TRANSWEST EXPRESS LLC

TransWest Express Transmission AC and DC Project

2018 – 2019 Interregional Transmission Project Submittal

ANSCHUTZ

Submittals to California Independent System Operator, WestConnect and Northern Tier Transmission Group

March 31, 2018

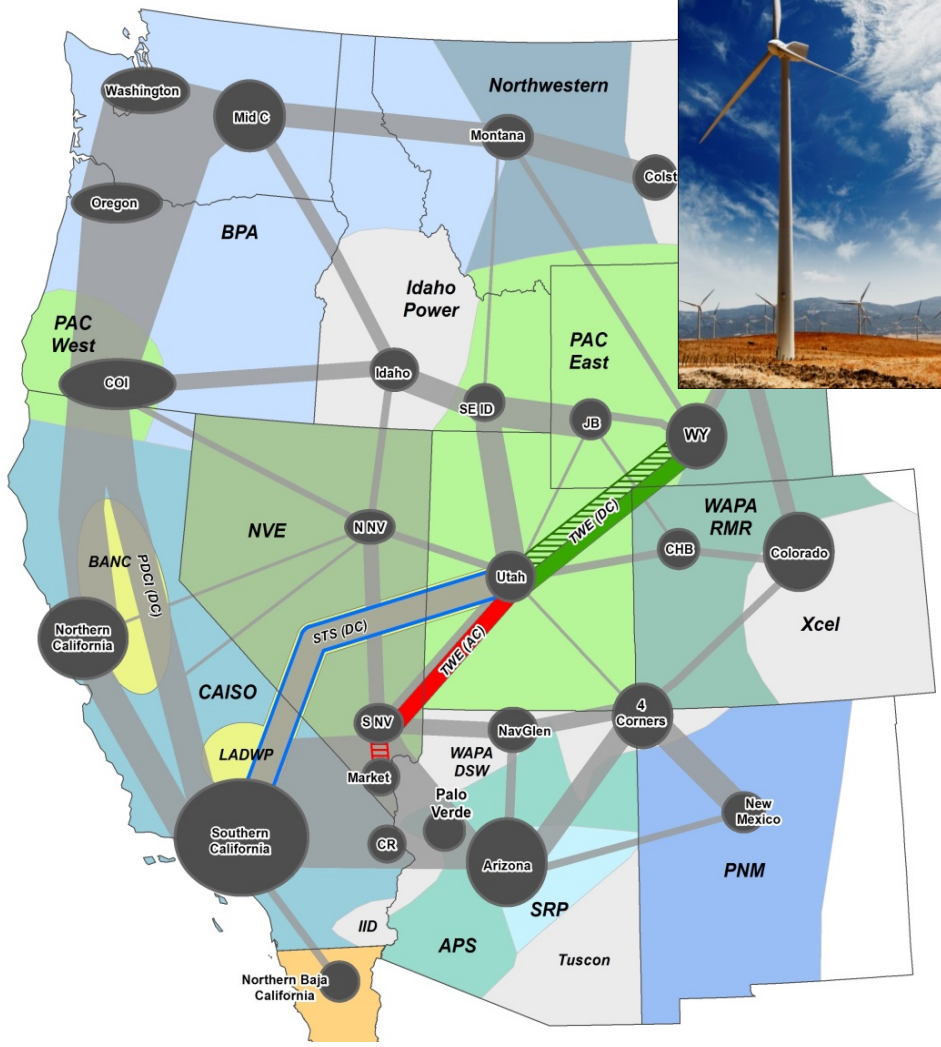
TransWest Express AC and DC Project: 2018 - 2019 Cycle Interregional Transmission Project Submittal at a Glance

