

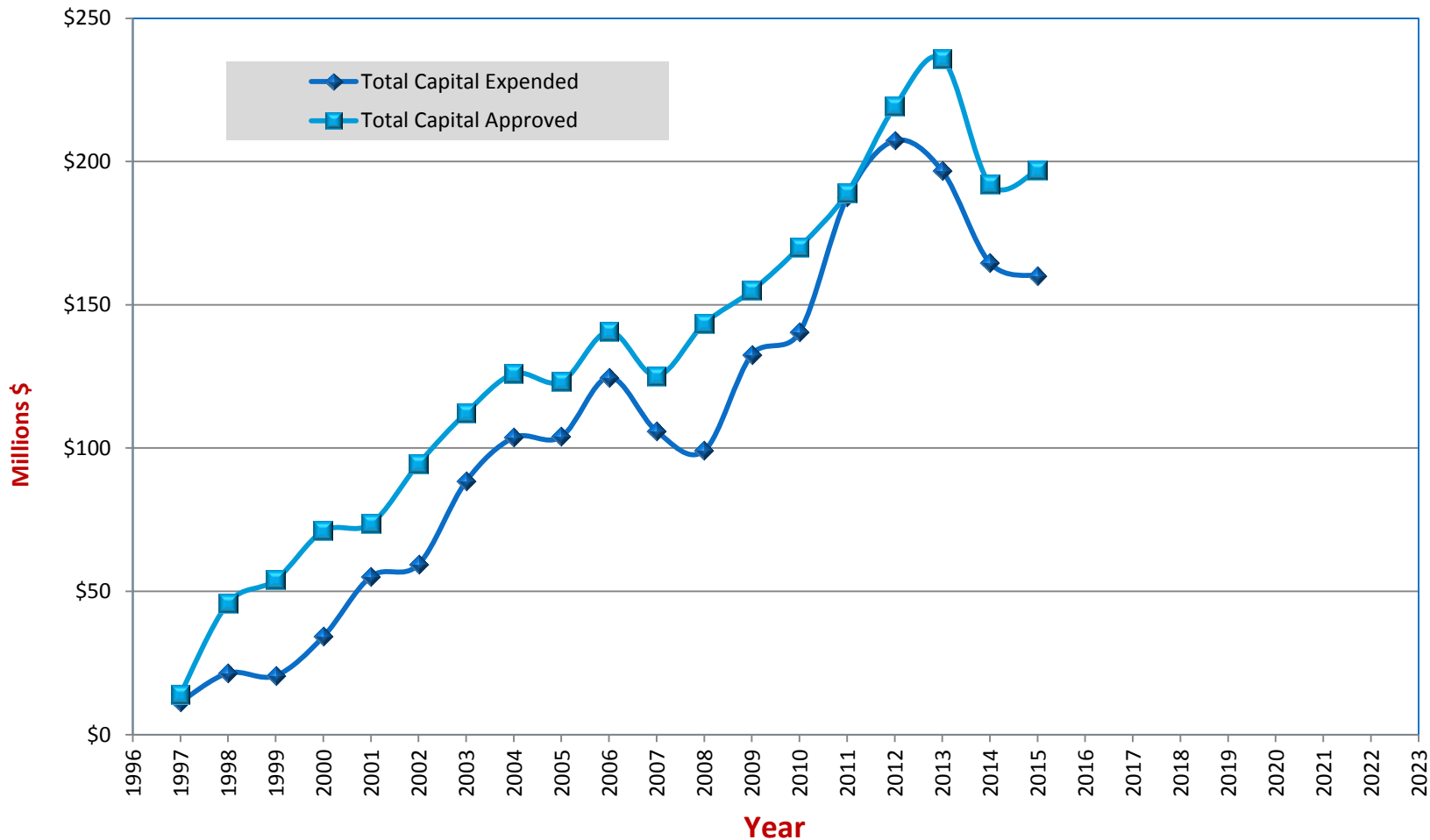
Focus 2028 Federal Hydropower Program

Kieran Connolly
VP, Generating Assets
Feb 11th 2016

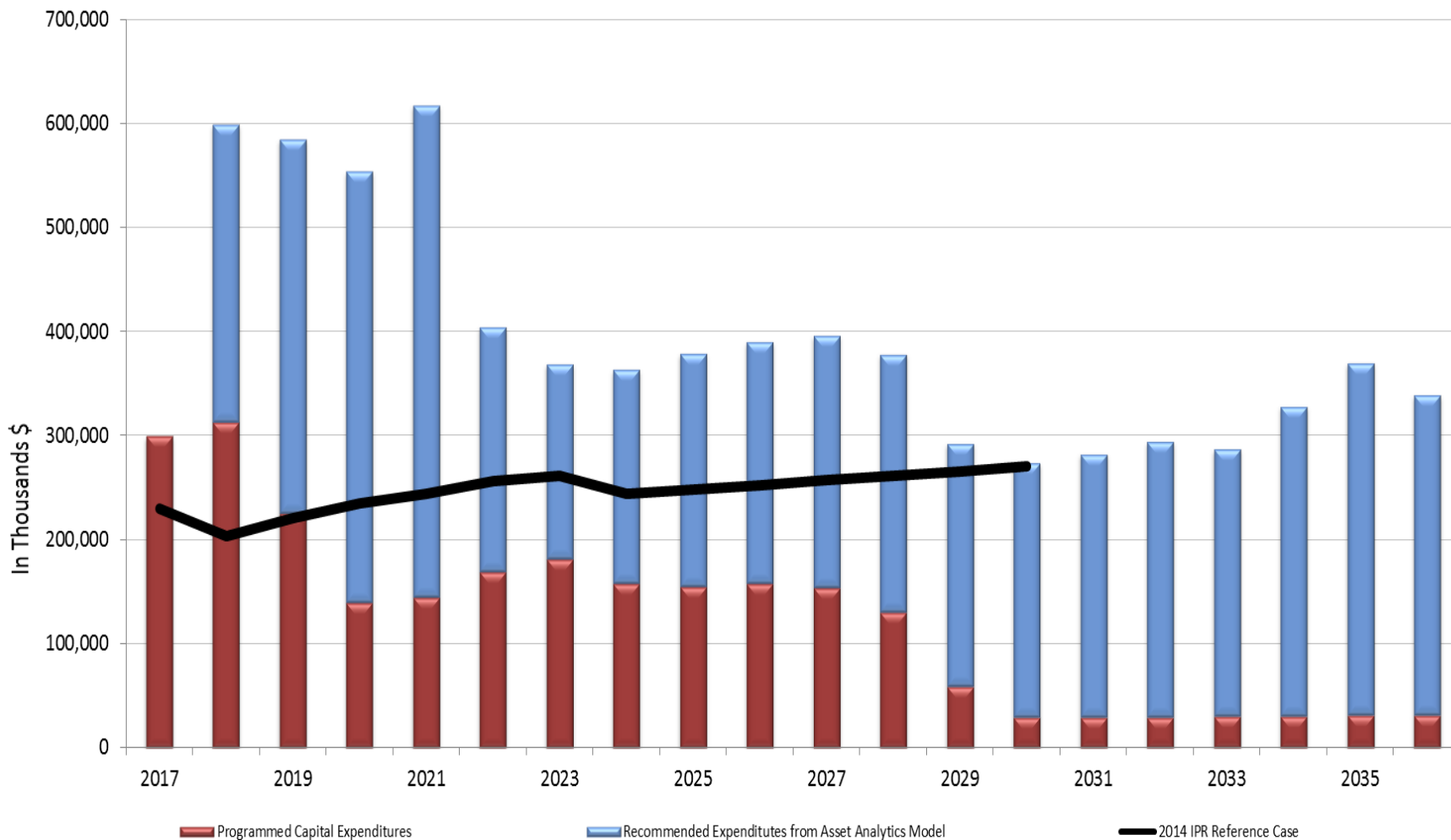
BONNEVILLE
POWER ADMINISTRATION



