ITP Evaluation Process Plan

TransWest Express DC Project

June 14, 2018

The goal of the coordinated Interregional Transmission Project (ITP) evaluation process is to achieve consistent planning assumptions and technical data of an ITP to be used in the individual regional evaluations of an ITP. The joint evaluation of an ITP is considered to be the joint coordination of the regional planning processes that evaluate the ITP. The purpose of this document is to provide a common framework, coordinated by the Western Planning Regions, to provide basic descriptions, major assumptions, milestones, and key participants in the ITP evaluation process.

The information that follows is specific to the ITP listed in the ITP Submittal Summary below. An ITP Evaluation Process Plan will be developed for each ITP that has been properly submitted and accepted into the regional process of the Planning Region to which it was submitted.

ITP Submittal Summary

Project Submitted To:	California Independent System Operator (California ISO), Northern Tier Transmission Group (NTTG), WestConnect
Relevant Planning Regions[1]:	California ISO, NTTG, WestConnect
Cost Allocation Requested From:	California ISO, WestConnect

The Relevant Planning Regions identified above developed and have agreed to the ITP Evaluation Process Plan.

1 ITP Summary

The TransWest Express Transmission DC Project (TWE DC Project) is a proposed 730-mile, phased 1,500/3,000 MW, ±600 kV, bi-directional, two-terminal, high voltage direct current (HVDC) transmission system with terminals in south-central Wyoming and southeastern Nevada.

The TWE DC Project northern terminal will be interconnected at 230 kV to the existing PacifiCorp 230 kV transmission line between the Platte and Latham substations and the planned 500 kV Gateway West D.2 segment in the NTTG planning region, and to the 3,000 MW

[1] With respect to an ITP, a Relevant Planning Region is a Planning Region that would directly interconnect electrically with the ITP, unless and until a Relevant Planning Region determines that the ITP will not meet any of its regional transmission needs, at which time it will no longer be considered a Relevant Planning Region.

Chokecherry and Sierra Madre Wind Energy Project1. The TWE Project design provides for connecting the northern terminal to the existing 230 kV Western Area Power Administration system in the WestConnect planning region near the Miracle Mile substation.

The TWE DC Project southern terminal will be interconnected to the 500 kV Eldorado substation in the CAISO planning region. It also will be interconnected to the 500 kV McCullough substation and the 500 kV Mead to Marketplace transmission line in the WestConnect planning region.

The TWE Project has an in-service date of 2022 and to date has obtained rights-of-way over all of the federal land along the route, which represents about 66% of the route. In 2016 and 2017, following eight years of environmental analysis under the National Environmental Policy Act, four federal agencies -- the Bureau of Land Management (BLM), U.S. Department of the Interior; Western Area Power Administration (WAPA), U.S. Department of Energy; United States Forest Service (USFS), U.S. Department of Agriculture; and the Bureau of Reclamation (BOR), U.S. Department of the Interior) -- issued records of decision finalizing and approving the route for the TWE Project on federal lands.2 WAPA acted as a joint lead agency with the BLM on the Environmental Impact Statement (EIS) and is considering further participation in the TWE Project through its Transmission Infrastructure Program. The BLM and WAPA published the Final Environmental Impact Statement (FEIS) for the TWE Project on May 1, 2015.

