2014-2015 Conceptual Statewide Transmission Plan Update

California ISO 2015-2016 Regional Transmission Planning Process

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Prepared by

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1. Introduction

The development of the Conceptual Statewide Transmission Plan (Plan) is pursuant to section 24.4.4 of the California ISO tariff and its purpose is to ensure that the California ISO's regional plan complements transmission plans of other CTPG members. The 2014-2015 Plan is an update to the 2013-2014 Plan and will be used as an input into the California ISO's 2015-2016 regional planning process which is currently under way. The information that is presented in this Plan has drawn from past efforts of the California Transmission Planning Group (CTPG) in which the California ISO participated in as well as information provided in 2015 WestConnect (Order 890) Annual Ten-Year Transmission Plan[1]. The Plan takes a California statewide perspective rather than focusing only on the California ISO Planning Region. As such, it includes potential high level transmission solutions across the state that are needed address identified reliability needs and to meet California's 33 percent renewable energy goal by 2020.

Finally, this Plan tabulates proposed transmission facilities of the California transmission planning entities as they are documented in the California ISO's 2014-2015 regional transmission plan and the 2015 WestConnect (Order 890) Annual Ten-Year Transmission Plan. Through the CTPG, its members have shared information regarding their planning efforts in the context of the collaborative activities of the CTPG. Since 2012, CTPG activities have largely been minimal due to the Planning Regions work to address FERC Order 1000 regional and interregional requirements. However, on June 1, 2015 FERC accepted the compliance filings for all four Planning Regions thus bringing the FERC Order 1000 regulatory filing requirements to a close. While CTPG has fulfilled a significant coordination role among its members since its inception, going forward coordination with those members involved in CTPG will now be accomplished through WestConnect. Given the interregional coordination efforts in place and that coordination with the annual transmission plan itself, the CAISO considers that the purpose originally served by the Conceptual Statewide Plan will be met through other forums, and anticipates bringing the annual development of this Conceptual Statewide Plan to an end in future planning cycles.

2. Development of the California ISO Conceptual Statewide Plan

Importantly, the transmission projects proposed by all California transmission planning entities will ultimately be approved through their own transmission planning processes. Accordingly, the California ISO is not seeking stakeholder comment regarding those

[1] http://www.westconnect.com/filestorage/2015_wc_order_890_ten_year_transmission_plan_final_021915.pdf

entities who are members of the WestConnect Planning Region as they will coordinate comments through their own processes. However, consistent with the objective of the Plan, the California ISO has included projects from all California transmission planning entities members to provide clarity on how the California ISO's 2013-2014 regional plan recommendations fit into the overall statewide plan.

In addition to the information provided in this Plan, general documentation of the California ISO's regional vision regarding the solutions that have been identified and approved through the California ISO's own regional planning process are also included. These solutions are based on, among other things, the California ISO's base case assumptions, studies of several sensitivity scenarios, other studies and analyses that the California ISO has previously discussed with stakeholders in the 2013-2014 regional planning process, as well as input from the CTPG and other planning regions.

Finally, with the release of this Plan the California ISO is providing an opportunity for interested stakeholders to submit comments and recommend modifications to the Plan as it pertains to the information presented in this Plan. This may include information that is documented within the California ISO's 2013-2014 regional plan, including alternative transmission and non-transmission solutions, potential interstate transmission lines and proposals for access to resources located in areas not identified in the plan. This information will be considered in the California ISO's 2014-2015 regional planning process. Stakeholder comments and recommended modifications to the Plan that are associated with CTPG members other than the California ISO will be provided to WestConnect for consideration in their process.

