Cross-Tie Transmission Line

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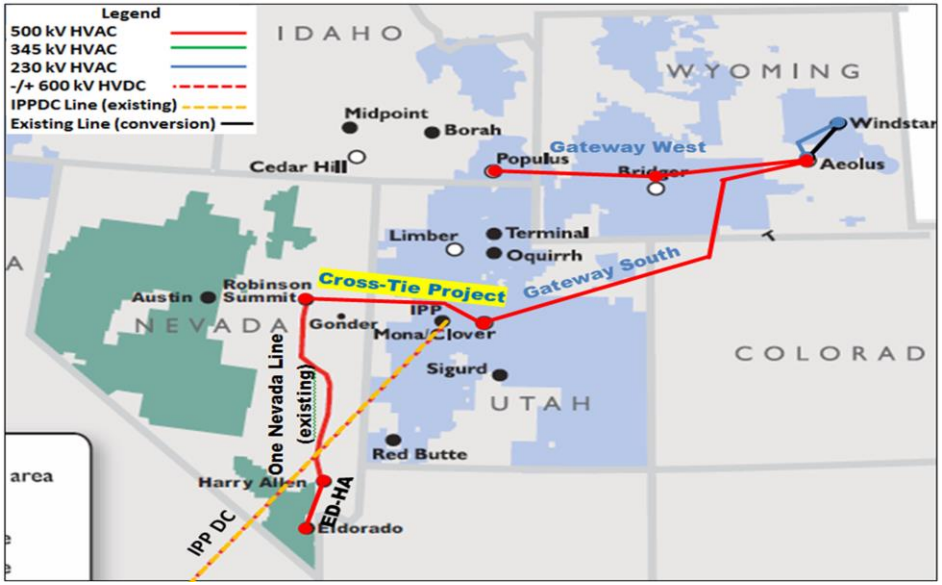
Overview

- 213 mile 500-kV transmission line between PacifiCorp's proposed Clover 500 kV substation with NV Energy's Robinson Summit 500 kV substation.

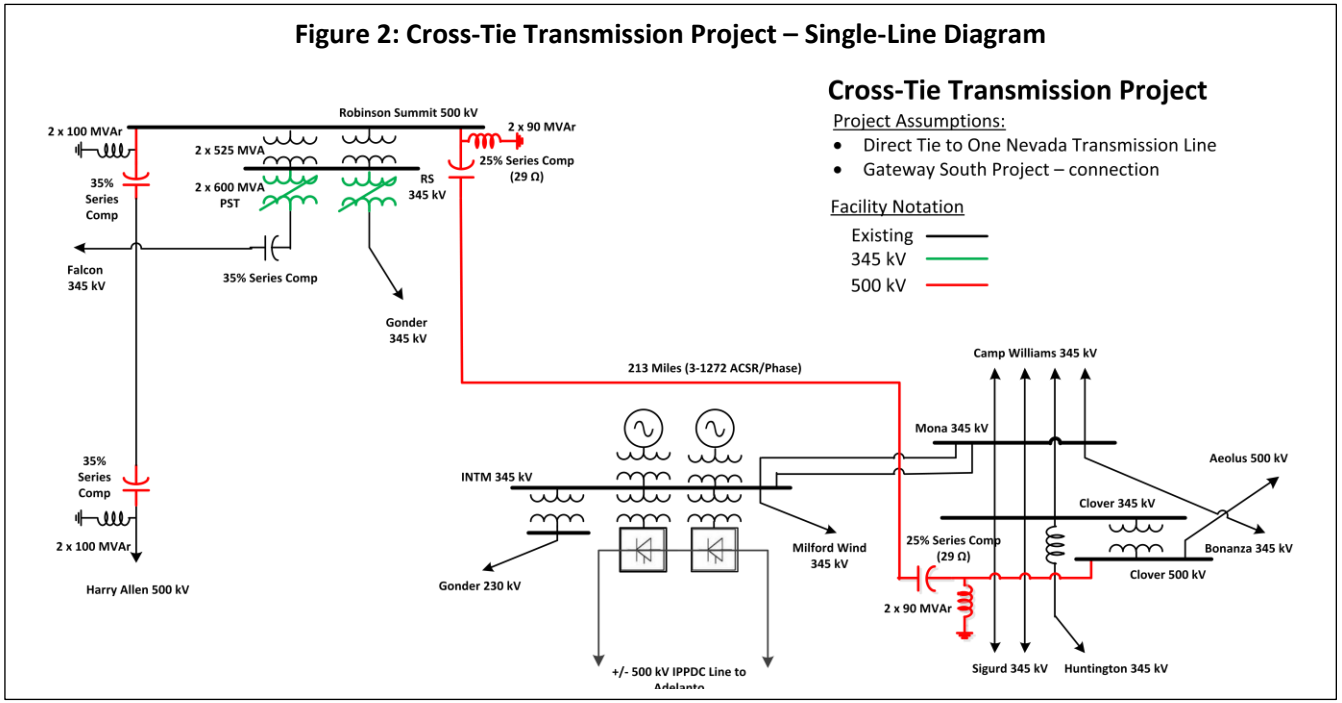
Figure 1 Cross-Tie Transmission Project Overview



