



Integrated Program Review 2

March 2, 2021



AGENDA

Time	Topic	Speaker
1:00 – 1:10	Opening Comments/Discussion Objectives	Michelle Manary
1:10 – 3:00	Transmission Capital Program	Richard Shaheen/Jeff Cook/Mike Miller/Michelle Cathcart/Brad Wright/Nadine Coseo
3:00 – 3:15	CRSO EIS	Scott Armentrout
3:15 – 3:20	CRFM Studies	Jesse Kintz
3:20 – 4:00	Question and Answer	

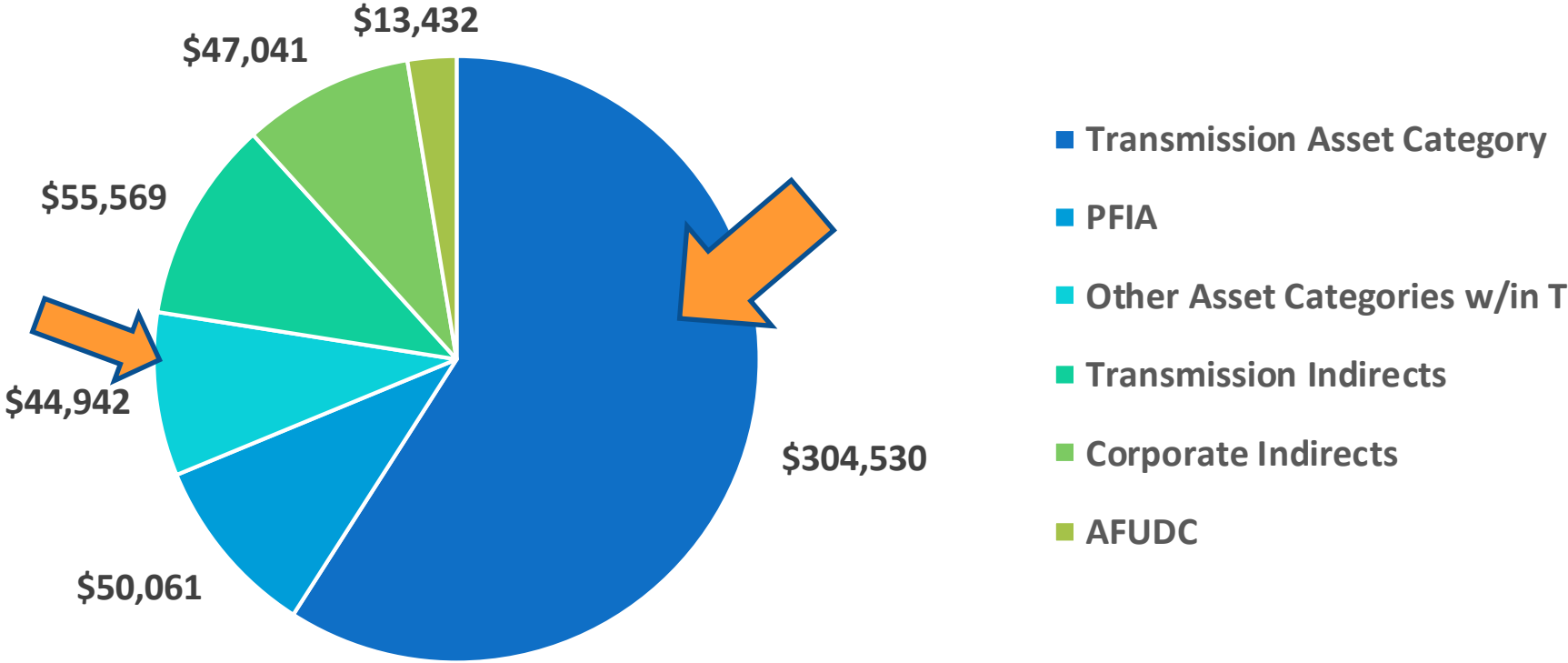
BP-22 Integrated Program Review 2

- In September 2020, BPA published the Close Out Report for the 2022 Integrated Program Review. In it we cited the need to be flexible to changing economic conditions and that we planned to hold an Integrated Program Review 2 (IPR2).
- BPA selected IPR2 topics based on known material changes and input from stakeholders. BPA believes, for the most part, the budgets we committed to in the 2022 IPR Close Out Report are still sufficient. Topics to be covered include:
 - Transmission Capital Program (direct program and facilities)
 - Fish and Wildlife budgets and support of the CRSO EIS programs

Transmission Capital Discussion Objectives

- Context
- Transmission Capital Program
 - Strategy
 - Execution & Performance
 - Special focus
- Budget

Transmission Capital Funding



FY21 RC Numbers



Transmission Capital: Strategy



BPA Strategic Plan - SAMP – Asset Plan Alignment



SAMP:
 Strategic Asset Management Plans (SAMP) convert the objectives of the organizational strategic plan and asset management policy into high-level, long-term action plans for the assets and asset systems, the asset portfolios or the asset management system.

ASSET PLAN:
 The Asset Plan (AP) is documented information that specifies the activities and resources and timescales required for individual assets, or groupings of assets, to achieve the organization's asset management objectives.

Historical & Future Capital Spend

Program	Actuals					Q1 Forecast	Rate Case		Future Fiscal Years	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capital Expand (CapEx)										
Main Grid	\$20,365	\$11,135	\$14,906	\$5,588	\$3,741	\$2,095	\$10,000	\$5,000	\$10,000	\$12,000
PFA	\$2,427	\$5,197	\$32,907	\$57,201	\$15,626	\$17,340	\$45,000	\$50,000	\$40,000	\$30,000
Area and Customer service	\$79,252	\$29,688	\$35,307	\$56,222	\$21,164	\$67,325	\$40,000	\$60,000	\$50,000	\$40,000
Upgrades & Additions	\$99,959	\$29,326	\$21,383	\$22,807	\$36,779	\$37,500	\$50,000	\$50,000	\$50,000	\$64,000
Total Capital Expand	\$202,003	\$75,346	\$104,502	\$141,818	\$77,310	\$124,260	\$145,000	\$165,000	\$150,000	\$146,000
Capital Sustain										
Steel Lines	\$10,144	\$13,793	\$15,259	\$13,242	\$22,880	\$10,000	\$24,000	\$24,000	\$49,000	\$51,000
Wood Lines	\$36,550	\$46,459	\$27,445	\$26,893	\$20,989	\$20,000	\$33,000	\$33,000	\$58,000	\$60,000
PSC & System Telecomm	\$31,309	\$32,054	\$23,412	\$18,854	\$12,570	\$29,550	\$53,000	\$53,000	\$57,000	\$57,000
SPC	\$25,995	\$17,341	\$14,143	\$12,125	\$8,115	\$20,700	\$21,000	\$21,000	\$25,000	\$26,000
Subs AC	\$48,606	\$62,117	\$50,785	\$38,968	\$39,670	\$41,700	\$44,000	\$44,000	\$49,000	\$49,000
Subs DC	\$79	\$433	\$5,415	\$8,804	\$16,389	\$8,200	\$3,000	\$3,000	\$3,000	\$3,000
Other*	\$26,519	\$28,325	\$23,224	\$20,657	\$24,448	\$28,050	\$34,000	\$34,000	\$34,000	\$172,600
Total Sustain	\$179,202	\$200,521	\$159,682	\$139,543	\$145,062	\$158,200	\$212,000	\$212,000	\$275,000	\$418,600
TOTAL CAPITAL	\$381,205	\$275,867	\$264,184	\$281,361	\$222,372	\$282,460	\$357,000	\$377,000	\$425,000	\$564,600
Rate Case Total	\$437,242	\$387,444	\$333,044	\$326,044	\$362,524	\$354,591				
							Q1 Forecast - Rate Case (72,131,071)			

*Does not include Non-T Asset Category Totals

**Direct dollars only (not fully loaded)

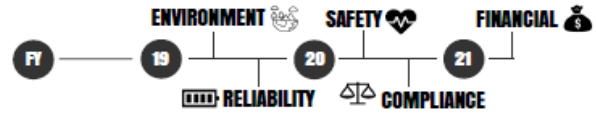
Drivers for Capital Spending

- Examples of capital spending drivers for managing risk in coming years
 - Wildfire Mitigation Plan and Program
 - GMD
 - Seismic
- Focusing on projects that have the highest risk on BPA's transmission system
 - From the Financial, Environmental, Reliability, Compliance and Safety perspective through the CHR process/analysis
- Spend the increased and targeted capital now to improve the safety and reliability of our system, in order to save money in the long run