3. Projects Comprising the California ISO Conceptual Statewide Plan

All projects which comprise the Plan are listed in Table 1. When considered together, they provide a foundational plan for achieving all requirements that have been identified by the California ISO's regional planning process and those planning processes of the other California transmission planning entities. All California ISO projects listed in Table 1 have been considered and approved through the California ISO's 2014-2015 regional planning process. Projects listed for other CTPG members and documented in the 2015 WestConnect (Order 890) Annual Ten-Year Transmission Plan or other designated document locations are proposed through the individual CTPG member's transmission plans and only establish a determination of need. The actual status of these individual projects may be included in the individual transmission plans through which their need was determined.

Table 1 – Projects Comprising the 2014-2015 Conceptual Statewide Plan

Balancing Authority	Area	Transmission	Included in 2014-2015 Conceptual Statewide Plan	Reported in Current Regional Transmission Plan
CAISO	SDG&E Area	2nd Pomerado - Poway 69kV Circuit	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	SDG&E Area	Mission-Penasquitos 230 kV Circuit	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	SDG&E Area	Reconductor TL692: Japanese Mesa - Las Pulgas	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	SDG&E Area	TL632 Granite Loop-In and TL6914 Reconfiguration	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	SCE	Laguna Bell Corridor Upgrade	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	PG&E	North East Kern 70 to 115 kV Voltage Conversion	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	PG&E	Martin 230 kV Bus Extension	No	CAISO 2014-2015 Plan - Table 7.2-1
CAISO	Policy-driven project	No policy-driven project identified in the 2014-2015 Transmission Plan	No	CAISO 2014-2015 Plan - Table 7.2-2
CAISO	PG&E	Economic-driven project: Lodi-Eight Mile 230 kV Line	No	CAISO 2014-2015 Plan - Table 7.2-3
LADWP[2]	Tehachapi area	Barren Ridge Renewable Transmission Project Barren Ridge-Haskell 230kV Lines and Barren Ridge-Rinaldi 230kV Line (upgrade)	Yes	Exhibit 6 2015 WestConnect Transmission Plan
IID[3]	Imperial County	Niland Substation Transformer Replacement	No	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	El Centro Switching Station (ECSS) to Fern Switching Station	No	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	Ramon Substation, 230/92 kV, 300 MVA Transformer addition	Yes	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	Highline to El Centro Switching Stations (ECSS): Upgrade existing 161-92 kV transmission lines to double circuit 230 kV.	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	El Centro Switching Station (ECSS)- Liebert Switching Station - Imperial Valley Substation new 230 kV line.	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan

[2] Los Angeles Department of Water Power
[3] Imperial Irrigation District

IID	Imperial County	New Imperial Valley (IV) Switching Station to Dixieland Switching Station 230 kV line double circuit with a bundle of 2 conductors per phase	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	El Centro Switching Station (ECSS) - Dixieland -Bannister 230 kV Upgrade	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	North Gila to Highline 500 kV Transmission Line.	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	North Gila to Imperial Valley Substation (IV Sub) 500 kV Transmission Line	No	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	Midway-Hoober-Bannister 230 kV Transmission Line	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Midway to Highline Switching Stations 230 KV Transmission Line	Yes	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	Midway – Devers Switching Stations 500 kV AC Line	No	Exhibit 6 2015 WestConnect Transmission Plan
IID	Imperial County	Highline (IID) to CETYS (CFE) Switching Stations 230 kV line	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Hoober 500 kV AC Substation	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Hoober 230 kV Switching Station	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Phase I 500 kV DC Line from Hoober Switching Station to SONGS Switching Station	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Imperial Valley-Hoober-500 kV AC Transmission Line "Eastern" Loop	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Imperial Valley to Hoober 500 kV AC Transmission Line "Western" Loop	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
IID	Imperial County	Second 500 kV DC Line C21Circuit (Phase 2) from Hoober Switching Station to SONGS Switching	Yes	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
WASN[4]	Northern California	Keswick-Airport-Cottonwood 230kV reconductoring	No	Exhibit 6 – Planned 2015 WestConnect Transmission Plan
WASN	Northern California	Olinda-Cottonwood #1 & #2 230 kV Reconductoring	No	Exhibit 6 – Planned 2015 WestConnect Transmission Plan