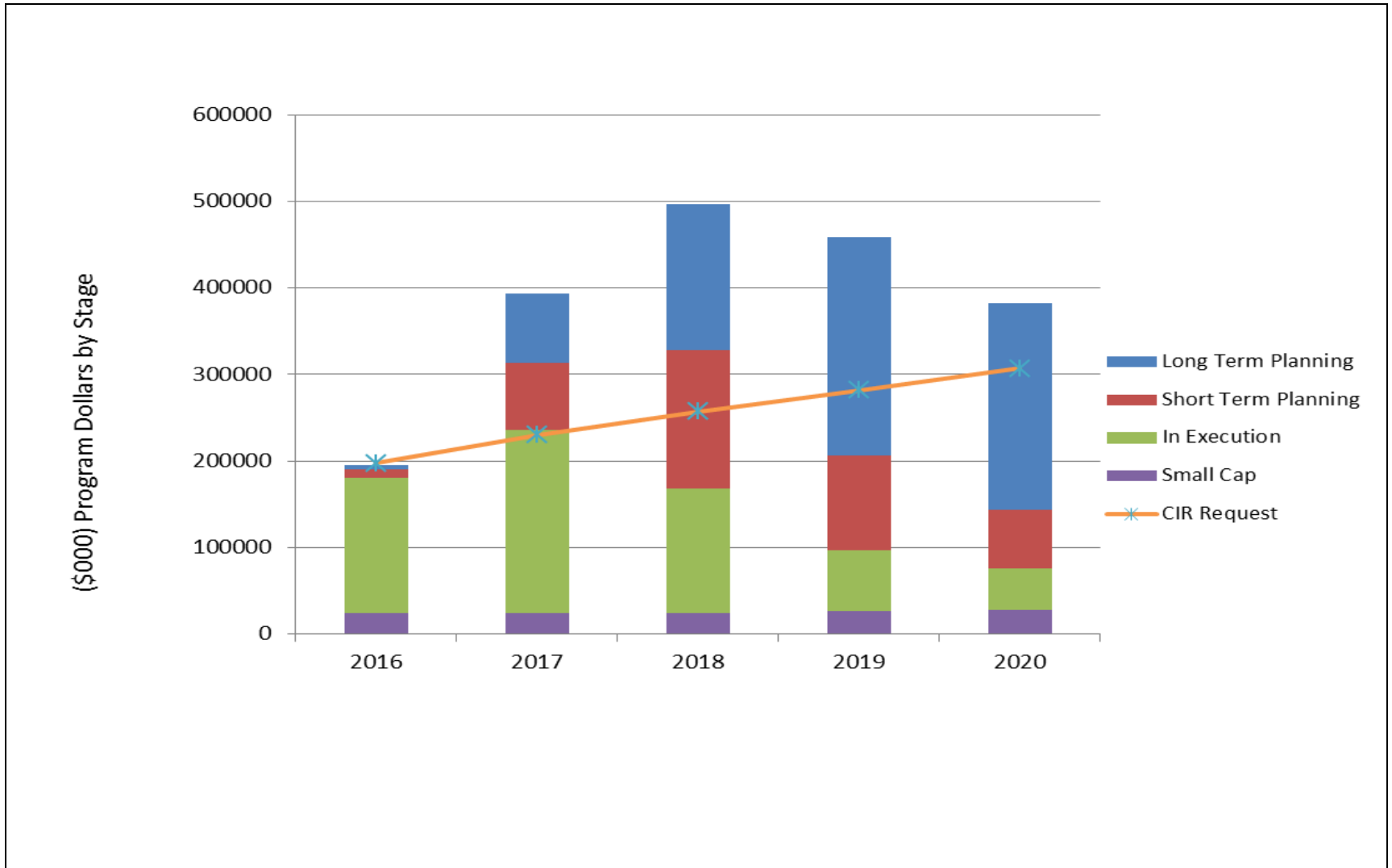
Capital Reinvestment Program



Backlog of Reinvestment Need



Capital Investment Program by Stage



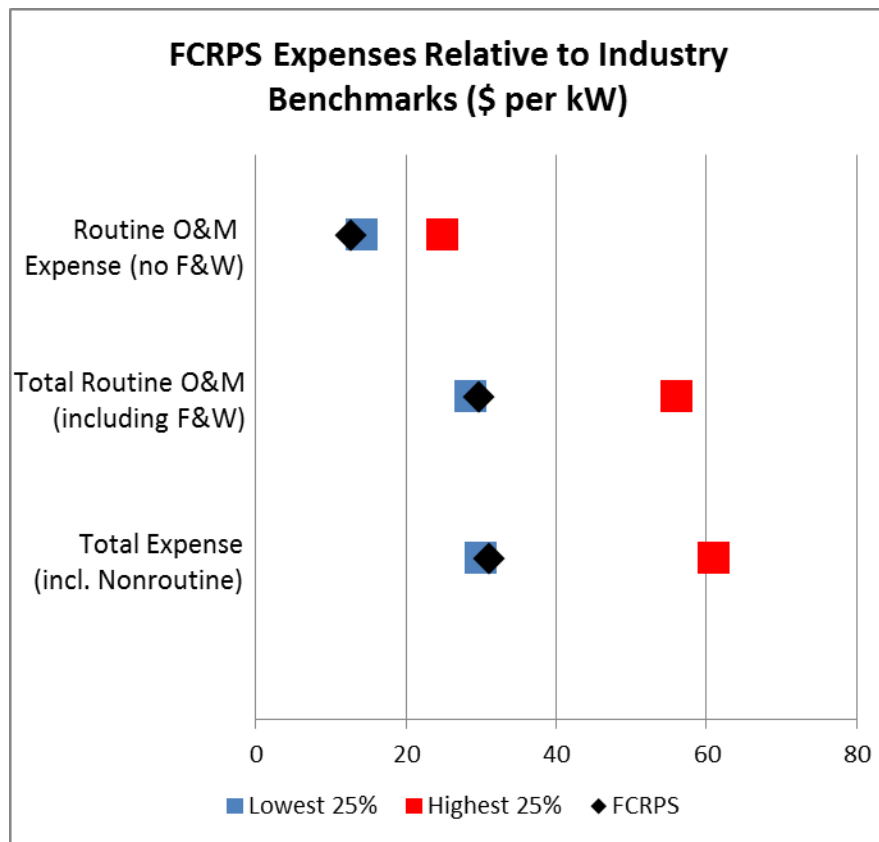
Major Projects Identified to begin within 10 yrs