Regional Entities	California Independent System Operator	WestConnect	Northern Tier Transmission Group
Physical Connection	Yes	Yes	Yes
Cost Allocation Requested	Yes	Yes	No, not at this time[1]
Identified Primary Need	CA SB350 needs including 50% RPS, AZ and NV RPS Compliance		Economic opportunities though expanded grid. Accommodate planned resources.
Load and Resource Data	Load served by high-quality and diverse Wyoming wind resources		The Chokecherry and Sierra Madre Wind Energy Project, and natural gas plants at Northern Terminal
Proposed Capacity	DC Portion: Phased 1,500/3,000 MW between WestConnect system in UT and NTTG system in WY AC portion: 1,500 MW CAISO and WestConnect system in NV and to TWE DC portion in UT		
Proposed Technology	Two-Terminal, 500 kV, Bipole HVDC and 500 kV AC		
Circuit length	DC potion: 406 miles, AC Portion: 324 miles or less as needed.		
In-service Date	2022		
Permitting Status	Federal Records of Decision and Right of Way Grants issued in 2016 and 2017, Wyoming Industrial Siting Permit and County Permits underway		
System Study Status	Initiated Phase 1 of WECC Path Rating in April 2018		
Other Transmission Project Dependency	None. Proposed HVDC project will complement 500 kV AC build out among Regional Entities similar to DC and AC buildout along the West Coast		
Project Alternatives	Initial DC segment capacity can be greater. AC segment can terminate at Crystal/Harry Allen. [Alternative TWE DC Project configuration submitted as separate 2018-2019 ITP proposal.]		
Project website	www.transwestexpress.net		
Project Sponsor	TransWest Express LLC David Smith (303) 299-1545 david.smith@tac-denver.com		

[1] TransWest Express LCC may request Cost Allocation from NTTG.

TransWest Express AC and DC Project: An Interregional Transmission Solution

- Proposed Project designed to provide needed transmission capacity from Desert Southwest Region to Wyoming wind resources and maximize use of existing STS capacity
- 1,500 MW initial/3,000 MW final, 500 kV HVDC
  - Utah connections: WestConnect
  - Wyoming connections: NTTG
- 1,500 MW, 500 kV AC
  - Nevada connections: CAISO, WestConnect
- Bi-directional operation



Project Need: Proposed TWE AC and DC Project Meets Interregional Needs

- TWE DC Project is an Interregional Transmission Project that provides needed capacity between California and Rocky Mountain regions
- Several studies found the benefits from additional capacity between these regions more than offset the transmission investment costs in meeting California's RPS and other more stringent green energy goals and targets being examined by utilities and other entities (Policy Need).
- The CAISO 2017-2018 Plan identified a severe lack of available transmission capacity to access Wyoming wind resources. The TWE AC and DC Project maximizes the use of existing transmission capacity between California and Utah.
- Other potential needs: (Economic) increased transmission capacity between CAISO and PacifiCorp BAAs could provide benefits due to the EIM, DAM and potential regional ISO.