- Anticipated Project rating: 1500 MW
- In Service Date: Q4 2024

System Elements and One-line

Figure 2: Cross-Tie Transmission Project – Single-Line Diagram



- 50% Series Compensated; 25% at each end
- Shunt Reactors at each end
- Existing System Upgrades
  - 2 X 600 MVA Phase Shifting Transformers at Robinson Summit.
  - Series Capacitors at either end of One Nevada Line.

Cross-Tie Regional Benefits

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- Macro Benefits: Cross-Tie is a network element that provides a portfolio of benefits to the regional transmission system
  - Immediate policy, reliability and economic benefits with Cross-Tie connection to existing system (Gateway Central to the east and One Nevada to the west) providing over 700MW of capacity
  - Benefits further enhanced to over 1500MW of capacity when paired with either Gateway South or portions of Gateway West in the future
  - Cross-Tie will increase transmission capacity between the PacifiCorp, NV Energy, CAISO and Idaho Power Balancing Areas
  - AC solution that reduces EHV load and resource interconnection costs and provides flexibility to move wind and solar (including California overproduction) to diverse load centers throughout the West
- Policy Benefits: Facilitates development of renewables to meet RPS and GHG goals of western states – enables lower cost way to meet policy objectives by tapping the best resources in the West and sharing those resources across the region

RPS	
California	50% RPS by 2030
Oregon	50% RPS by 2040
Nevada	25% RPS by 2025
Utah*	20% RPS by 2025
Washington	15% RPS by 2020
Arizona	15% RPS by 2025

GHG	
California	40% below 1990 levels by 2030
	80% below 1990 levels by 2050
Oregon	75% below 1990 levels by 2050
Washington	50% below 1990 levels by 2050

*Voluntary target

Cross-Tie Regional Benefits (cont.)

