)?
- Are there options that would not require expenditures of capital? For instance, software-as-a-service, maintenance/repair, changes to operations, rent/lease in lieu of buy/own?
- Are there quick-fix or gradual-fix solutions that would enable the investment to be deferred?

What are the ingredients of Net Economic Benefit Ratio?

$$\text{Net Economic Benefit Ratio} = \frac{\text{PV Economic Benefits} - \text{PV Project Investment} - \text{PV Post-Project Costs}}{\text{PV Project Investment}}$$

{PV = Present Value}

“Bang for the buck” ratio

“PV Economic Benefits” includes the present value of (examples):

- Avoided congestion costs (avoided fuel and other production costs that are enabled by adding capacity on constrained transmission paths)
- Avoided power purchase costs or increased power sales
- Incremental revenue (i.e., revenue beyond that needed to recover project investment and post project costs)
- Labor cost savings through process efficiencies
- Avoided customer value losses from outages
- Avoided CO2 or other environmental costs (monetized)

“PV Project Investment” includes the present value of:

- Upfront project costs (project planning, environmental review (NEPA), land/land rights acquisition, procurement, construction/installation)

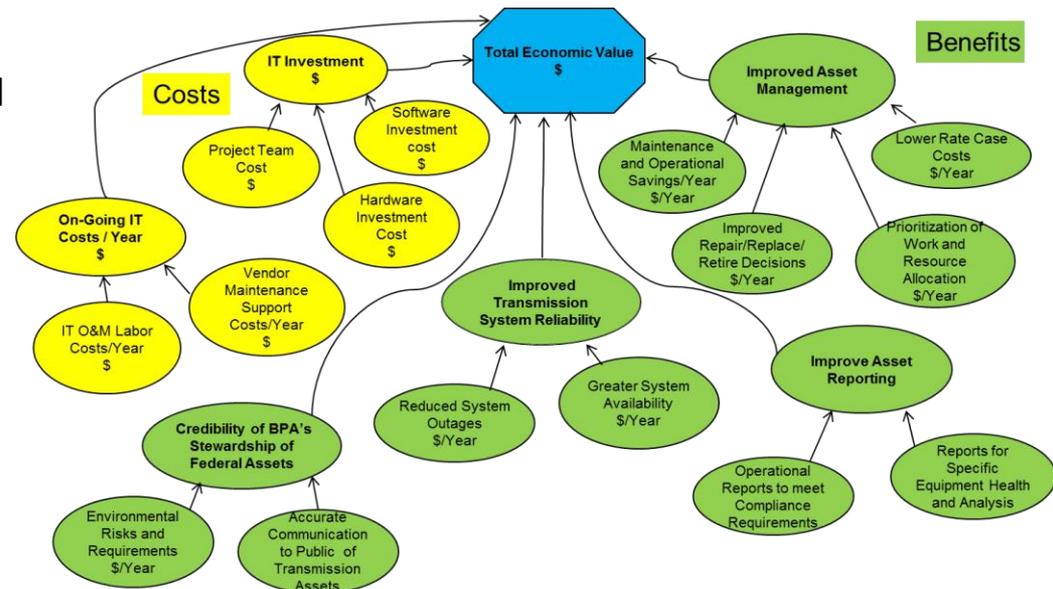
“PV Post-Project Costs” includes the present value of:

- Maintenance and operations costs that would be incurred to sustain the asset after it is in service, e.g., maintenance, repairs, component replacements, monitoring, licensing (IT), other support

This metric is directed at capturing the net economic costs and benefits of the investment. Net economic benefits are determined without regard to the source of capital that would be used to fund the project and without regard to who might receive the benefits.

Investment Influence Diagrams were developed and used to build spreadsheet models to collect cost and benefit data, as well as evaluate investments

- Investment test cases were selected and used to develop influence diagrams
- Influence diagrams used to:
 - Identify types and sources of information
 - Clarify the relationship between inputs, decisions and value
 - Serves as a design to build spreadsheet model(s) used to assess and evaluate investment alternatives
- Influence diagrams were used to build generic spreadsheet models that could be used to assess costs and benefits, evaluate economics for a variety of investment alternatives



Source of value examples:

- Avoided congestion costs
- Avoided revenue losses
- Avoided power purchase costs
- Avoided equipment-related costs
- Incremental revenue
- Avoided facility-related costs
- Avoided software-related costs
- Avoided fines/sanctions
- reduced labor hours/costs
- Avoided productivity losses
- Avoided recovery and restoration costs
- Avoided outage costs (planned and unplanned)

A low / base / high range is assessed by Subject Matter Experts which captures key cost and benefit uncertainties for all model inputs

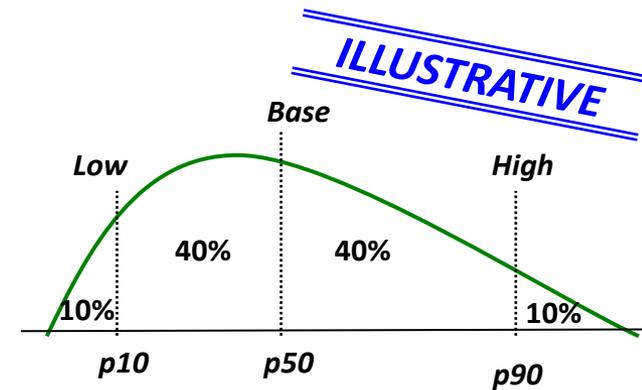
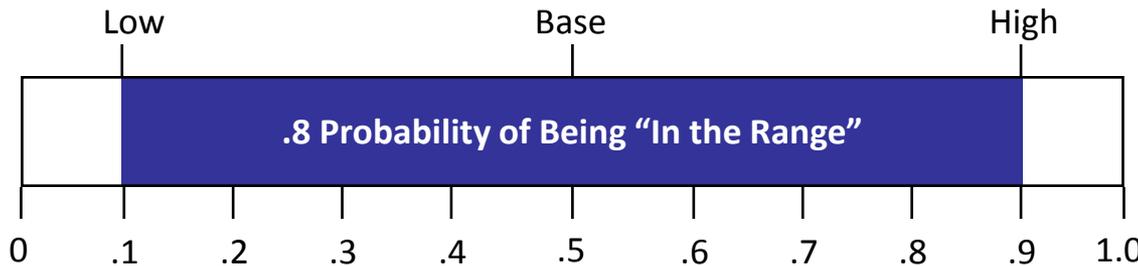
Definition

Low There is only a 10 percent probability that the variable will be *less than or equal to* this value

High There is only a 10 percent probability that the variable will be *greater than* this value.

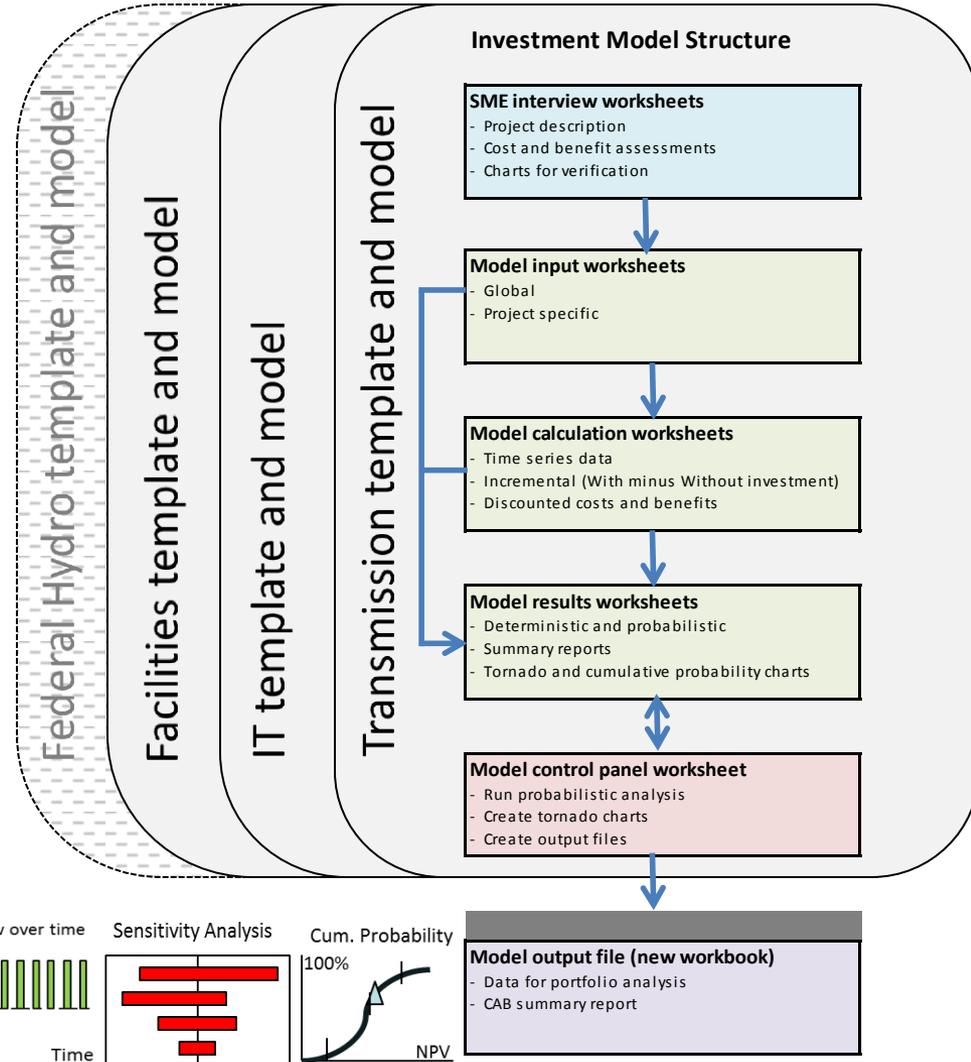
Base Case There is a 50 percent probability that the variable will be *less than or equal to* this value.