| Corps of Engineers |
|---|
| McNary Turbine Design and Replacement |
| Ice Harbor Turbine Runner Replacements |
| Chief Joseph Generator Rewind and Cooling |
| The Dalles Units 15-22 Generator Rewinds |
| Bonneville Generator Refurbishment |
| John Day Turbine Hub Upgrades and Fixed Blade Conversions |
| McNary Station Service Replacement |
| John Day Station Service Reconfiguration |

| Bureau of Reclamation |
|---|
| Grand Coulee G19-21 Modernization and Unit Uprate |
| Grand Coulee G1-18 Modernization |
| Grand Coulee Switchyards |
| Hungry Horse Turbine Replacements and Generator Rewinds |
| Keys Base Reliability Investments |
| Grand Coulee K21A-k24A Transformer Replacement |
| Grand Coulee Drumgate Floating Bulkhead |
| Grand Coulee G11-G18 Transformers |



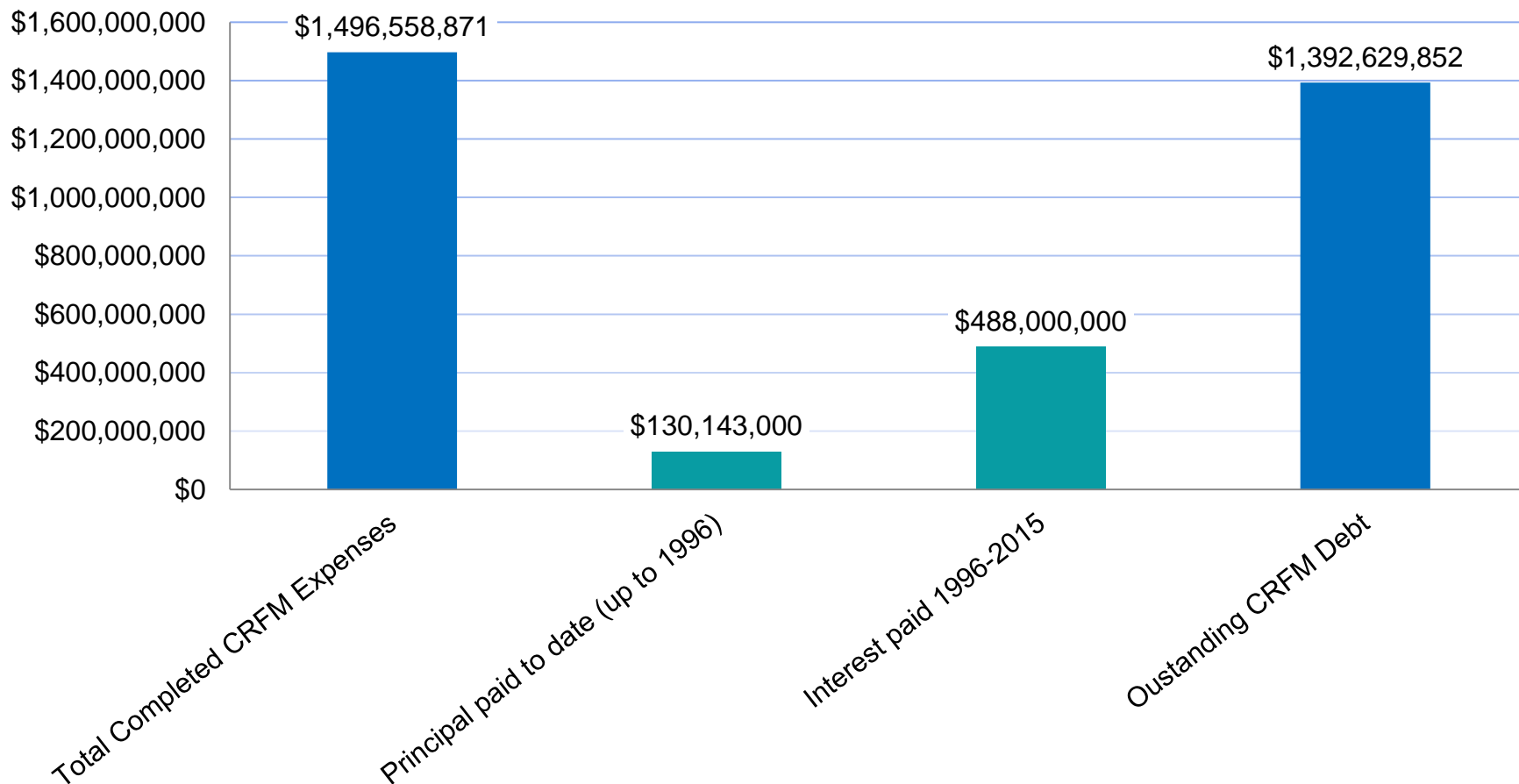
O&M Expenses - Benchmarking



- Industry-wide, hydro utilities are responding to aging infrastructure and increased regulatory requirements through their capital investment and O&M programs
- FCRPS O&M Expenses are lower than most large hydro utilities in North America

- Benchmarking data from EUCG, Inc.
- Includes 6 North American hydro utilities > 3500 MW total capacity
- FY 2014 Corps data. Reclamation data is comparable per kW
- F&W = Fish and Wildlife
- F&W Expenses include BPA program, direct funds, and appropriations

Columbia River Fish Mitigation (CRFM)