[4] Western Area Southern Nevada

WASN	Northern California	Olinda 230 kV Reactive Voltage Control	No	WASN OASIS Website

The California ISO Planning Region portion of this Plan, which is based on assumptions and analyses the California ISO has conducted through its regional process, consists of several major transmission projects that have been previously approved by the California ISO and are fully permitted by the California Public Utilities Commission (CPUC) for construction, plus several transmission projects that the California ISO's interconnection studies have shown are needed to serve the interconnection customers for which those studies were done, but are still progressing through the approval process. Approving additional major transmission now would increase the risk of stranded investment. However, to the extent the key assumptions behind this assessment change during the 2015-2016 regional planning effort and beyond, the California ISO will reevaluate and modify the plan accordingly.

The next section of this report provides an overview of the California ISO Planning Region and includes more information on the renewable transmission upgrades that have been identified in the California ISO 2014-2015 transmission plan. Background and details on the transmission plans of other CTPG members can be found in the 2015 WestConnect (Order 890) Annual Ten Year Transmission Plan.

4. Details of the California ISO Conceptual Statewide Plan

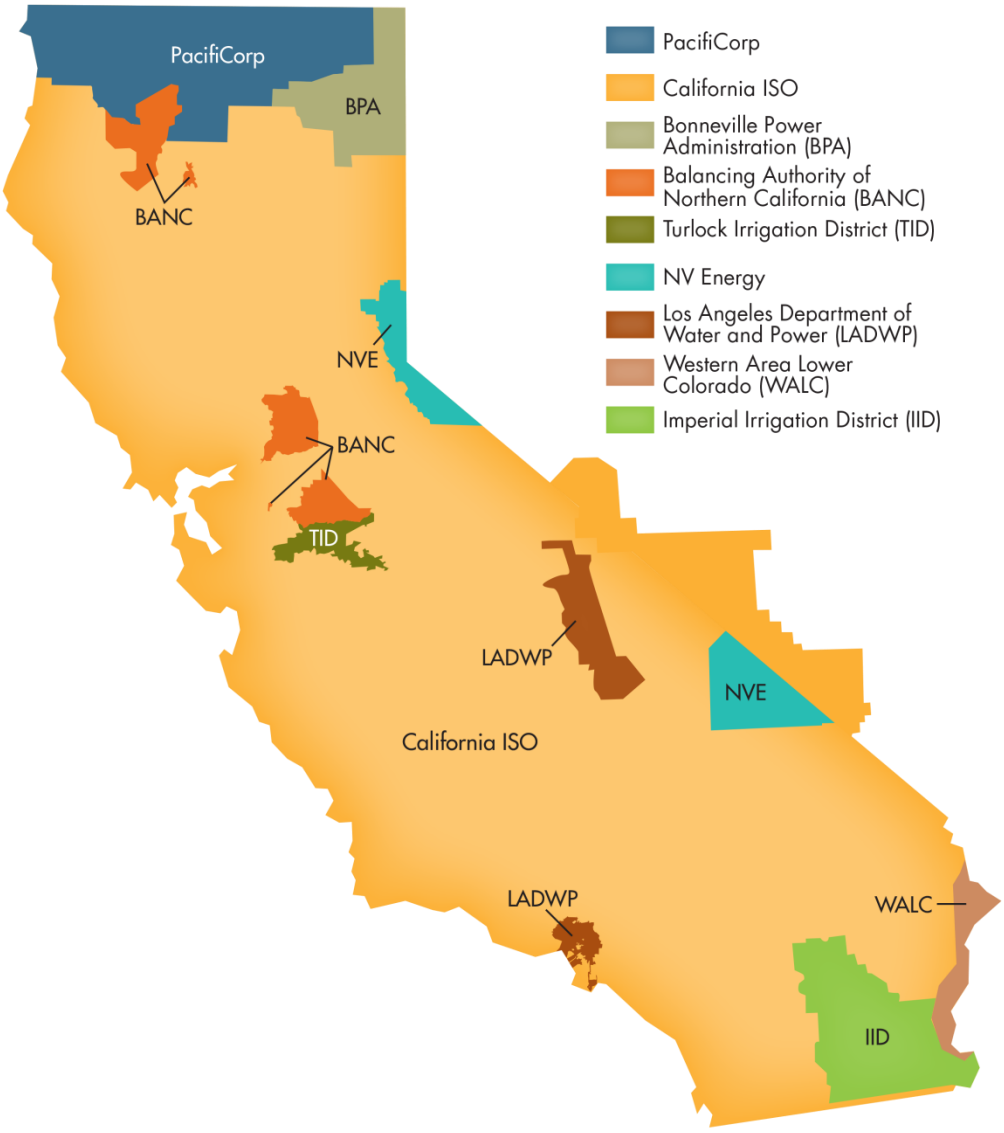
Since the 2013-2014 Plan was prepared, the California ISO and WestConnect Planning Regions have performed and documented, respectively, the results of their regional planning assessments to address reliability and RPS needs, among others, across the next ten years. This portion of the report provides an overview of the California ISO's 2014-2015 planning effort which covers a broad range of needs throughout the California ISO's Planning Region. A detailed discussion of the California ISO's planning assessment is documented in the California ISO's 2014-2015 Transmission Plan[5]. Likewise, other California transmission planning entities participate in and have documented their transmission assessments through the WestConnect Planning Region's planning process. As such, details on their transmission plans are documented in the 2015 WestConnect (Order 890) Annual Ten Year Transmission Plan.

