

Program Exploration

Transmission Services

Agenda

- Introduction
- Planning and Asset Management
- Engineering and Technical Services, and Field Services
- Operational Systems and Commercial Efforts
- A Changing Industry

Transmission Lifecycle

- Invest in greater operational situational awareness or better state awareness
- Leverage technology

System Operations

Commercial



- Continually develop and expand desired products to customers
- Extract full use and value of installed infrastructure

Field Services

Planning

- Regional point of view
- Consider and integrate alternatives in planning process
- Balance risk with investing to save

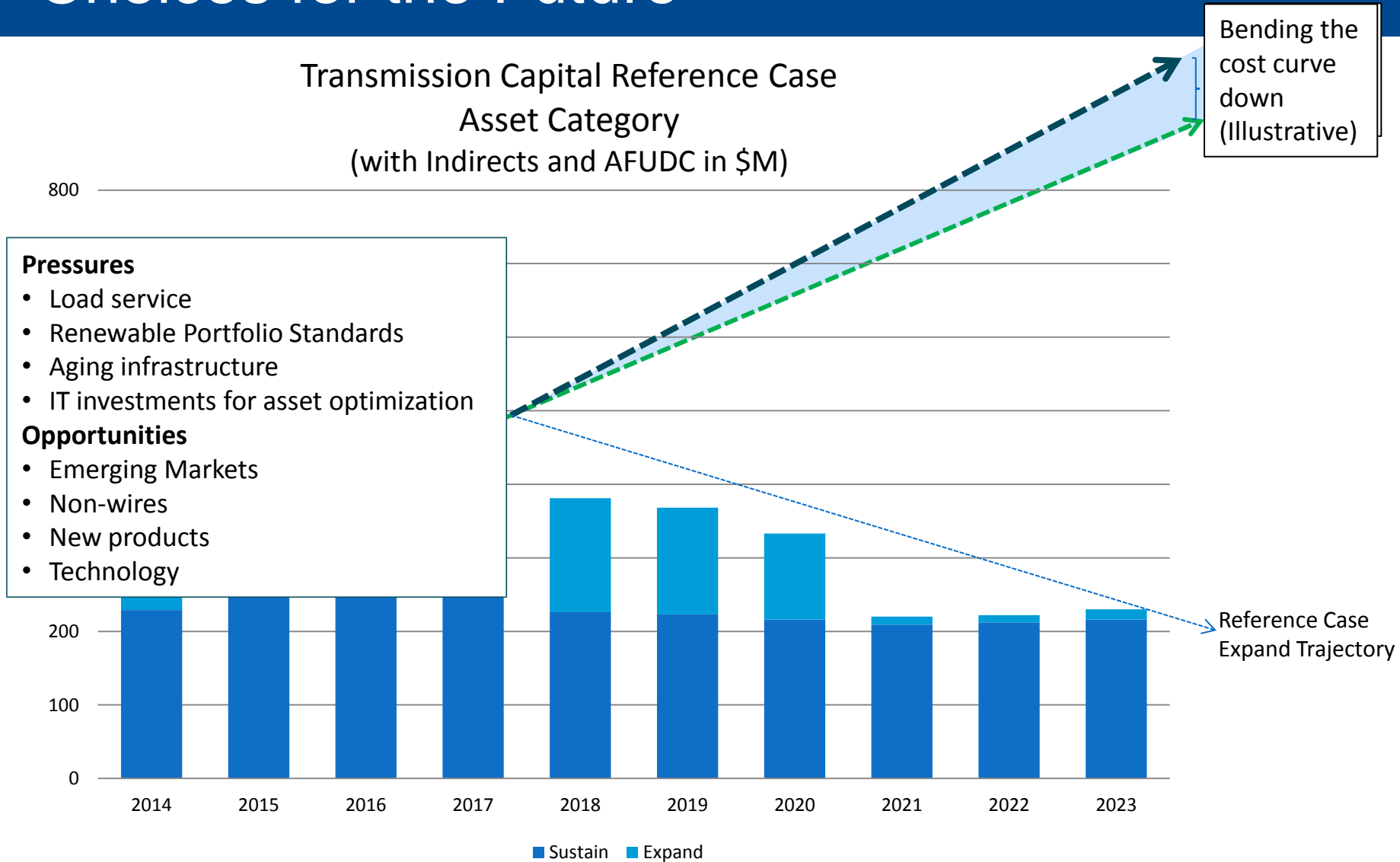
Engineering

- Improved processes that achieve and deliver certainty
- Safety by Design

- Continue to install, maintain and troubleshoot Tx grid
- Invest in continuous improvements in processes and procedures, as well as talent skilling and training