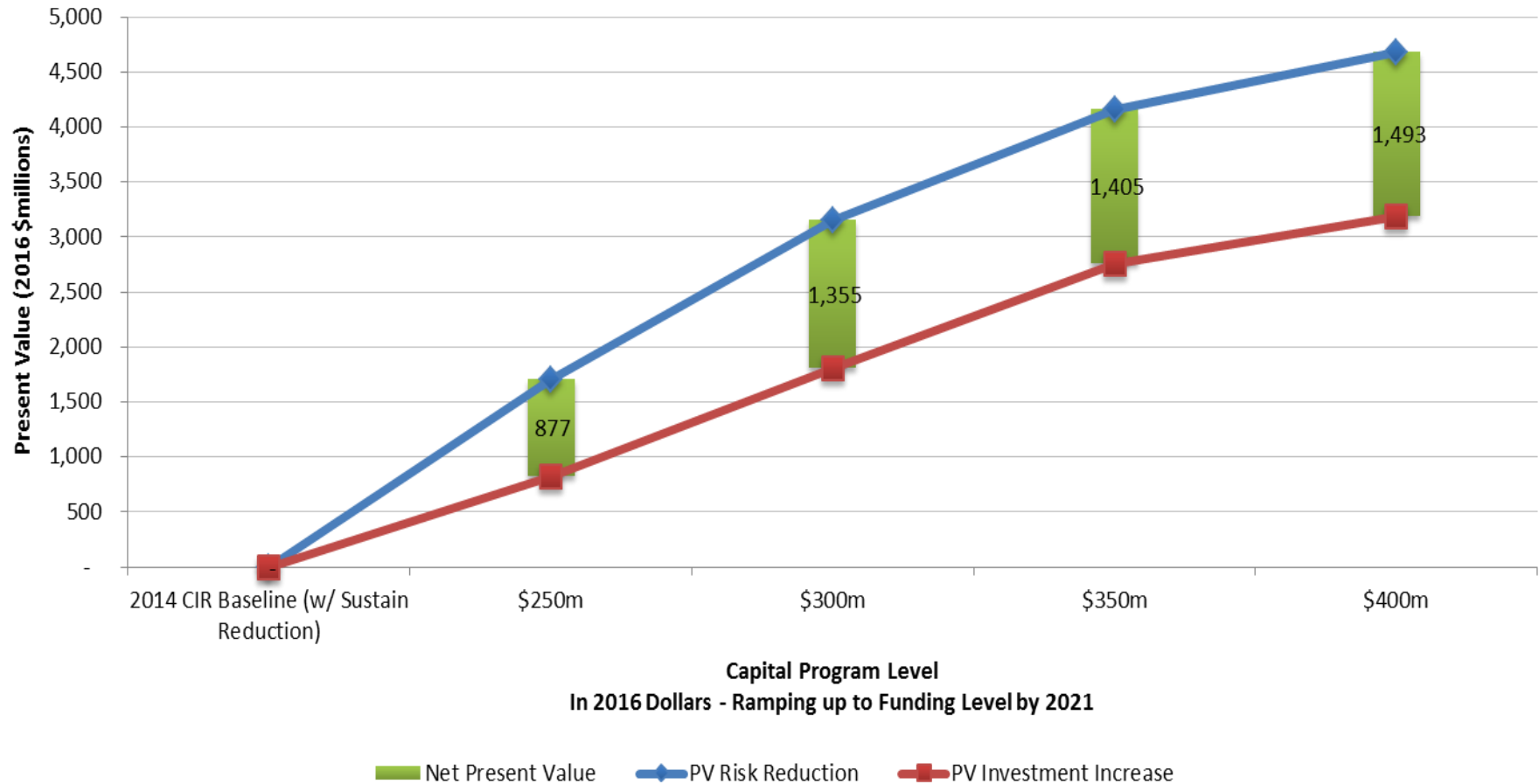
Note: \$75 million in new CRFM ~ \$5 million in amortized annual expense

Performance Management in the FCRPS

- Key metrics are tracked monthly for FCRPS plants to encourage continuous improvement and industry-leading performance:
 - Safety
 - Financial Performance
 - Unit Availability and Forced Outage
 - Maintenance
- Maintenance and investment work is scheduled throughout the year to minimize impacts to system performance and maximize work execution

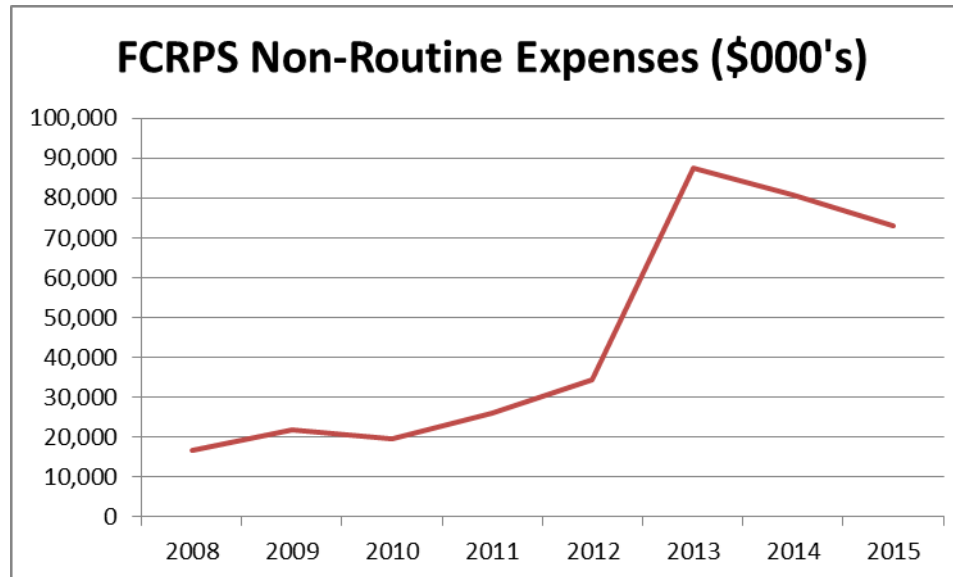
NPV of Different Funding Levels (6% Discount)

- Lifecycle cost minimization analyses have shown that there are benefits in growing the Capital Program beyond the current funding level of approximately \$200 million per year.



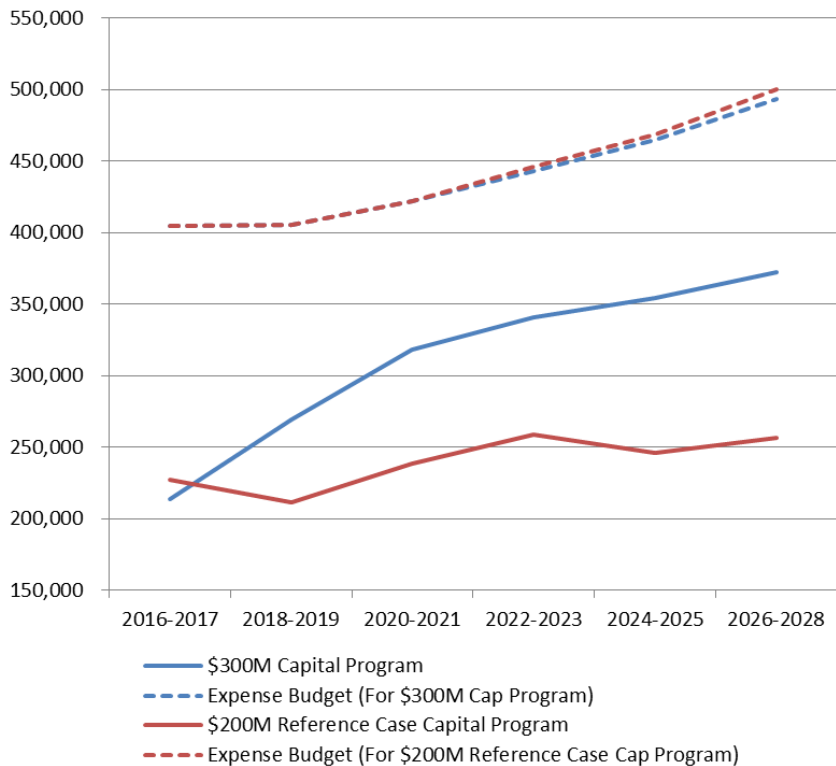
FCRPS O&M Non-Routine Expenses - Overview

