Imperial County Transmission Consultation

Draft Discussion Paper

July 2, 2014

Ver3.0

Draft Discussion Paper

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1. Introduction

The California ISO is conducting a stakeholder consultation on options to address renewable generation deliverability out of Imperial County to the San Diego and LA Basin areas in support of the California ISO's transmission planning process. This consultation effort will provide opportunities for stakeholder input on a range of issues that will inform the California ISO's 2014-2015 transmission planning process, which is currently underway.

In the 2014-2015 transmission planning process, the California ISO is studying renewable generation portfolios provided by the California Public Utilities Commission (CPUC) to identify the transmission solutions that would enable increased volumes of renewable generation in Imperial County. That analysis is being conducted for information purposes to further inform future CPUC portfolio development.

A number of factors drive the need for these studies. These include the past efforts of the California ISO and the CPUC to enable renewable generation in Imperial County, a recent high level environmental assessment performed by the California Energy Commission (CEC)/Aspen Environmental Group of certain potential transmission alternatives in the Imperial County/Southern California region, the interest in geothermal generation development in the Salton Sea area, and the loss of coastal generation including the early retirement of the San Onofre Nuclear Generating Station (SONGS) and the implementation of the Once Through Cooling (OTC) requirements in the Los Angeles and San Diego areas. Further, the California ISO documented in the 2013-2014 Transmission Plan that the early retirement of SONGS materially shifted anticipated electrical flow patterns and negatively impacted the ability to provide deliverability to future increased generation potential in Imperial County.

The technical analysis of these issues is progressing as part of the 2014-2015 transmission planning process. However, to better inform the California ISO's planning process on options for future development of additional renewable energy, the California ISO will host a stakeholder consultation meeting on July 14, 2014 to present a discussion paper and discuss issues surrounding the deliverability from the Imperial County to California ISO's balancing control areas.

The California ISO is seeking to have a consultation with stakeholders to gather input and/or inform the following:

1. Overview of the California ISO's 2014-2015 transmission planning effort to assess deliverability capability out of Imperial County into the California ISO;
2. Viability of major 500 kV AC or HVDC transmission from Imperial County to the LA Basin/San Diego area, building on the existing CEC/Aspen Environmental Group environmental feasibility analysis of potential corridor designations in southern California;
3. Consider reallocating a portion of the Maximum Import Capability that is allocated to the transmission path from Arizona to enable increased capability from Imperial County;

As noted above, this stakeholder consultation will complement and inform the California ISO's 2014-2015 transmission planning process in which the technical need analysis is taking place.

2. Overview

The California ISO's annual transmission planning process includes provisions for meeting federal and state policies, which presently focus on achieving the state's 33% renewables portfolio standard. To this end, since 2011 the California ISO has targeted enabling 1400 MW of renewable generation imports from Imperial County to be deliverable. This stemmed from efforts the California ISO made in 2011 to support the viability of renewable generation being considered in the CPUC's 2011 RPS procurement proceeding. While virtually no generation was acquired in Imperial County in that process for other reasons, the California ISO has continued to test that future deliverability could be provided in subsequent transmission plans through study of the renewable generation portfolios provided by the CPUC. Further, modest transmission reinforcements were identified and approved by the California ISO to move towards these targeted levels based on the renewable generation portfolios.[1] These portfolios included sufficient generation in the Imperial County to both meet the target for imports from Imperial Irrigation District (IID) as well as the forecast of generation connecting directly to the California ISO-controlled grid in the area. While the IOUs have largely procured the generation necessary for meeting the state's 33% RPS, there remains interest in further renewable development in Imperial County to achieve future potential renewables objectives, in particular geothermal resources. At present there are two bills reflective of this interest; SB 1139, which requires non-municipals to acquire at least 500 MW of geothermal energy produced by new power plants by 2024; and AB 148, Salton Sea restoration to pursue restoration efforts in that area. The Assembly Committee on Utilities and Commerce approved SB 1139 on June 23, 2014, followed by approval by the Assembly Natural Resources Committee two days later. The legislature has passed AB 148 and it is currently awaiting the Governor's signature.

