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Bay Area Municipal Transmission Groupâ€™s Comments on the Renewable Energy Transmission Initiative 2.0 Transmission Technical Input Group July 29, 2016 Update

Additional submitted attachment is included below.

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August 8, 2016

1. Introduction

The Bay Area Municipal Transmission Group[1] (BAMx) appreciates the opportunity to comment on the Renewable Energy Transmission Initiative 2.0 (RETI 2.0) Transmission Technical Input (TTIG) Group Update meeting, dated July 29, 2016. In BAMx's earlier comments[2], it had requested the TTIG considers the following three aspects while assessing Transmission Assessment Focus Areas (TAFA).

- Capability of Existing Transmission Needs to be Further Explored;
- Need to Better Understand Capability of Existing Transmission to Import Out-of-State (OOS) Resources; and
- Need to Study Exports.

BAMx is very pleased with the TTIG's work presented during the July 29th update that addresses above-mentioned first two aspects, especially considering that TTIG had to rely solely on the existing available studies and information. Although BAMx would have appreciated having the TTIG further study the third bullet, capability and adequacy of the existing transmission system to facilitate California exports[3], we appreciate that the TTIG does not have any currently available information on this very important issue and that it would not be able to undertake research on this topic within the current RETI 2.0 timeline. We note that Commissioner Weisenmiller and Commissioner Picker's letter to the CAISO, dated July 30, 2015, expected RETI 2.0 efforts to shed light on California's export ability. In particular, that letter states the following.

[1] BAMx consists of City of Palo Alto Utilities and City of Santa Clara's Silicon Valley Power.

[2] BAMx comments, dated June 23, 2016 (http://docketpublic.energy.ca.gov/PublicDocuments/15-RETI-02/TN211953_20160623T065546_Joyce_Kinnear_Comments_Bay_Area_Municipal_Transmission_Group%E2%80%99s.pdf) and May 16, 2016 (http://docketpublic.energy.ca.gov/PublicDocuments/15-RETI-02/TN211487_20160516T084230_Joyce_Kinnear_Comments_Bay_Area_Municipal_Transmission_Group%E2%80%99s.pdf) .

[3] As part of the SB 350 Study efforts, the CAISO has acknowledged that the system can likely physically export as much as 8,000 MW, with lower limited being institutional rather than physical. Source: SB 350 Study- "The Impacts of a Regional ISO-Operated Power Market on California," July 8, 2016 (p. i-7, vii-9).

> "For many states in the west (due to when the sun sets), their electricity consumption typically peaks two hours earlier than California does, through a regional market that can be taken advantage of and California can delivery clean solar power that is in excess to them."

If the current work plan cannot accommodate the time to study this important export issue, BAMx requests that such an effort be given high priority in any follow-on effort.

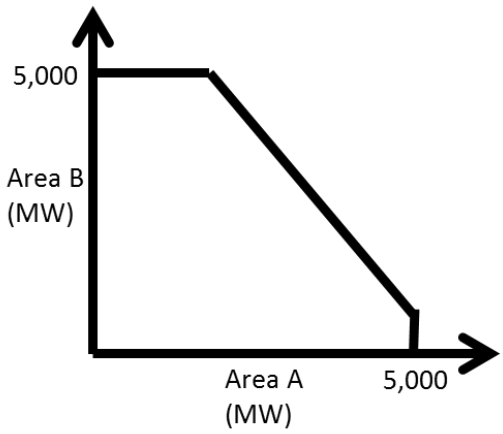
Based upon the data and information that was shared during the July 29th workshop, BAMx provides comments on the following four (4) topics.

- Need to Better Understand Interaction Between Two or More TAFAs;
- Need Better Documentation of Capital Cost for New Transmission Upgrades;
- Need Clarification on Capability of Existing Transmission to Import OOS Resources; and
- Need to Feed Information Developed by TTIG into Planning and Screening Tools, such as CPUC RPS Calculator.

2. Need to Better Understand Interaction Between Two or More TAFAs

During the July 29th meeting, the TTIG presentation emphasized that not all capacity from all transmission areas is simultaneously available. That is, transmission capacity is dynamic, and resource additions in one area may impact transmission availability in another area. Conversely, mitigating a single limiting constraint can benefit two or more renewable development areas. To demonstrate this concept, the TTIG included a nomogram as shown in Figure 1 below.[4]

Figure 1: An Illustration of Interaction Between TAFAs



[4] Transmission Technical Input Group Update, RETI 2.0, July 29, 2016 (TTIG Presentation, hereafter), Slide #10.

While the concept was clearly presented, the quantification of its application to the TAFAs was less clear. BAMx requests the TTIG to summarize the information on the transmission interaction between TAFAs in a table that both shows a "$/kW" impact in terms of new transmission cost at 50%, 75% and 100% of the study (MW) range for each TAFA and notes those areas where there are nomograms between TAFAs such as the one identified in Figure 1. It is important to understand the incremental cost impacts of renewable energy development within the TAFAs to allow the construction of cost-effective resource portfolios.

To support the development of cost-effective resource portfolios, BAMx suggests that the transmission cost impact for Delivery Network Upgrades (DNU) needed to incrementally accommodate renewable resources in a given TAFA be organized as illustrated in Table 1 below. This Table reflects both incremental transmission cost impacts of resource development in a given TAFA (*TAFA A*) as well as the cumulative impacts of development in linked TAFAs for which a nomogram relationship exists (*TAFA B*).

Table 1: Cost Impact ($/kW) of New Incremental Transmission Needed in *TAFA A* (For Illustration Purpose Only)

% of Study Range	Incremental Study Capacity (MW)	Incremental DNU Cost ($/kW)[1]	Incremental DNU Cost with 5,000MW in *TAFA B* ($/kW)
50%[2]	2,500	$0	$400
75%[2]	3,750	$600	$1,000
100%	5,000	$800	$1,800

[1] Refers to the cost of new DNU(s) spread over the incremental generation capacity that triggers the need for those DNU(s).