- About 17% of all O&M Expenses are for Non-Routine Extraordinary Maintenance, the large infrequent repair activities associated with failing equipment, as well as long-term scheduled maintenance such as the Grand Coulee Third Powerplant Overhaul.
- As condition of aging infrastructure has degraded, costs have increased over time

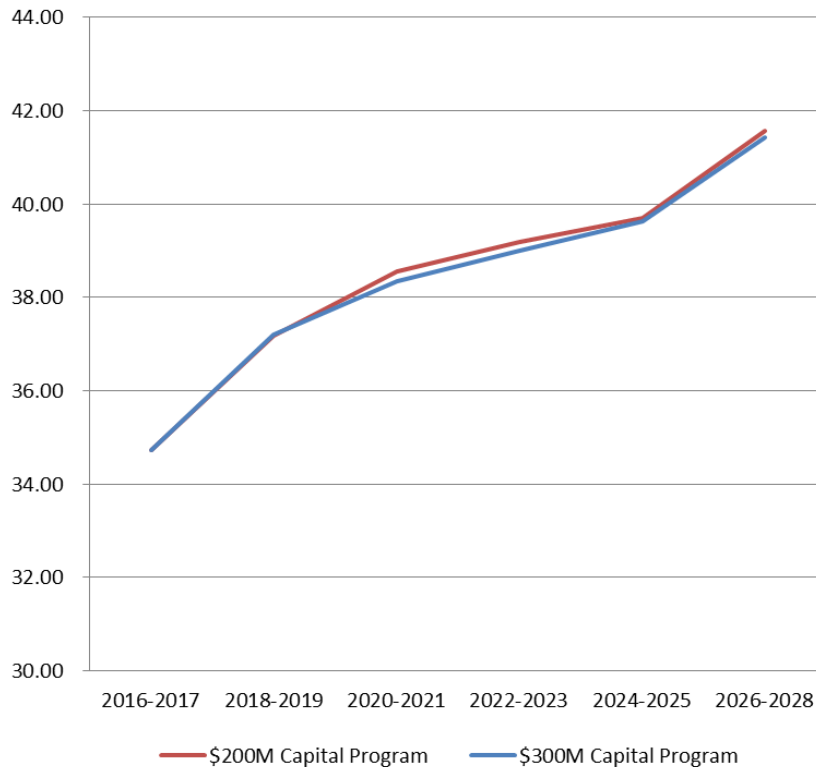


Rate Impact of a \$300 Million Capital Program

Forecasted Hydro Capital and Expense Program Levels (nominal \$000s)

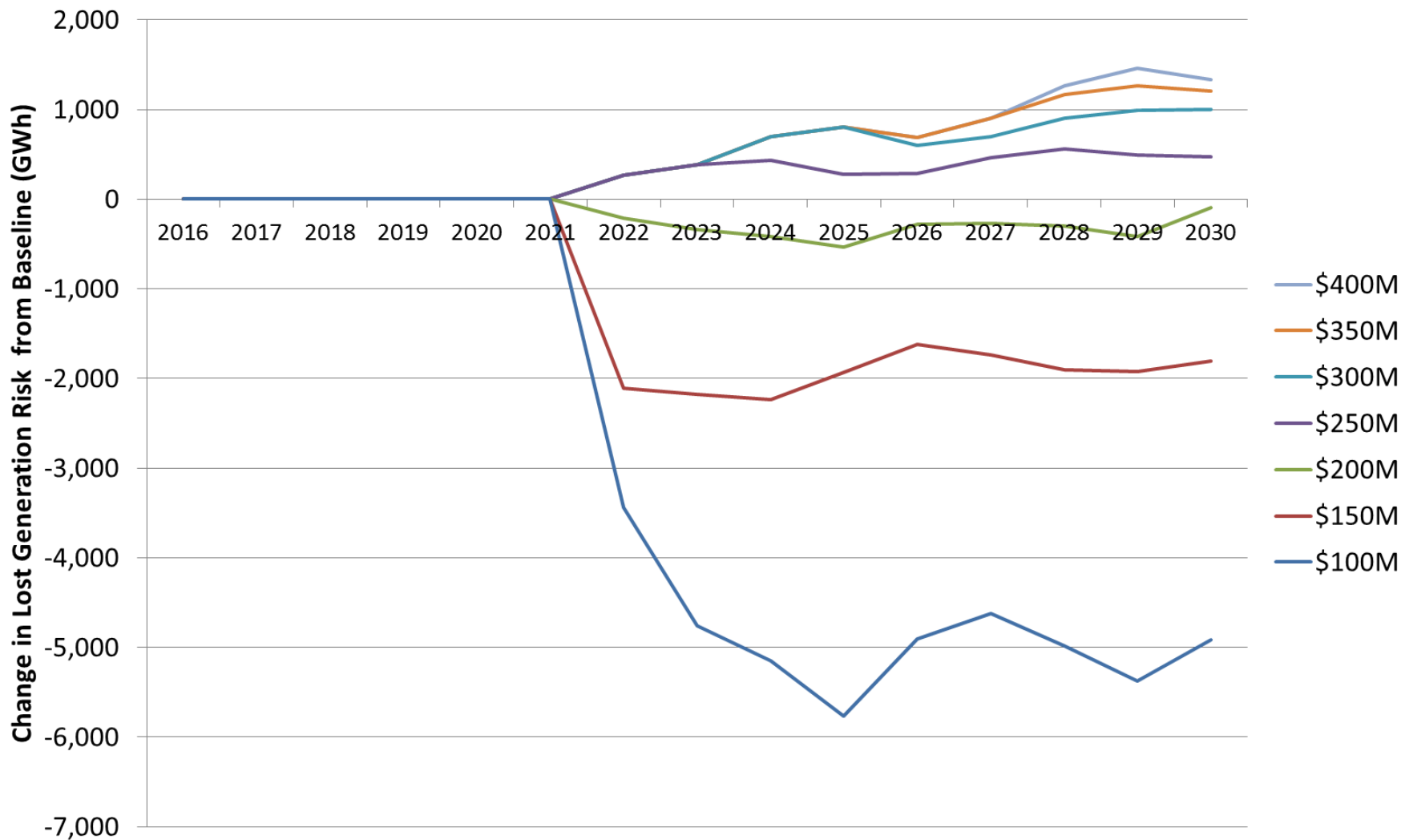


Forecasted Tier 1 PF Rate by Hydro Program Level \$/MWh (nominal dollars)