[5] http://www.caiso.com/Documents/Board-Approved2014-2015TransmissionPlan.pdf

5. California ISO Balancing Authority Area

The California ISO Balancing Authority Area (BAA) is the largest of its kind in California and serves over 80 percent of the electricity demand in California. In general, the area identified as the California ISO BAA also represents the California ISO's Planning Region whose approximate geographic area is illustrated in shown Figure 1.

Figure 1 – California Balancing Authorities



The 2014-2015 California ISO Transmission Plan provides a comprehensive evaluation of the ISO transmission grid to identify upgrades needed to successfully meet California's policy goals, in addition to examining conventional grid reliability requirements and projects that can bring economic benefits to consumers. This plan is updated annually, and is prepared in the larger context of supporting important energy and environmental policies while maintaining reliability through a resilient electric system.

In recent years, California enacted policies aimed at reducing greenhouse gases and increasing renewable resource development. The state's goal, to have renewable resources provide 33 percent of California's retail electricity consumption by 2020, became the principal driver of substantial investment in new renewable generation capacity both inside and outside of California. While the bulk transmission needs to meet this objective have largely been identified and are moving forward, the plan is tested in each planning cycle with updated information to ensure it is still adequate to support the 33 percent renewable energy goal. As well, the early retirement of the San Onofre Nuclear Generating Station coupled with the impacts of potential retirement of gas-fired generation in the San Diego and LA Basin areas – largely to eliminate coastal water use in "once-through cooling" have created both opportunities for development of preferred resources as well as challenges in ensuring continued reliable service in these areas.

Those solutions that were identified by the 2014-2015 regional planning process to meet California's policy goals are listed in Table 2.