Choices for the Future

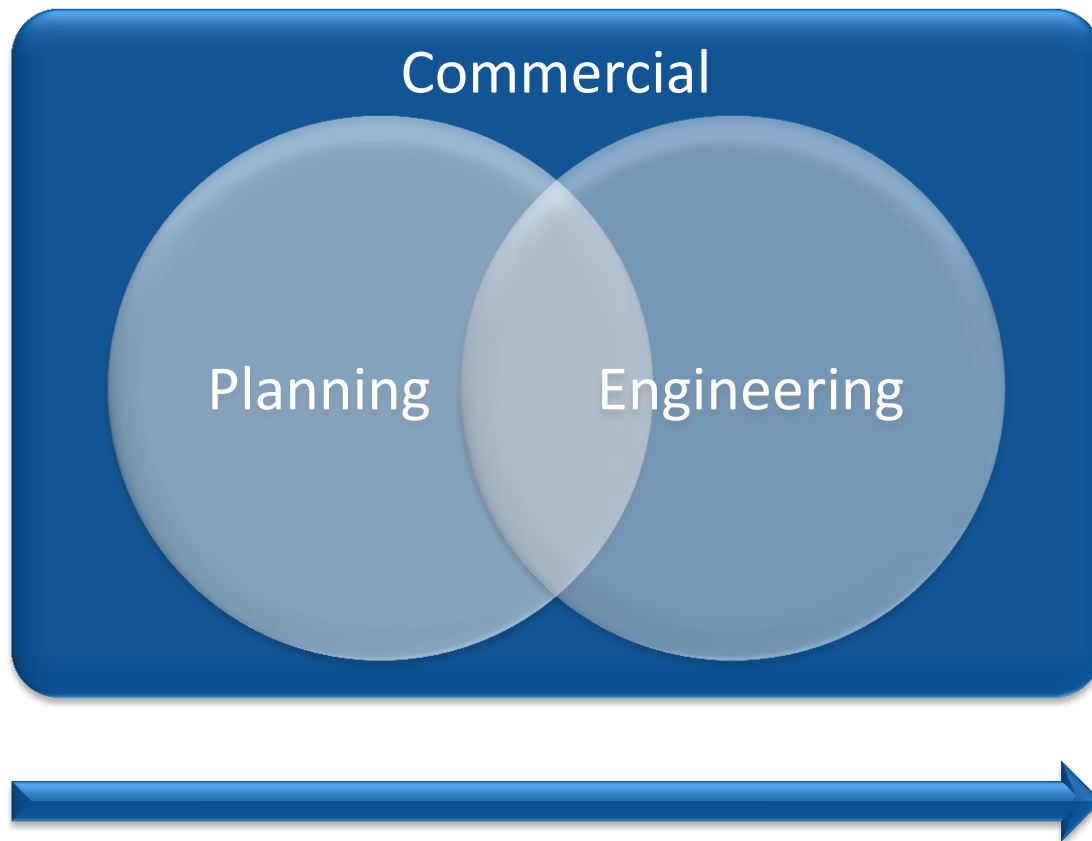
Transmission Capital Reference Case
 Asset Category
 (with Indirects and AFUDC in \$M)



Transmission Services

PLANNING AND ASSET MANAGEMENT

Connections

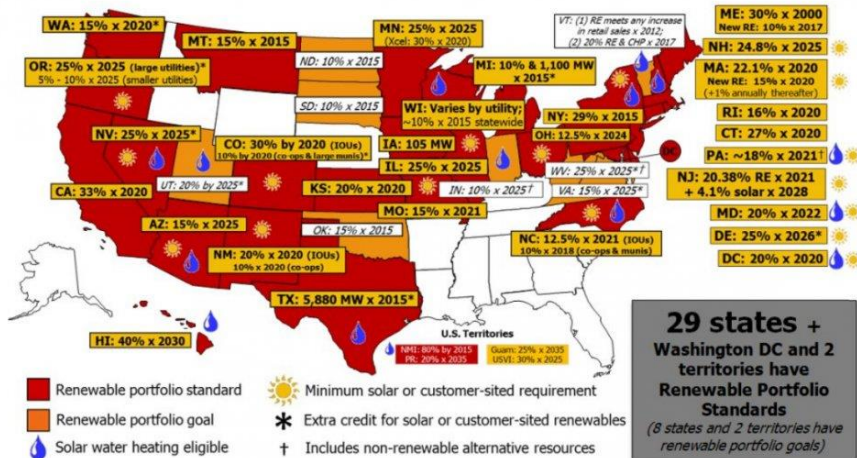


A Changing Industry

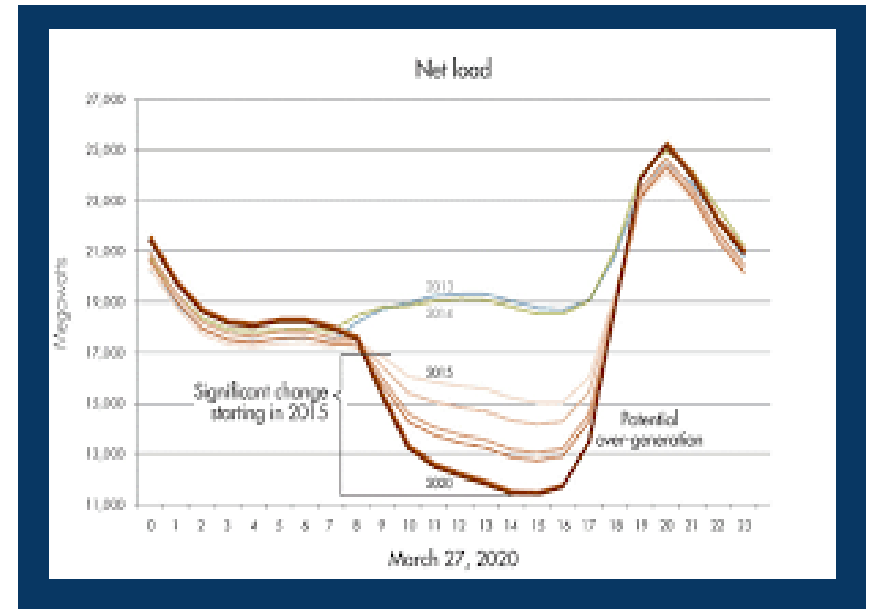
- Key business drivers
 - Forecasted Demand
 - Impacts of Energy Markets
 - Generation Choices
 - National, Regional, and Local Policies