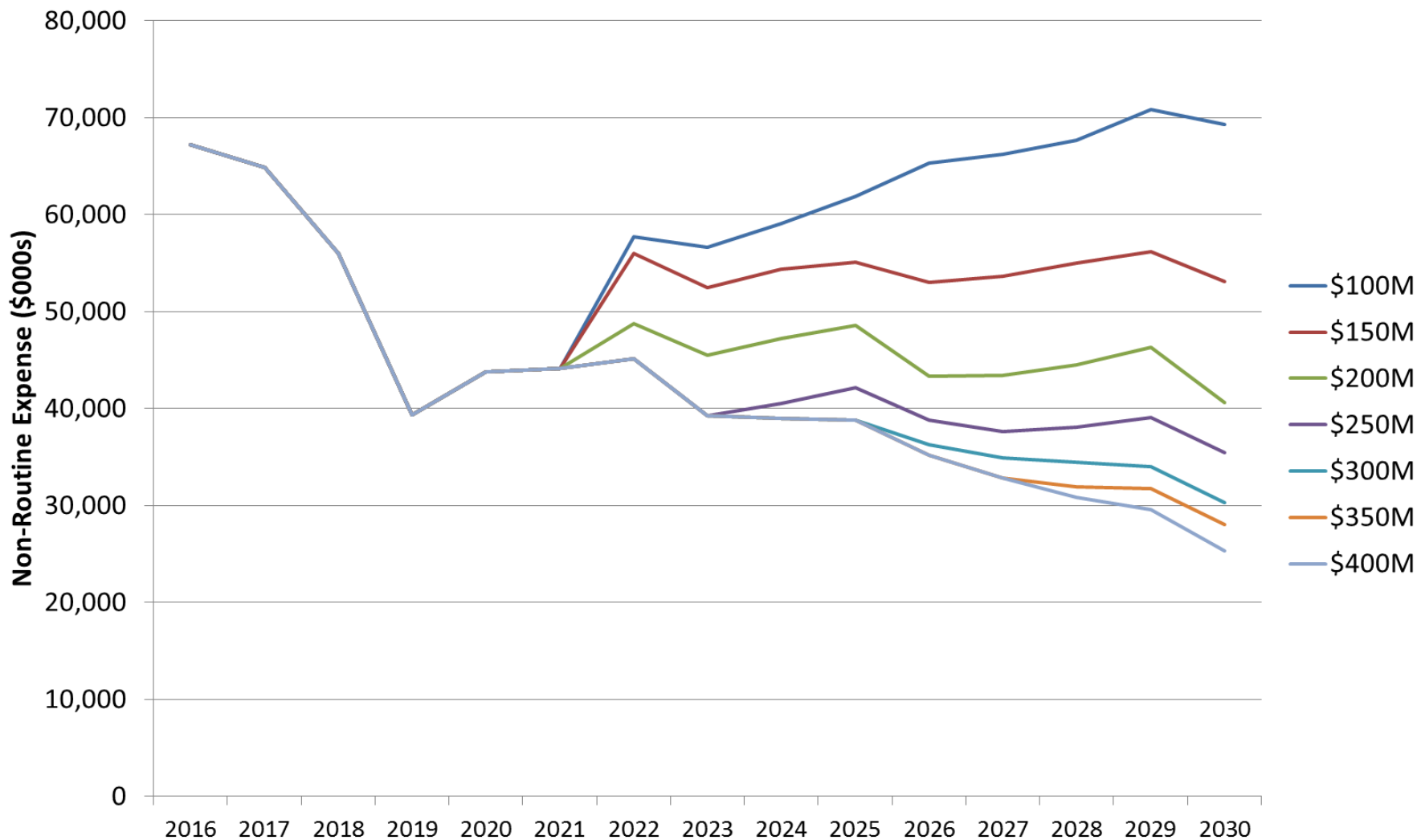


- Preliminary results from a long term rates study suggest that rates will be slightly lower in 2028 with a \$300m per year hydro capital program level than with a \$200m per year program due to increased generation from higher unit availability and reduced Non-Routine Expense.

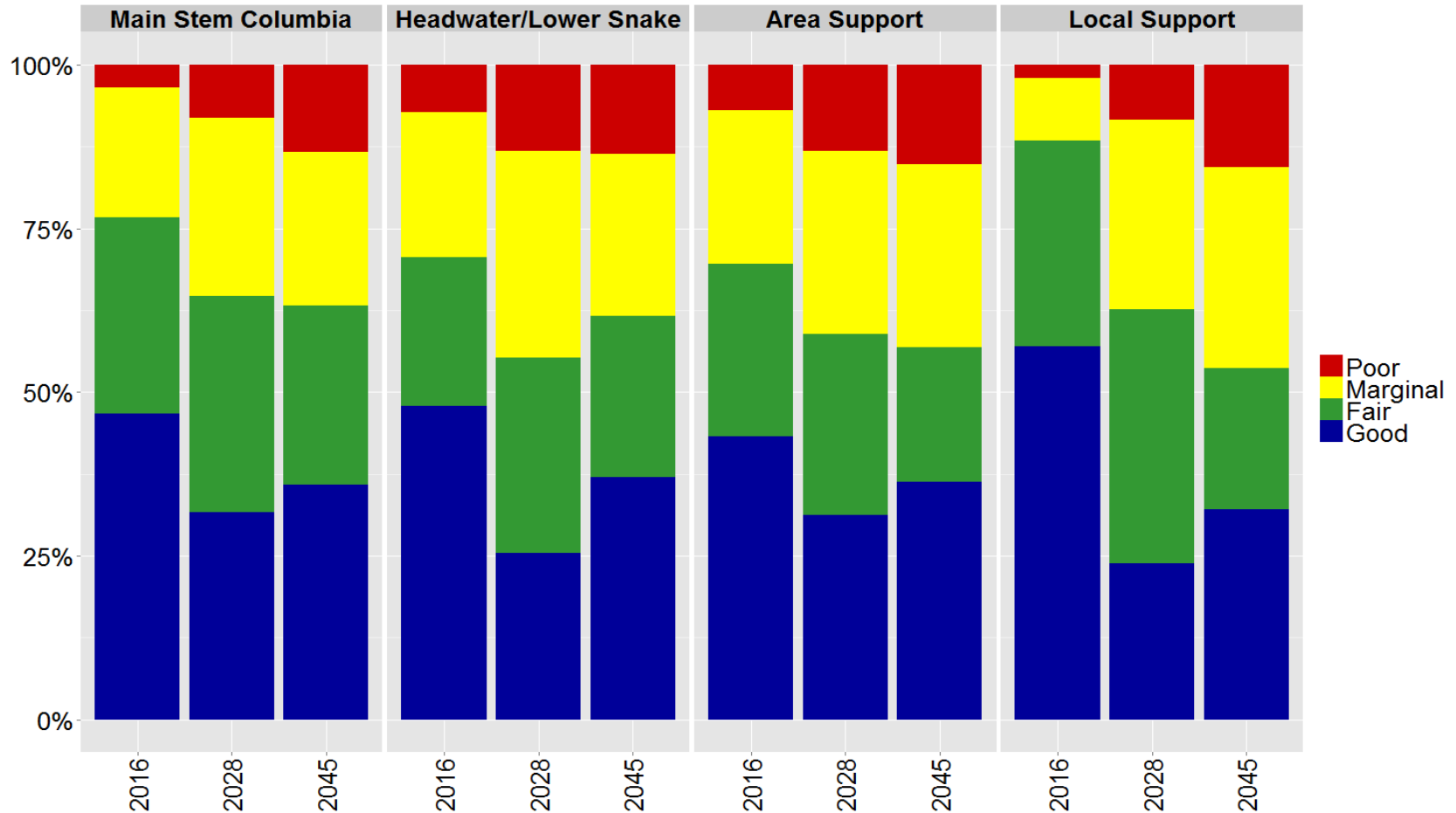
Capital Program Level Impact on Generation