Table 2: Elements of California ISO 2014-2015 Regional Plan Supporting Renewable Energy Goals

Transmission Facility	**Online**
Transmission Facilities Approved, Permitted and Under Construction	
Sunrise Powerlink (completed)	2012
Tehachapi Transmission Project	2016
Colorado River - Valley 500 kV line (completed)	2013
Eldorado – Ivanpah 230 kV line (completed)	2013
Carrizo Midway Reconductoring (completed)	2013

Additional Network Transmission Identified as Needed in California ISO Interconnection Agreements but not Permitted	
Borden Gregg Reconductoring	2019
South of Contra Costa Reconductoring	2016
West of Devers Reconductoring	2019
Coolwater - Lugo 230 kV line	2018
Policy-Driven Transmission Elements Approved but not Permitted	
Mirage-Devers 230 kV reconductoring (Path 42)	2015
Imperial Valley Area Collector Station	2015
Sycamore – Penasquitos 230kV Line	2017
Eldorado-Mohave and Eldorado-Moenkopi 500 kV Line Swap	2016
Lugo – Eldorado series cap and terminal equipment upgrade	2016
Warnerville-Bellota 230 kV line reconductoring	2017
Wilson-Le Grand 115 kV line reconductoring	2020
Suncrest 300 Mvar SVC	2017
Lugo-Mohave series capacitors	2017
Additional Policy-Driven Transmission Elements Recommend for Approval in the 2014-2015 Transmission Plan	
None identified in the 2014-2015 Transmission Plan	

6. Collaborative Planning Efforts

The California ISO, utilities, state agencies and other stakeholders continue to work closely to assess how to meet the environmental mandates established by state policy. The collaboration with these entities is evident in the following initiatives.

6.1 State Agency Coordination in Planning

State agency coordination in planning has continued to be improved in 2014 building further improvements into the development of unified planning assumptions that have enhanced the 2014-2015 Transmission Plan as well as setting a stage for enhancements in future transmission planning cycles.

The development of the unified planning assumptions for the 2014-2015 planning cycle benefited from further improvements in coordination efforts between the CPUC, the California Energy Commission (CEC) and the California ISO. Building from previous collaboration efforts focused on a single "managed" load forecast, staff undertook an inter-agency process alignment[6] forum to improve infrastructure planning coordination within the three core processes:

- Long-term forecast of energy demand produced by the CEC as part of its biennial Integrated Energy Policy Report (IEPR),
- Biennial Long Term Procurement Plan proceeding (LTPP) conducted by the CPUC, and
- Annual Transmission Planning Process (TPP) performed by the California ISO.

The agencies also agreed on an annual process to be performed in the fall of each year to develop planning assumptions and scenarios to be used in infrastructure planning activities in the coming year. The assumptions include demand, supply and system infrastructure elements, including the renewables portfolio standard (RPS) portfolios. The results of the CPUC's annual process feeding into this 2014-2015 transmission planning process were communicated via an assigned commissioner's ruling in the 2014 LTPP[7]. These assumptions are further vetted by stakeholders through the stakeholder process in developing each year's study plan.

[6] ISO, CEC and CPUC planning and procurement process alignment. http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=5B40CD53-EE59-4EE9-953E-F7DA70D47A53

[7] Rulemaking 13-12-010 "Assigned Commissioner's Ruling Technical Updates to Planning Assumptions and Scenarios for Use in the 2014 Long-Term Procurement Plan and 2014-2015 CAISO TPP" on February 27, 2014, with a technical update adopted on May 14, 2014.

Based on the process alignment achieved to date and the progress on common planning assumptions, the California ISO anticipates conducting future transmission planning process studies, 10-year Local Capacity Requirement studies, and system resource studies (including operational flexibility) during each transmission planning cycle, using the consistent planning assumptions established for both processes.

6.2 Preliminary Reliability Plan for LA Basin and San Diego:

In response to the announced closure of the San Onofre Nuclear Generating Station on June 7, 2013, the staff of the CPUC, CEC, and California ISO developed a Preliminary Reliability Plan for the LA Basin and San Diego area. The draft, released on August 30, 2013, was developed in consultation with SWRCB, SCE, SDG&E and South Coast Air Quality Management District (SCAQMD) and describes the coordinated actions the CPUC, CEC, and California ISO staff are pursuing in the near term (4 years) and the long-term (7 years). These actions collectively comprised a preliminary reliability plan to address the closure of San Onofre, the expected closure of 5,068 MW of gas-fired generation that uses once-through cooling technology, and the normal patterns of load-growth.