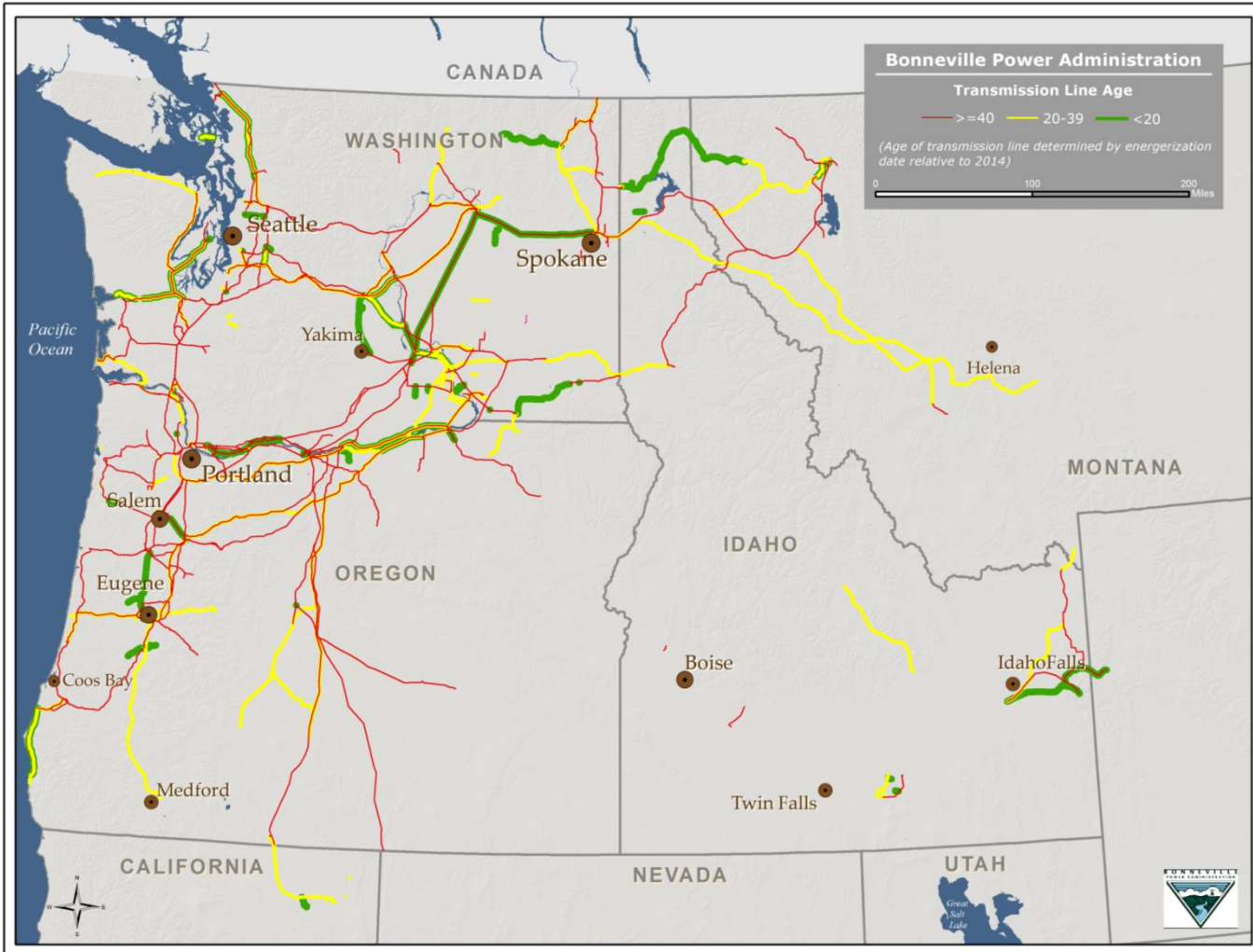
Exhibit 20
State Renewable Portfolio Standards



Source: Database of State Incentives for Renewables and Efficiency (DSIRE) RPS Policies summary map, March 2013