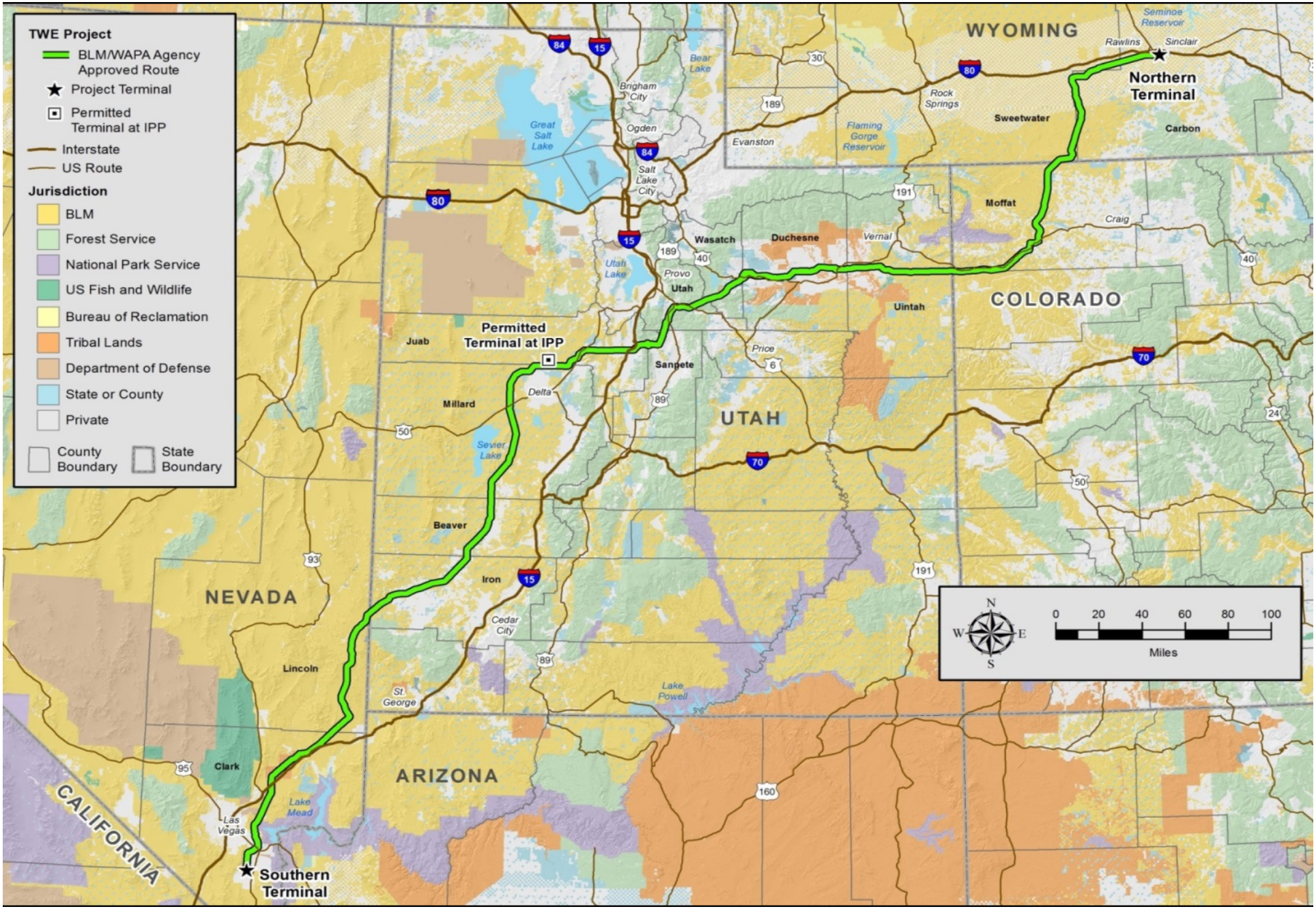


TransWest Express Project Development Status

- Development initiated in 2008 with primary focus on permitting.
- TransWest and Western Area Power Administration jointly working on development since 2010.
- Bureau of Land Management and Western issued Records of Decision in December 2016 and January 2017, respectively. Right-of-way grants for federal land (67% of line route) issued in 2017 and 2018. Private land ROW acquisition and local permitting underway and planned to be completed in 2019.
- WECC Path Rating Phase 1 initiated, planned to complete Phase 2 and SIS analysis in 2019.
- Three year construction schedule planned.
- TWE Project can be placed in-service as early as 2022 or as needed.
- TransWest Express affiliates are developing the 3,000 MW Chokecherry and Sierra Madre Wind Energy Project[2] and potential natural gas generating plant located near the TWE Project's Northern Terminal.