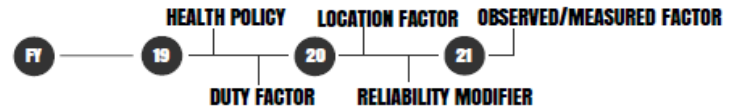
Criticality, Health & Risk (CHR)

BPA STRATEGIC PLAN: OBJECTIVE 2A—PAGE 26

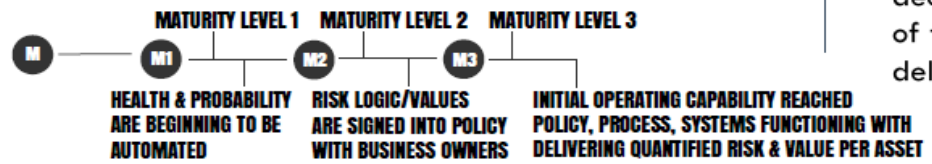
C CRITICALITY



H HEALTH



R RISK



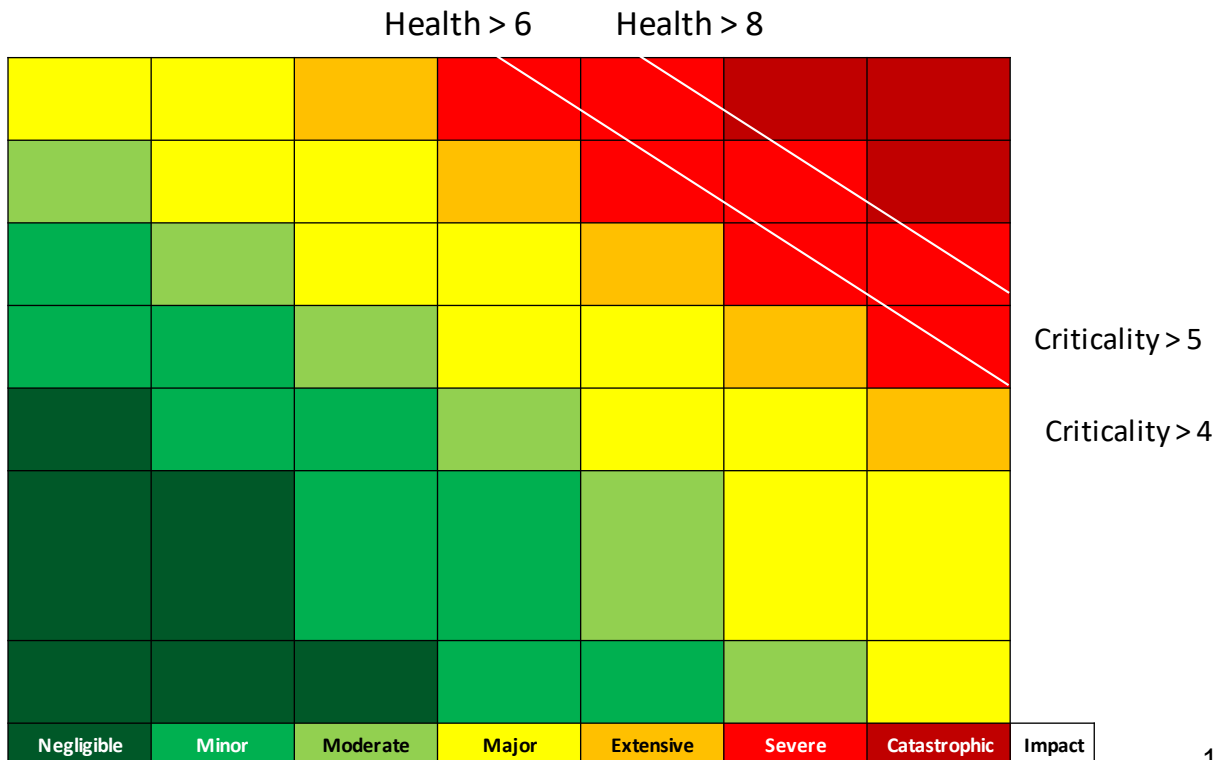
BPA has adopted industry leading asset management standards and begun building the capabilities to understand individual asset’s criticality, health and risks. Defensible and proven methodologies and analytical methods will be developed, tested and adopted to inform the prioritization of maintenance and capital investments. Transparent, objective CHR information and risk quantification will enable Transmission decision makers to optimize the utilization of financial and human resources to deliver best value for BPA and the region.

Risk Table With Impacts

	Safety	Reliability	Financial	Environmental	Compliance
Impact Level	The potential impact of a risk even on a public or worker safety	The potential impact of a risk even on service or grid reliability	The potential risk event resulting in a financial costs to customers/rate payers measured in incremental dollar impact	The potential impact on natural resources such as air, soil, water, plant or animal life	The potential impact of noncompliance with federal, state, local, industrial, or operational standards or requirements
Catastrophic	Many Fatalities, Mass Serious injury or illness: Many fatalities of employees, public members or contractors; Mass serious injuries or illness resulting in hospitalization, disability or loss of work; Widespread illness caused typically caused by sustained exposure to agents.	Customer Hours Impact: Outage resulting in greater than 20 million total customer hours of interruption.	Impact > \$3 billion in costs; consider costs to customers, shareholders and third parties.	Irreversible and immediate damage to surrounding environment (e.g. extinction of species).	NonCompliance Impact: Actions resulting in potential closure, split or sale of Company.
Severe	Few Fatalities, Serious injuries or illness; Permanent Disability: Few fatalities of employee, public member or contractor; Many serious injuries or illnesses resulting in hospitalization, disability or loss of work; Localized illness typically caused by acute or temporary exposure to agents.	Outage resulting in at least 2 million total customer hours of interruption.	Impact between \$300 million and \$3 billion in costs; consider costs to customers, shareholders, and third parties.	Resulting in acute longterm damage greater than 10 years; Severe damage to surrounding environment.	NonCompliance Impact: Regulator issued cease and desist orders; Regulators force the shut down of critical assets, and demand changes to operations/administration
Extensive	Serious injuries or illness; Permanent Disability: Serious injuries or illness to many employees, public members or contractors resulting in hospitalization, disability or loss of work.	Outage resulting in at least 200,000 total customer hours of interruption.	Impact between \$30 million and \$300 million in costs; consider costs to customers, shareholders, and third parties.	Resulting in significant mediumterm damage greater than 2 years;	NonCompliance Impact: Regulatory investigations and enforcement actions, lasting longer than a year; Violations that result in multiple large nonfinancial sanctions; Regulators force the removal and replacement of management positions.
Major	Serious injuries or illness; Permanent Disability: Serious injuries or illness to few employees, public members or contractors resulting in hospitalization, disability or loss of work; Several employees, member of the public or contractors sent requiring treatment beyond first aid.	Outage resulting in at least 20,000 total customer hours of interruption.	Impact between \$3 million and \$30 million in costs; consider costs to customers, shareholders, and third parties.	Resulting in moderate mediumterm damage greater than few months; Reversible damage to surrounding environment.	NonCompliance Impact: Significant new and updated regulations are enacted as a result of an event; Violations that result in adopting modest changes to operations/administration; Increased oversight from regulators.
Moderate	Minor injuries or illness: Minor injuries or illness to several employees, public members or contractors; Few employees, member of the public or contractors requiring treatment beyond first aid.	Outage resulting in at least 2,000 total customer hours of interruption.	Impact between \$300k and \$3 million in costs; consider costs from customers, shareholders, and third parties.	Resulting in moderate shortterm damage of few months; Reversible damage to surrounding environment with no secondary consequences.	NonCompliance Impact: Violations that result in minor changes to operations/administration; No additional oversight from regulators.
Minor	Minor injuries or illness: Minor injuries or illness to few employees, public members or contractors requiring first aid.	Outage resulting in at least 200 total customer hours of interruption.	Impact between \$30k and \$300k in costs; consider costs to customers, shareholders, and third parties.	Immediately correctable damage to surrounding environment.	NonCompliance Impact: Selfreported or regulator identified violations.
Negligible	No injury or illness.	Outage resulting in less than 200 total customer hours of interruption.	Impact of less than \$30k in costs; consider costs to customers, shareholders, and third parties.	Resulting in negligible to no damage; Very small damage scale, if not negligible.	NonCompliance Impact: No compliance impact up to an administrative impact.