Our Infrastructure is Aging

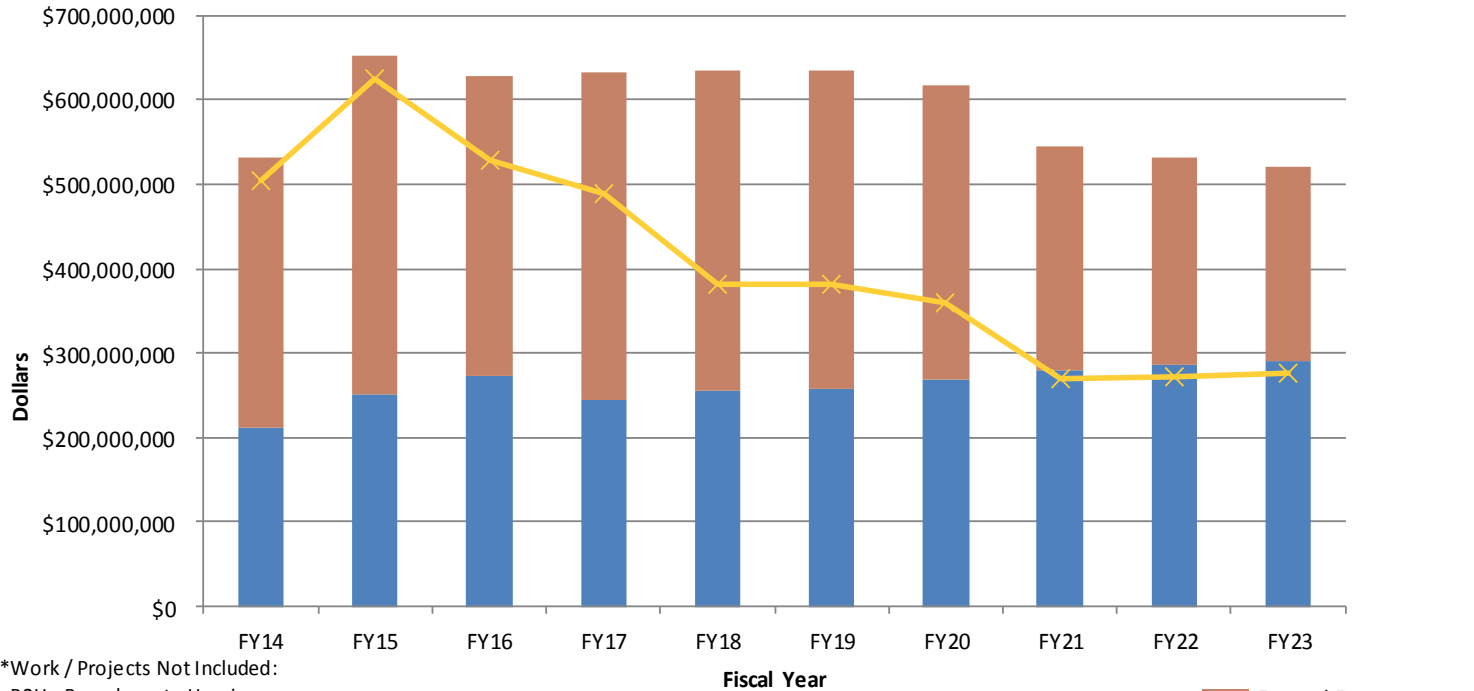


Greater than 50% of the facilities were constructed prior to 1962.

Potential Transmission Investment Levels

Transmission Sustain and Expand 2014 Forecast

Includes Capital Indirects

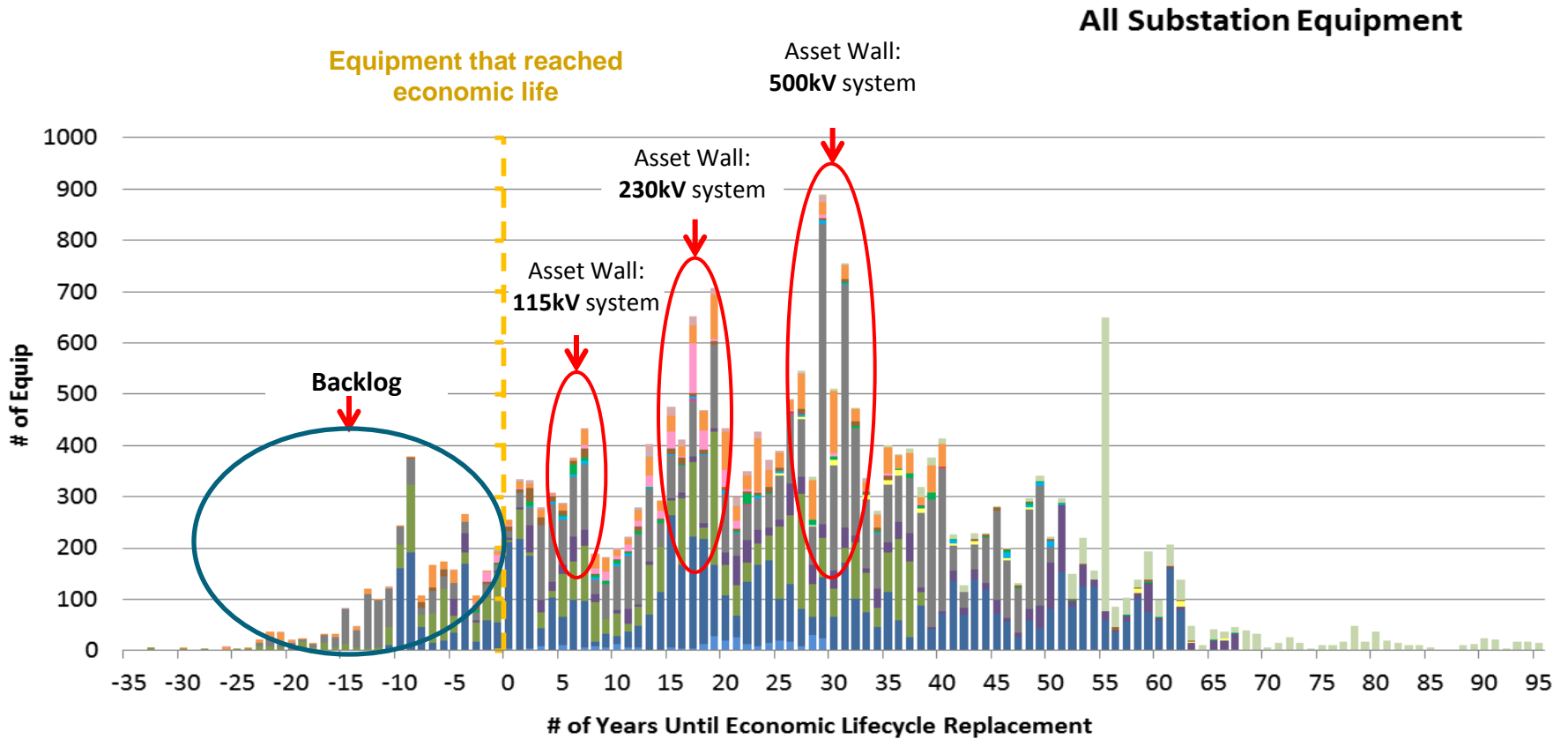


*Work / Projects Not Included:

- B2H - Boardman to Hemingway
- M2W - Montana to Washington - CUP West
- CUP East
- NOS 2013
- Gaelectric RAS need for M2W shift
- All PFIA projects