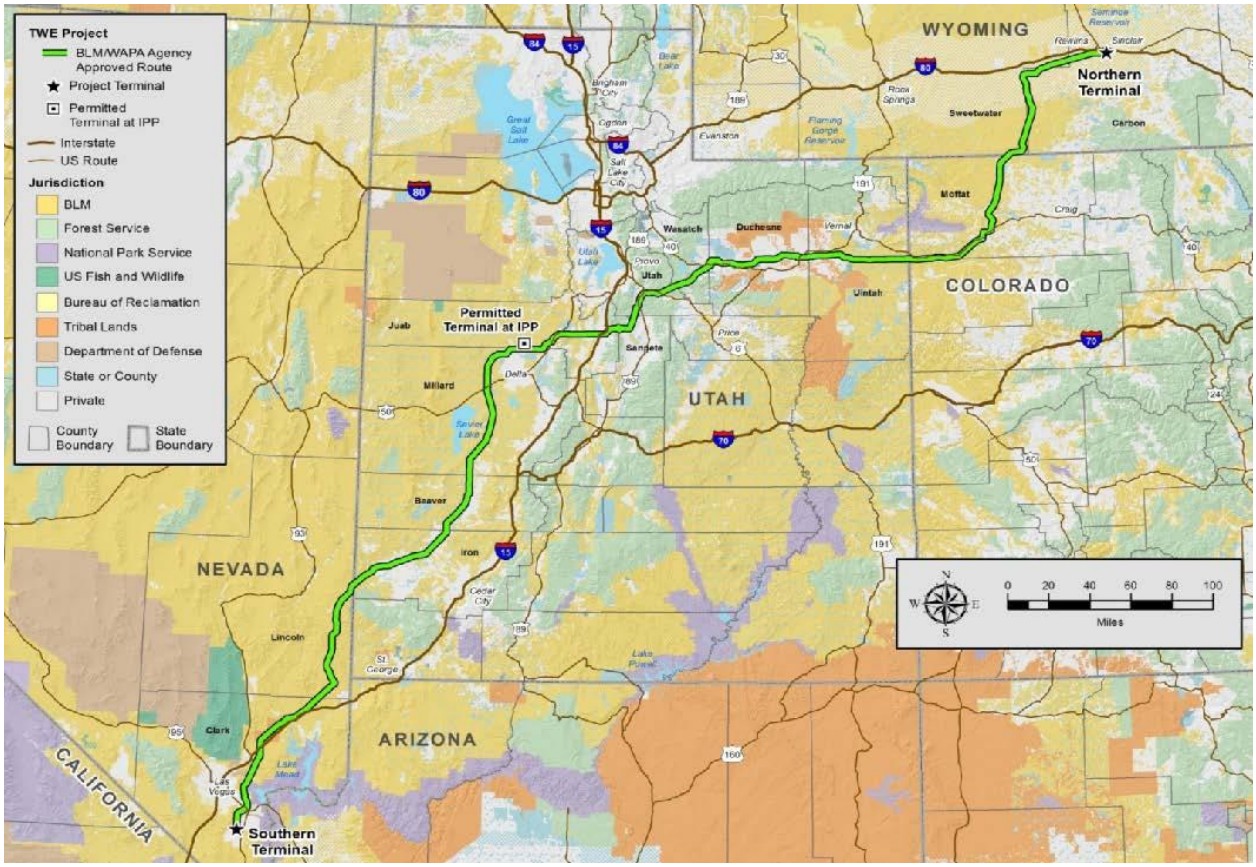
A project map of the proposed project is shown in Figure 1.

2 Evaluation by Relevant Planning Regions

The California ISO has been identified as the Planning Region that will lead the coordination efforts with the other Relevant Planning Regions identified for the ITP. In this capacity, the California ISO will organize and facilitate interregional coordination meetings and track action items and outcomes of those meetings. For information regarding the ITP evaluation conducted within each Relevant Planning Region's planning process, please contact that Planning Region directly.

Given that the joint evaluation of an ITP is considered to be the joint coordination of the regional planning processes that evaluate the ITP, the following describes how the ITP fits into each Relevant Planning Region's process. This information is intended to serve only as a brief summary of each Relevant Planning Region's process for evaluating an ITP. Please see each Planning Region's most recent study plan and/or Business Practice Manual for more details regarding its overall regional transmission planning process.

Figure 1: TWE DC Transmission Route
(Source: TWE DC Project Summary)



2.1 California ISO

The project sponsor states that the TWE DC Project is proposed as a two phase project with an initial rating of 1,500 MW. Phase 1 would consist of building the fully rated 3,000 MW transmission line using triple conductor (Athabaska Aluminum Steel Core Reinforced conductor). Then, each terminal would have a 1,500 MW bi-pole configured line current commutated HVDC converter with AC substations, including filters and dynamic compensation devices, AC interconnections, a communication system and ground electrode facilities. In November 2017, the Western Electricity Coordinating Council granted the TWE DC Project Phase 3, Accepted Rating status with a capacity up to 1,500 MW.