CHR Use In FY20 (Active Now)

Frequency Description	Frequency/Year	Frequency Level
Once Every > 10 / year	$F \Rightarrow 10$	Common
Once Every 1-10 / years	$F = 1-10$	Regular
Once Every 1-3 / Years	$F = 1 - 0.3$	Frequent
Once Every 3-10 / Years	$F = 0.3 - 0.1$	Occasional
Once Every 10-30 / Years	$F = 0.1 - 0.033$	Infrequent
Once Every 30-100 / Years	$F = 0.033 - 0.01$	Rare
Once Every 100+ / Years	$F = < 0.01$	Remote



Only applies to lines, subs & SPC. Telecomm excluded until criteria development.

Risk Heat Map Based on CHR Methodology

Frequency Description	Frequency/Year	Frequency Level	Notation: Health, Criticality							
Once- 10/year	F = >10	Catasrophic	7	10,1	10,2	10,3	10,4	10,5	10,6	10,7
Once Every 1-10 / years	F = 1-10	Severe	6	9,1	9,2	9,3	9,4	9,5	9,6	9,7
Once Every 1-3/Years	F = 1-0.3	Extensive	5	8,1	8,2	8,3	8,4	8,5	8,6	8,7
Once Every 3-10/Years	F = 0.3 - 0.1	Major	4	7,1	7,2	7,3	7,4	7,5	7,6	7,7
Once Every 10-30/Years	F = .1 - .0333	Moderate	3	6,1	6,2	6,3	6,4	6,5	6,6	6,7
Once Every 30-100/Years	F = .033 - 0.01	Minor	2	4-5,1	4-5,2	4-5,3	4-5,4	4-5,5	4-5,6	4-5,7
Once Every 100+/Years	F = < 0.01	Negligible	1	1-4,1	1-4,2	1-4,3	1-4,4	1-4,5	1-4,6	1-4,7
				1	2	3	4	5	6	7
			Impact	Negligible	Minor	Moderate	Major	Extensive	Severe	Catasrophic

Reliability Risk Heat Map

Reliability Criticality Impact Scale



Clear Filters

Risk Tolerance Options

Risk Tolerance	Total Bundle Estimate
Below Risk Tolerance Threshold	\$129,752,800
Exceeds Risk Tolerance Threshold	\$58,995,566
Total	\$188,748,366

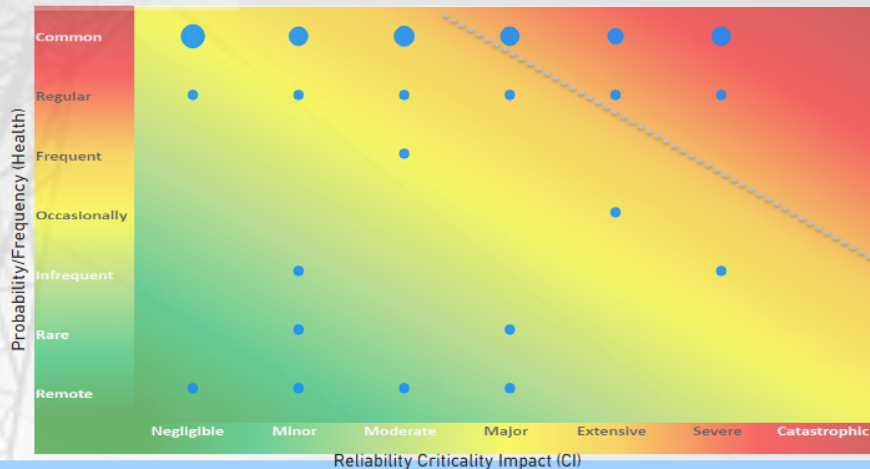
SG Status

- All
- Program
- All
- Bundle ID
- All

API FY Start

All

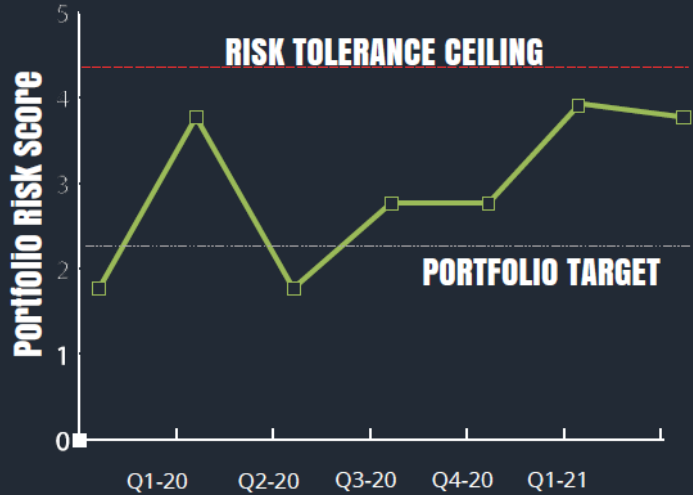
Reliability Risk Heat Map



Resource Queue Reliability Risk Assessment by Bundle

Bundle ID	Bundle Name	RS	Reliability CI	Max Health Score	FY20	FY21	FY22	FY23	FY24	Total Bundle Estimate FY20-FY24
P01281	MCNARY-ROSS-1: INSULATOR REPLACEMENT	69856856	6	10	\$0	\$0	\$526,461	\$3,145,725	\$3,145,725	\$6,817,910
P02633	MURRAY-CUSTER-1: CORRIDOR NCI REPLACEMENT	16177917	6	10	\$0	\$0	\$0	\$6,252,640	\$6,252,640	\$12,505,280
P03954	CHEMAWA DISTRICT PRIORITY POLES, FY20 DESIGN FY21 PROC...	7054246	6	10	\$99,170	\$240,754	\$66,276	\$0	\$0	\$406,200
P03957	REDMOND DISTRICT PRIORITY POLES, FY20 DESIGN FY21 PRO...	2875925	5	10	\$2,754,745	\$4,218,674	\$1,100,318	\$0	\$0	\$8,073,737
P03956	KALISPELL DISTRICT PRIORITY POLES, FY20 DESIGN FY21 PROC...	2758266	5	7	\$159,048	\$313,376	\$84,470	\$0	\$0	\$556,893
P02003	GRAND COULEE-HANFORD-1: GW REPLACEMENT	2075221	5	10	\$0	\$283,238	\$128,279	\$0	\$0	\$411,517
P03951	THE DALLES DISTRICT PRIORITY POLES, FY20 DESIGN FY21 PRO...	1637215	5	9	\$186,927	\$376,575	\$101,757	\$0	\$0	\$665,259
P01322	PEARL-KEELER-1: (STEEL) 2.5" EXPANDED RECONDUCTOR	1096018	6	10	\$0	\$0	\$96,008	\$341,517	\$341,517	\$779,041
P02505	OSTRANDER-PEARL-1: (STEEL) 2.5" EXPANDED RECONDUCTOR	975298	6	10	\$0	\$0	\$0	\$0	\$0	\$0
Total					\$9,064,358	\$32,057,952	\$46,517,746	\$50,554,155	\$50,554,155	\$188,748,366

Asset Management & CHR Metrics



- Asset Utilization Ratio: Total revenue earned for every dollar of assets
- Severe Risk Assets: How many assets above risk tolerance where replaced
- Portfolio Spend Efficiency: How effective is the portfolio makeup at risk reduction per dollar
- Portfolio Reliability Strength: 0 – 1 indicator of how healthy the system is

CHR Return on Investment

CHR Informing decisions has resulted in savings. This includes examples of savings into perpetuity. Examples include:

- Dual vs. Single Vendor Relay Lifecycle analysis. Ongoing Lifecycle savings with time (Lifecycle cost savings of ~\$5M - \$8M/year in perpetuity).
- Shelton – Fairmount Cable Selection. Direct savings from historic design selections with alternative cable selection. (Lifecycle cost savings ~\$5M)
- Transformer Seismic Mitigation at Longview. Risk analysis for project scope resulting in avoided costs and acceptable risk. (Avoided costs of ~\$4.2M)
- Circuit Breaker refurbishment vs replacement analysis for fault duty. Millions in avoided costs through risk/lifecycle analysis. (Avoided costs of ~\$4.5M)