Project contingencies are not included in upfront cost estimates.



Investment Model(s) support investment decision-making

- Capital Prioritization process is supported by a suite of EXCEL based models (customized by Asset Category) including @RISK add-on for probabilistic analyses
- Supports the total economic value approach to valuing investment proposals
- Capable of modeling all sources of economic value and cost, i.e., value to BPA and customers
- Information to evaluate investments is assessed by credible Subject Matter Experts (SMEs)
- Customized templates are used to input basic project descriptive information, key start and end dates, life cycle, upfront costs (capital and expense) and to assess ongoing costs/benefits
- SMEs provide a range for each input rather than single point estimates capturing the uncertainty
- Key metrics include Net Economic Benefit, Investment (Present Value) and Net Economic Benefit Ratio used to rank projects by their economic “bang for the buck”



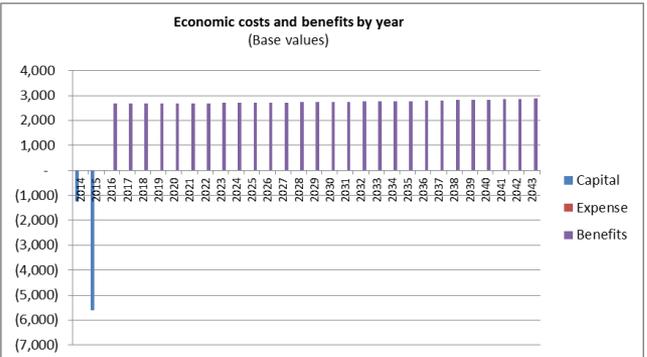
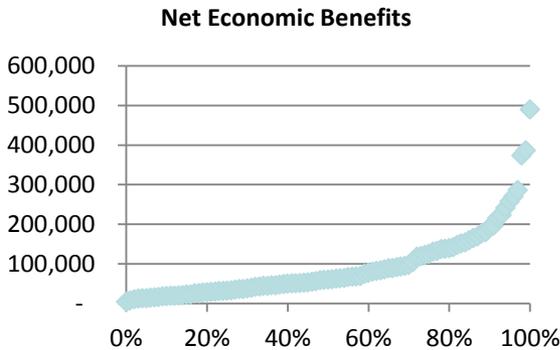
Sample project evaluation results –

For investments with assessed costs and benefits these were analyzed through standardized lenses

Investment Example

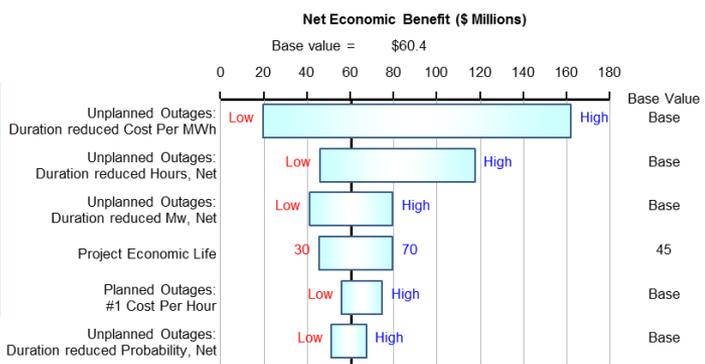
Investment value and key sources of risk (Project Example)

Uncertainties in project value will be captured probabilistically



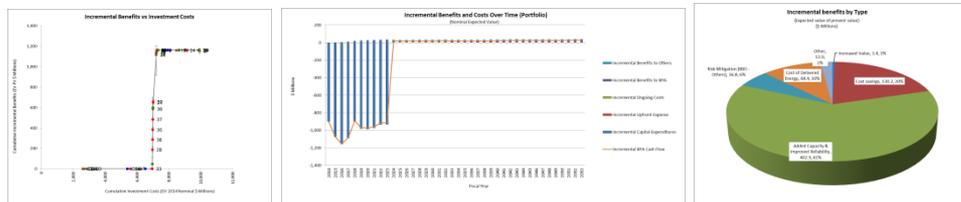
- Different values will be quantified
 - Value to BPA
 - Value to Region
- Key risk drivers will be quantified consistently to represent the same level of uncertainty (confidence intervals)
- Inputs will be assessed by SMEs and trained portfolio facilitators to eliminate systematic biases

Sensitivity analysis is conducted to identify key value/risk drivers

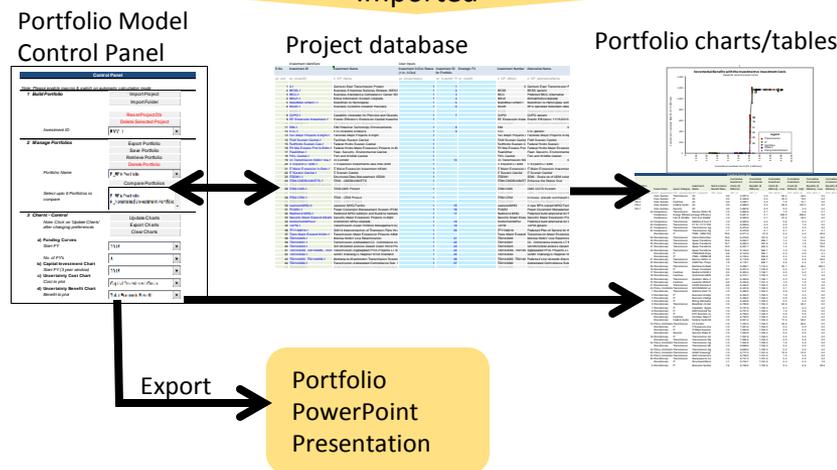
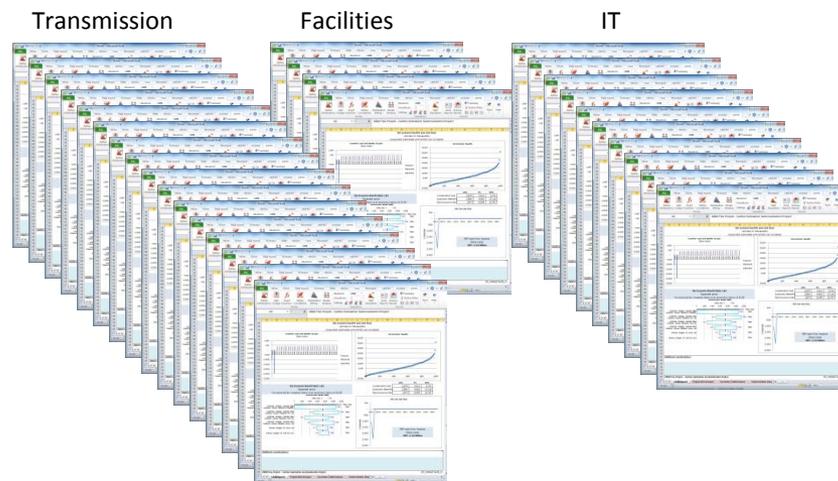


Portfolio Model aggregates individual investment results, presents portfolio perspective

- Investment Portfolio tool is EXCEL database with automated interface to:
 - Import project data
 - Manage database of projects
 - Save alternative portfolio's
 - Update standard Portfolio charts and tables
 - Export results to PowerPoint presentation
- Produces variety of funding curve perspectives for specified portfolio of selected investments
- Visual basic code enables automation, productivity savings in preparing and producing results
- Results can be exported to a PowerPoint slide deck where slides can be selected and further edited
- Example outputs:



Investment Model Output Files



Investment Prioritization Summary of Portfolio Results

40 investments were nominated as new starts in the FY2015- FY2017 prioritization window

	Compliance	Policy Commitment	Discretionary	Comments
Nominated, assessed and evaluated	4	0	21	Some are “green lighted” and others need additional assessment work with SMEs before ready for decision
Nominated, but not assessed	0	6	9	Premature to assess costs/benefits at this point, submitted too late for this cycle, or treated separately
Nominated, but removed from consideration	2	7	2	Cancelled, combined, deferred beyond 3-year window, moved to Core Sustain, or rescheduled to be authorized in 2014

Individual summaries and results for the 40 investments are available here [\(link\)](#)

Caveats

Costs and benefits assessed in Real \$ 2014. For purposes of assessing costs and benefits for investments, as well as comparing investment alternatives, project costs and benefits are expressed in real 2014 dollars

- Cost estimates include both direct and overhead expenditures. AFUDC is not included

Nominal \$. For purposes of comparing investment levels to the affordability cap and developing capital budgets, the capital costs were expressed in nominal (inflated) dollars

- Costs estimates include both direct and overhead expenditures, as well as AFUDC

Application of Overhead costs. The economic analysis of Transmission and Facilities projects includes overhead costs of 25% of the projects estimated direct capital cost, but excludes AFUDC

- The rate is applied to each year's capital spending in transmission and facilities when assessing each projects upfront costs
- Federal Hydro and IT investments receive no overhead distributions

Project Interdependencies. Some investments are interdependent, and we've noted the bigger interdependencies in the investment summaries. A prime example is the IT Service Management "suite" of three projects that IT would undertake to reduce labor hours/costs, reduce IT system outages, and otherwise improve quality and efficiency.

Contingent investments. Three LGIA are contingent on the resource developer entering into an LGIA and providing BPA an advance of funds. The probabilities of the investments going forward are not captured in the stochastic modeling.

Assessment of alternatives. In the case of some investments, investment alternatives were identified that have not yet been assessed. Generally, when time was limited, the alternatives deemed by SMEs to hold the most promise were the ones that were assessed.

Assessment of transmission project benefits. Broadly put, the benefits of transmission expansion projects appear to be understated, such as the benefits of avoided outages and the benefits of avoided low-probability but high consequence disruptive events. In addition, there may be some overstating of upfront investment costs. These are areas which will be improved in future cycles.