- Expand Forecast
- Core Sustain Forecast
- ✕ Affordability CapTotal

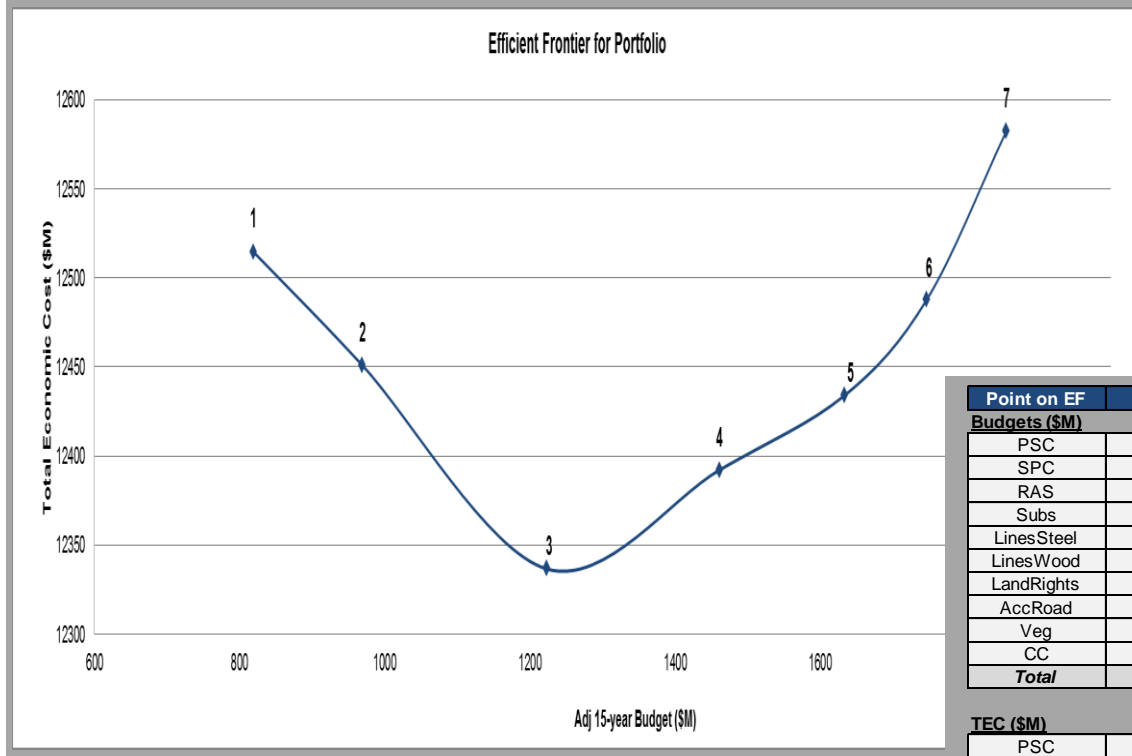
Situation: Hitting the Asset Walls



Substation AC is one of the largest transmission programs at BPA with some of the most critical equipment on the system. It currently has a **\$700M+** backlog.

Improvements in Sustain Program Planning:

Prioritizing Sustain Programs based on Total Economic Cost

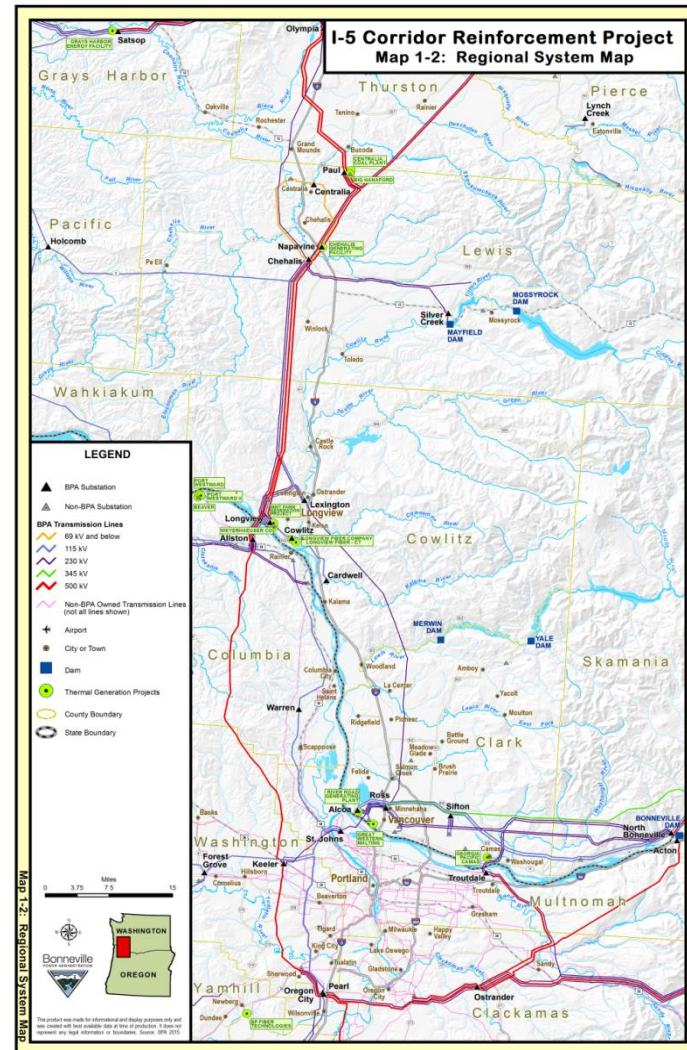


Illustrative

Point on EF	1	2	3	4	5	6	7
Budgets (\$M)							
PSC	107	237	237	245	285	337	410
SPC	60	69	200	238	249	261	272
RAS	0	0	0	0	0	0	0
Subs	316	325	420	430	494	494	494
LinesSteel	49	49	49	83	90	93	97
LinesWood	218	219	243	304	332	365	378
LandRights	0	0	0	0	0	0	0
AccRoad	69	69	73	161	183	197	206
Veg	0	0	0	0	0	0	0
CC	0	0	0	0	0	0	0
Total	819	969	1223	1461	1633	1747	1856
TEC (\$M)							
PSC	1819	1760	1760	1760	1765	1788	1853
SPC	1136	1134	1065	1065	1067	1072	1082
RAS							
Subs	6259	6257	6211	6212	6224	6224	6224
LinesSteel	1317	1317	1317	1309	1309	1311	1314
LinesWood	1673	1672	1670	1668	1672	1686	1695
LandRights							
AccRoad	311	311	314	379	396	407	415
Veg							
CC							
Total	12515	12451	12337	12392	12434	12488	12582