23 Million

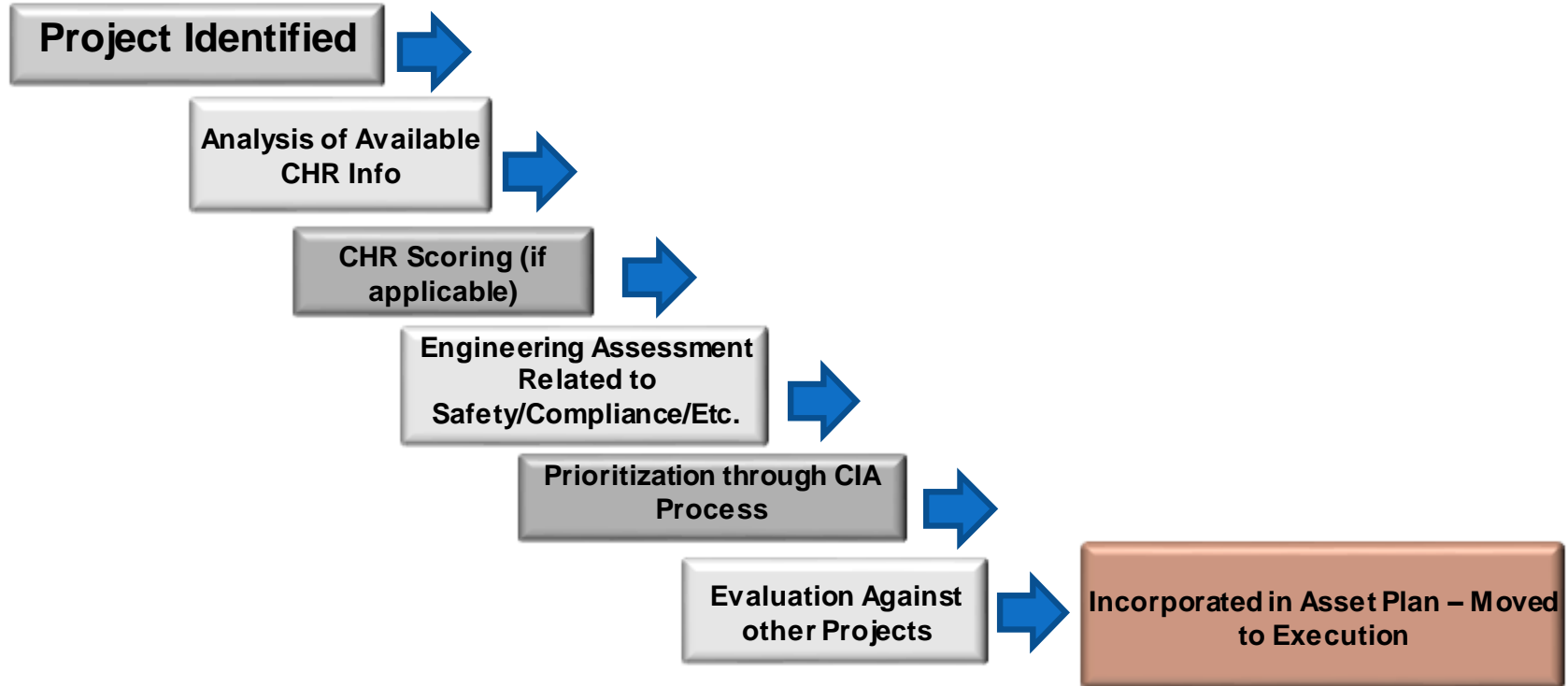
Saved to date, direct and opportunity costs capital & expense.

27% Efficiency Savings

22% Avoided Costs

51% Asset Life cycle savings

Process of Prioritization



Risk Assessment

Shelton – Fairmont No.1 Line CHR in action to inform decision

Shelton-Fairmont No 1 Heat Map 2019

Frequency/Year		Shelton-Fairmont No 1 Heat Map 2019							
> 10/year	Catastrophic	7							
1-10/year	Severe	6						Environmental	
Once 1-3 years	Extensive	5							
Once 3-10 years	Major	4				System Reliability			
Once 10-30 years	Moderate	3							
Once 30-100 years	Minor	2							
Once 100+ years	Negligible	1							
	Impact		1	2	3	4	5	6	7
			Negligible	Minor	Moderate	Major	Extensive	Severe	Catastrophic

Model map represents 75% Confidence

Shelton-Fairmount NO.1	Rebuild Line Risk Score		Spot Maintenance Risk Score	
	Year 2020	Year 2027	Year 2020	Year 2027
Risk Score	10800	18980	10800	109980
Delta (2027 - 2020)	8180		99180	
EAC Per Option	1618		223800	

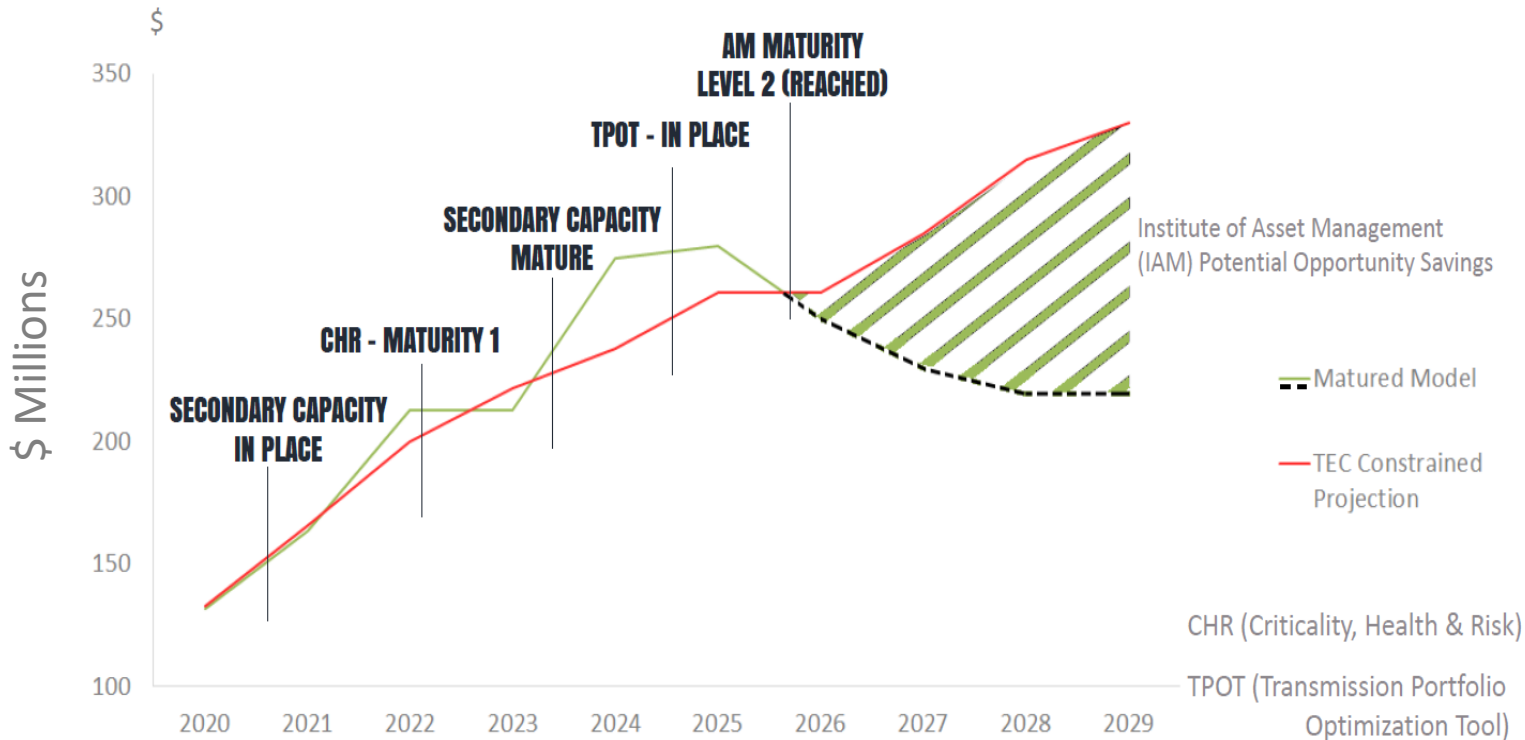
Risk Spend Efficiency	5.06	0.44
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Rebuild option has higher Risk Spend Efficiency; or reduces more risk per annum per dollar.