Phase 2 would consist of adding 1,500 MW of parallel HVDC converter equipment at each of the terminals. Figure 2 is a map of the proposed TWE Project superimposed on the existing transmission facilities and other planned projects. Figure 3 is the one-line diagram for the proposed TWE Project

The project sponsor states that the TWE DC Project will provide direct bidirectional transmission capacity from Wyoming wind resources and the diverse Rocky Mountain load centers to replace and support a portion of the Public Policy and Economic Regional Needs of the three planning

regions. The project sponsor further states that several "independent" studies have analyzed the project and concluded that the TWE Project will provide California rate-payers significant savings while addressing the "lack of certainty" around accessing geographically diverse renewable resources. The TWE DC Project would also support meeting Regional Needs within the California ISO, NTTG, and WestConnect by providing "Public Policy" and "Economic" benefits to each of the three Relevant Planning Regions and as defined by Arizona, California, and Nevada.

The TWE DC Project was submitted into the 2016-2017 interregional coordination cycle where the California ISO considered the proposed project in the context of California's 50% RPS goal where accessing out-of-state renewable resources for California was considered in the proposed project's assessment at a "high" or "cursory" level. The effort to perform an "informational" assessment of California procurement of out-of-state resources was concluded and documented in the 2017-2018 Transmission Plan[2].

California renewable procurement portfolios provided by the California Public Utilities Commission for reliability and "informational" policy analysis for the 2018-2019 transmission planning cycle provide direction that all renewable procurement to achieve the 50% RPS goal to be considered by the California ISO's planning process be obtained from within California. As such, the 2018-2019 planning process will consider the TWE DC Project in the context of production cost simulation benefits from importing and exporting surplus resources between California and the Wyoming area. However, if the ISO does not observe any significant transmission congestion in its production cost simulation studies without the TWE DC Project modeled that could be reasonably expected be mitigated by the TWE DC project, then it may be unnecessary to proceed any further with the analysis. Given that the renewable portfolios in the 2018-2019 transmission planning cycle do not include any wind generation in Wyoming, it is possible that no significant congestion will be identified that the TWE DC project would be expected to mitigate. If the production cost analysis produces adequate economic benefits to proceed further with the analysis, then powerflow and stability analysis will be performed as well.

The California ISO will develop the detailed modeling information for the GridView and GE PSLF computer programs and exchange that information with WestConnect commensurate with existing data confidentiality requirements.

2.2 NTTG

The NTTG Regional Transmission Plan evaluates whether transmission needs within the NTTG Footprint may be satisfied on a regional and interregional basis more efficiently or cost effectively than through local planning processes. While the NTTG Regional Transmission Plan is not a construction plan, it provides valuable regional insight and information for all

[2] http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf

stakeholders, including developers, to consider and use in their respective decision-making processes.

The first step in developing NTTG's 2018-2019 Regional Transmission Plan is to identify the Initial Regional Plan that includes NTTG's Funding Transmission Providers' local transmission plans and the uncommitted projects in NTTG 2016-2017 Regional Transmission Plan. NTTG then uses Change Cases to evaluate regional and interregional transmission projects that may produce a more efficient or cost effective regional transmission plan for NTTG's footprint. A Change Case is a scenario where one or more of the uncommitted transmission project(s) in the Initial Regional Plan will be added to, defer, or replace one or more of the other non-committed project(s) in the Initial Regional Plan.

The Initial Regional Plan and Change Cases will be evaluated using power flow and dynamic analysis techniques to determine if the modeled transmission system topology meets the system reliability performance requirements and transmission needs. If the Change Case fails to meet these minimum reliability requirements, it will either be set aside as unacceptable or modified by the addition of another uncommitted project to ensure transmission reliability. The number of Change Cases will be determined through the technical planning process to carefully examine the reliability of and need for the non-committed regional and interregional projects to meet the region's transmission needs. The set of uncommitted projects, either from the Initial Regional Plan or a Change Case, that delineate the more efficient or cost-effective regional transmission plan, as measured economically by changes in capital related costs, losses and reserve margin, and adjusted by their effects on neighboring regions, will be selected into NTTG's Regional Transmission Plan. A more detailed discussion of NTTG's study process can be found in NTTG's Biennial Study Plan posted on NTTG's website.