Key planning assumptions

Inflation Rates – Consistent with Finance’s start-of-year budget handbook. The rates are based on projected changes in the U.S. GDP Price Deflator, a broad measure of inflation in the economy. The annual rates average 1.74% over 30 years

Carbon Cost – Based on the *US Government Interagency Working Group on Social Cost of Carbon* study (May 2013 update). Low, medium and high values, with the medium value being \$13.93/MWH in 2014, rising to \$26.73/MWH by 2050

Market Price Forecast – Based on the expected value forecast per the FY14/15 rate proposal. It is a "flat" forecast that blends the HLH and LLH forecasts at the weighted WECC on-peak/off-peak ratio (57%/43%). "High" and "Low" cases are derived which are based on 75 and 25 percentile assumptions, respectively

Labor Savings – Standard rates are established for five general staffing categories. The rates range from \$55/hour for a BPA hourly employee to \$100/hour for a professional contract employee

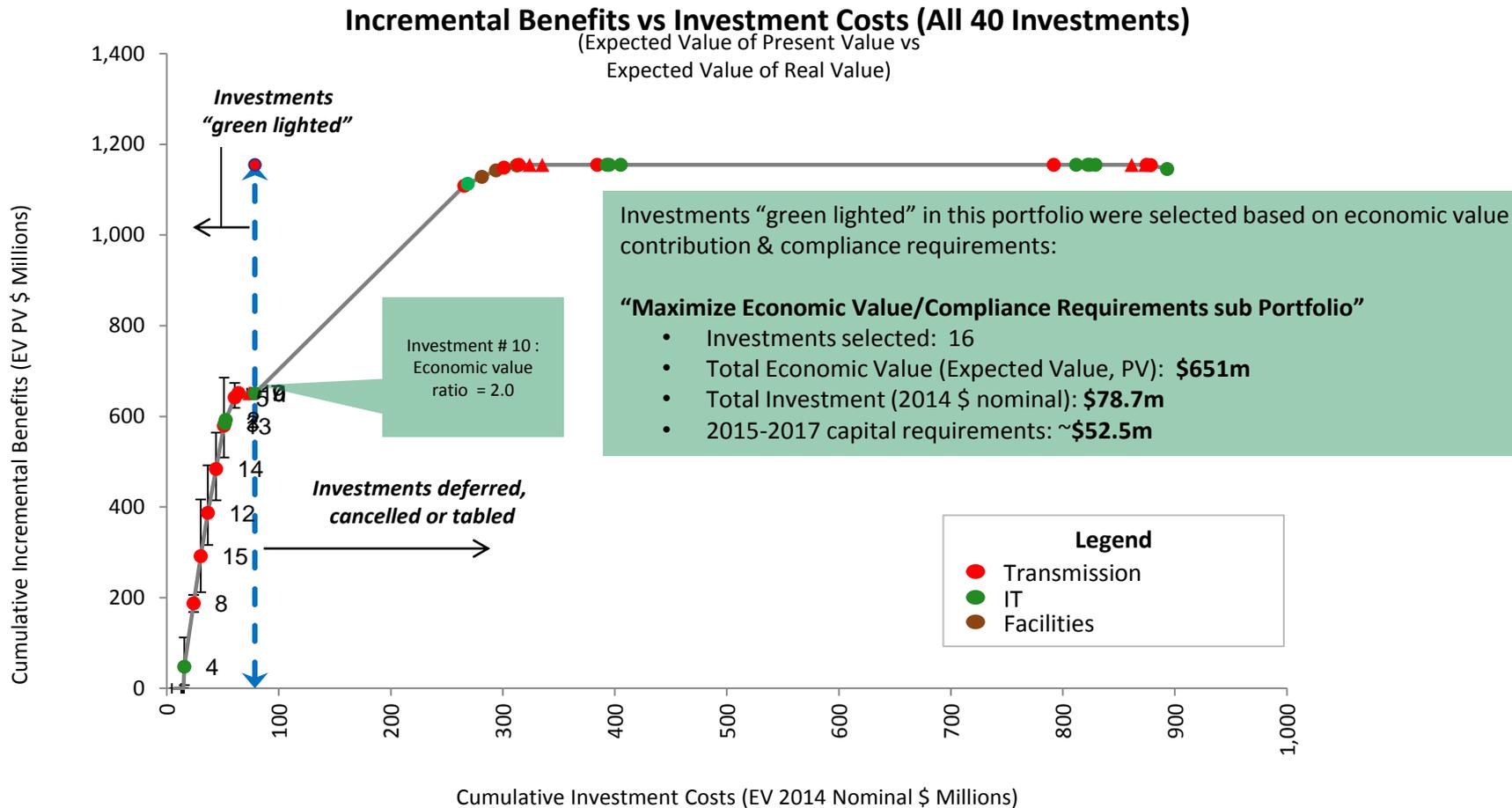
Discount Rate – A real discount rate of 3% is used for the evaluation of expansion investments in the prioritization process. This rate represents the agency’s approximate cost of capital of 5%, less a 2% inflation adjustment. The 5% rate is used in lieu of the traditional 9-12% rates because uncertainty ranges of costs and benefits are embedded in the assessment and evaluation of investments

AFUDC – Calculated at 3.59%, the FY 2013 BPA rate. The rate is based on the weighted average interest rate of most BPA debt

Capitalized overhead rates – Capitalized overhead costs were calculated to be 25% of the direct capital expenditures for Transmission and Facilities investments. This rate blends the FY 2013 rates of 32% for BPA labor and 6% for materials and construction contracts (13% for transmission overheads and 12% for corporate overheads). No capitalized overheads are applied to IT investments.

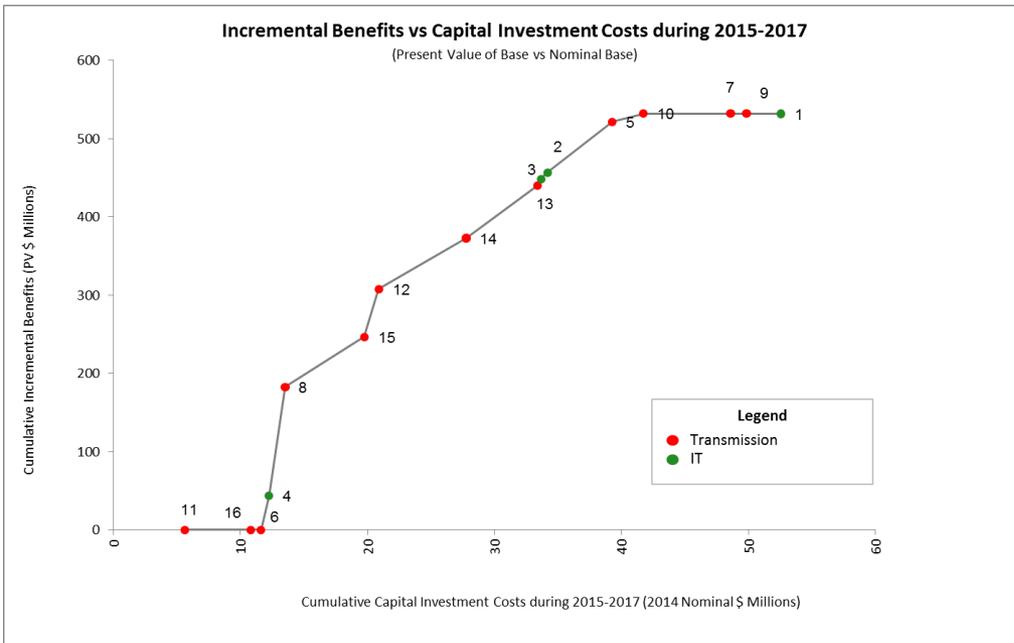
Prioritized Expansion Portfolio Funding Curve

(All 40 Nominations)



Prioritized Expansion Portfolio Funding Curve

("Green lighted" Investments)



Invest ID in Portfolio	Investment Name	Net Economic Benefit Ratio
<i>FC8_InvestID_Pi</i>	<i>FC8_InvestID</i>	<i>FC8_Sort</i>
11	DeMoss-Fossil Shunt Reactive Project	-1.0
16	FY15 - FY17 PMUs	-1.0
6	Transmission Aggregated CC Compliance projects LT \$3M	-1.1
4	ITSM - CRM Project	76.5
8	Walla Walla Reinforcement (Tucannon River-Hatwai 115kV)	18.1
15	Spare Transformers at Wind Sites - Slatt Substation	16.8
12	Spare Transformers at Wind Sites - Central Ferry Substation	15.7
14	Spare Transformers at Wind Sites - Rock Creek Substation	13.0
13	Spare Transformers at Wind Sites - John Day Substation	12.8
3	ITSM-CMS Project	8.8
2	ITSM - CMDB/AIM/ETS	8.6
5	Monroe 500kV Line Retermination	5.7
10	O&M Flex Project - Carlton Substation Sectionalization Project	2.0
7	Transmission Aggregated PFIA Projects LT \$3M	-1.0
9	Transmission Aggregated A & CS projects LT \$3M	-1.0
1	Structured Data Management (SDM)	-1.1

- This Curve includes only the capital spending during the prioritization window (2015 – 2017) for investments receiving a “green light”
- X-axis is “Cumulative capital expenditures (nominal) during the 3-year prioritization window”, not necessarily the capital budget for these projects as timing may change

Prioritized Expansion Portfolio (1)

(Net Economic Benefits Ratio)