*EAC = Equivalent Annual Cost (over lifecycle)

Transmission Sustain Program Capital Funding Maturity Model



Note: includes wood and steel poles, subs AC, subs DC, PSC, & SPC

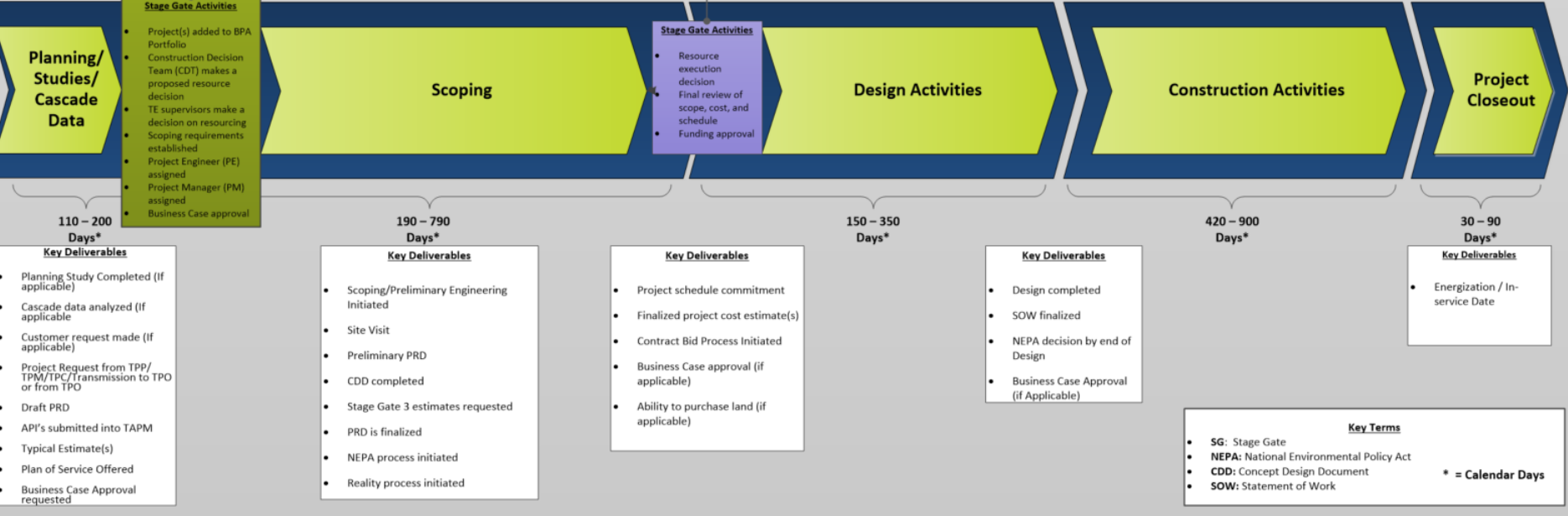


Transmission Capital: Execution & Performance

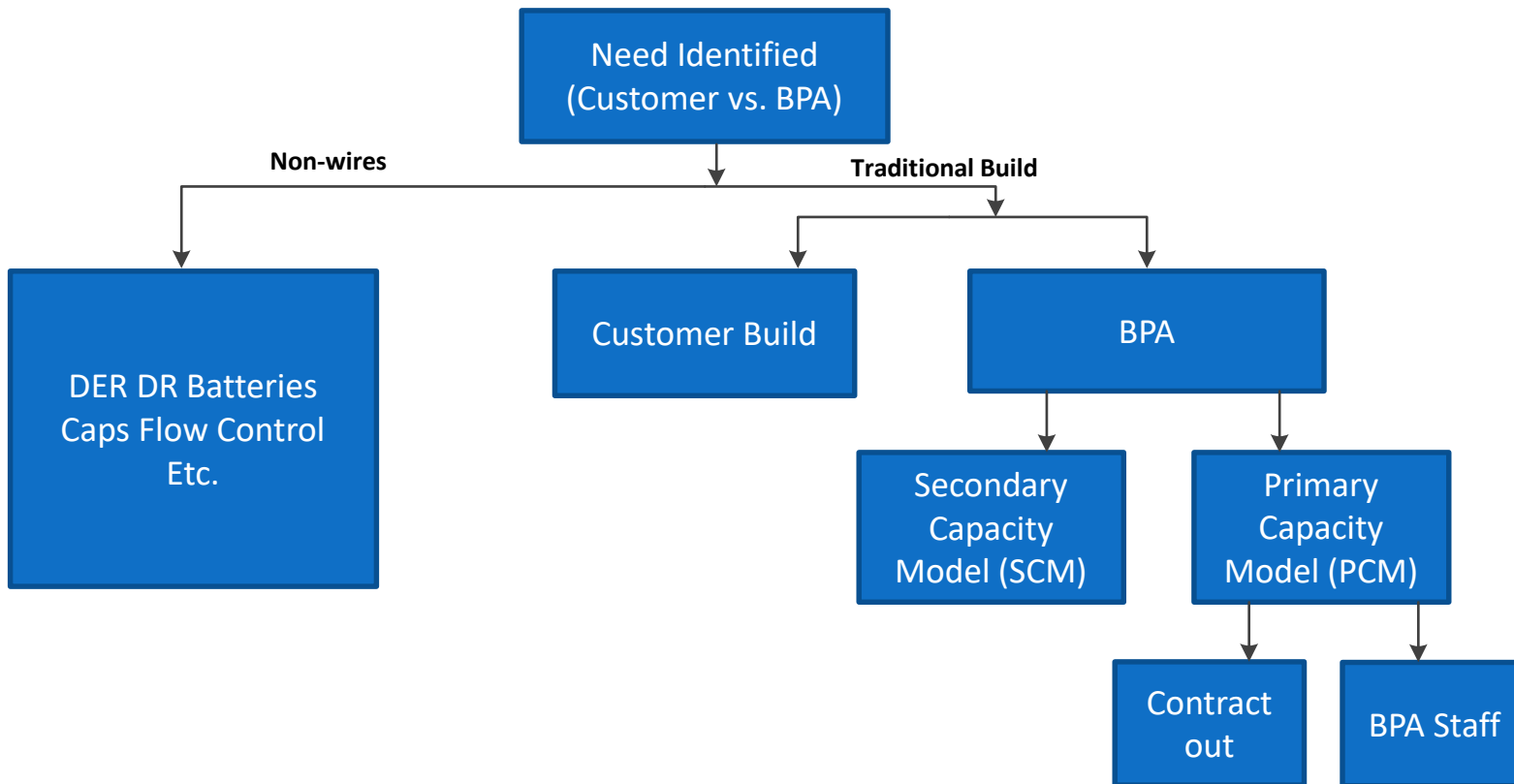


Capital Investment Acquisition (CIA) Process

Capital Projects



Project Playbook



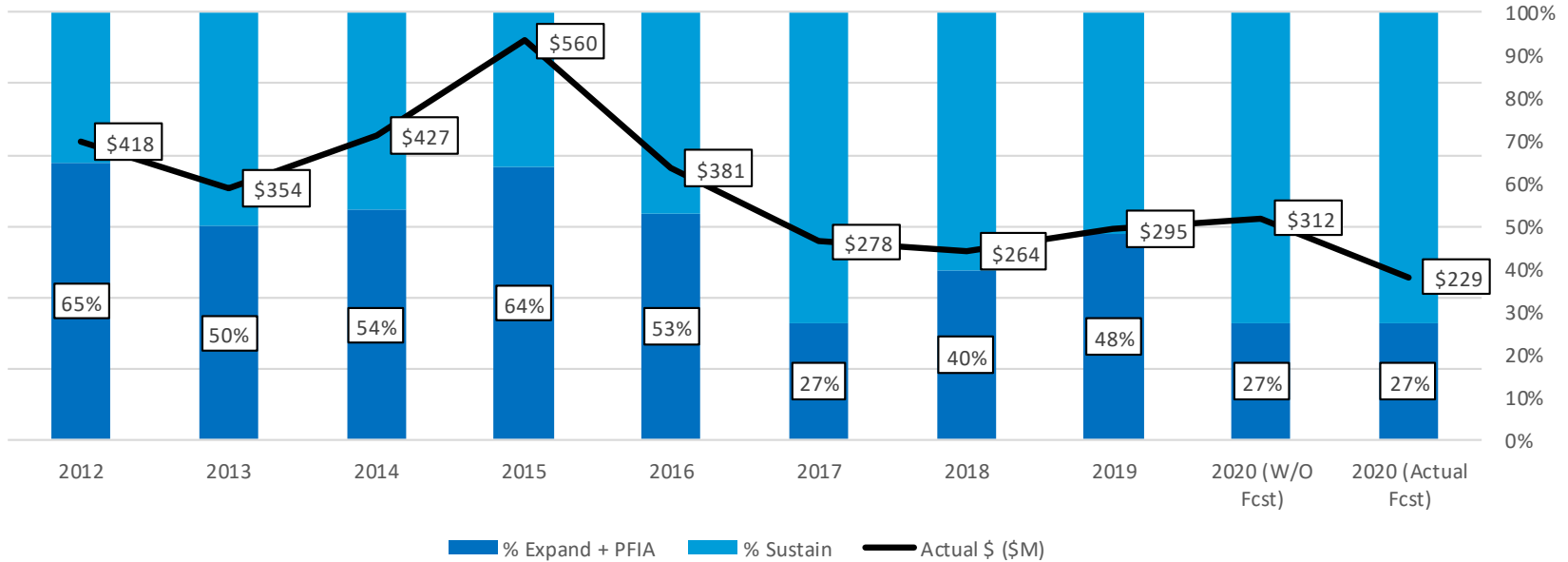
The Need For A New Capital Execution Model

What drove the need?