Capital Program Impact on Non-Routine Expense

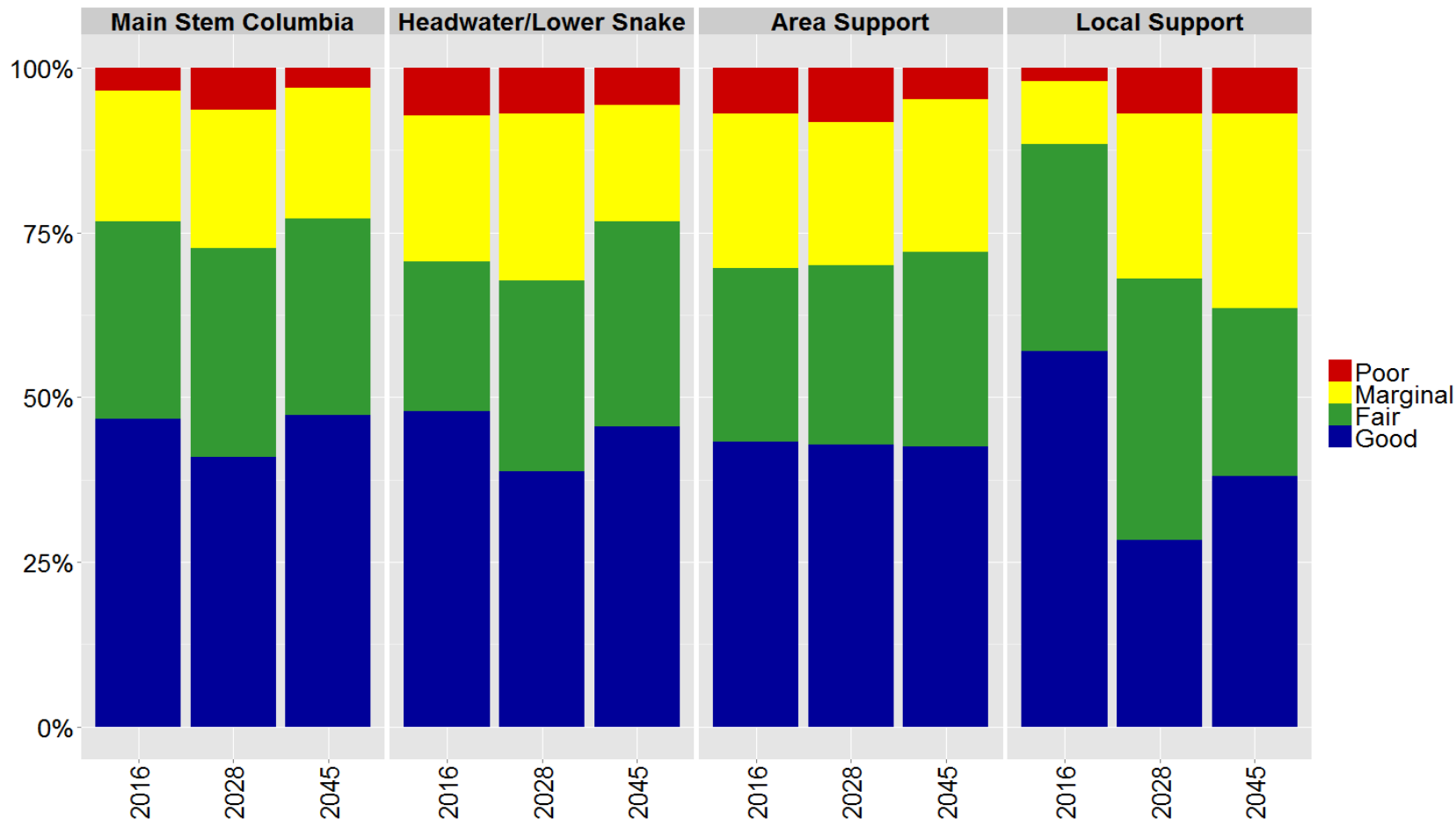


Condition by Strategic Class - \$200M program



A \$200 million program cannot keep up with degrading condition as the percentage of equipment in Good or Fair condition declines for all Strategic Classes over time.

Condition by Strategic Class - \$300M program



A \$300 million program effectively sustains equipment in Good or Fair condition through 2028 and slightly increases the percentage by 2045 for the majority of the Strategic Classes.

Asset Investment Excellence Initiative

“... The FCRPS is comprised of billions of dollars in assets and provides great economic and social benefits for the Pacific Northwest region and beyond.

As such, we owe it to our stakeholders to be World Class managers of those assets to ensure the long term viability of those benefits for the good of the Nation and future generations. It is our goal to develop **a long-term asset investment plan** to provide for **certainty, efficiency, affordability** and **reliability** of the System’s long-term value.”

*Excerpt from the “**Statement of Strategic Intent**” developed by the three agencies’ executives, February 2015*

- *Elliot Mainzer, Administrator, Bonneville Power Administration*
- *Lorri Lee, Director, North Pacific Regional Office, Bureau of Reclamation*
- *BG John Kem, Commander, Northwestern Division, U.S. Army Corps of Engineers*



Chief Joseph Dam Powerhouse

Asset Investment Excellence Initiative Objectives

Long Term Program Planning

- ✓ System Asset Plan (20 + year FCRPS Asset Plan for the System)
- ✓ Identification of requirements
- ✓ “Valuing” requirements
- ✓ Prioritizing & Optimization
- ✓ Bundling work when justified
- ✓ Aligning requirements with affordability

Contracting and Procurement

- ✓ Increased lead time and better scopes to develop acquisition strategies and tools
- ✓ More regional and interagency acquisition strategies
- ✓ Higher consistency between Corps Districts and with Reclamation in working with industry