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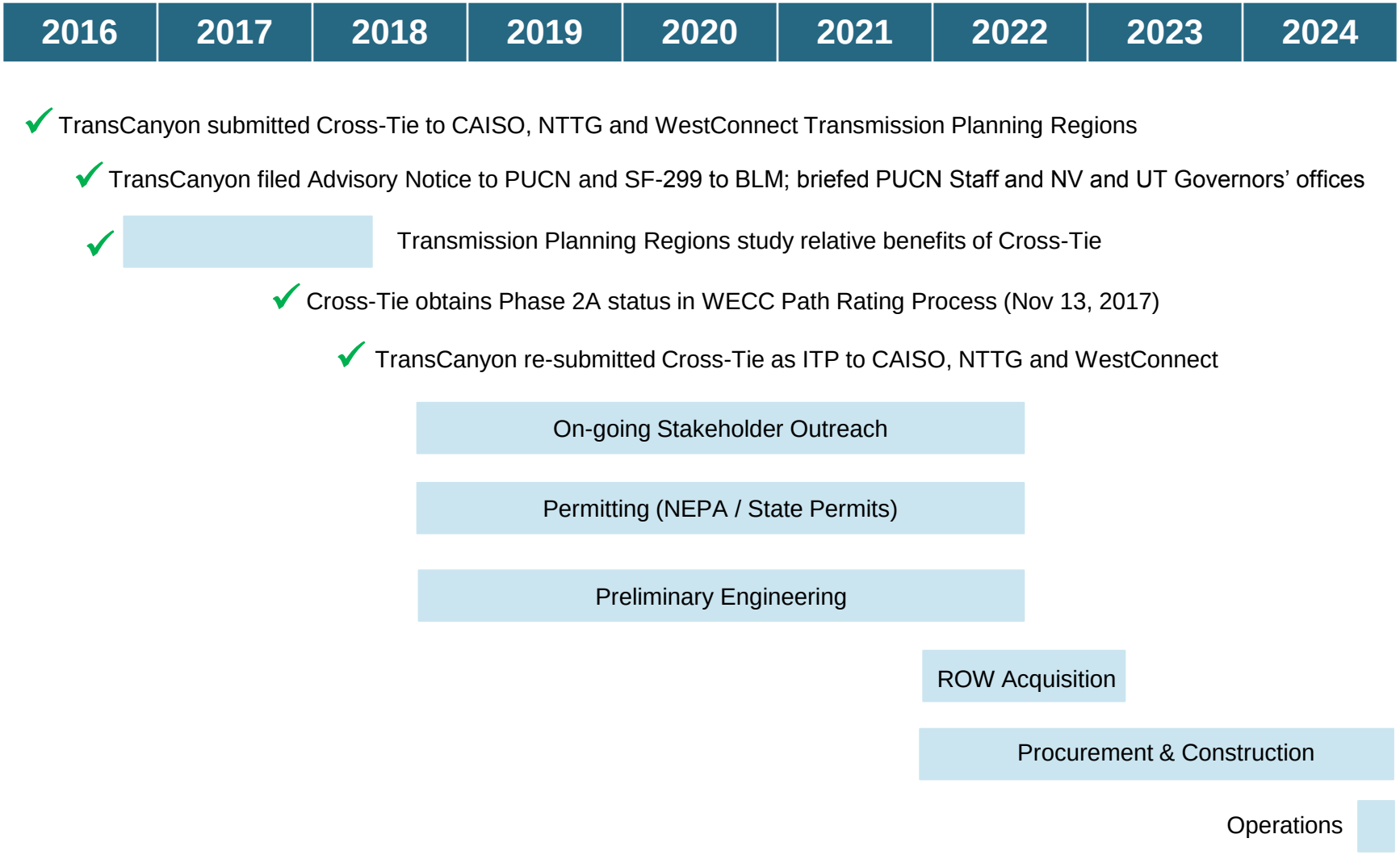
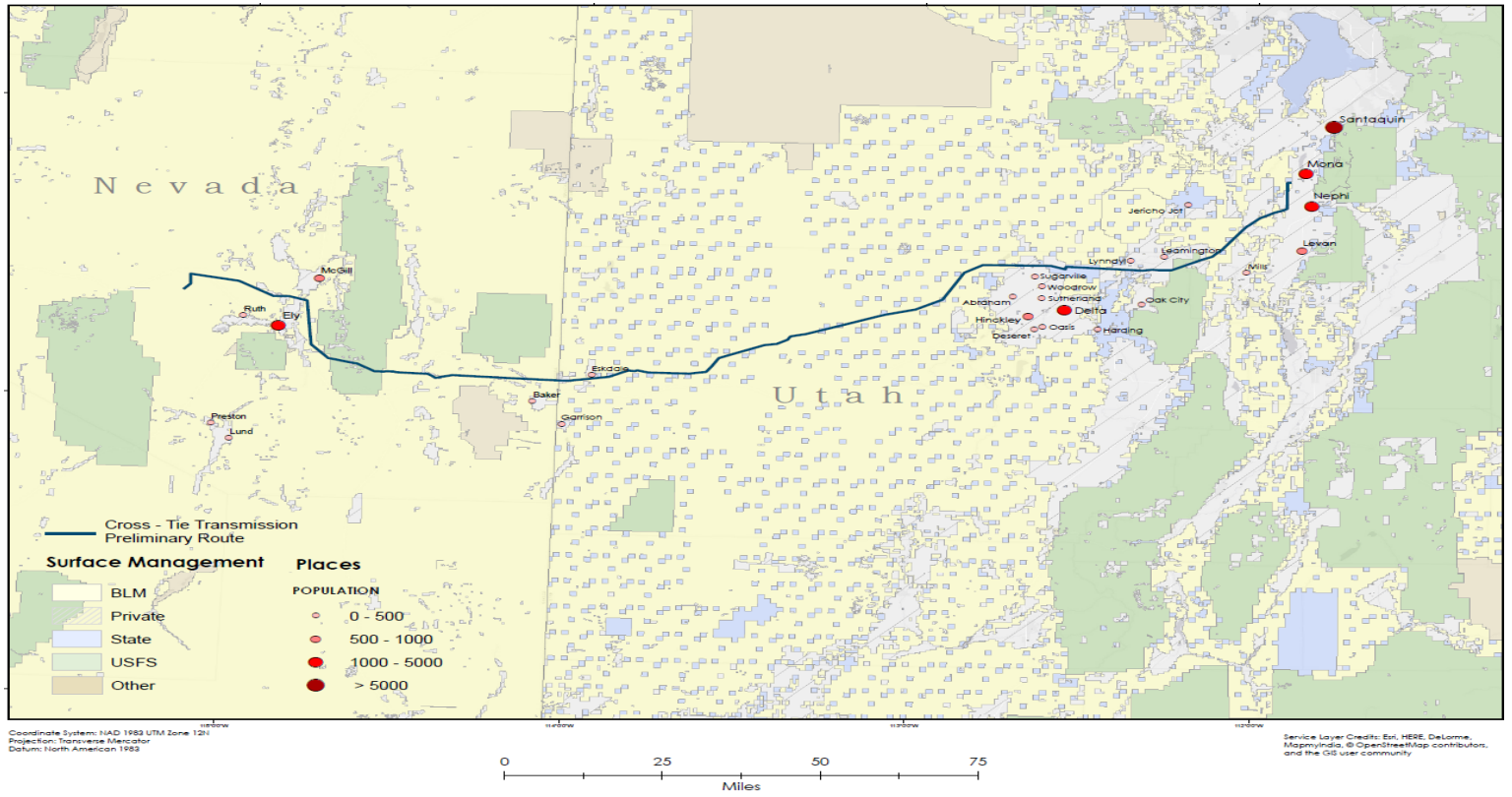
- Reliability Benefits:
  - Low-cost investment to leverage existing system and increase regional reliability benefits to the Western Interconnection
  - Improves system reliability during system disturbances and forced outages (weather, fire, natural disasters)
- Economic Benefits:
  - Regional economic benefits from more efficient resource procurement and dispatch
  - Relieves congestion on the California-Oregon Intertie by providing flow relief and alternate transmission paths
  - Substantially Interconnects Berkshire Hathaway Energy's two largest load and generation centers (BAs) in the west (PacifiCorp East and NV Energy)
  - EIM participants enjoy benefits of more transmission capacity to bid resources into neighboring markets
    - Current participants include CAISO, PacifiCorp, NV Energy, Arizona Public Service, Puget Sound Energy, Portland General Electric, Idaho Power and Powerex
    - Planned participants include the Balancing Area of Northern California/SMUD (2019), Seattle City Light (2020) Los Angeles Department of Water and Power (2020) and Salt River Project (2020)
  - Benefits increase further with expanded RTO