- Transmission Services has had difficulties fully executing on its Strategic Asset Management Plan based on two main drivers
 1. An increase in the amount of small, labor intensive projects.
 2. A decrease in labor resources.
- The result has primarily impacted the replacement of aging infrastructure.

Capital Project Types

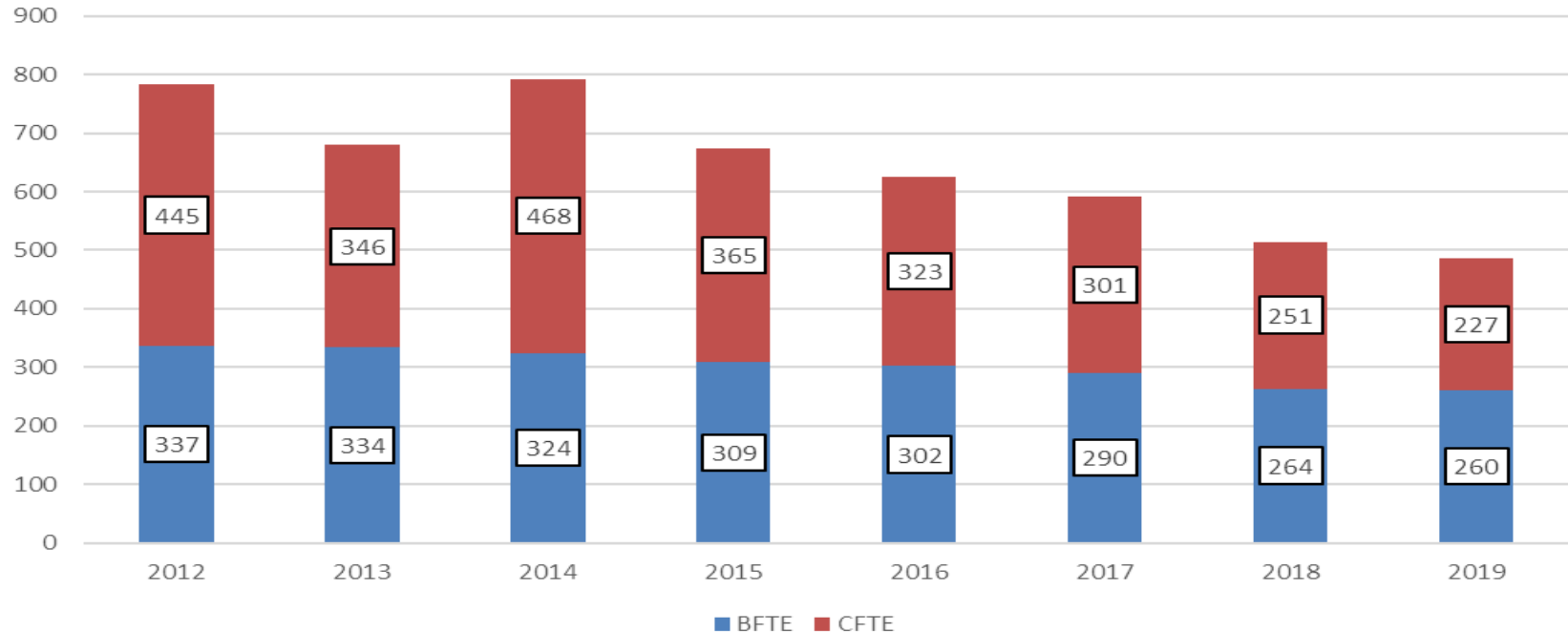
Total Capital Spend vs Product Mix (Expand + PFIA / Sustain)



Product mix is crucial in determining delivery on the capital program.

Transmission Engineering Resources

Federal and Supplemental FTE by FY



FTE down 35%

Secondary Capacity Model (SCM)

What will BPA resources be focused on going forward?

- BPA resources will support both SCM and Primary Capacity Model (PCM) work.
- Specifically, BPA resources will be engaged with the Owners Consultant (OC) and Progressive Design Builder (PDB) at defined touchpoints. Oversight is provided by the project management offices interface team.

How will customers benefit?

- Increased reliability of the transmission system as identified aging assets are replaced.
- Increased ability to execute customer work

Secondary Capacity Model (SCM)

First Projects Being Executed Through SCM	
PROJECT	PROJECT DESCRIPTION
Allston – Driscoll	21 mile transmission line rebuild
Driscoll – Astoria	21 mile transmission line rebuild
Ostrander Sub	Replace a reactor bank and 17 - 500kV disconnect switches.
Hot Springs Sub	Replace 500kV Reactor bank, 3 breakers, and 12 disconnect switches.
St. Johns Sub	Replace 500/230kV Transformer bank and 17 disconnect switches.
Rocky Reach Sub	Replace one phase of the 345/230kV Transformer bank and 3 disconnect switches.
Ross – St. Johns	Replace insulators and ground wire on the 7 mile double circuit line.
Santiam – Albany	New 230kV bay at Santiam, replace 4 breakers, 16 disconnect switches and a variety of 69kV outdoor equipment
Longhorn Sub	New 500/230kV substation



Transmission Capital: Special Focus

Vancouver Control Center
Facilities



Facilities Capital Program

- Vancouver Control Center (VCC) is a major component of the Facilities Capital in the next several years
- Stakeholder workshops on individual capital projects are not the norm, but BPA recognizes the size and importance of this project makes it different.

Does BPA Need a Control Center?

- Even in RTO/ISO structures, local utilities maintain most TOP responsibilities and some BA responsibilities

NERC Req'ts *	Midwest ISO		Local Utility	
	BA	TOP	BA	TOP
Full	332	37	0	0
Partial	7	2	7	2
None	4	489	332	37
Normal	110	0	114	489

RTO: Regional Transmission Organization
 ISO: Independent System Operator
 TOP: Transmission Operator
 BA: Balancing Authority
 NERC: North American Electric Reliability Corp.
 RAS: Remedial Action Schemes

*Organization Registration and Organization Certification ([nerc.com](http://www.nerc.com))

- Control Center functions are more than just NERC responsibilities, for example:
 - Safe switching and clearance procedures
 - Dispatching crews
 - Monitoring communications network
- Technology needs are significant, for example:
 - Significant RAS infrastructure
- Communications network is designed and built to support Ross Complex
- Legal and policy constraints on contracting out inherently governmental functions

Why is the VCC Needed?

Business Needs: Dittmer Control Center (DCC) is in an end-of-functional life facility that must be upgraded or replaced to preserve existing functionality and mitigate growing operational risks.

#2 MODERNIZE
ASSETS &
SYSTEM OPERATIONS

- Improve resiliency against physical risks (seismic, fire, etc.)

#2 MODERNIZE
ASSETS &
SYSTEM OPERATIONS

- Improve physical security

#2 MODERNIZE
ASSETS &
SYSTEM OPERATIONS

- Support Grid Mod benefits

#2 MODERNIZE
ASSETS &
SYSTEM OPERATIONS

- Meet 20 year space needs for staff/equipment

#1 STRENGTHEN
FINANCIAL HEALTH

- Lower total cost of ownership

#1 STRENGTHEN
FINANCIAL HEALTH

- Lower leased space cost

#1 STRENGTHEN
FINANCIAL HEALTH

- Improve workflow and efficiency

#1 STRENGTHEN
FINANCIAL HEALTH

- Consolidate data centers

#4 MEET TRANSMISSION
CUSTOMER NEEDS
EFFICIENTLY & RESPONSIVELY

What's in it for Customers? Continuity, resiliency and efficiency are essential for Bonneville to meet customer needs and reliably serve the Pacific NW

What if we don't build VCC?