[2] Selection of these intermediate levels would be driven by the available study data.

There are several advantages to presenting the TAFA data in this format. First, this approach identifies the extent to which new DNUs are needed to accommodate different levels of capacity in a given TAFA. The above representation provides more meaningful information in terms of identifying the level of new renewable resource capacity that would trigger the need for next DNU. Second, it identifies the interaction between two or more TAFAs not only qualitatively, but also quantitatively. Third, by showing the $/kW cost associated with incremental transmission development in a given area, policymakers can compare the total cost of resource

location options and avoid the major incremental transmission upgrades that would not be economic when compared to resource selection in another TAFA. BAMx believes that such a representation is helpful even when some of the data needed to completely populate the table is currently unavailable.

BAMx is aware that the TTIG does not plan to perform any new studies as part of the current efforts, but rather rely on the existing available studies. This means that TTIG will not be able to necessarily determine the system limits for each TAFA, especially in conjunction with the resource development in the other TAFAs. However, we are hopeful that the TTIG will be able to present the results for multiple resource capacity levels in each TAFA.[5]

3. Need Better Documentation of Capital Cost for New Transmission Upgrades

TTIG's July 29th presentation included capital cost estimates for the potential new DNUs that might be required to accommodate the study range in each TAFA area. BAMx urges the TTIG to include supporting documentation for each of the DNUs. For example, the TTIG presentation indicates that the capital cost for the Coolwater-Lugo 220 kV Transmission Project (CLTP) is expected to be $480 million.[6] However, the capital cost included in the Southern California Edison's (SCE) Certificate of Public Convenience and Necessity (CPCN) were considerably higher.[7] BAMx understands that the project scope for the CLTP included in SCE's CPCN application may be greater than the one anticipated in the TTIG assessment. However, if that is indeed the case, then it would be helpful to have the TTIG lay out the underlying assumptions and sources used to develop those capital cost estimates.

[5] In particular, the TTIG could refer to past CAISO generation interconnection/cluster studies to capture various levels of generating capacity. For example, assuming that the Cluster 7 Phase I study for a given TAFA had modeled 3,000MW of new generating capacity, whereas 5,000MW of new generation was modeled in the Cluster 8 Phase I study, by comparing the two study findings, the TTIG can assess the incremental impact of 2,000MW of incremental resources on the need for new DNU.

[6] TTIG Presentation, slide #14.

[7] SCE estimates the total costs for the Project to be in the range of $755 million to $1,047 million in 2013 constant dollars, of which approximately $197 million to $271 million, respectively are for contingency. **Source:** SCE AFC Appendix H, Application 13-08-023.

4. Need Clarification on the Capability of Existing Transmission to Import OOS Resources

The TTIG presentation provides summary data on the impact of the renewable capacity study range assumed at certain import/export path TAFAs.[8] It is important for decision makers to better understand the ability of the existing transmission system and the additional DNUs that would be required to accommodate incremental full capacity and/or energy-only resources in each of the import paths. For example, consider the Eldorado/Mead/Marketplace import path. It is BAMx's understanding that nearly 3,000MW of full capacity resources (which could be greater for energy-only resources) can be imported/accommodated in the *Eldorado* area provided that the Lugo-Victorville 500 kV line is upgraded.[9] This assessment assumes about 5,000MW of buildout in the *Riverside-East* TAFA.[10] Any additional amount of generation capacity in the *Eldorado* area (subject to the North of Lugo constraint) or in the *Riverside-East* TAFA (subject to the Desert area constraint) may trigger additional DNUs. Please confirm the accuracy of BAMx's understanding and provide any additional information that is now available with respect the capability to import OOS resources.

5. Need to Feed Information Developed by TTIG into Planning and Screening Tools, such as CPUC RPS Calculator.

The California System Operator (CAISO) typically provides information to the CPUC RPS Calculator regarding the capability of the existing transmission to accommodate fully deliverable and energy-only resources in each transmission area. It also provides information on the amount of new fully deliverable and energy-only resource capacity that can be incrementally accommodated with additional DNUs. BAMx encourages the TTIG to provide the very useful information that it has gathered characterizing transmission cost and availability for fully deliverable and energy-only resources in order to update the RPS Calculator.[11] For example, the current version (6.2) of the RPS Calculator assumes that 2,628MW of fully deliverable (or 3,794MW energy-only) resources can be accommodated in the Tehachapi TAFA on the existing

[8] TTIG Presentation, slide #27.

[9] BAMx interpretation of the data presented in a table on the slide #17 of the TTIG Presentation.

[10] We note that in the SB 350 studies, imported resources were preferred over additional development in the *Riverside East* TAFA area. The need to understand this tradeoff between imports and internal resources is a specific example of the value in developing the information illustrated in Table 1.

[11] As we have stated earlier, more efforts are needed refine the transmission capital cost data and to address the interactions among multiple TAFAs.

transmission.[12] Based on the data provided by the TTIG on July 29th, it appears that 2,628MW (3,794MW) needs to be increased to 4,500MW (5,600MW).[13]

BAMx appreciates the opportunity to submit comments and acknowledges the significant effort of the TTIG in a relatively short period of time. As indicated earlier, future efforts should prioritize the development of information on the ability to export and import OOS resources from/to the existing California transmission network.

If you have any questions concerning these comments, please contact Joyce Kinnear (jkinnear@santaclaraca.gov or (408) 615-6656).

[12] RPS Calculator version 6.2, ***CAISO_Tx_Inputs*** tab.

[13] TTIG Presentation, slide #12.