Expand Program Drivers

Example:
South of Allston system requirements



What are the gaps the Transmission Asset Strategy is focused on closing?

- Optimize lifecycle of assets
 - Improve the implementation of critical capital replacements
 - Reduce total economic costs
 - ✓ *Get the most life out of the asset while managing risks*
- Make process improvements
 - Integrate sustain program asset strategies
 - Prioritize replacements to meet budget limitations
 - Access to higher quality asset data
 - Implement portfolio management tools
 - ✓ *Provide efficiency in the way we do our work*

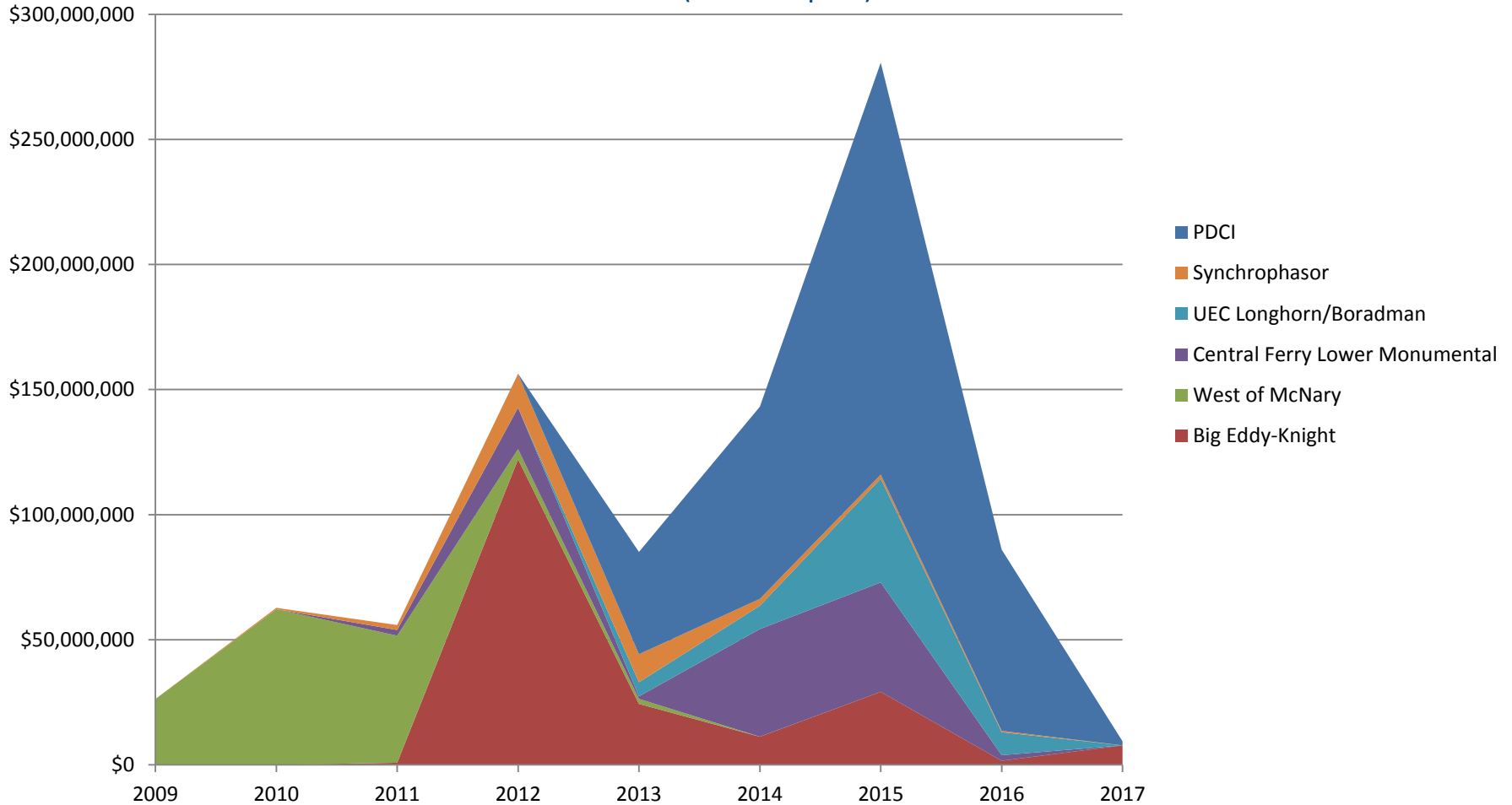


Transmission Services

ENGINEERING AND TECHNICAL FIELD SERVICES

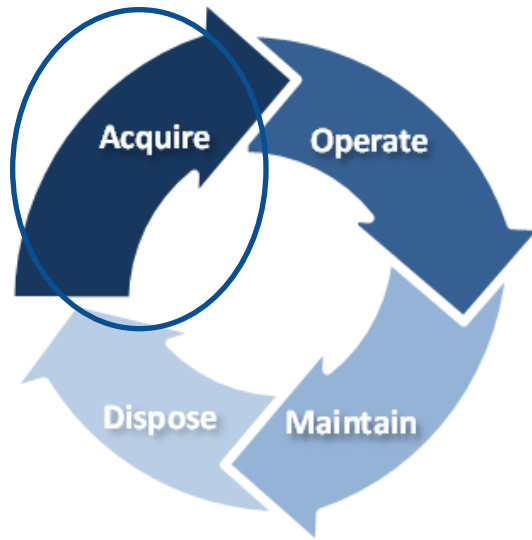
Recent Major Transmission Expand Projects