2.3 WestConnect

WestConnect's 2018-19 Regional Study Plan was approved by its Planning Management Committee (PMC) in March of 2018.[3] The study plan describes the system assessments WestConnect will use to determine if there are any regional reliability, economic, or public policy-driven transmission needs. The models for these assessments are built and vetted during Q2 and Q3 of 2018. If regional needs are identified during Q4 of 2018, WestConnect will solicit alternatives (transmission or non-transmission alternatives (NTAs)) from WestConnect members and stakeholders to determine if they have the potential to meet the identified regional needs. If an ITP proponent desires to have their project evaluated as a solution to any identified regional need, they must re-submit their project during this solicitation period (Q5) and complete any outstanding submittal requirements. In late-Q5 and Q6 of the 2018-19 planning cycle, WestConnect will evaluate all properly submitted alternatives to determine whether any meet the identified regional needs, and will determine which alternative(s) provide the more efficient or cost-effective solution. The more efficient or cost-effective regional projects will be selected and identified in the WestConnect Regional Transmission Plan. Any regional or interregional

[3] https://doc.westconnect.com/Documents.aspx?NID=18068&dl=1

alternatives that were submitted for the purposes of cost allocation and selected into the Regional Transmission Plan as the more efficient or cost-effective alternative to an identified regional need will then be evaluated for eligibility for regional cost allocation, and subsequently, for interregional cost allocation.[4]

WestConnect regional needs assessments are performed using Base Cases as identified in the regional study plan. Base Cases are intended to represent "business as usual," "current trends," or the "expected future". WestConnect may also conduct information-only scenario studies that look at alternate but plausible futures. In the event regional transmission issues are observed in the assessments of the scenario studies, these issues do not constitute a "regional need", will not result in changes to the WestConnect Regional Transmission Plan, and will not result in Order 1000 regional cost allocation. The WestConnect PMC has ultimate authority to determine how to treat regional transmission issues that are identified in the information-only scenario studies. They will determine whether an issue identified in a scenario —whether it be reliability, economic, or public-policy based—constitutes additional investigation by the Planning Subcommittee.

TWE DC Project representatives and other stakeholders are encouraged to participate in the development of the Base Cases to be studied in WestConnect's 2018-19 Planning Cycle. These studies, as outlined in Table 1, will form the basis for any regional needs that ultimately may lead to ITP project evaluations in 2019. Stakeholders are also encouraged to participate in the development of the scenarios identified in WestConnect's 2018-19 Study Plan. These studies are also outlined in Table 1.

Table 1: WestConnect 2018-19 Transmission Assessment Summary

10-Year Base Cases (2028)	**10-Year Scenarios (2028)**
Heavy Summer (reliability) Light Spring (reliability) Base Case (economic)	Load Stress Study (reliability) CAISO Export Stress Study (reliability)
May result in the identification of regional needs, requires solicitation for alternatives to satisfy needs	Informational studies that will not result in the identification of regional needs. Alternative collection and evaluation is optional and is not subject to regional cost allocation

[4] Please see the WestConnect Business Practice Manual for more information on cost allocation eligibility.

3 Data and Study Methodologies

The coordinated ITP evaluation process strives for consistent planning assumptions and technical data among the Planning Regions evaluating the ITP. The Relevant Planning Regions have summarized, in Table 2, the types of studies that will be conducted that are relevant to the TWE DC Project evaluation in each Planning Region. Methodologies for coordinating planning assumptions across the Relevant Planning Region processes are also described.