However, in the 2013-2014 transmission planning process, the California ISO noted the deliverability of future renewable generation from the Imperial Valley area may be significantly reduced from previous estimates primarily due to changes in flow patterns resulting from the retirement of the San Onofre Nuclear Generating Station. Despite the impacts being heavily offset by other reinforcements proposed in the transmission plan, only 1000 MW of the 1715 MW of the Imperial County renewable generation portfolio amounts developed for the 2013-2014 transmission planning process can be made deliverable without additional actions. A considerable portion of that 1000 MW is connecting directly to the California ISO controlled grid in the area, not to Imperial County[2]. Given this significant change in

[1] In the ISO's 2010/2011 transmission planning process analysis of deliverability out of Imperial County resulted in the ISO's recommendation and approval of upgrades to Path 42 which, as identified by the ISO, was required to achieve 1400 MW incremental deliverability out of Imperial County into the ISO once other upgrades were also complete.[1] At that time, ISO planning studies had already established the existing MIC limits for resource adequacy purposes to be 471 MW IID to SCE, and zero MW IID to SDG&E.

[2] The portfolio amount of 1715 MW specified for the Imperial County reflected potential generation the geographic area, whether connected to the ISO grid or IID grid in the area.

circumstance the California ISO concluded that further study of deliverability capability from Imperial County to the San Diego and LA Basin areas was warranted in the 2014-2015 transmission planning process. As such, additional deliverability analysis is being included in the 2014-2015 transmission planning process to further refine the results and conclusions from the 2013-2014 transmission plan with the aim of assessing and identifying (for informational purposes only) the most effective solution to achieve previously targeted deliverability levels. To support this study effort, the CPUC and CEC provided in February, 2014, new portfolios for both the base forecast amount of 1000 MW new renewable generation in the Imperial County, as well as a sensitivity of 2500 MW in the Imperial County.

Simultaneously, the reliability challenges in the LA Basin/San Diego area have been considered. The analysis documented in the California ISO's 2013-2014 transmission plan indicated that depending on the effectiveness of the transmission solutions already approved by the California ISO, the success of the resource procurement approved in the CPUC's LTPP process, and the development of other preferred resources, the remaining local capacity deficiency in the LA Basin/San Diego area could reach 900 MW. Given these results, this analysis is being updated in the 2014-2015 planning process to reflect the latest information.

In identifying the transmission solutions that would be necessary to enable previously-targeted levels of renewable import from Imperial County, the California ISO intends to consider transmission concepts that have been put forth in past processes as possible means to both address local capacity needs in the LA Basin/San Diego area and to provide opportunity for additional renewable generation to develop in Imperial County.

On balance, the California ISO believes that consideration of these issues should inform the 2014-2015 transmission planning studies. Therefore, a successful stakeholder consultation is a necessary effort to complement the 2014-2015 transmission planning process. This will ensure that stakeholder input can be incorporated into the California ISO's transmission planning analysis in a manner that is consistent with the already established 2014-2015 transmission planning milestone schedule. As such, the stakeholder consultation effort is being initiated now.

2.1 Schedule

The California ISO's 2014-2015 transmission planning process is currently underway and under the guidance of the 2014-2015 Transmission Planning Process Unified Planning Assumptions and Study Plan[3]. The schedule for the 2014-2015 planning process shows that a draft transmission plan will be posted for stakeholder review in January 2015. In order for the stakeholder consultation effort to provide meaningful input into the current California ISO transmission planning effort, it will need to be completed by December 2014 so that information from the consultation effort can be considered in the policy-driven transmission analysis of the 2014-2015 transmission planning process.

[3] http://www.caiso.com/Documents/2014-2015FinalStudyPlan.pdf

At present, it is anticipated that only one stakeholder consultation meeting will be required to develop and finalize the discussion paper. However, a second stakeholder meeting or stakeholder call has been included in the schedule should it be needed.

The proposed schedule for the stakeholder consultation effort is shown in Table 2-1.

