Comments of Pacific Gas and Electric Company on the Review TAC Structure Stakeholder Working Groups

Submitted by	Company	Date Submitted
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Introduction

The current Transmission Access Charge (TAC) structure was developed when some of the operational, policy, technological, load trend, and other considerations that impact California's electric grid were different than they are today. In exploring whether to revise the current TAC structure, the CAISO is asking fundamental questions about whether the mechanism by which system-wide transmission costs are recovered today aligns with the evolving realities of the transmission grid and broader energy landscape. To determine an answer, and assess whether an alternative structure is preferable to the one in use today, stakeholders and the CAISO must understand the grid landscape and how TAC will fit within it. The "right" TAC structure can't be developed in a vacuum; whether a structure is appropriate depends on the context in which it is used.

At this point in the Review TAC Structure initiative, PG&E encourages the CAISO to drive critical level-setting that will lay the groundwork for a productive analysis and data-collection phase. Taking time to focus all stakeholders on developing a shared starting point and understanding of grid realities will help manage the enormous complexity involved in this initiative, and allow stakeholders to move forward more effectively.

In the comments below, PG&E offers observations on the landscape that will have to be aligned with any new TAC structure. Rather than answering each question in the CAISO's comments template, PG&E focuses on contributing to a level-setting discussion. In particular, PG&E outlines guiding principles and foundational considerations that will inform the options development and assessment process.

Foundational principles

PG&E supports CAISO's determination that reconsideration of Transmission Access Charges should proceed in an orderly fashion, driven by sound principles, and based on research and thoughtful consideration of alternatives. Approaching this complex issue with such a methodical approach will be best achieved by starting from a blank slate, guided by sound principles, rather than with any assumptions or preconceived basis on which solution development will be built.

PG&E suggests the following principles be upheld in any TAC structure proposal considered by the CAISO and stakeholders:

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Allocation of TAC

- The grid should be technology neutral.
- Users of the grid should pay for services they receive
  - The grid is more than a conveyer of electricity
    - The grid provides reliability and flexibility
    - The grid provides integration of increasingly diverse import and export profiles
- CAISO should recognize the changing nature of the transmission grid.
- Equity and fairness are best established through rates based on the cost of service principles
  - The primary drivers of transmission costs include overall system peak load, local peak loads and accomplishments of renewable policy goals, including integration.
- Rates should be simple, transparent and implementable
- Rates should reduce cost shifts to the extent possible

Calculation of TAC

- The transmission grid provides services beyond simple conveyance of energy, including standby service, reliability, voltage support and frequency response.
- Entities that provide a service to the grid should be compensated for those services.
  - PTOs should continue to recover costs of prudent investment
  - CAISO should consider whether compensation for market services (reliability, flexibility, voltage support, frequency response) should be included in TAC
- Compensation should be limited to ensure providers are compensated for the same service only once.

PG&E will also be evaluating proposals to ensure alignment with core underlying principles:

- Safe: Investments in safety should be supported by and aligned with any cost recovery mechanism.
- Reliable: The grid must stay reliable for customers, and retain security and resilience even as system complexity increases. Regardless of the technology, grid assets must reliably perform the functions they were intended to perform.
- Affordable: Cost to receive electric service must remain affordable and equitably allocated.
- Clean energy future: California is a leader in greenhouse gas reduction and in developing a clean energy economy; the transmission grid should help facilitate—and never contradict—that goal

Transmission Landscape

The transmission system is planned, built, and maintained to provide reliable, safe, and increasingly clean, power to customers as economically and efficiently as possible. The transmission system is technology- and resource- neutral; it is a platform that ensures reliability across the system at all times, under a variety of contingencies, and must comply with national and state standards and regulations. The transmission grid delivers energy, but is also relied upon to provide a range of services and attributes that support the entire grid and those entities and individuals connected to the transmission or distribution system.