The reliability plan identified challenging goals that needed to be fully vetted in the public decision making processes of the appropriate agency, with a focus on ensuring reliability, finding the most environmentally clean grid solutions, and urgently pursuing the variety of decisions that must ultimately be made and approved by key state agencies. Also, implementing the specific mitigation options required decisions to be determined through CPUC or CEC proceedings, through the California ISO planning process or both.

Considerable progress has been made in the various proceedings which indicate that the authorized resources and approved transmission are sufficient to meet the currently forecast needs. Staff is continuing to monitor the progress of the demand-side programs, the utilities' progress in procuring authorized resources, and the progress of approved transmission mitigations.

6.3 Inter-regional Planning Requirements of FERC Order 1000

In July 2011, FERC issued Order No. 1000 on "Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities." The order required the California ISO to make a filing demonstrating that the California ISO is a qualified regional planning entity under the definition of the order, and modifying the California ISO tariff as needed to meet the regional planning provisions of the order as noted earlier. It also required the California ISO to develop and file common tariff provisions

with each of its neighboring planning regions to define a process whereby each pair of adjacent regions can identify and jointly evaluate potential inter-regional transmission projects that meet their transmission needs more cost-effectively or efficiently than projects in their regional plans, and to specify how the costs of such a project would be assigned to the relevant regions that have selected the inter-regional project in their regional transmission plans.

Through collaborative efforts, the four planning regions reached agreement joint tariff language that was ultimately proposed for inclusion placed in each transmission utility provider's tariff. On May 10, 2013 the California ISO, along with transmission utility providers belonging to the NTTG, and WestConnect planning regions jointly submitted their Order 1000 interregional compliance filings. The ColumbiaGrid transmission utility providers submitted the joint tariff language in June 2013 as part of the ColumbiaGrid interregional filing. The California ISO considers these filings to be a significant achievement by all four planning regions and a reflection of their commitment to work towards a successful and robust interregional planning process under Order 1000. A FERC order on these initial filings was issued on December 18, 2014, largely adopting the filings with an effective date of October 1, 2015. The California ISO was required to file a second compliance filing relating to certain details of benefit assessments to be used in interregional cost allocation processes. On June 1, 2015 FERC issued its final order on interregional coordination fully accepting the compliance filings of all four Planning Regions. Since that time, the California ISO and the other three Planning Regions have undertaken coordination activities to the extent possible prior to the actual effective date of October 1, 2015.

6.4 Advancing Preferred Resources

Building on efforts in past planning cycles, the California ISO is continuing to make material strides in facilitating use of preferred resources to meet local transmission system needs.

The California ISO issued a paper[8] on September 4, 2013, as part of the 2013-2014 transmission planning cycle in which it presented a methodology to support California's policy emphasis on the use of preferred resources[9] — energy efficiency, demand response, renewable generating resources and energy storage — by considering how such resources can constitute non-conventional solutions to meet local area needs that

[8] http://www.caiso.com/Documents/Paper-Non-ConventionalAlternatives-2013-2014TransmissionPlanningProcess.pdf

[9] To be precise, "preferred resources" as defined in CPUC proceedings applies more specifically to demand response and energy efficiency, with renewable generation and combined heat and power being next in the loading order. The term is used more generally here consistent with the more general use of the resources sought ahead of conventional generation.

otherwise would require new transmission or conventional generation infrastructure, with initial work based on a generic suite of preferred resources until procurement activities provided better information on the detailed characteristics being provide by the market.

While the California ISO initially considered trying to augment the generic suite of resources, the California ISO has reviewed the existing methodology and concluded that further refinement of the generic suite of preferred resources forming the basis of the methodology would not be practical or effective until more detailed information is available about the types of preferred resource options being brought forward in the existing procurement processes. Instead, efforts were focused on testing the resources provided by the market into the utility procurement processes for preferred resources.