Table 2-1
Proposed Stakeholder Consultation Schedule

Date	Action
July 2	Post draft discussion paper
July 14	Stakeholder meeting (in person)
July 28	Stakeholder comments due by 5:00 p.m.
August 14	Post final draft discussion paper
August 28	Stakeholder meeting or call (if needed)
September 11	Stakeholder comments due by 5:00 p.m.
September 24-25	Stakeholder meeting #2 of the 2014-2015 transmission planning process
November 19-20	Stakeholder meeting #3 of the 2014-2015 transmission planning process
January 2015	California ISO posts draft transmission plan

3. Stakeholder Consultation Areas of Discussion

The stakeholder consultation proposes to cover three topic areas: an overview of the California ISO's 2013-2014 transmission planning study results for Imperial County in southern California; consideration of the viability of major 500 kV AC or HVDC transmission from Imperial County to the LA Basin/San Diego area and in particular a review of the CEC/ASPEN environmental feasibility analysis of potential corridor designations in southern California; and a consideration of potentially reallocating a portion of the Maximum Import Capability that is allocated to the transmission path from Arizona to enable increased capability from IID.

3.1 2013-2014 California ISO Transmission Plan – Reliability Driven Requirements in Southern California

A major reliability focus of 2013-2014 transmission planning effort was the reliability needs in Southern California, in particular the LA Basin and San Diego areas, in light of the retirement of the SONGS generation coupled with the impacts of potential retirement of OTC gas-fired generation in the San Diego and LA Basin areas.

The California ISO and state agency staff worked collaboratively to develop a preliminary draft plan, which helped frame the scope of the issues that were addressed to ensure coordinated action was being initiated on a number of fronts. The approach focuses on achieving reliability while transitioning to a cleaner, lower emission future and it inherently accepted that a range of mitigations would be required

in the face of the scope of issues to be addressed in the area in which preferred resources, transmission, and some level of conventional generation would all be needed.

Through its transmission plan, the California ISO has accounted for the need for continued coordination and iterative dialogue with other state agency processes such as the CPUC Long Term Procurement Process and CEC forecasting processes as well as the need to move decisively on least regrets transmission solutions that can play a significant role in addressing the local area challenges in the LA Basin and San Diego areas.

Based on the results of its assessments the California ISO categorized potential transmission solutions into three groups:

- Group I projects

  These project "optimize existing transmission" projects to address a portion of the residual needs in the LA Basin and San Diego area and as a more certain hedge against other resources failing to develop on schedule. These projects provide material reductions in local capacity requirements without the addition of new transmission rights of way thus providing the best use of existing transmission lines and transmission rights of way, as well as minimizing risk about permitting and the timing of permitting;

- Group II projects

  These projects are considered potential LA/San Diego connector projects that would be identified through a longer term analysis (10 to 20 year) in 2014-2015 or 2015-2016 cycle to address evolving load forecasts and the potential for preferred resources and storage. And finally;

- Group III projects

  These projects provide reliability benefits but also could play a role in achieving future state policy objectives by enabling additional renewable generation in the Imperia zone, and they may obviate the need to advance a future reliability-driven Group II project.

The California ISO 2013-2014 Transmission Plan recommended the least regrets Group I transmission solutions be implemented at that time; recognizing that there remains ample residual need for additional preferred resources and potentially other solutions, and for flexibility for future potential changes in load forecasts. In the California ISO's 2014-2015 transmission planning process, the California ISO is updating and refining the analysis to identify residual needs and the role of major transmission reinforcements in meeting that need.

Figure 1 depicts the Group II projects that were considered in the 2013-2014 Transmission Plan. A number of variations of transmission configurations have been proposed and evaluated by the California ISO for reinforcing the connections between the San Diego and LA Basin area. These have included both overhead AC and submarine DC cable concepts, and provide a number of alternatives. Siting is expected to be challenging for all these alternatives.