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Costs incurred to achieve the mandate of the transmission grid—and the drivers of those costs—are not uniform across geographies, time horizons, or other project types. Making generalizations can lead to unhelpful or misleading conclusions about what causes total transmission costs to increase or decrease over time.

Transmission investments are driven by system needs

Before turning to cost allocation and specific cost drivers, it is important to recall that transmission investments are fundamentally the result of established transmission planning processes that are consistent with NERC and other federal and state guidelines. As such:

- Transmission costs are incurred to meet needs defined by national and state laws and regulations, operating standards, policies, and other guidelines;
- Transmission planning processes identify needs and determine the capabilities required to meet the need before evaluating potential solutions;
- Needs evaluated in transmission planning include investments required to maintain and replace existing facilities such that they comply with regulation and guidelines and contribute to system performance; and
- Expected new transmission investments can change, because planning processes evaluate and reevaluate identified system needs as newer data is available.

The needs identified in transmission planning processes lead to proposals for individual projects or other investments, but individual projects contribute to a functioning system capable of complying with regulation and providing reliable and efficient service. Given the paramount importance of the system as a whole, it is particularly challenging to tie a particular investment (or a cancelation or postponement of an investment) to a single variable or to assume that a change (e.g. load growth or addition of new resources) that contributed to a new need at one time and location would produce a similar need at another.

Transmission investments will continue, but understanding drivers is key

Looking at historical data provides some guidance for the future, but transmission costs and cost drivers going forward will not follow the same trajectory as those made in the past. A new TAC structure will have to align with a transmission landscape in which:

- The majority of future transmission investments are for maintenance and replacement projects which are needed and unavoidable;
- New costs will emerge to increase grid flexibility and support new technologies relying on the grid;
- Peak and capacity changes will have minimal impact on cost; and
- RPS targets may no longer drive significant new transmission investment

A significant amount of transmission system cost cannot be reduced.

Looking ahead, the majority of costs reflected in the CAISO system-wide TRR are expected to come from expenses associated with existing facilities. These expenses- for operations, maintenance, and replacement- are almost entirely fixed; in other words, the expenses will not increase or decrease as a result of changes to load served by the facility, peak, or resource mix on the transmission and distribution grids. These costs are associated with facilities that were approved to meet identified needs, and will remain unless the entire facility is no longer needed at all.

New operating costs are emerging as the transmission grid is required to be more flexible.
In addition to routine O&M, there are new costs associated with operating a more geographically diverse low carbon energy system. There are already costs associated with making the grid more flexible and therefore able to accommodate greater variability on both the transmission and distribution systems. In addition to some of the voltage support projects described below, PG&E is also making investments in our SCADA system along with increased Switch installations to add more visibility and control to both our transmission and distribution systems. PG&E is also upgrading existing substations to break-and-a-half or ring configurations to make them more flexible and resilient (e.g. Embarcadero 230kV GIS, El Cerrito "G" 115kV). If 30 percent of total MWhs are provided by Wholesale DG and BTM exports, as in an example scenario provided by the Clean Coalition, any evaluation of transmission cost impact would have to reflect that investments would be required to support that scenario.

Peak changes will not eliminate transmission need or costs, particularly beyond the next 5-10 years.
Reductions or shifts in peak loading attributed to DG are notable, but the impact on peak seen today will not continue indefinitely. Increased penetration of behind-the-meter solar has been shifting peak load to sunset or later, and in the short-term, increases in DG will reduce peak loading in some specific areas or the overall PG&E peak. This shifting of peak to later hours has diminishing returns, however. In five to ten years, further investment in solar DG will not have any impact on peak loading to the extent that the new CAISO peak will occur when the sun has already set. Even as DG solar is paired with storage, new operational systems and markets are needed to ensure that the storage is scheduled to meet system needs and fully available at peak times. Enabling this participation necessitates an active reliability study process, and will likely involve costs to develop and use new enabling processes and technologies.