What happens to the capital?

- Dittmer Control Center (DCC) will require major renovations
- Re-deployed for other work, such as replacements and abatement

What are the risks?

- Construction cost escalation (~\$20M / year)
- Continued operational risk acceptance
- Continued maintenance/repair with decreased return value

Stakeholder Engagement

- Design Business Case expected in Sep. 2021
- BPA will hold a stakeholder workshop after the design Business Case is completed, including updated cost estimates

BP-22 Facilities Capital Program

- \$53M reduction to BP-22 capital levels
- Managing costs and improving estimates and certainty of capital investments
- Vancouver Control Center (VCC) investment
 - Shift +1 year for scoping to refine cost and schedule
 - Costs are contained through use of the Capital Investment Acquisition (CIA) process
 - Improved execution through Progressive Design-Build

Facilities Capital

Capital Summary

(\$ thousands)	Final IPR		Average BP-20 Rate Case	Average Initial IPR	Average Final IPR/Proposed IPR2	<i>Delta Average Final IPR less Average Rate Case</i>	<i>Delta Average Final IPR less Average Rate Case</i>
	2022	2023	2020-2021	2022 - 2023	2022 - 2023	<i>Increase (Decrease)</i>	<i>Increase (Decrease)</i>
Asset Category Direct Spending							
Facilities BP-22 Final IPR	74,200	88,200	26,450	81,200	81,200	54,750	-
Facilities BP-22 Proposed IPR2	53,200	56,200	26,450	81,200	54,700	28,250	(26,500)
Delta of Proposed IPR2 - Final IPR	(21,000)	(32,000)	0	0	(26,500)	(26,500)	(26,500)

Vancouver Control Center Capital

BP-22 Final IPR

(\$ thousands)							
Capital spending assumed, Technical Services Building and Vancouver Control Center							
	2022	2023	2024	2025	2026	2027	Total
Facilities	37,300	74,600	74,600	-	-	-	186,500
Transmission	-	-	-	148,600	144,000	70,000	362,600
IT	-	-	-	5,000	-	-	5,000
Total Vancouver Control Center	37,300	74,600	74,600	153,600	144,000	70,000	554,100

BP-22 Proposed IPR2

(\$ thousands)							
Capital spending assumed, Technical Services Building and Vancouver Control Center							
	2022	2023	2024	2025	2026	2027	Total
Facilities	12,200	42,000	78,000	55,000	-	-	187,200
Transmission	-	-	-	148,600	144,000	70,000	362,600
IT	-	-	-	5,000	-	-	5,000
Total Vancouver Control Center	12,200	42,000	78,000	208,600	144,000	70,000	554,800

VCC Delta Proposed IPR2 to Final IPR	(22,500)	(26,400)	3,400	55,000	0	0	7,500
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VCC Business Case Development



Capital Cost Containment

- Capital Investment Acquisition process helps limit exposure
- Stage Gate 0 approved limited capital for feasibility scoping
- SG3 Business Case would include design costs only
- SG4 Business Case would include balance of construction and activation costs

August 2019 – September 2021 (SG0-SG3) – Key Deliverables

- Alternatives selected
- Preliminary engineering valid
- Requirements finalized
- Concept design completed
- Cost estimate -30% to +50%
- NEPA environmental review initiated
- Primary Alternative selected
- Owners Consultant/Progressive Design Builder On boarded
- Business Case Approval for Design *
- Project Schedule Approval

September 2021 – July 2023 SG3 – Key Deliverables

- Design Completed
- Activation plan completed
- Guaranteed Maximum Price determined
- Project Schedule updated if needed
- Cost estimates -20% to +30%
- Business Case Approval for Construction

July 2023 – September 2027 SG4 – Key Deliverables

- Site Preparation
- Cost estimates -15% to +20%
- Project Schedule Updated if needed
- VCC Building Completed
- Technical Equipment installation begins

* **Take Away:** One alternative to be selected via Business Case in Sep. 2021 at Stage Gate 3 (SG3) for design development

Vancouver Control Center

Next Steps

- Complete design Business Case (Sep. 2021), including cost refinement
- Future VCC customer workshop to be scheduled
- Explore all financing options, including lease financing
- Continue to refine future capital projections, including sustain vs. expand, to deliver long-term value



Transmission Capital: Budget



Historical & Future Capital Spend

Program	Actuals					Q1 Forecast	Rate Case		Future Fiscal Years	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capital Expand (CapEx)										
Main Grid	\$20,365	\$11,135	\$14,906	\$5,588	\$3,741	\$2,095	\$10,000	\$5,000	\$10,000	\$12,000
PFA	\$2,427	\$5,197	\$32,907	\$57,201	\$15,626	\$17,340	\$45,000	\$50,000	\$40,000	\$30,000
Area and Customer service	\$79,252	\$29,688	\$35,307	\$56,222	\$21,164	\$67,325	\$40,000	\$60,000	\$50,000	\$40,000
Upgrades & Additions	\$99,959	\$29,326	\$21,383	\$22,807	\$36,779	\$37,500	\$50,000	\$50,000	\$50,000	\$64,000
Total Capital Expand	\$202,003	\$75,346	\$104,502	\$141,818	\$77,310	\$124,260	\$145,000	\$165,000	\$150,000	\$146,000
Capital Sustain										
Steel Lines	\$10,144	\$13,793	\$15,259	\$13,242	\$22,880	\$10,000	\$24,000	\$24,000	\$49,000	\$51,000
Wood Lines	\$36,550	\$46,459	\$27,445	\$26,893	\$20,989	\$20,000	\$33,000	\$33,000	\$58,000	\$60,000
PSC & System Telecomm	\$31,309	\$32,054	\$23,412	\$18,854	\$12,570	\$29,550	\$53,000	\$53,000	\$57,000	\$57,000
SPC	\$25,995	\$17,341	\$14,143	\$12,125	\$8,115	\$20,700	\$21,000	\$21,000	\$25,000	\$26,000
Subs AC	\$48,606	\$62,117	\$50,785	\$38,968	\$39,670	\$41,700	\$44,000	\$44,000	\$49,000	\$49,000
Subs DC	\$79	\$433	\$5,415	\$8,804	\$16,389	\$8,200	\$3,000	\$3,000	\$3,000	\$3,000
Other*	\$26,519	\$28,325	\$23,224	\$20,657	\$24,448	\$28,050	\$34,000	\$34,000	\$34,000	\$172,600
Total Sustain	\$179,202	\$200,521	\$159,682	\$139,543	\$145,062	\$158,200	\$212,000	\$212,000	\$275,000	\$418,600
TOTAL CAPITAL	\$381,205	\$275,867	\$264,184	\$281,361	\$222,372	\$282,460	\$357,000	\$377,000	\$425,000	\$564,600
Rate Case Total	\$437,242	\$387,444	\$333,044	\$326,044	\$362,524	\$354,591				

Q1 Forecast - Rate Case (72,131,071)

*Does not include Non-T Asset Category Totals

**Direct dollars only (not fully loaded)

Strategic Capital & Financial Health Engagement

- BPA has made progress on its Financial Plan goals and continues to identify areas for improvement.
- Key areas of improvement:
 - Borrowing Authority: BPA is not on track to meet our goal of maintaining \$1.5b of available borrowing authority. The forecast shows that in 2024, BPA falls short of this objective and needs to take action to achieve this goal.
 - Debt Outstanding: BPA's debt to asset ratio has improved slightly, however Transmission has and continues to be a net borrower, resulting in growing debt outstanding, large fixed costs and reduced financial flexibility.

Strategic Capital & Financial Health Engagement

BPA is committed to engaging more deeply on these issues and related customer concerns. The following forums will be used:

- QBR technical workshops: BPA established these workshops to routinely brief the region on our key financial and operational performance metrics.
 - We recognize the need for a more detailed and routine update on the various Transmission capital program cost and execution metrics and will be including these in upcoming QBR meetings this year.
- Post BP-22 Workshops: Following the BP-22 rate case, BPA will host a series of public workshops to engage with customers on the financial health objectives laid out in the Financial Plan.
 - The goals of the Financial Plan are still valid. The intent is to reassess how we achieve those goals, discuss additional metrics and policies that may be needed to bolster our financial health, and formulate a glide path toward sustainable capital financing.
 - BPA recognizes the critical dependency between our financial health objectives, rates and the planning and execution of the Transmission capital program. Our intention for these workshops is to ensure a comprehensive review and discussion of these interrelated issues to formulate a long-term approach.