Figure 1: Conceptual Transmission Alternatives to Strengthen the Connection of LA Basin and San Diego Local Capacity Areas (Group II)

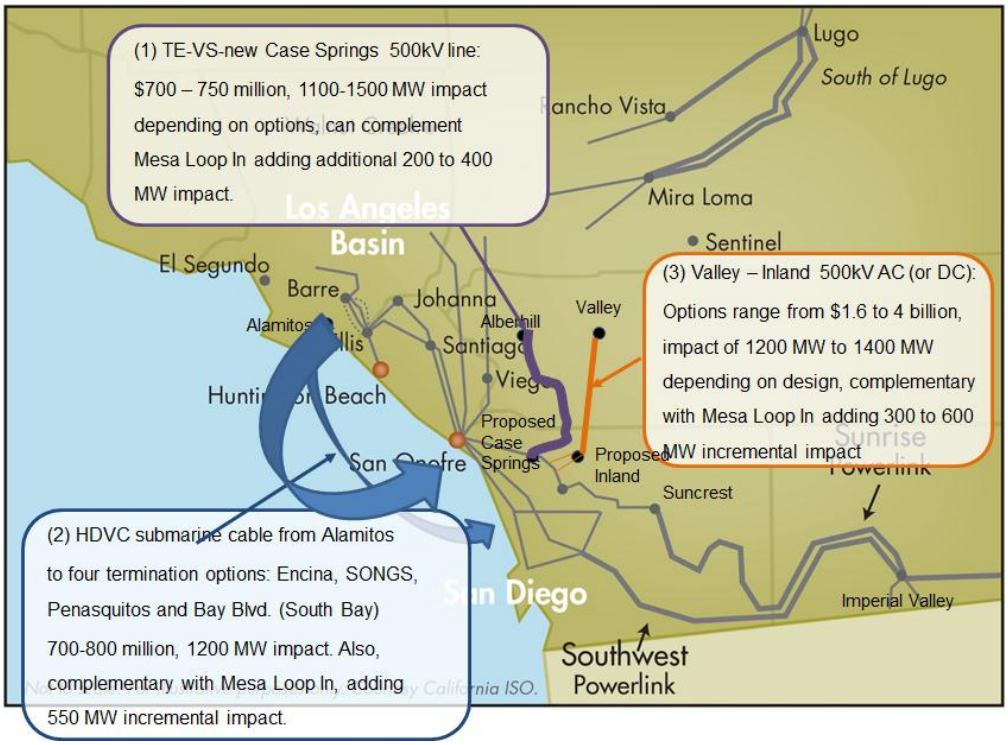
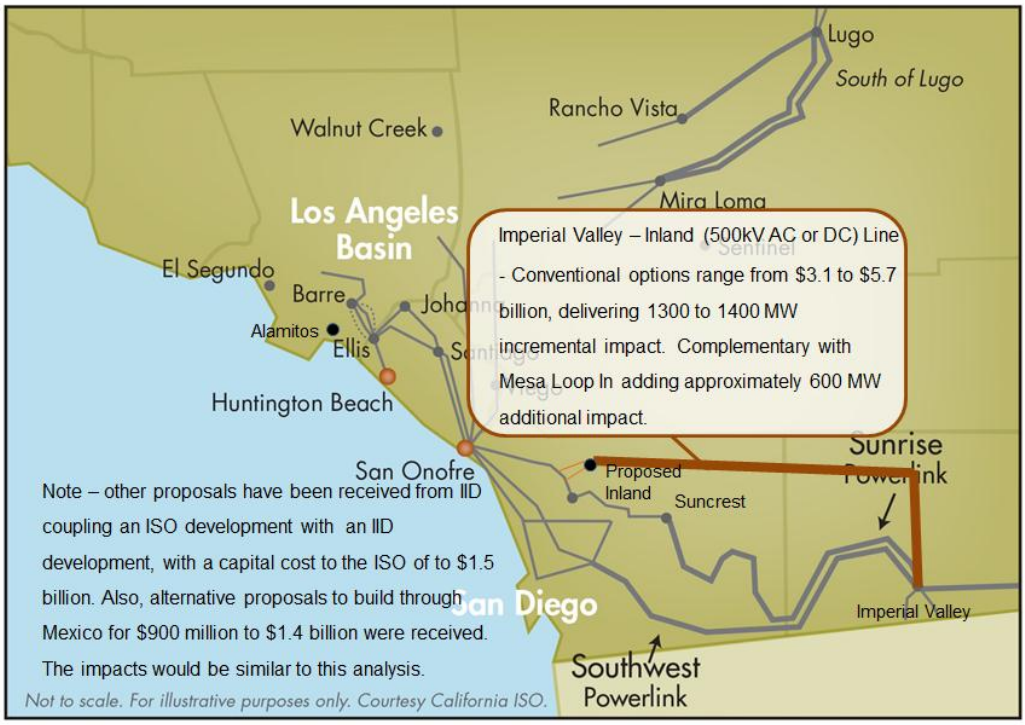