The California ISO has provided additional support in advancing the cause of preferred resources in a number of forums. These include actively supporting the development of an energy storage roadmap in concert with state energy agencies; actively participating in the CPUC's demand response related proceedings; and supporting identification of the necessary operating characteristics so that the demand response role in meeting transmission system increases as design and implementation issues are addressed.

6.5 Reliability Assessment

The reliability studies necessary to ensure compliance with North American Electric Reliability Corporation (NERC) and California ISO planning standards are a foundational element of the transmission plan. During the 2014-2015 cycle, California ISO staff performed a comprehensive assessment of the California ISO controlled grid to ensure compliance with applicable NERC reliability standards. The analysis was performed across a 10-year planning horizon and modeled summer on-peak and off-peak system conditions. The California ISO assessed transmission facilities across voltages of 60 kV to 500 kV, and where reliability concerns were identified, the California ISO identified mitigation plans to address these concerns. These mitigation plans include upgrades to the transmission infrastructure, implementation of new operating procedures and installation of automatic special protection schemes. All California ISO analysis, results and mitigation plans are documented in the transmission plan.

In total, the 2014-2015 Transmission Plan proposed approval of seven reliability-driven transmission projects, representing an investment of approximately $352 million in infrastructure additions to the California ISO controlled grid. The majority of these projects (5) cost less than $50 million and have a combined cost of $98 million. The

remaining two projects with costs greater than $50 million have a combined cost of $254 million and consist of the following:

6.5.1 North East Kern 70 to 115 kV Voltage Conversion

Converting two existing 70 kV circuits in the area to 115 kV, reconductoring an existing 115 kV line with larger conductor, and upgrading an existing substation to breaker-and-a-half configuration.

6.5.2 Martin 230 kV bus extension project

Reconfiguring the existing 230 kV transmission terminating at Martin to provide one 230 kV path bypassing the Martin substation.

These reliability projects are necessary to ensure compliance with the NERC and California ISO planning standards. The number of reliability-driven transmission projects identified in the 2014-2015 planning cycle is significantly reduced from previous cycles. This reflects the progress made in previous planning cycles addressing longer term reliability needs as well as the increased reliance on preferred resources.

The majority of identified reliability concerns are related to facility overloads or low voltage. Therefore, many of the specific projects identified through the planning process include line reconductoring and facility upgrades for relieving overloading concerns. Several initially identified reliability concerns were mitigated with non-transmission solutions. These include generation redispatch and, for low probability contingencies, possible load curtailment.

One new project is part of a larger basket of reinforcements planned for the San Francisco area. The other mitigations planned to improve the reliability on the peninsula, both to reduce risk of outage and to improve service restoration following a more severe event, are more appropriately considered capital maintenance.

The analysis presented in the 2014-2015 Transmission Plan indicates that the authorized resources, forecast load, and previously-approved transmission projects working together meet the reliability needs in the LA Basin and San Diego areas. However, due to the inherent uncertainty in the significant volume of preferred resources and other conventional mitigations, the California ISO has performed extensive analysis of alternatives in the event other resources fail to materialize.

6.6 33 Percent RPS Generation Portfolios and Transmission Assessment

The transition to greater reliance on renewable generation has created significant transmission challenges because renewable resource areas tend to be located in places distant from population centers. The California ISO's transmission planning process has balanced the need for certainty by generation developers as to where this transmission will be developed with the planning uncertainty of where resources are likely to develop by creating a structure for considering a range of plausible generation development scenarios and identifying transmission elements needed to meet the state's 2020 RPS. Commonly known as a least regrets methodology, the portfolio approach allows the California ISO to consider resource areas (both in-state and out-of-state) where generation build-out is most likely to occur, evaluate the need for transmission to deliver energy to the grid from these areas, and identify any additional transmission upgrades that are needed under one or more portfolios.

