

Subject: CPUC Comments on CAISO White Paper: Transmission Capability Estimates as an input to the CPUC IRP Portfolio Development

Submitted by	Organization	Date Submitted
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CPUC staff appreciates the opportunity to comment on the California Independent System Operator (CAISO) Transmission Capability Estimates as an input to the CPUC IRP Portfolio Development White Paper, and the May 28th, 2019 stakeholder call discussing the white paper.

Energy Division staff comments are summarized below:

- 1. CPUC staff thanks the CAISO for hosting the stakeholder call on the development of transmission capability estimates and looks forward to continued transparency.**

The transmission capability estimates and upgrade costs are an important input to the RESOLVE model used within the CPUC IRP process. The CPUC relies on stakeholder input as an additional layer of IRP input and assumption vetting. For this reason, it is important that parties have insight into how the transmission capability constraints and estimates for potential upgrades are developed by the CAISO. Additionally, it is important that parties are able to apply the transmission estimates developed by CAISO to the specific geographic areas pertinent to them. In order to do so, parties need to know what geographic area is within the bounds of each subzone referred to in the table on the following page. Acknowledging the evolving nature of busbar mapping as well as the confidentiality surrounding critical energy infrastructure, CPUC staff requests that to the extent possible the CAISO provide additional information regarding the definition of each transmission zone and sub-zone and its boundaries.

- 2. CPUC staff requests that the CAISO include in the white paper or elsewhere a definition of “minor upgrades” and “major upgrades” as seen in the table on slide 10.**

Understanding potential differences between the two upgrade types can inform how they are used as inputs within RESOLVE and what post processing occurs when CPUC staff collaborate with CEC staff to ensure that all constraints are met as resources are mapped to specific busbars. For example, if a minor upgrade can be distinguished from a major upgrade by the fact that it does not entail any significant environmental impacts, this point should be considered by CPUC staff within the RIP process. For this reason, CPUC staff request the CAISO define the two upgrade types or at a minimum provide a description of the primary differences (i.e., no significant environmental impacts, costs greater than \$50 million, etc.).

Transmission Capability Estimates as of May 20, 2019

Table Source: CAISO White Paper on Transmission Capability Estimates as an input to the CPUC IRP Portfolio Development

Transmission capability estimates to support CPUC's IRP process (May 20, 2019)									
Transmission zones and sub-zones	Estimated FCDS Capability (MW)				Incremental Upgrade Cost Estimate (\$million)				Estimated EODS Capability** (MW)
	Existing System	Minor Upgrades	Major Upgrade #1	Major Upgrade #2	Existing System	Minor Upgrades	Major Upgrade #1	Major Upgrade #2	Existing System
Northern CA	2,000		2,000				\$ 285		3,900
- Round mountain	500								2,100
- Humboldt	-								100
- Sacramento River	2,000								4,600
- Solano	600		2,000				\$ 322		1,300
Southern PG&E	1,100		1,000				\$ 55		TBD
- Westlands	1,100		1,000				\$ 55		TBD
- Kern and Greater Carrizo	1,000		1,500				\$ 241		TBD
- Carrizo	400		700				\$ 53		400
- Central Valley North & Los Banos	1,000		1,000				\$ 274		TBD
Tehachapi	4,300	1,000					\$ 100		5,100
Greater Kramer (North of Lugo)	600		400				\$ 146		600
- North of Victor	300		400				\$ 485		300
- Inyokern and North of Kramer	100		400				\$ 485		100
- Pisgah	400		400				\$ 261		400
Southern CA Desert and Southern NV	3,000		2,800				\$ 2,156		9,600
- Eldorado/Mtn Pass (230 kV)	250		1,400				\$ 76		2,400
- Southern NV (GLW-VEA)	700		1,400				\$ 150		700
- Greater Imperial*	1,200		1,400				\$ 2,334		3,100
- Riverside East & Palm Springs	2,950		1,500				\$ 2,156		5,500

3. CPUC staff affirms that a smoother transmission upgrade cost profile would benefit the CPUC IRP process.

The upgrade estimates provided in the CAISO table are primarily all for major upgrades and the high incremental capability and cost amounts are lumpy in nature. The size and cost of identified major transmission upgrades may be pose a significant hurdle to further generation resource buildout in that specific zone. The RESOLVE model used for IRP planning may instead select a different zone for generation buildout as a more cost-effective option. It is important for the CPUC to be aware of smaller potential upgrades that may exist. A smoother cost profile with more intermediate options for lower cost transmission investments would improve the ability with which RESOLVE could select the most optimal portfolio of resources. Can the CAISO provide estimates for more incremental transmission upgrades?

In addition, CPUC staff seeks to better understand to what extent minor upgrades and major upgrades will be identified within the CAISO processes in the future. The estimates recently provided by the CAISO only identified one minor upgrade and no secondary upgrades (refer to "major upgrades #2" columns in table above"). Is the lack of these type of upgrades a function of the TPP and GIDAP process not being well-suited to identify them, is it an outcome specific to the resource portfolios transmitted to the CAISO by the CPUC, or is there a different reason for the low prevalence of information regarding these upgrade types?

CPUC staff thanks the CAISO for hosting the call and increasing transparency regarding these important transmission inputs to the CPUC Integrated Resource Planning process.