Figure 2 depicts the Group III projects that were considered in the 2013-2014 Transmission Plan. A number of variations of transmission configurations have also been proposed for bringing new transmission into the San Diego/LA Basin area from Imperial Valley to access renewables including geothermal development.

Figure 2: Conceptual Transmission Alternatives into the Greater LA Basin/San Diego Local Capacity Areas (Group III)



3.2 Aspen Environmental Group Environmental Feasibility Analysis

In collecting input on the feasibility of various transmission solutions focusing on southern California reliability and enabling renewable generation in the Imperial County, the California ISO intends to draw on the existing information gathered by Aspen Environmental Group and further input received in this consultation process. Aspen Environmental Group prepared environmental feasibility analysis[4] in response to a request from the California Energy Commission staff to inform the Energy Commission staff and California ISO about concerns related to potential electric transmission options under consideration by the California ISO in response to the closure of the San Onofre Nuclear Generating Station. The options included a range of potential projects that were later categorized by the California ISO as Group II and Group III projects as described in Section 3.1 above. These options may be considered by the Energy Commission staff for potential transmission corridor designations.[5,6]

Under the direction of the Energy Commission staff, Aspen worked with an external team that included representatives of Southern California utilities in the study area (San Diego Gas & Electric Company

[4] http://www.energy.ca.gov/2014publications/CEC-700-2014-002/index.html
[5] The projects to be evaluated by Aspen were finalized by the California ISO in early October 2013.
[6] Potential long-term transmission alternatives to the closure of SONGS under consideration by the California ISO were also discussed at a California Energy Commission Integrated Energy Policy Report (IEPR) workshop held on September 9, 2013 and discussed in the 2013 IEPR, posted at http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-CMF.pdf, pp. 167-9.

[SDG&E] and Southern California Edison [SCE]); state and federal agencies with permitting authority in the study area (U.S. Bureau of Land Management, U.S. Forest Service, California Public Utilities Commission, California State Parks, and the San Diego County Planning Department) and the California ISO. The Aspen Environmental Group studied potential corridors for two basic types of transmission options. First, the report describes and evaluates a series of potential onshore transmission alternatives, including both alternating current (AC) and direct current (DC) systems and substation upgrades. Second, the report describes and evaluates the technology, viability, and potential to develop offshore corridors for a high-voltage direct current (HVDC) submarine cable between the SCE and SDG&E territories. The studied alternatives include:

- Alternative 1, Submarine HVDC Cable.
- Alternative 2, Alberhill to Suncrest.
- Alternative 3, Enhanced Talega-Escondido/Valley-Serrano (Forest Route).
- Alternative 4, Enhanced Talega-Escondido/Valley-Serrano (Talega-Serrano Route).
- Alternative 5, Imperial Valley to Inland (Overhead AC and Overhead/Underground DC).
- Alternative 6, Valley to Inland (Overhead AC or Underground DC).
- Alternative 7, Imperial Valley Expansion.
- Alternative 8, Mesa Substation Loop-In.

The work performed by the Aspen Environmental Group presents an early-stage evaluation of the potential transmission corridors in the Southern California study area. The alternatives were ranked on a qualitative four level scale of possible, possible but challenging, challenging, and very challenging. Developing any of the transmission options would require viable project sponsors with experience and access to sufficient resources to propose an optimum route and design. Full environmental and technical studies would still need to occur before any agency could approve a project within any of the potential corridors.