Actual Project Costs
(Direct Capital)



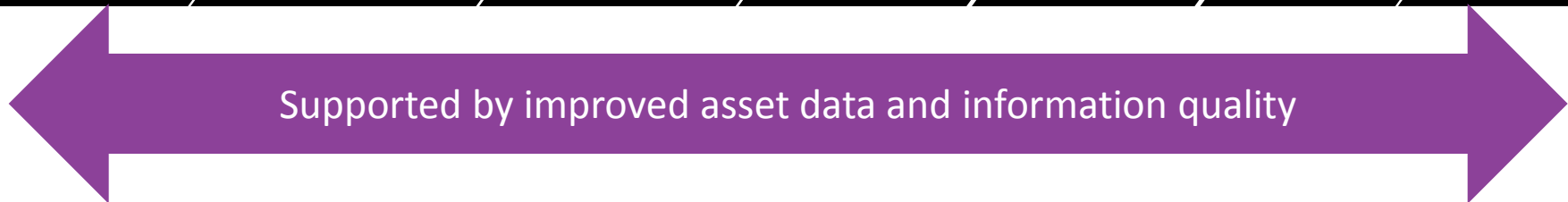
Transmission Improvement Efforts

“Asset Management and Program Delivery” Initiative

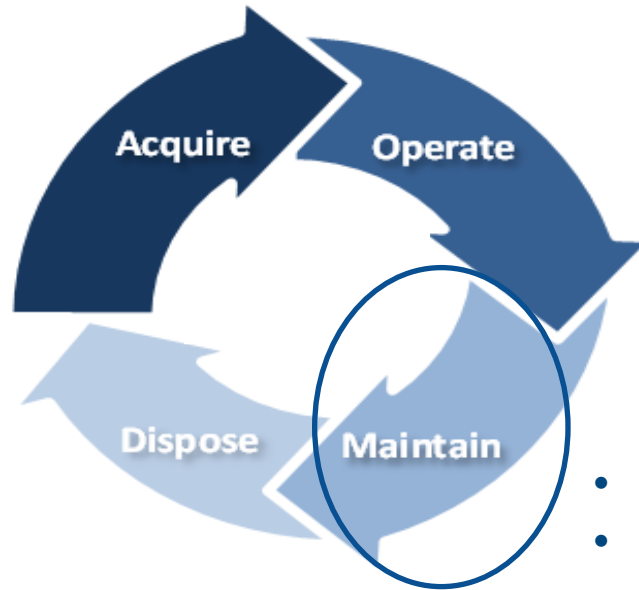


Focusing on improving capabilities in the Acquire phase of the asset lifecycle and on Transmission asset information

Revised Asset Acquisition Lifecycle



Field Services



- Troubleshooting
- Preventative maintenance
- Event response



...Keeping the lights on while controlling costs

Transmission Services

SYSTEM OPERATIONS COMMERCIAL EFFORTS

System Operations and Commercial Efforts

- **System Operations – *moving from reactive to proactive***
 - Investment in new technology to improve quality of service
 - Remedial action schemes, situational awareness tools, flow forecasting abilities, system operating limits (SOL) on demand, etc.
 - **Regulatory requirements**
 - Continued and increasing focus on cyber and physical security in addition to reliability areas
- **Commercial Efforts – *extracting full use and value from the wires***
 - Evolving products and services to meet customer needs
 - Investing in technology to provide better visibility of system use
 - Searching for ways to maximize use of assets without compromising reliability