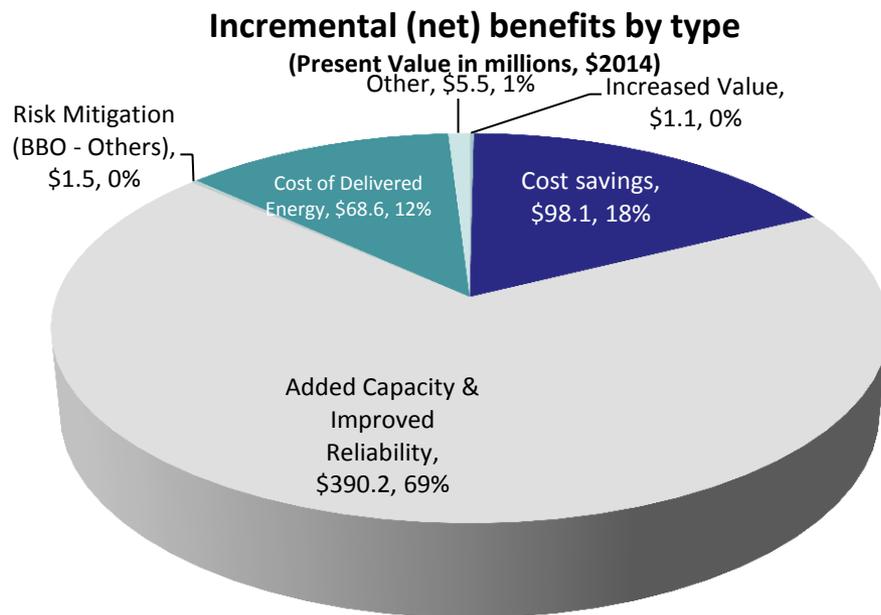
Investment Name	Asset Category	Investment Classification	Net Economic Benefit Ratio	Capital spending (base amounts; without AFUDC)					Total	Next Steps
				2014	2015	2016	2017	Later Years		
Compliance Investments (Costs only assessed)										
Transmission Aggregated CC Compliance projects LT \$3M.	Transmission	Compliance		0	794	0	0	0	794	Proceed with projects, update cost estimates
Transmission Aggregated Compliance Sub Upgrades LT \$3M	Transmission	Compliance		0	0	0	589	589	1,178	Defer for now
FY15 - FY17 PMUs	Transmission	Compliance		0	337	3,032	1,819	1,550	6,738	Proceed to Business Case
DeMoss-Fossil Shunt Reactive Project	Transmission	Compliance		0	281	1,125	4,219	0	5,625	Proceed to Business Case
Subtotal				0	1,412	4,157	6,627	2,138	14,334	
Discretionary Investments (Costs & Benefits assessed)										
ITSM - CRM Project	IT	Discretionary	76.5	0	0	628	0	0	628	Proceed to Inception Stage
Walla Walla Reinforcement (Tucannon River-Hatwai 115kV)	Transmission	Discretionary	18.1	0	424	424	424	7,212	8,485	Proceed to Business Case
Spare Transformers at Wind Sites - Slatt Substation	Transmission	Discretionary	16.8	0	0	1,136	5,114	0	6,250	Proceed to Business Case
Spare Transformers at Wind Sites - Central Ferry Substation	Transmission	Discretionary	15.7	0	0	0	1,136	5,114	6,250	Proceed to Business Case
Spare Transformers at Wind Sites - Rock Creek Substation	Transmission	Discretionary	13.0	0	1,250	5,625	0	0	6,875	Proceed to Business Case
Spare Transformers at Wind Sites - John Day Substation	Transmission	Discretionary	12.8	1,250	5,625	0	0	0	6,875	Proceed to Business Case
ITSM - CMDB/AIM/ETS	IT	Discretionary	8.6	0	511	0	0	0	511	Proceed to Inception Stage
ITSM-CMS Project	IT	Discretionary	8.8	0	0	276	0	0	276	Proceed to Inception Stage
Monroe 500kV Line Retermination	Transmission	Discretionary	5.7	0	0	1,271	3,813	3,390	8,474	Proceed to Business Case
O&M Flex Project - Carlton Substation Sectionalization Project	Transmission	Discretionary	2.0	1,055	2,461	0	0	0	3,516	Proceed to Business Case
Montana-to-Washington Transmission System Upgrade Project	Transmission	Discretionary	1.6	0	18,250	82,125	82,125	0	182,500	Cancelled
Power Constraint Management System (PCMS)	IT	Discretionary	0.5	0	1,854	955	0	0	2,809	Examine alternatives
Redmond MHQ Addition and Building Upgrade	Facilities	Discretionary	0.3	0	0	1,238	3,713	7,425	12,375	Examine alternatives
Snohomish MHQ Upgrade	Facilities	Discretionary	0.2	0	1,300	3,900	7,800	0	13,000	Examine alternatives
Southern Idaho Communication Upgrade	Transmission	Discretionary	(0.1)	0	0	1,400	4,900	700	7,000	Redefine scope of project
Lewiston MHQ Facility	Facilities	Discretionary	(0.5)	0	0	0	1,119	10,069	11,188	Examine alternatives
L0322 Klondike-Blalock Reinforcement Mobile Transformer	Transmission	Discretionary	(0.5)	0	0	0	1,663	0	1,663	Re-assess benefits
Sacajawea to Ice Harbor-Franklin 115kV #1 Line	Transmission	Discretionary	(1.0)	0	0	173	2,770	519	3,463	Cancelled
Structured Data Management (SDM)	IT	Discretionary	(1.1)	0	1,080	1,620	0	0	2,700	Proceed to Inception Stage
Business Systems Disaster Recovery	IT	Discretionary	(1.6)	0	5,502	8,254	0	0	13,756	Tabled
Subtotal				2,305	38,258	109,025	114,576	34,429	298,592	

Prioritized Expansion Portfolio (2)

(Net Economic Benefits Ratio)

Investment Name	Asset Category	Investment Classification	Net Economic Benefit Ratio	Capital spending (base amounts; without AFUDC)					Total	Next Steps
				2014	2015	2016	2017	Later Years		
Discretionary/Policy Commitment Investments (Costs only assessed at this point)										
Garrison East Transmission Project	Transmission	Discretionary		0	2,500	7,500	30,000	10,000	50,000	Deferred
Business Enterprise Services Strategy (BESS) initiatives	IT	Discretionary		0	0	2,490	520	2,790	5,800	Examine alternatives
Business Intelligence Competency Center	IT	Discretionary		0	0	0	2,100	0	2,100	Examine alternatives
Billing Information System Upgrade	IT	Discretionary		0	0	5,000	5,000	0	10,000	Examine alternatives
Boardman to Hemingway	Transmission	Discretionary		0	0	0	0	375,000	375,000	Assess benefits, examine alternatives
Capability Upgrades for Planning and Operations in Power Service Area	IT	Discretionary		0	1,540	4,616	4,616	9,232	20,004	Examine alternatives
EIM Potential Technology Enhancements	IT	Discretionary		0	0	850	850	6,800	8,500	Assess benefits, revise cost estimates
Transmission Asset Portfolio Management System	IT	Discretionary		0	2,500	2,500	0	0	5,000	Define scope, assess costs and benefits
G0314 Interconnection of Thompson Falls Hydroelectric Project	Transmission	Policy Commitment		0	0	1,781	7,719	2,375	11,875	Tabled
G0105/G0432 enXco's Desert Claim Wind Project	Transmission	Policy Commitment		0	0	0	563	10,688	11,250	Tabled
Transmission Aggregated PFIA Projects LT \$3M	Transmission	Policy Commitment		0	2,287	2,287	2,287	2,287	9,146	Proceed with projects, update cost estimates
G0361 Invenergy's Heppner Wind Stanfield	Transmission	Policy Commitment		0	0	0	3,750	21,250	25,000	Tabled
Transmission Aggregated A & CS projects LT \$3M	Transmission	Policy Commitment		0	625	625	0	0	1,250	Proceed with projects, update cost estimates
Monroe 500kV Reactor	Transmission	Policy Commitment		0	1,502	1,502	6,009	1,002	10,015	Assess benefits
ETC Scenario Analysis	IT	Discretionary		0	0	500	500	0	1,000	Examine alternatives
Subtotal				0	10,954	29,651	63,913	441,423	545,940	
Projects "Green Lighted" and in Prioritized Portfolio										
				2,305	15,675	18,049	18,812	19,552	74,392	
Projects deferred, excluded until further assessment				0	34,949	124,784	166,304	458,438	784,474	
Total Prioritized Portfolio				2,305	50,623	142,833	185,116	477,990	858,866	

Incremental benefits by type for “green lighted” investments



Portfolio “Bang for the buck”