3.3 Reallocation of Maximum Import Capability (MIC)

The MIC, which the California ISO calculates annually, is the maximum megawatt amount of import capacity that will be available to load serving entities (“LSEs”) for procuring resources outside the California ISO balancing authority area to meet their Resource Adequacy (RA) requirements for the upcoming year. The current MIC methodology is part of the California ISO deliverability assessment process. To meet their RA requirements, LSEs must procure capacity that has been demonstrated to be deliverable through the California ISO’s deliverability assessment process. For RA capacity procurement purposes, the import capability of the California ISO system is determined by the California ISO and then allocated to LSEs in accordance with a detailed 13-step process set forth in Tariff Section 40.4.6.2.

In 2010 the California ISO revised the MIC calculation methodology so as to make it possible to set larger MIC values than the then current historically-based approach allowed, without compromising the fundamental requirement that all RA capacity be simultaneously deliverable to the California ISO

balancing authority area to meet peak load conditions. This “expanded MIC” methodology has been in place since 2011.

During the development of the 2014/2015 Transmission Planning Process Draft Unified Planning Assumptions and Study Plan the California ISO committed to an updated analysis of the available Imperial County deliverability; its intention being to continue its commitment to identifying and if appropriate, implementing solutions to ensure that Imperial County deliverability is maintained at a level that meets intended state policy targets for that area. At that time some stakeholders questioned the viability of retaining Imperial County deliverability levels given the retirement of SONGS among other system changes currently in play. It was suggested that given the interaction between import capacity from Arizona and import capacity from the Imperial Irrigation District, a reallocation of import capacity from the Palo Verde branch group to the Imperial Valley branch groups could be a viable option to facilitate additional deliverability from Imperial County without requiring system upgrades. This was further reinforced by stakeholders later in the 2013-2014 transmission planning process, when the implications of the SONGS retirement on import capacity from IID were identified.

In fact, such an approach was suggested during the development of the expanded MIC methodology in 2011 where excess MIC at one intertie could be reallocated to another intertie based on its effectiveness factor thus reducing the possibility of triggering system upgrades. While redistributing import capability among certain interties may address the same issue that the expanded MIC methodology was attempting to resolve it is important to mention that it would likely not be on a “one-for-one” basis. Redistribution of MIC among interties would need to be based on effectiveness factors to the most limiting constraints. The California ISO’s response was that it did not believe it appropriate to pursue the suggestion to reallocate some MIC capacity away from some interties to other interties as such an effort would defeat the objective of getting new MIC methodology changes in place within the short time-frame being pursued by that stakeholder effort as it would impede the near-term enhancements many stakeholders were seeking at the time. While the California ISO’s decision to not pursue the “reallocation” proposal in the expanded MIC stakeholder effort, the issues which the California ISO faces today place a much different perspective on the merits of such an approach. Therefore, the California ISO believes that consideration of a reallocation methodology is consistent with the intent of this consultation effort. As such, the California ISO requests stakeholders to consider the reallocation concept and to propose reasonable methodologies for the California ISO to consider in its transmission planning process.

4. Informing the California ISO 2014-2015 Planning Process

The purpose of this discussion paper is to provide a framework for gathering stakeholder input on the issues set out in the paper. This information, in conjunction with the information studies being conducted as sensitivities in the 2014-2015 planning process, will enable more complete presentation of the issues for consideration by the state agencies in developing future renewable generation portfolios to respond to state policy objectives at that time.

Based on the current transmission planning process schedule, the third stakeholder meeting is considered the appropriate point in the planning process schedule for the discussion paper to inform the 2014-2015 transmission planning process results. The reasoning for this point in time is that the third stakeholder meeting is when the California ISO presents the preliminary assessment of the policy driven & economic planning study results to stakeholders. It is at this time that the information documented in the Imperial County Transmission Consultation discussion paper should be considered within the planning process and subsequently documented in the 2014-2015 transmission plan itself. While the precise outcome of the transmission plan cannot be predicted at this time, the California ISO certainly believes that the consultation effort will facilitate development of a clear transmission plan for Imperial County that presents the best outcome from the most current data available to the California ISO.