Transmission Services

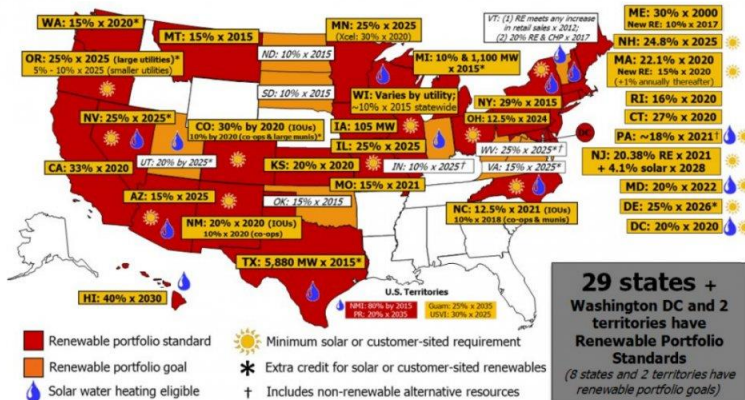
A CHANGING INDUSTRY AND CHOICES

A Changing Industry

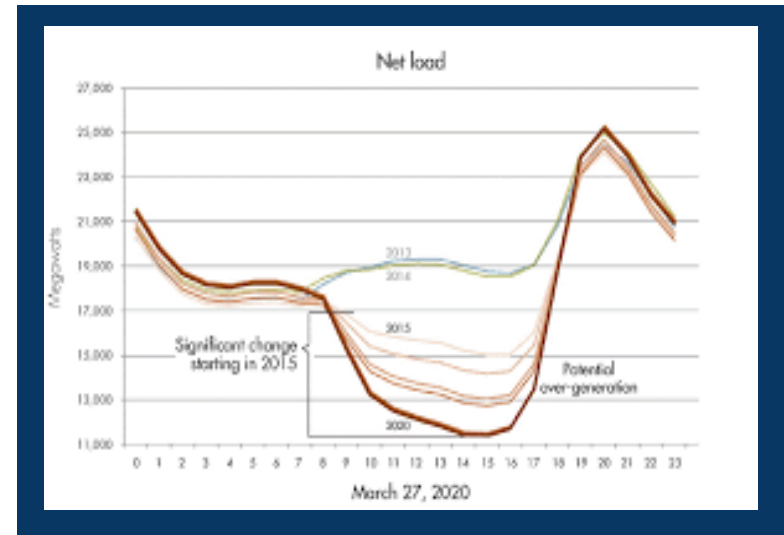
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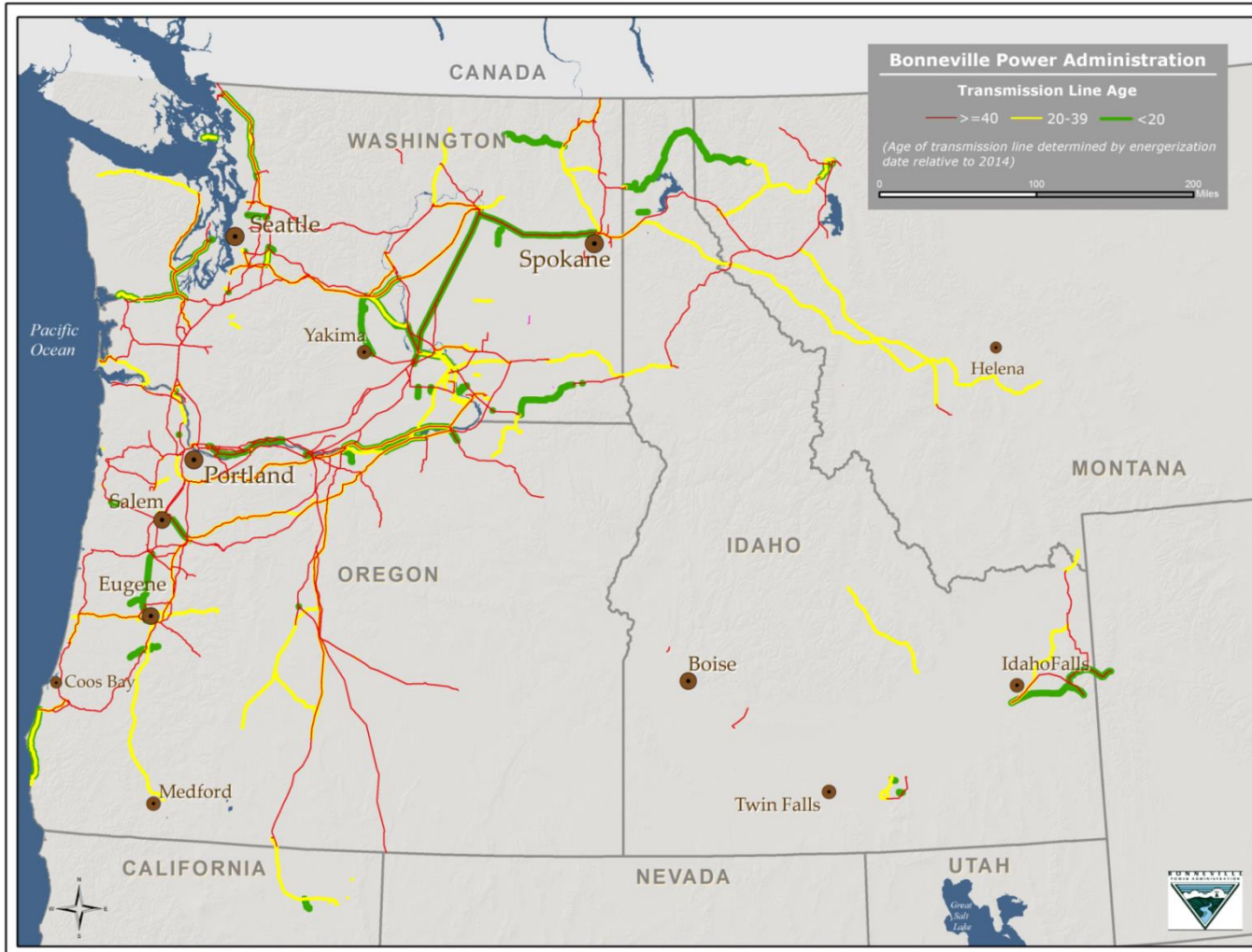
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A Changing Industry



Today's Facts:

***50% of Transmission's revenue requirement is for capital related cost**

***There are over 9000MW of requests in the BPA queue for transmission service**

***BPA Transmission contracts with roll-over rights are only a minimum of 5 years in commitment**

***BPA sells unlimited hourly firm and non-firm on its network**

***For January 2016, BPA's e-tag volume was 152K**

Choices Towards the Future

Today's Facts:

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Implications:

*The more debt that is incurred the less nimble the rate can be to react to changes in the industry

*Getting in the queue is easy but may not reflect the long term commitment to pay for expansion

*Short term requests on the network are given the same status as long term when system conditions warrant cuts

*BPA's transmission system is in the middle of regional transactions

Choices:

*Look at different options for asset expansion (non wires)

*Balance the risk of stranded assets with different funding mechanisms

*Develop more differentiated products, services and rate design

*Invest in situational awareness tools to minimize need for unnecessary margins – maximize system use

Financial Disclosure

This information has been made publicly available by BPA on February 12, 2016 and contains information not reported in BPA's financial statements.