Table 2: Relevant Planning Region Study Summary Matrix

Planning Study	**California ISO**	**NTTG**	**WestConnect**
Economic/Production Cost Model	Using the California ISO PCM Base Case, based on the WECC 2028 Anchor Data Set (ADS), GridView will be used to perform production cost simulation. All model information will be shared with WestConnect.	Using the NTTG PCM Base Case, based on the WECC 2028 ADS Case, GridView will be used to conduct PCM analysis to determine those hours in the study year when load and resource conditions are likely to stress the transmission system within the NTTG footprint	Regional Economic Assessment will be performed on WestConnect 2028 Base Case PCM (based on WECC 2028 Anchor Data Set[5])
Reliability/Power Flow Assessment	Depending on the results of the production cost modeling, the GE PSLF may be used to perform steady state and as needed, transient analysis. The WECC 2028 ADS and	The selected stressed hours will be transferred from GridView to the PowerWorld power flow model to conduct reliability analysis	Regional Reliability Assessment will be performed on WestConnect 2028 Heavy Summer and Light Spring cases[6]

[5] WestConnect ITP Project evaluation is subject to a number of factors, the first and most critical being the identification of regional needs as a part of the 2018-19 Base Case transmission needs assessments.

[6] Id

	2028 LSP1 will be modified as needed to accurately model the California network and resources that reflects the ISO's finalized 2017-2018 transmission plan. The TWE DC Project will be added to that model. All model information will be shared with WestConnect.		

Note that the TWE DC Project evaluation will be conducted by each Relevant Planning Region in accordance with its approved Order 1000 Regional Planning Process. This includes study methodologies and benefits identified in planning studies.

4 Data Coordination

The Relevant Planning Regions will strive to coordinate major planning assumptions through the following procedures.

4.1 Economic/Production Cost Model

The Relevant Planning Regions intend to use the WECC 2028 Anchor Data Set (ADS) as the starting point data set for regional economic planning studies conducted in 2018 and 2019 (as applicable). Each Planning Region intends to update the 2028 ADS with their most recent and relevant regional planning assumptions to reflect its starting point transmission topology and generation data. The Planning Regions will strive to coordinate major updates made to the 2028 ADS as part of their regional model development efforts in late Q3, 2018.[7]

As an example, the California ISO will update the 2028 ADS to reflect their recently completed 2017-2018 Transmission Plan[8]. NTTG will ensure that its prior Regional Transmission Plan[9] is

[7] This schedule is dependent on the 2028 Anchor Data Set being provided by WECC no later than the end of Q2, 2018, and the sharing of planning data or assumptions will be subject to applicable confidentiality requirements in each Planning Region.

[8] http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf

[9] NTTG 2016-2017 Regional Transmission Plan

reflected. WestConnect will represent their current Base Transmission Plan[10] and ColumbiaGrid will provide major updates to the 2028 ADS based on the information from the latest Biennial Plan[11] to other Planning Regions subject to each region's applicable confidentiality requirements.

Through this coordination of planning data and assumptions, the Relevant Regions will strive to build a consistent platform of planning assumptions for Economic/Production Cost Model evaluations of the ITP.

4.2 Reliability/Power Flow Assessment

Since each Planning Region reflects characteristics and a planning focus that is unique, different power flow models are generally needed to appropriately reflect each region's system and key assumptions. As such, each Planning Region will develop its models and data that accurately reflect their Planning Region, but will seek to coordinate this information with the other Relevant Planning Regions subject to applicable confidentiality requirements. The identification of the starting WECC power flow cases ("seed cases" for the purpose of this evaluation plan), and significant assumptions or changes a Planning Region may make to a seed base case are examples of information that will be considered by each Planning Region and coordinated with the other Planning Regions. As such, the inclusion or removal of major regional transmission projects will be coordinated through existing data coordination processes, but the season or hour of study and particular system operating conditions may vary by Planning Region based on its individual regional planning scope and study plan.

4.3 Cost Assumptions

In order for each Relevant Planning Region to evaluate whether the TWE DC Project is a more efficient or cost-effective alternative within their regional planning process, it is necessary to coordinate ITP cost assumptions among the Relevant Planning Regions. For planning purposes, each Region's cost share of the TWE DC Project will be calculated based on its share of the calculated benefits provided to the Region by the TWE DC Project (as quantified per that Region's planning process). The project cost of the TWE DC Project, as provided in their ITP Submittal form, is provided in Table 3.