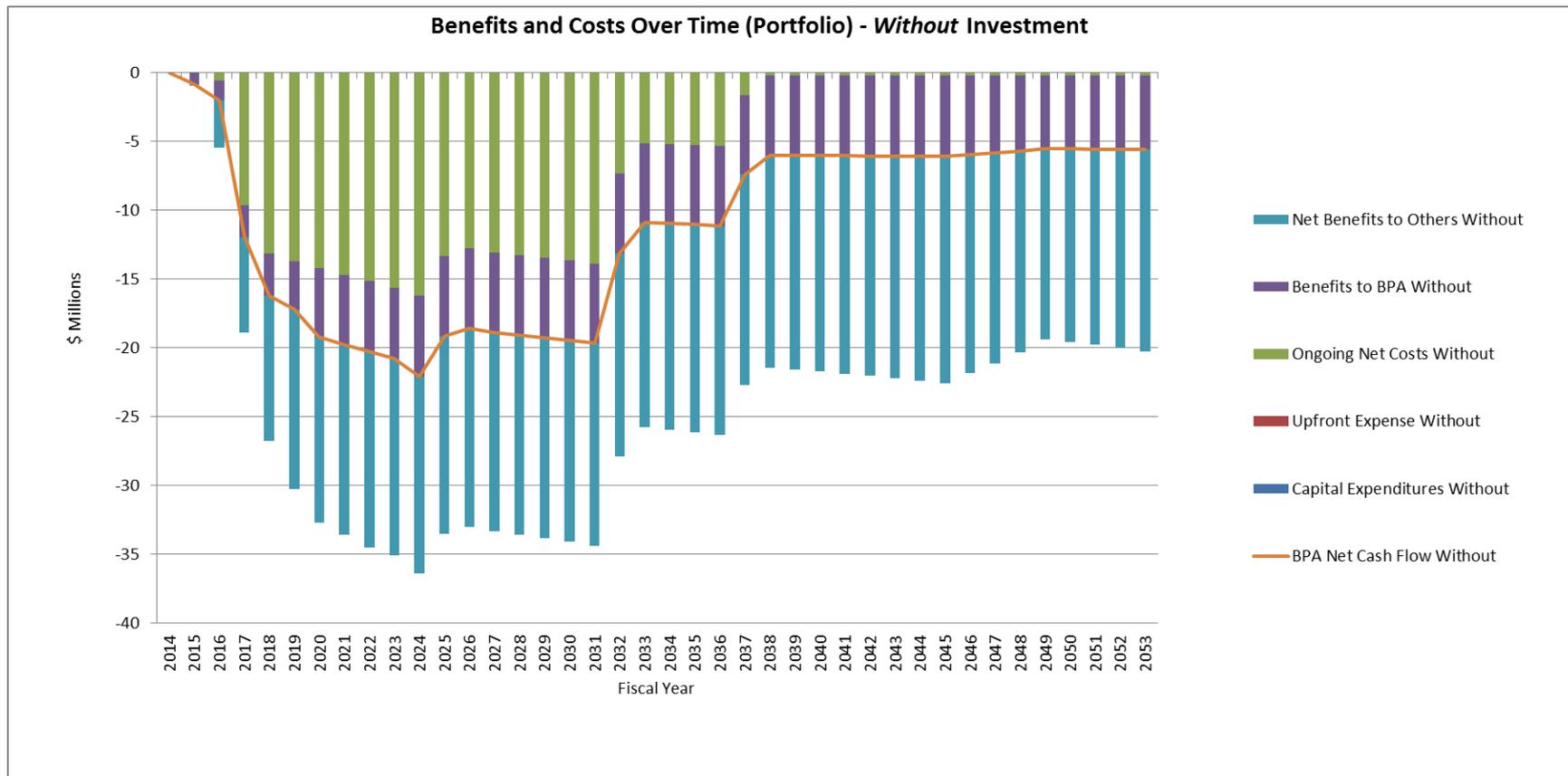
Total investment (expected value, PV): \$72.9 million

Total net benefits (expected value, PV): \$578.2 million

Aggregate Net Economic Benefit Ratio: **7.9**

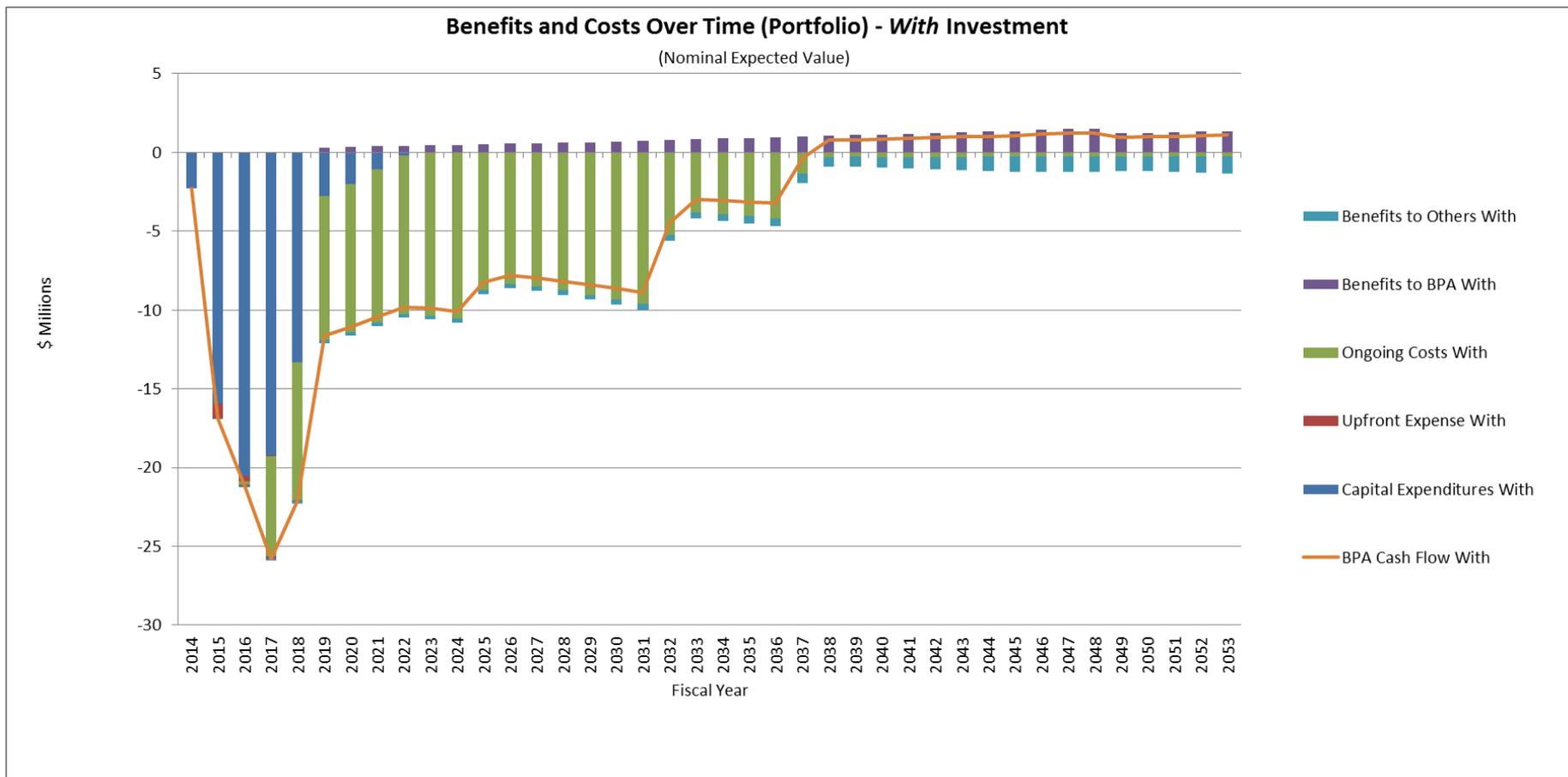
Costs and benefits over time (1)

Status Quo Case (without the investments)



For investments assessed, SME’s were asked to provide a range of costs and benefits assuming that no investment were made, i.e., to help illuminate the costs that would be avoided if the investments were made

Costs and benefits over time (2) “Green lighted” investments (with the investment)

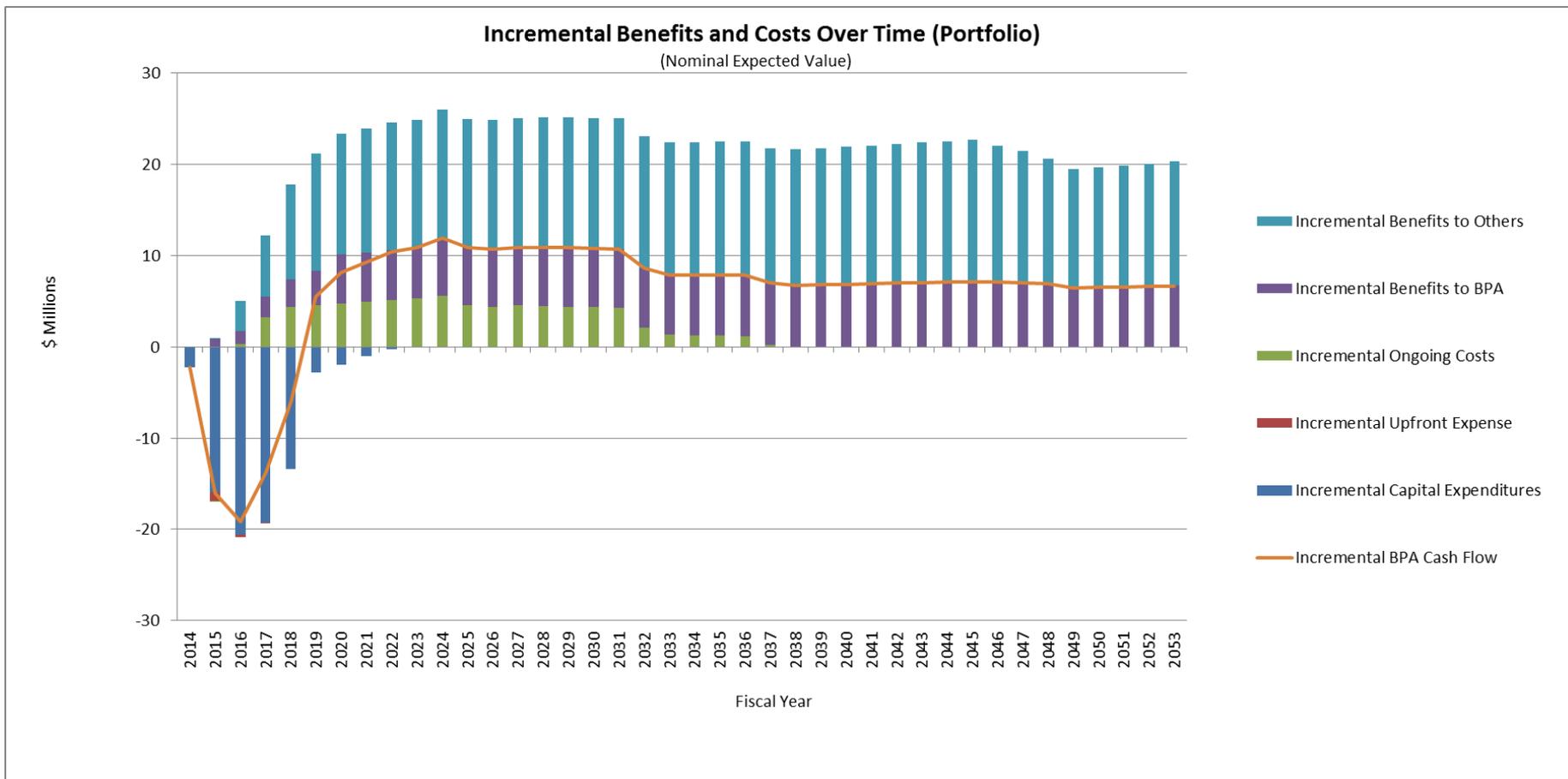


Then SME’s were asked to provide a range of costs and benefits assuming the investments were made, i.e., what are the upfront costs (capital and expense), what are the ongoing costs for the economic life of the investment, etc.

