

March 3, 2017

Mr. Neil Millar
Executive Director
Infrastructure Development
California Independent System Operator
250 Outcropping Way, Folsom, CA 95630

RE: Draft 2016-2017 Transmission Plan

Mr. Millar:

Smart Wires commends the tremendous efforts of you and the CAISO team in developing the draft 2016-2017 Transmission Plan.¹ The team has conducted an impressive evaluation of many different reliability, economic, and public policy driven projects under considerable uncertainty. In particular, Smart Wires applauds the groups for its commitment to keeping costs low for consumers. This *customer-first* mentality is demonstrated in your team's re-evaluation of previously approved project, in the careful consideration of future scenarios and uncertainty, in the planning process itself, and in this report. The TPP comes with the implicit responsibility to find the best possible investments on behalf of the California rate-payers. To that end, CAISO continues to do an excellent, and too often thankless, job.

We appreciate the opportunity to participate in and submit comments to 2016-2017 CAISO Transmission Planning Process. On the topic of the draft report, Smart Wires respectfully offers three on the following pages.

Sincerely,



Todd Ryan

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¹ CAISO's 2016-2017 Draft Transmission Plan
<http://www.caiso.com/Documents/Draft2016-2017TransmissionPlan.pdf>

Comment 1: The emerging trend of short-term transmission needs. Is CAISO seeing the same emerging trend?

There appears to be an emerging trend of an increasing number of short-term reliability issues. By this we mean a reliability need (*e.g.*, thermal overload) that exists for a few years, much less than the useful life of transmission infrastructure. An example of such projects in this year's process are the Mission – Old Town² and Mission – Miguel³ reconductorings. As the CAISO noted, the reliability issues that create the justification for these reconductorings exist for a limited time, or as we call it, a short-term need.

In this particular instance, the short-term need exists until the completion of a new line. Other short-term needs may be driven by thermal generation retirements; by increased adoption of distributed energy resources, renewable energy, energy storage, or energy efficiency; by construction delays; or a host of other possibilities.

Does CAISO frequently see short-term needs in its transmission plan?

Is CAISO seeing an increased number of short-term needs?

Traditional investments tend to have long lifetimes and be permanent. This means that the consumer continues to pay for that traditional investment long after the reliability need has disappeared.

Smart Wires would like to remind CAISO and stakeholders that a host of advanced transmission technologies exist that can be quickly deployed, and redeployed as the system evolves, creating a short-term investment that matches the duration of the short-term need – saving consumers money. Smart Wires power flow control technologies and energy storage are just two examples of such redeployable transmission technologies.

Comment 2: There appears to be an emerging trend of uncertainty creating “bubble” projects. Is CAISO seeing the same emerging trend?

Contrary to transmission planning of the past century, modern efforts must address the needs of today's grid while accounting for quickly-changing power flows and an uncertain future. Smart Wires has noticed, in working with our utility partners, that transmission line loading is highly sensitive to many uncertainties: load growth; adoption of distributed energy resources, renewable generation, energy storage, or energy efficiency; thermal generation retirements; weather patterns; and construction delays, to name a few. The confluence of all of these developing variables, in combination with the sensitivity of transmission line loading, is resulting in reliability needs that are highly uncertain and could pop into existence, or disappear, with small changes in case assumptions. All of this uncertainty leads to a set of projects that are “on the bubble”, that is, could be needed or might not be needed in the future, depending on how the uncertainty that exists today resolves in the future. Evidence of this can be seen

² *Supra* Mission-Old Town 230 kV lines TL23027 & TL23028B reconductor

³ *Supra* Mission-Miguel 230 kV lines TL23022 & TL23023 reconductor

in the sensitivity to the AEE assumptions, where CAISO notes that a number of reliability issues exist, or disappear, based on the AEE assumption.⁴

Does CAISO frequently see “bubble” projects in its transmission plan?

Is CAISO seeing an increased number of “bubble” projects in recent years?

Traditional investments have long lead-times and tend to be lumpy⁵ in nature. These two facts mean that the TPP needs to try to predict 5, 10, even 20 years into the future in order to justify the project and guard against stranded asset risk, which is increasingly difficult. Often times the near-term need is much more certain, *i.e.*, there is high confidence about the reliability need in the next five years. This near-term certainty begs to be solved with a more flexible investment strategy where CAISO and California utilities could economically meet the near-term need and then update the investment, by adding or subtracting capability, as the uncertainty of the future resolves.

Smart Wires would like to remind CAISO and stakeholders that advanced transmission technologies exist that are capable of such a flexible investment strategy because the technologies are scalable, rapidly deployed, and rapidly redeployed. Energy storage and Smart Wires power flow control technologies are just a two examples of such technologies which can be used to invest incrementally with time, adding or redeploying as needed, as the uncertainty of a need resolves.

Smart Wires encourages CAISO and stakeholders to remain mindful of the importance of planning for uncertainty and the value of an agile system capable of reacting quickly and handling future unknowns.

Comment 3: Smart Wires encourages CAISO to continue to look into low cost, flexible solutions that could address the Mission – Old Town and Mission – Miguel overloads and mitigate the risk of shedding load in San Diego.

Since the publishing of the draft report, San Diego Gas & Electric has received CPUC approval to build the Sycamore - Penasquitos transmission line.⁶ Until this line is operational, a risk of load shedding in San Diego exists. We agree that the CAISO was correct to suggest pursuance of alternative solutions based on the nature of the project: a 40-year investment for an interim need; the uncertainty as to whether a reconductoring can be completed; the permanent environmental and visual impact; and the high sunk cost to consumers.

However, there exist risks that are beyond the control of San Diego Gas & Electric that could extend or increase the risk of dropping load in San Diego. For example, a delay in the Encina generation

⁴ *Supra* at 7.3.1 *Additional achievable energy efficiency (AEE) in PG&E service territory*

⁵ A lumpy investment is one that comes in large, fixed increments and generally has a long lead-time. Reconductoring and new line constructions tend to be lumpy as these investments cannot create just one or two megawatts of additional transfer capability; these investments tend to only create large (*e.g.*, hundreds megawatts) of additional transfer capability.

⁶ See <http://www.sdge.com/key-initiatives/sycamore-penasquitos-230kv-transmission-line-project>

repowering or a delay in the Sycamore-Penasquitos construction would extend the reliability risk to San Diego customers.

Smart Wires encourages CAISO and its stakeholders to consider flexible short-term solutions that are well-suited to these types of short-term needs: a quickly deployable and redeployable solution that can offer a low-cost, short-term insurance policy for consumers.

About Smart Wires

Based in the San Francisco Bay Area, with offices in the United States, United Kingdom, Ireland and Australia, Smart Wires is the leader in grid optimization solutions that leverage its patented modular power flow control technology. Driven by a world-class leadership team with extensive experience delivering innovative solutions, Smart Wires partners with utilities globally to address the unique challenges of the rapidly evolving electric system. Smart Wires technology was developed by utilities for utilities, led by a consortium of large US utilities at the National Electric Energy Testing Research and Applications Center (NEETRAC). This core group of utilities, which included Southern Company, the Tennessee Valley Authority (TVA), Baltimore Gas and Electric Co. (BG&E) and the National Rural Electric Cooperative Association (NRECA), defined the vision for the original modular power flow control solution. Today, the technology is rapidly becoming part of the utility tool kit as more and more electric utilities explore new ways to alleviate congestion, improve network utilization, manage changing generation profiles and maintain reliable electric service.

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