Cross-Tie Project Timeline



Preliminary Route Map



- Development is anticipated within existing BLM utility corridors.
- WECC Data Viewer - minimal to moderate environmental sensitivities or constraints expected.

Permitting Activities

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- Filed Advisory Notice to PUCN (June 13, 2016)
- Submitted SF-299 to BLM (June 29, 2016)
- Conducted Regulatory and Agency Briefings
  - PUCN Staff (June 10, 2016)
  - NV Governors' office (June 10, 2016)
  - UT Governors' office (August 12, 2016)
  - Multiple NGO webinar briefing at TWS office in Denver (August 11, 2017)
- The BLM has begun organizing an Interdisciplinary Team and requested assignment of a BLM National Project Manager
- TransCanyon provided comments in support of Cross-Tie project to the BLM for the Region 2 & 3 review of the Section 368 West-Wide Energy Corridors
- General support of preferred route

Planning Cost Estimate

- Black & Veatch Transmission and Substation Cost Totals

Project Cost Results	Per Mile	Total
Clover - Robinson Summit Line	$ 2,319,250.45	$ 461,530,838.79
ROW Cost	$ 19,964.14	$ 3,972,864.00
Clover Substation	N/A	$ 10,959,685.80
Robinson Summit*	N/A	$ 28,930,423.20
Substation Adjustments**	N/A	$ 62,000,000.00
	N/A	$ -
AFUDC/Overhead Cost	$ 501,215.01	$ 99,741,787.84
All Costs	**$ 2,840,429.60**	**$ 667,135,599.63**

Adjustments to TEPPC model data

	QTY	Rate	Total
Provide 345kV 600MVA PST @ Robinson Summit	2	$ 20,000,000.00	$ 40,000,000.00
Allowance for construction modifications at Robinson Summit	1	$ 10,000,000.00	$ 10,000,000.00
Allowance for works to support SC at Harry Allen	1	$ 12,000,000.00	$ 12,000,000.00
Total			**$ 62,000,000.00**
AFUDC/Overhead @ 17.5%			**$ 10,850,000.0**

- Line Cost

Project Cost Results	Per Mile	Total
Line Cost	$ 2,319,250.45	$ 461,530,838.79
ROW Cost	$ 19,964.14	$ 3,972,864.00
AFUDC/Overhead Cost	$ 409,362.55	$ 81,463,147.99
All Costs	$ 2,748,577.14	$ 546,966,850.78

- Clover Substation

Cost Component	Cost
Base Cost	N/A
Circuit Breakers	$ 4,478,708
HVDC Converter	$ -
Transformer(s)	$ -
SVC(s)	$ -
Shunt Reactor(s)	$ 3,727,080
Series Capacitor(s)	$ 2,753,898
AFUDC/Overhead Cost	$ 1,917,945.015
Total Substation Cost	**$ 12,877,631**

Robinson Summit

Cost Component	Cost
Base Cost	$ 2,559,262
Circuit Breakers	$ 2,985,805
HVDC Converter	$ -
Transformer(s)	$ -
SVC(s)	$ -
Shunt Reactor(s)	$ 12,009,480
Series Capacitor(s)	$ 13,935,138
AFUDC/Overhead Cost	$ 5,510,694.840
Total Substation Cost	**$ 37,000,380**

Transmission Cost Calculations

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Resource Cost, Performance, & Financing

System Cost	
Total System Cost	$667,135,600

Economic Lifetime	
System Economic Life	50

Ongoing Costs	
Fixed O&M Costs (%)	1.00%
Fixed O&M Costs Escalator (%/yr)	2.00%
Property Tax	1.00%
Insurance	0.50%

Income Tax Assumptions	
Income Tax - Federal	35.0%
Income Tax - State	7.0%
Income Tax - Effective Tax Rate	39.55%
MACRS Term	15
Levelization Escalation Rate	0.00%

Financing	
Financing Choice	IPP
% Financed w/ equity	50.0%
% Financed w/ debt	50.0%
Debt Interest rate	6.0%
Cost of Equity	10.5%
Debt period in years	50
WACC	7.06%
Equity Amount	$333,567,800
Debt Amount	$333,567,800

Outputs	$/yr	% CapEx/yr
Capital	$60,428,330	9.1%
Property Tax & Insurance	$9,184,067	1.4%
Fixed O&M	$8,402,585	1.3%
Total	$78,014,982	11.7%

- At an estimated cost of $667 million (including AFUDC), the project is estimated to cost customers $78.0 million annually (nominal, levelized) over the 50-year assumed life of the facilities.