[10] WestConnect 2018-2019 Base Transmission Plan
[11] ColumbiaGrid Update to the 2017 Biennial Transmission Plan

Table 3: Project Sponsor Cost Information[12]

Project Configuration	Cost ($) (2018$)
Initial phase (1500 MW)	$2.11 billion
Full project (3000 MW)	$2.98 billion

4.4 Cost Allocation

Interregional cost allocation may apply for the TWE DC Project for the 2018-2019 cycle.

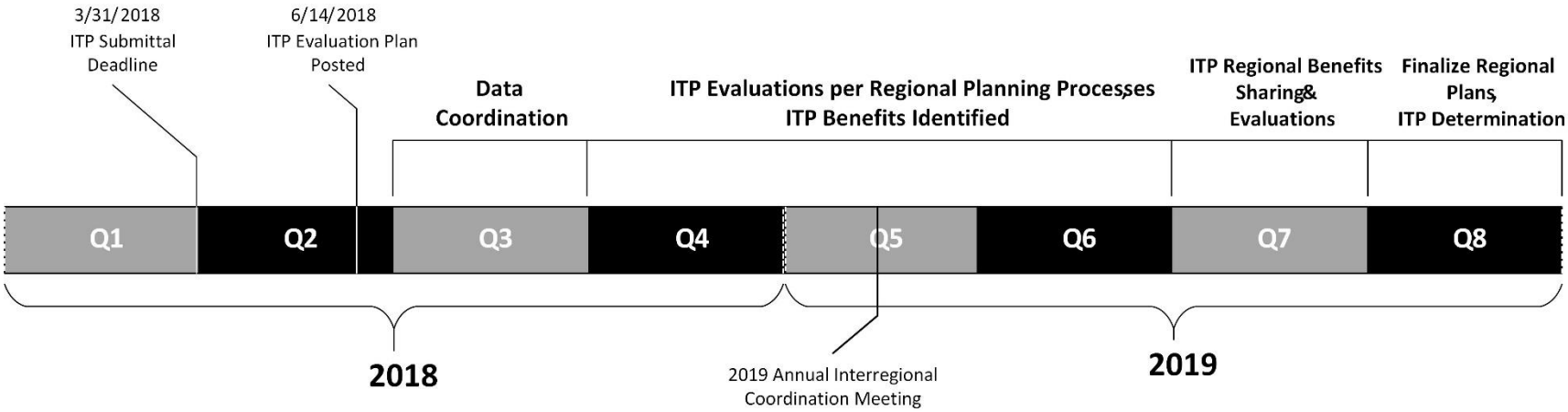
TransWest Express LLC requested cost allocation from California ISO and from WestConnect, and met the necessary requirements within each respective Planning Region's regional process to be considered eligible to request cost allocation. If both California ISO and WestConnect subsequently select the TWE DC Project in their respective regional transmission plans for purposes of Interregional Cost Allocation, California ISO and WestConnect will individually apply their regional cost allocation methodology to the projected costs of the TWE DC Project assigned to each region as described in the previous section and in accordance with each region's regional cost allocation methodology. If only one of the two Relevant Planning Regions for the TWE DC Project select the project in its regional transmission plan for purposes of Interregional Cost Allocation, and the number of Relevant Planning Regions for the TWE DC Project is reduced to one, the project will no longer be eligible for interregional cost allocation.

[12] This information is contingent upon verification by the Planning Regions and may be subject to change during the ITP evaluation process

5 Schedule and Evaluation Milestones

The ITP will be evaluated in accordance with each Relevant Planning Region's regional transmission planning process during 2018 and (as applicable) 2019. The ITP Evaluation Timeline, shown in Figure 2, was created to identify and coordinate key milestones within each Relevant Planning Region's process. Note that in some instances, an individual Planning Region may achieve a milestone earlier than other Regions evaluating the ITP.

Figure 2: ITP Evaluation Timeline



Meetings among the Relevant Planning Regions will be coordinated and organized by the lead Planning Region per this schedule at key milestones such as during the initial phases of the ITP evaluations and during the sharing of ITP regional benefits.

6 Contact Information

For information regarding the ITP evaluation within each Relevant Planning Region's planning process, please contact that Planning Region directly.

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