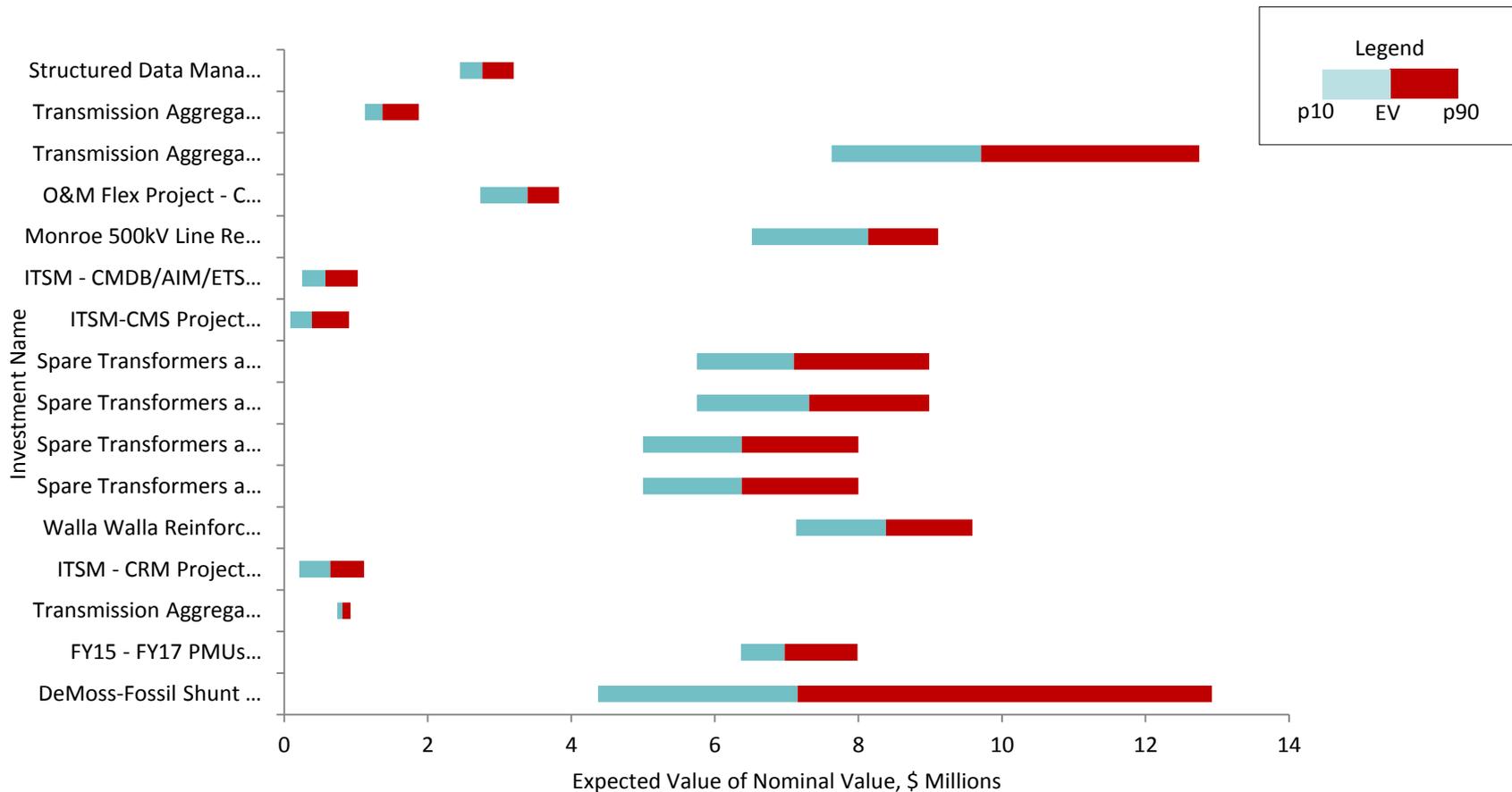
Incremental (net) costs and benefits over time (3)

“Green lighted” investments

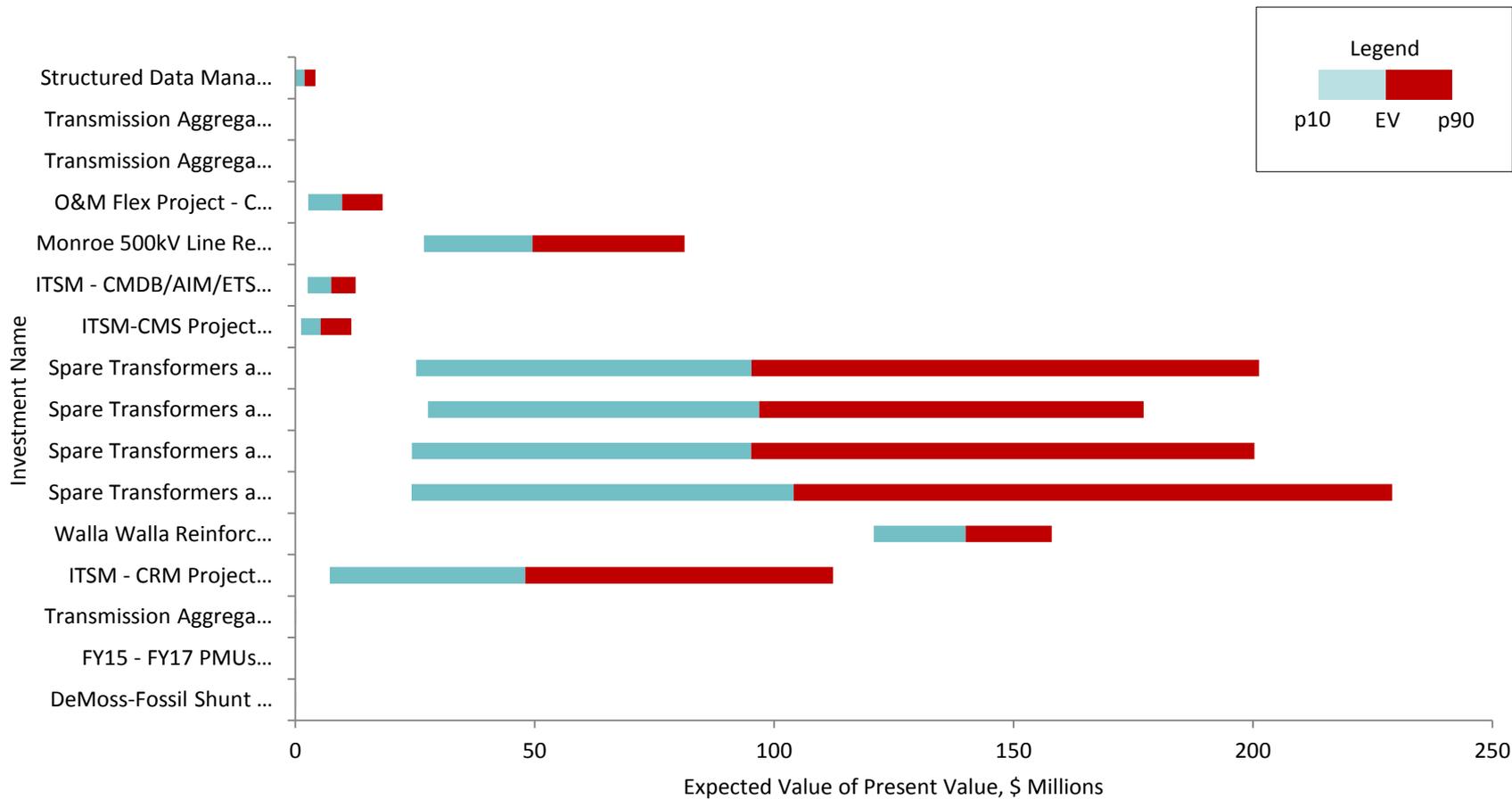
(Nominal Expected Value)



Capital Investment – range of cost uncertainty by investment



Total Economic Benefit – range of uncertainty by investment



Investment Prioritization Next Steps

BPA plans to build upon the work done so far in implementing the expansion investment prioritization process through next steps . . .