Columbia River System Operations Environment Impact Statement



CRSO EIS

- In the September 30, 2020 IPR closeout letter, Bonneville acknowledged that financial impacts of the Columbia River System Operations (CRSO) Environmental Impact Statement and associated ESA consultations may need to be addressed in a second IPR.
- In the CRSO EIS ROD, Bonneville indicated that it would likely be able to implement the actions it agreed to fund in the Selected Alternative within Bonneville's cost structure or through cost management actions across Bonneville.
- The CRSO EIS ROD also provided a comprehensive list of all mitigation and non-operational conservation measures for ESA-listed species from the CRSO EIS and associated ESA consultations.
- BPA has reviewed its obligations in the CRSO EIS ROD for the Selected Alternative. For those actions that Bonneville expects to fund through its Fish and Wildlife (F&W) Program in FY22 and FY23, Bonneville's assessment is that the F&W budget established in the September 2020 IPR will be sufficient to cover the costs of the actions. Flexibility within the F&W Program allows budgets to be shaped annually to ensure that priority-funding needs are met.



Columbia River Fish Mitigation Studies



CRFM Studies – Proposed IPR Expense

- In the BP-22 Initial Proposal BPA proposed expensing Corps of Engineers Columbia River Fish Mitigation (CRFM) studies instead of making them a regulatory asset.
 - Note that as this is a rates proposal, the BP-22 dataset included the CRFM studies whereas the IPR dataset did not
- If the proposal is accepted, CRFM study costs starting in FY22 would be classified as an IPR expense and BPA will update our IPR dataset to include the costs.
- Current IP CRFM studies amounts:
 - FY22: \$7.3M
 - FY23: \$3.6M



IPR2 Next steps



Process Overview

March 3 – March 24

- Opportunity to comment on IPR2 topics

Early – Mid April

- Post responses to IPR2 questions and comments

April 30

- IPR2 Closeout report published with final spending levels

Submitting Comments

- Comment period open March 3 – March 24
- Comments can be submitted:
 - Email BPAFinance@bpa.gov
 - Online at www.bpa.gov/comment
 - By mail to BPA, P.O. Box 14428, Portland, OR 97293



Thank you

Questions?





APPENDIX



Prior Presentation on Debt Management

- BPA outlined concerns around borrowing authority, debt management and access to capital issues at a public workshop in September 2020.
- Those materials can be found on bpa.gov, at the following [link](#), starting at page 49 of the package.

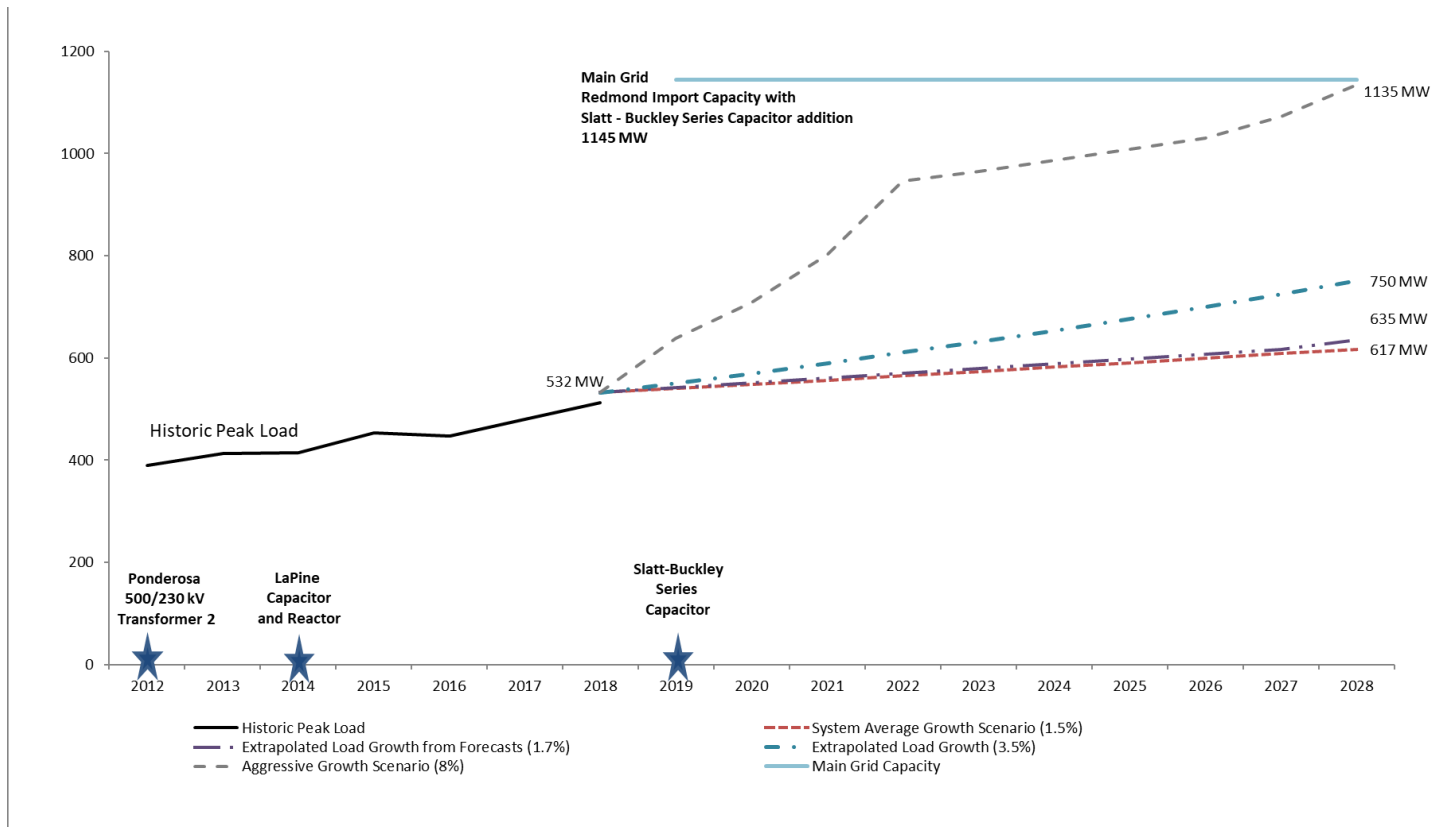
Portfolio Prioritization Analysis

- Evaluate at Portfolio level for Benefit/Total Economic Cost, Budget Level Alignment, and Resource Capability
 - Generate Asset Plan
 - 2 Year Cycle
 - Update Each Year (Rolling Methodology)
- Portfolio Evaluation Categories
 - Expand
 - Main Grid
 - Projects Funded In Advance
 - Area & Customer Service
 - Upgrades/Additions
 - Sustain
 - Power System Control (PSC) – 4 Projects
 - System Power Control (SPC) – 8 Projects
 - Subs AC – 11 Projects
 - Subs DC – 2 Projects
 - Lines – Wood/Steel – 17 Projects
 - Telecom – 9 Projects

Economic Development and Reliability

- BPAT has made significant investments in its Transmission System in order to support the commercial needs of customers.
 - Large Generation Interconnection
 - New Large Load Interconnections (e.g. Quenett Creek, Morrow Flat)
 - Upgrades driven by Transmission Requests (i.e. Cluster Study)
- Balance between customer-expand versus sustain replacement projects
 - Reliability impacts
 - Service quality to existing customers
 - Prioritizing resources for larger customer-driven projects balanced with smaller projects

Case Study: Central Oregon



Example of Playbook – Customer Development / Ownership

Goldendale Substation - 115/69kV Xfmr bank & brkr

- BPA substation is completely depreciated and at end of life
- Estimated rebuild cost: \$10M
- Alternative to BPA rebuild
 - Customer utility Klickitat PUD could replace the function in its nearby E.E. Clouse Substation for approximately \$4M
 - Con: BPA would need to provide expense funding to Klickitat
 - Pro: Eliminates future replacement obligation and avoid \$25K/year O&M costs.
- Currently negotiating lease agreement