Public policy requirements and directives are an element of transmission planning that was added to the planning process in 2010. Planning transmission to meet public policy directives is a national requirement under FERC Order No. 1000. It enables the California ISO to identify and approve transmission facilities that system users will need to comply with state and federal requirements or directives. The primary policy directive for last four years' planning cycles and the current cycle is California's Renewables Portfolio Standard that calls for 33 percent of the electric retail sales in the state in 2020 to be provided from eligible renewable resources. The California ISO's study work and resource requirements determination for reliably integrating renewable resources is continuing on a parallel track outside of the transmission planning process, but steps are taken in the California ISO's transmission plan to incorporate those requirements into annual transmission plan activities.

In consultation with interested parties, CPUC staff developed three renewable generation scenarios for meeting the 33 percent RPS goal in 2020, with one of these being a sensitivity study for informational purposes that included significantly higher levels of renewable generation in the Imperial area. The reduced number of scenarios from previous transmission planning cycles and less variability between several of the scenarios are indicative of there being greater certainty around the portfolios, as utilities have largely completed their contracting for renewable resources to meet the 2020 goals.

The results of the assessments presented in the 2014-2015 Transmission Plan did not identify a need for new transmission projects to support achievement of California's 33 percent renewables portfolio standard given the transmission projects already approved

or progressing through the California Public Utilities Commission approval process. However, the California ISO did identify some transmission operational solutions for improving transmission deliverability out of the Imperial area. More specifically:

- the California ISO has identified operational solutions that, coupled with previously approved transmission reinforcements, restores the deliverability of future renewable generation from the Imperial Valley area to the levels that were forecast before the early retirement of the San Onofre Nuclear Generating Station. The early retirement of the San Onofre Nuclear Generating Station had materially changed flow patterns in the area, resulting in a significant decline in forecast deliverability from the Imperial area as set out in the 2013-2014 Transmission Plan. These new measures, in combination with previously approved transmission projects, result in a forecast of over 1700 MW incremental capacity for new renewables above existing facilities. As approximately 1000 MW of new renewable generation is already moving forward in the California ISO or IID in the Imperial area, there remains a forecast of between 500 and 750 MW being available above renewables projects already moving forward, depending on the precise location within the Imperial area, and
- the California ISO also analyzed as a sensitivity study the transmission requirements necessary to deliver up to 2500 MW incremental renewable generation, above existing levels, from the Imperial area.

7. Conclusions and Next Steps

The 2014-2015 ISO Transmission Plan provides a comprehensive evaluation of the ISO transmission grid to identify upgrades needed to adequately meet California's policy goals, address grid reliability requirements and bring economic benefits to consumers. This year's plan identified 8 transmission projects, estimated to cost a total of approximately $359 million, as needed to maintain the reliability of the ISO transmission system, meet the state's renewable energy mandate, and deliver material economic benefits. As well, the ISO has identified the need to continue study in future cycles focusing on:

- continuing the coordinated and iterative process of assessing southern California (LA Basin and San Diego area) needs with an emphasis on preferred resources, and in particular, assessing the progress made on the planned mitigations to consider the need for additional, alternative measures;
- continuing to explore and refine methodologies to ensure the maximum opportunity for preferred resources to meet transmission system needs; and

- exploring the infrastructure needs for future additional renewable energy development in anticipation of higher reliance upon these resources in future government policy direction.

Finally, with the release of this Plan the California ISO is providing an opportunity for interested stakeholders to submit comments and recommend modifications to the Plan as it pertains to the information presented in this Plan. This may include information that is documented within the California ISO's 2014-2015 regional plan, including alternative transmission and non-transmission solutions, potential interstate transmission lines and proposals for access to resources located in areas not identified in the plan. This information will be considered in the California ISO's 2015-2016 regional planning process. Stakeholder comments and recommended modifications to the Plan that are associated with CTPG members other than the California ISO will be provided to WestConnect for consideration in their process.