- Focus on continuous improvement in process, people and tools
- Explore investment alternatives more fully
- Improve cost and benefit assessments for existing and new investment proposals
- Fully implement “Peer Reviews” to ensure consistency and quality of input assessments
- Enhance and improve existing models, add Federal Hydro
- Build internal capability through training and coaching
- Expand the coverage of the process

Next Steps for nominated and assessed investments (1)

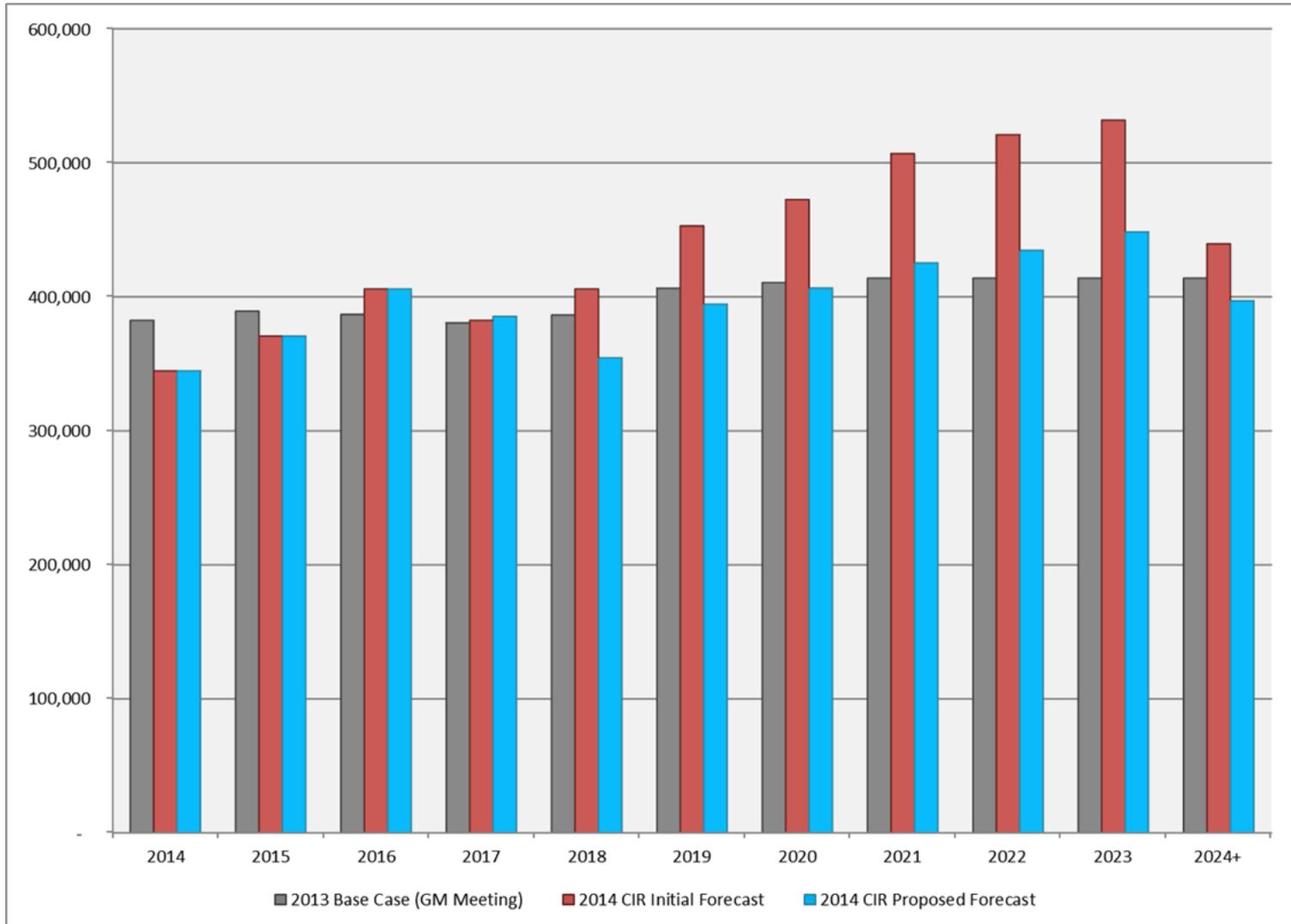
Project	Asset Category	Actions	Remarks
DeMoss-Fossil Shunt Reactive	Transmission	“Green Light” - proceed to meet near-term compliance requirements	Prepare business case that sets project execution targets and risk mitigation plan. Project starts in FY 2015 and is estimated to cost \$5.8 million
PMU FY 2015-2017 (Phasor Measurement Units)	Transmission	“Green Light” – proceed to meet near-term compliance requirements	Prepare business case that sets project execution targets and risk mitigation plan. Project starts in FY 2015 and is estimated to cost \$5.4 million
Misc. Small Control Center Compliance Projects < \$3million	Transmission	“Green Light” – proceed to meet near-term compliance requirements	Prepare business case that sets project execution targets and risk mitigation plan. Project starts in FY 2015 and is estimated to cost \$0.8 million
Misc. Small Substation Compliance project	Transmission	Defer decision	Project is not expected to start before FY 2017
CMDB/AIM/ETS-Configuration Mgmt CRM - Customer Relation Mgmt system CMS - Change Management System	IT	“Green Light” this suite of data base and applications	These projects show great promise in benefits because they deliver significant internal IT efficiencies when completed. The projects should proceed to the “Inception Phase”, then “Alternatives Phase”.
Spare Transformers at Wind Generation substation sites: John Day, Central Ferry, Slatt and Rock Creek	Transmission	“Green Light” – proceed to prepare business cases for these projects	These investments have significant economic value.
Walla Walla Reinforcement	Transmission	“Green Light” – proceed to prepare business case	Validate avoided wheeling costs associated with this line build.
Monroe 500 kV Line Retermination	Transmission	“Green Light” – proceed to prepare business case	Agency approval in FY 2014 with design/construction start in FY 2015
O&M Flex –Carlton substation	Transmission	“Green Light” – proceed to prepare business case	Agency approval in FY 2014 with design/construction start in FY 2015
SDM – (Structured Data Management)	IT	“Green Light” – proceed to Inception Phase	This project has significant compliance components, starts in FY 2015 and is expected to cost \$3.6 million
Montana to Washington 500 kV line Reinforcement & Garrison East	Transmission	Removed at this time, examining alternatives	

Next Steps for nominated and assessed investments (2)

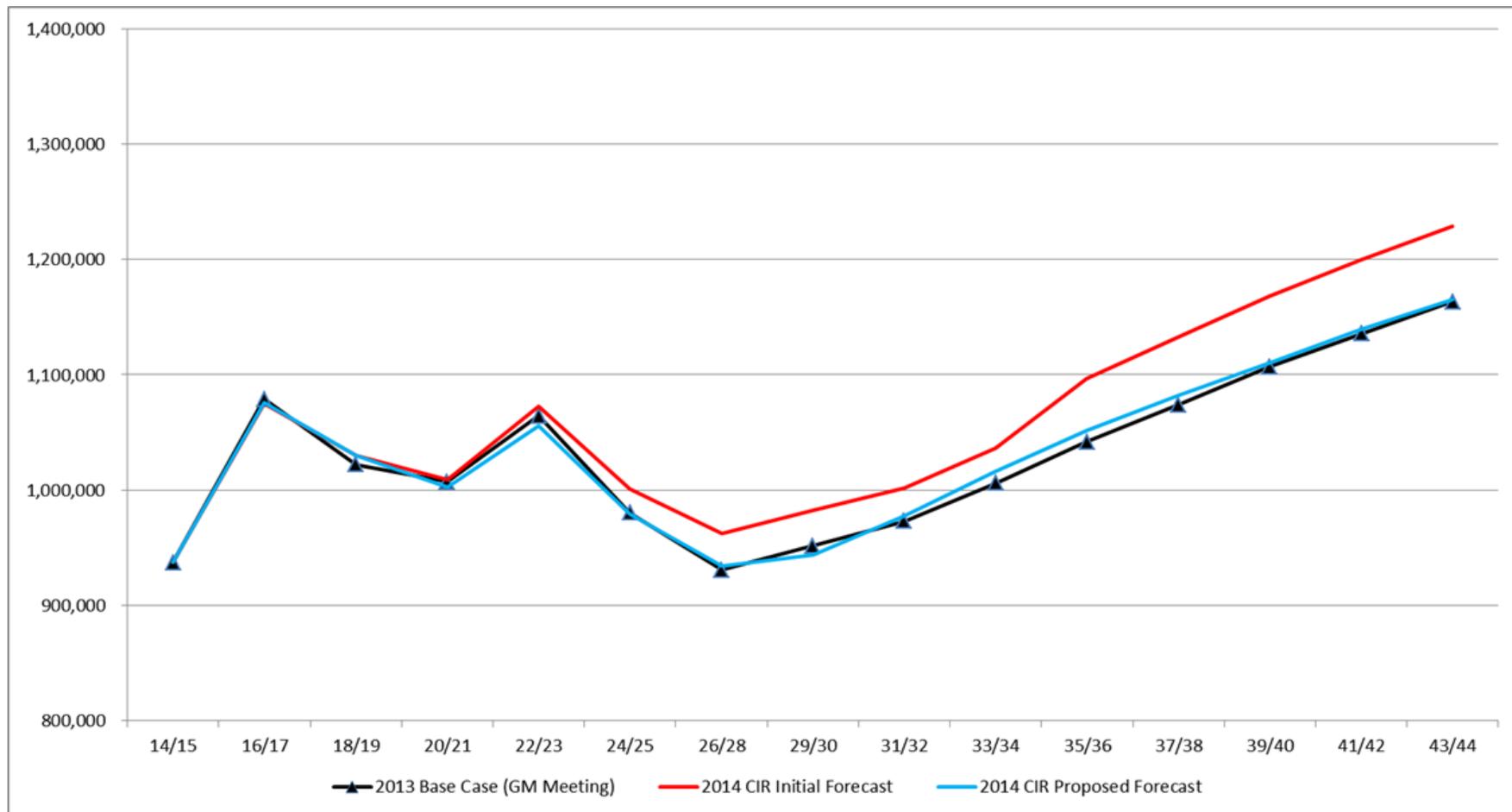
Project	Asset Category	Actions	Remarks
Monroe 500 kV Reactor	Transmission	Assess project benefits	Project costs have been assessed but not all the benefits
Klondike-Blalock Reinforcement Southern Idaho Communications	Transmission	Re-scope, re-assess costs and benefits	
Power Constraint Management System (PCMS)	IT	Re-scope, re-assess costs and benefits	
Maintenance HQ projects at: Redmond, Snohomish & Lewiston	Facilities	Re-scope, assess costs and benefits	Projects as originally scoped are not economic. Examine alternatives that reduce costs/increase benefits. Bring re-scoped projects back for further consideration in a future cycle.
LGIA projects: Heppner wind, Thompson Falls & Desert Claim Wind	Transmission	Continue to monitor need for these investments	LGIA investments that is customer-driven with very low probability to start before FY 2018.
Aggregated projects <\$3 million - PFIA - A&CS	Transmission	"Green Light" - Proceed with investments as needed	These projects are classified as policy commitment
Sacajawea to Ice harbor-Franklin 115 kV #1 Line	Transmission	Table or cancel	Lacks adequate benefit to justify proceeding
Various IT investments nominated but not assessed BESS, BICC, CUPO, ETC, BISU, EIM and TAPM	IT	Continue to scope, identify alternatives and assess costs and benefits	Consider re-submitting revised projects in future investment evaluation cycle
Boardman to Hemingway	Transmission	Proceed to assess economics and evaluate alternatives	
I-5	Transmission	Continue with NEPA	