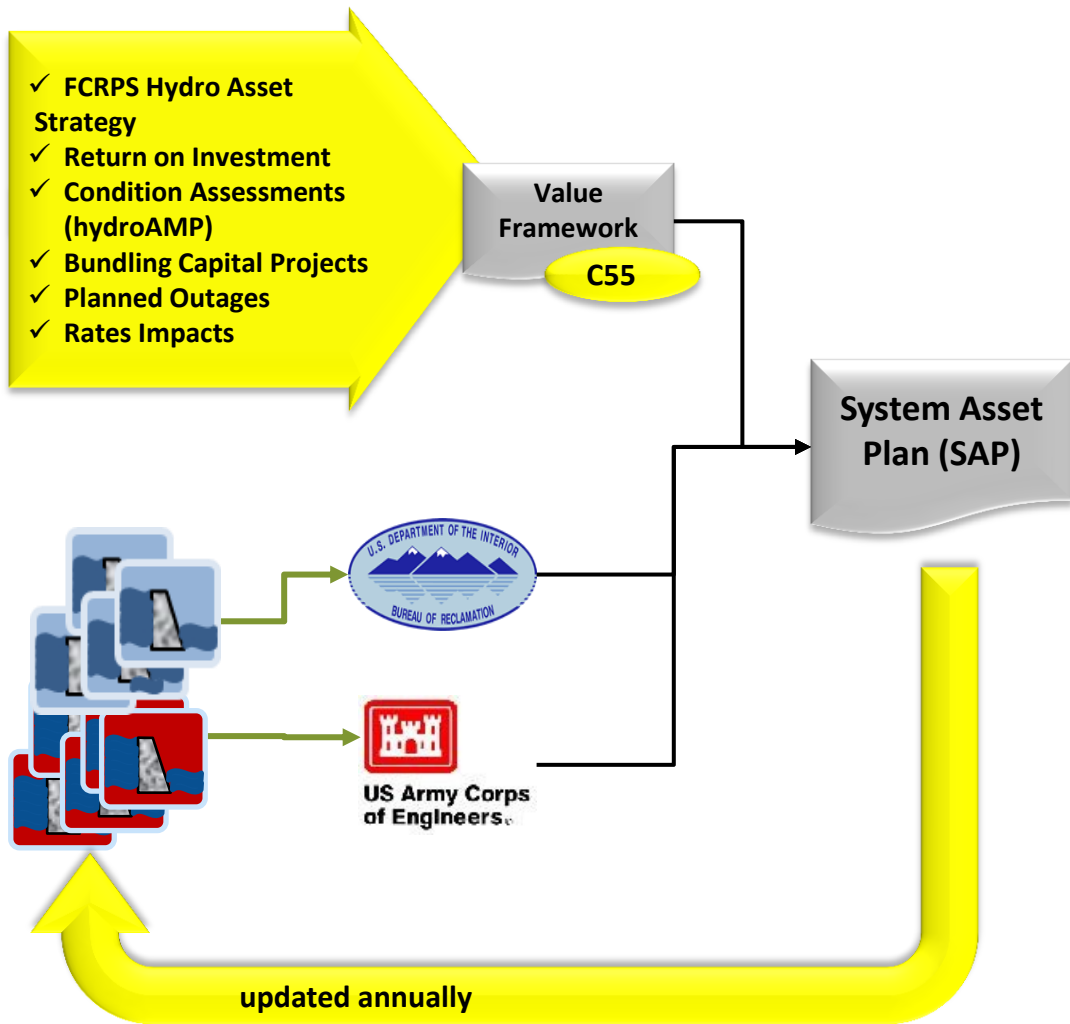
Program Execution

- ✓ Proper lead time for design, contracting, and project planning and staffing
- ✓ Certainty in future workload and funding
- ✓ Shared Lessons Learned
- ✓ Improved project execution

Human Capital

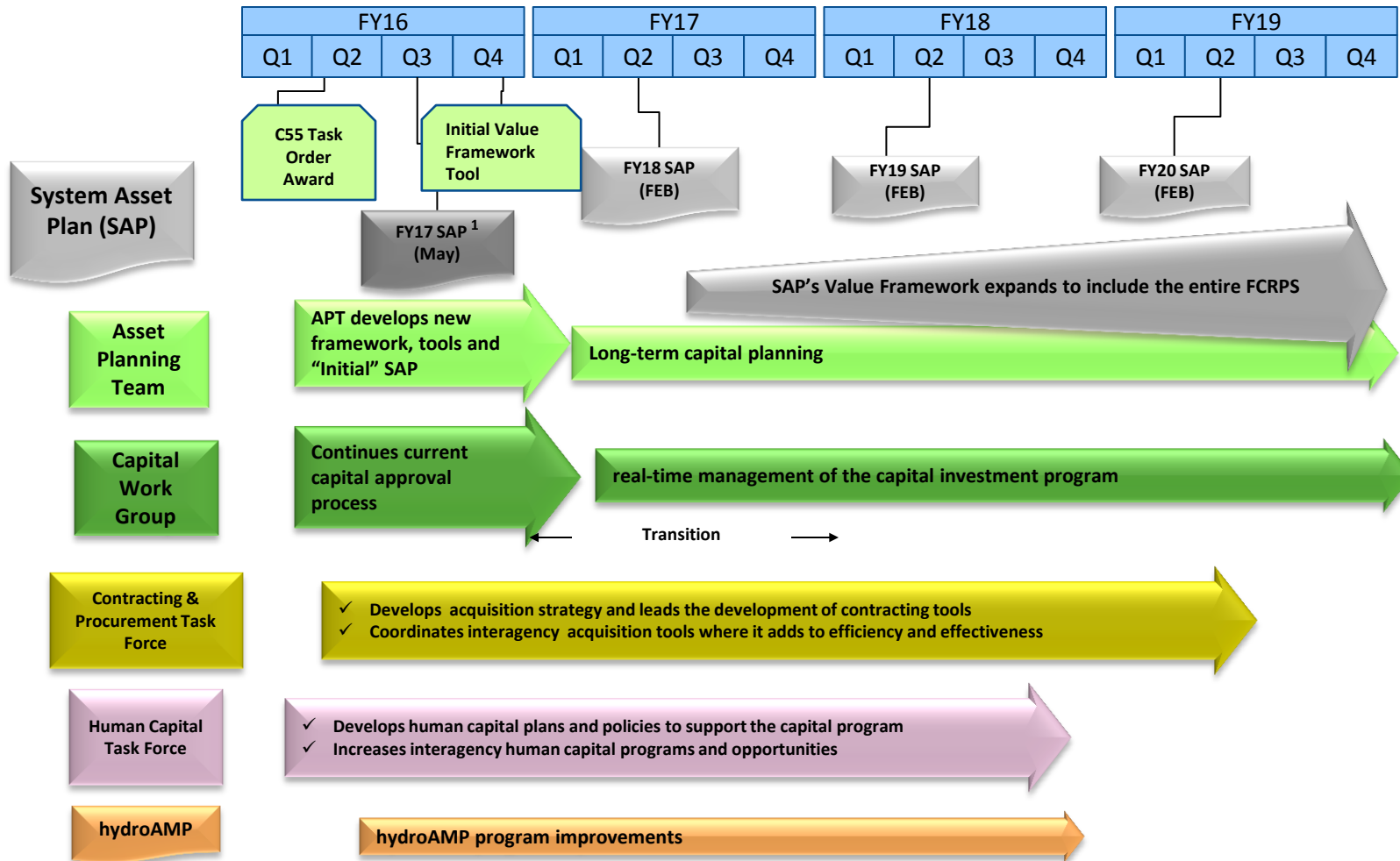
- ✓ Necessary lead time to program staffing for major projects
- ✓ Increased interagency teamwork on recruiting, retaining and training our staffs

Long-term Planning Process – Capital Program



John Day Dam, Powerhouse, 2006

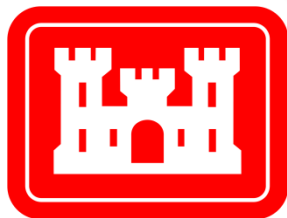
Asset Investment Excellence Initiative - Timeline



SAP Notes:

1. Initial SAP will not use the C55 Value Framework

B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N



Financial Disclosure

- This information has been made publicly available by BPA on February 11, 2016 and contains information not reported in BPA's financial statements.