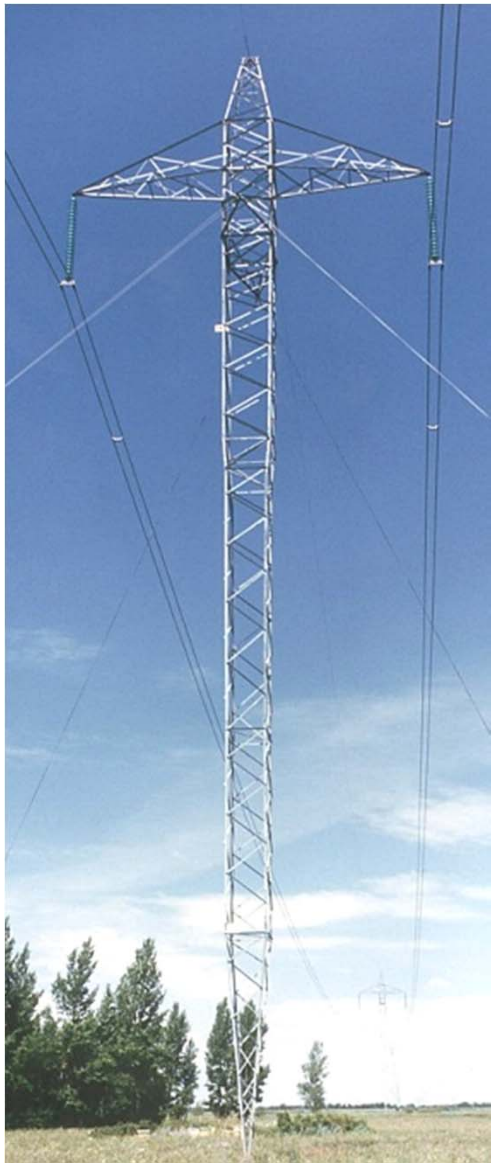
[2] www.powercompanyofwyoming.com

TransWest Express Transmission Project Route



Technical Data Submitted

- DC Alternatives – The proposed TWE Project is to build a 3,000 MW HVDC line and only 1,500 MW of terminal capacity and add in parallel a 1,500 MW of terminal equipment later. The initial HVDC capacity can be between 1,500 to 2,500 MW and there are alternative phasing approaches that would lower costs if the period between initial and final build out is shortened.
- AC Alternatives – The 500 kV AC portion could installed along with the DC portion or on a separate schedule depending on system needs. In addition the 500 kV AC project could be interconnected to the Crystal and/or Harry Allen 500 kV stations north of Las Vegas.
- Overall Alternatives – TransWest submitted a separate 2018-2019 ITP submittal for the TWE DC Project, which is an alternative configuration allowed for in the TWE Project Records of Decision.
- TransWest submitted the power flow models being used in WECC Path rating process to the planning entities.
- Capital Cost estimate – The initial 1,500 MW phase DC segment, $1.62B. To increase the capacity to 3,000 MW, $0.87B. The 324 mile, 500 kV AC segment, $600M.



Development, Construction and Operation Plans

- TransWest plans to continue development activities including state and county permits, private ROW acquisition, Interconnection Agreements, Technical Specifications and project financing.
- TransWest project delivery plans are to use an Engineer, Procure, Construct (EPC) approach. The HVDC equipment will be procured separately and provided to the EPC contractor for installation.
- Alternative project delivery approaches may be used depending on the make-up the TWE Project owners and access to balance sheet financing at the time of financial close for construction.

- The TWE Project will require full-time operators at both terminals along with maintenance staff. AC substation and transmission line operations and maintenance will be contracted out. Western, PacifiCorp and other utilities that operate in the region are likely candidates to perform these services.

TransWest Express LLC

- TransWest Express LLC is a wholly-owned affiliate of The Anschutz Corporation.
- The Anschutz Corporation is a privately held, multibillion dollar diversified company with worldwide investments in natural resources - including oil and gas, pipelines, ranching - and in other diverse industries.
- Anschutz has extensive experience in developing, constructing, financing and operating many large projects in the natural resources, real estate, sports and entertainment industries.
- The Anschutz Corporation has sufficient financial resources to provide the equity investment, although future equity partners will be obtained in the market. The Anschutz Corporation has on many occasions secured equity investments in other projects and continues to possess the appropriate reputation and relationships to attract such investments.

Interregional Project Review Considerations

- Policy and Economic Assessments
  - Proposed Project designed to meet CPUC/CAISO and WestConnect Policy and Economic needs.
  - Proposed Project not designed to meet NTTG regional needs expected in the 2018-2019 Study Plan. However, examination of broader economic opportunities including EIM, DAM and access to solar resources during over-generation periods may be warranted.
- Reliability Assessments
  - Multiple reliability assessments have been completed for Path Rating and are underway for SIS work with multiple entities from three regional planning groups plus Columbia Grid are already directly participating.
- Cost Allocation Consideration
  - Seeking Cost Allocation consideration from CAISO and West Connect. Not currently seeking Cost Allocation consideration from NTTG.
  - Cost Allocation of DC Project avoids common transmission cost allocation pitfalls of AC projects.
  - DC controllability allows for subscription capacity process and limits free rider benefits.