Capital Related Cost Analysis

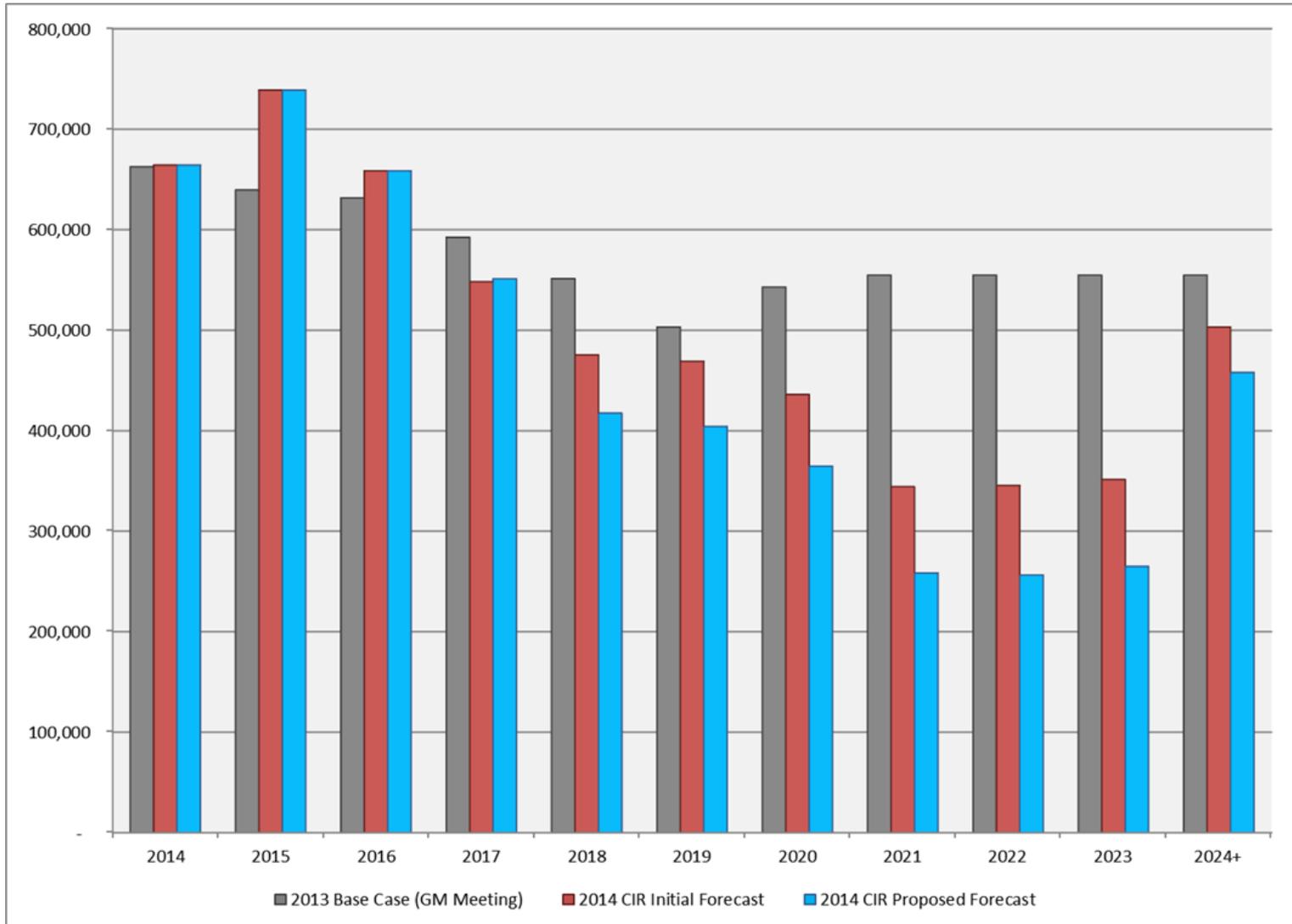
Power Capital Forecast



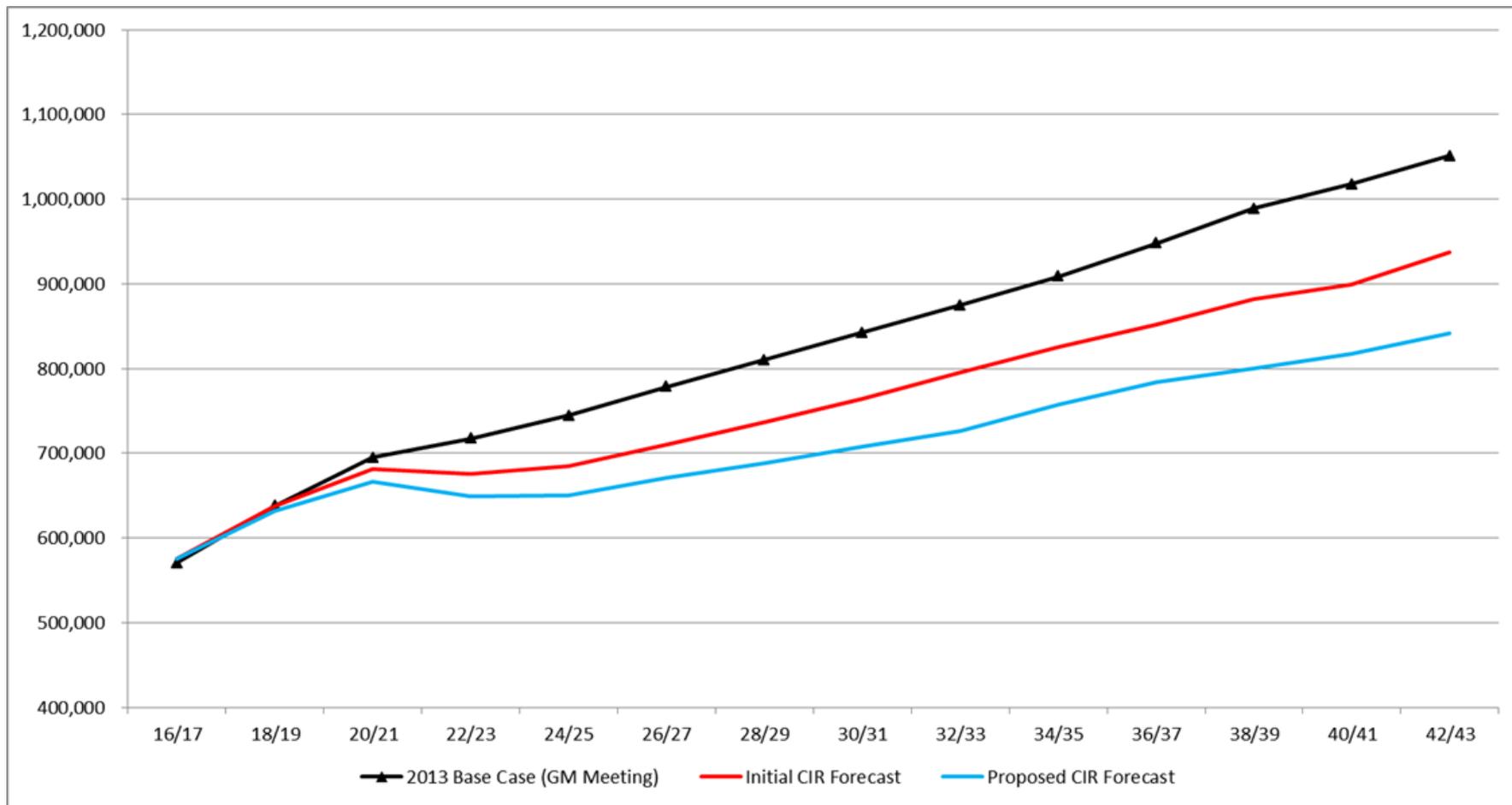
Power Revenue Requirement Capital Related Costs Compared to GM Package, Annual Average Per Rate Period
Adjustments limited to interest, depreciation, MRNR resulting from change in capital forecast



Transmission Capital Forecast



*Transmission Revenue Requirement Capital Related Costs Compared to GM Package, Annual Average Per Rate Period
Adjustments limited to interest, depreciation, MRNR resulting from change in capital forecast*



Conclusions

- Investment prioritization, together with the Affordability Cap, should enable BPA to optimize its investment portfolio such that the funding demands of BPA's aging infrastructure, statutory and regulatory obligations, and other investment drivers are balanced with the region's capacity to absorb rate increases.
- BPA will continue to build upon and improve the capital investment prioritization process and expand coverage of investments
- BPA's optimized long-term investment portfolio is not static and will be reviewed and updated on a six month cycle



Financial Disclosure

This information has been made publicly available by BPA on March 7, 2014 and contains information not reported in agency financial statements.