Preliminary Technical Analysis

- Transmission model in planning cases
  - 500 kV, 213 miles, 3-1272 ACSR conductor line between the Clover and Robinson Summit substations
  - 50% series compensation on the 500 kV line (29 ohms at each end)
  - 2 x 80 MVAr shunt reactors at each end of the line
  - Two - 345 kV phase shifters at Robinson Summit 345 kV on the Falcon – Robinson Summit 345 kV line and the Gonder – Robinson Summit 345 kV line.
  - 70% series compensation on the 500-kV line from Robinson Summit to Harry Allen (45 Ohms at each end of the line)
- Comprehensive Progress Report and Phase 1 rating study available:
  - http://www.transcanyon.com/cross-tie-1.html
  - The Cross-Tie Project will require an Accepted Rating
  - The studies show that the CrossTie Project can meet the NERC Reliability Standards/WECC Criteria and that the 1,500 MW Proposed Rating for the Cross-Tie Project is achievable.

Scenarios for Evaluation

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- Scenario 1
  - 10 years out Renewable Energy Requirement
  - Existing RPS targets (10 years out) for each state in Western Interconnection. Add at least 3,000 MW of wind resources in Wyoming. Proposed Transmission to facilitate delivery of new RPS Generation.
  - No Wyoming wind without Gateway Segments D and F. Additional Solar in Southern Utah that can support 650 MW on Cross-Tie.
- Scenario 2
  - 20 years out Renewable Energy Requirement
  - 50% RPS across Western Interconnection. Add at least 6,000 MW of wind resources in high potential WREZ zones in Wyoming.

Who We Are

TRANSCANYON

TransCanyon is an independent developer of electric transmission infrastructure for the western United States

- Independent well-positioned to drive creative solutions
- Leverage the combined energy expertise and financial strength of Berkshire Hathaway Energy and Pinnacle West
- Focused on all phases – development through ongoing operation
- Long-term stewards of the environment
- Value collaboration to achieve success
- Strategic alliance with PG&E on CAISO competitive projects

Deep Experience in the West

TRANSCANYON

Our team builds on the skills, resources and experience of its parent companies and utility affiliates across the western United States

PINNACLE WEST CAPITAL CORPORATION

BERKSHIRE HATHAWAY ENERGY

aps

1.2 million customers in AZ

Bright Canyon ENERGY

BHE U.S. TRANSMISSION

PACIFICORP

1.8 million customers in CA, OR, UT, WA and WY

NVEnergy

1.3 million customers in NV

TRANSCANYON

28 Professionals Led by 4 Board Members and 3 Key Officers

Board Members

Mark Schiavoni
Bright Canyon Energy

Jason Smith
Bright Canyon Energy

John Cupparo
BHE U.S. Transmission

Doug Kusyk
BHE U.S. Transmission

Key Officers

JASON SMITH
President

BOB SMITH
Vice President, Transmission Planning & Development

TODD JENSEN
Vice President, Project Delivery

Full Range of Expertise & Capabilities

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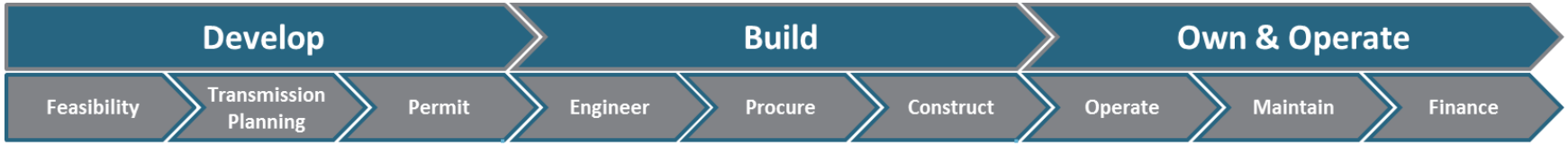
Experienced team has completed 1,050 miles and $3.7B of transmission investment in the western United States



- WECC TEPPC participation
- WestConnect Order 1000 Implementation Committee and Planning Management Committee
- 2,400 miles of permitting experience in western U.S.
- Twelve WECC path ratings

- Constructed and energized 10 major transmission projects since 2009
- Extensive engineering, design and construction experience
- All components of transmission (i.e., lines and substations)

- APS operates and maintains 2,651 miles of high-voltage lines
- PacifiCorp operates and maintains 2,005 miles of high-voltage lines
- Financial strength of Berkshire Hathaway Energy (A3/A) and Pinnacle West (A3/A-)