Increased capacity needs are unlikely to drive new investments.
The relationship between transmission investment and load is not simple or linear. Minimal to flat load growth does not eliminate the need for transmission investment, and transmission investments do not grow (or decrease) linearly with energy consumption. The CAISO stated in its 2016-2017 TPP that it does not anticipate a need for new transmission to accommodate load growth or local capacity, and notes that the 2016-2017 plan "continued the trend of a declining amount of new capital transmission projects being identified—to the lowest level of new capital since the planning process was revised…"[1]

Decreases in load can actually drive some transmission costs. In the last year or two, PG&E has already proposed and approved several voltage support projects that are needed to reduce voltages where loads have declined (most significantly due to energy efficiency and distribution-connected PV). PG&E invests in shunt reactors, Static Var Compensators (SVCs), Static Synchronous Compensators (STATCOMs), or other voltage support devices in order to keep voltages with required bands and maintain quality of service. Though connected to the distribution system, distributed generation creates variable output and lower loads that have significant implications for the transmission system. If that distributed generation goes offline either by schedule or distribution fault, the distribution load must

[1] CAISO Transmission Plan 2016-2017, Executive Summary, 1. http://www.caiso.com/Documents/Board-Approved_2016-2017TransmissionPlan.pdf

now be served by the transmission system (i.e. transmission generation). Depending on the magnitude of the load, fluctuations with frequency and/or voltage can occur. The transmission system must be able to accommodate these fluctuations. Per NERC Standard VAR-001-4.2, we must ensure that voltage levels, reactive flows, and reactive resources are monitored, controlled, and maintained within limits in Real-time to protect equipment and the reliable operation of the Interconnection. In addition, we must adhere to NERC Standard TOP-001-3 to prevent instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Interconnection by ensuring prompt action to prevent or mitigate such occurrences.

RPS targets may no longer drive significant new transmission investment

The RPS was the main policy driver of transmission investment in California over the last decade. Significant transmission investment was accordingly planned, approved in the TPP, and built to facilitate access to renewable energy. However, several of the last TPP cycles have not identified any need for policy projects to facilitate RPS achievement in the future. Furthermore, it is unclear what policy goals will drive future transmission investment. With the ongoing Integrated Resource Planning (IRP) process driven by GHG policy goals, and the re-examination of the need for deliverability from RPS resources, it is unclear what will drive policy-focused transmission investments in the future.

Transmission and Procurement

In addition to discussing transmission costs and cost drivers, questions about the ability of TAC structure to influence procurement and resource planning decisions have been raised in the Review TAC Structure initiative. It is important to clarify at the outset of the initiative that procurement decisions are not the same as transmission planning decisions. This simple point deserves attention, because it underscores the need to better understand the connectivity between transmission planning processes and resource procurement processes in managing overall system costs and decision-making.

The difference between resources that would require new transmission investments and those that would not should be—and are—considered in planning processes.

In general, wholesale rates are a blunt tool to send the sorts of specific price signals needed to defer location-specific transmission investments. The difference in cost between resources requiring transmission facility investments and those that do not can best be considered in a planning process—and to the extent that such considerations are easily quantifiable, the IRP already provides that venue.

Incremental network transmission costs that are directly associated with new resources are currently assessed in the procurement process. The Least Cost/Best Fit[2] process requires IOUs to employ transparent, CPUC-approved criteria to the analysis of bids for new generation resources, and balances the need for "portfolio fit" against cost minimization objectives. Shortly before the CPUC adopted LCBF, it required that IOUs approximate the final cost of upgrading the transmission system to bring renewable power to load[3]. IOUs are required in their RPS Plans to include their evaluation criteria used in the LCBF selection process. For an IOU evaluating procurement options, a resource requiring substantial network transmission upgrades will be less competitive compared to a resource with

[2] Adopted by the CPUC in D.04-07-029

[3] (D.04-06-013)

minimal costs associated with interconnecting into the transmission grid. Procurement decisions also take into account a variety of factors including regulatory requirements and guidelines, DER incentive programs administered by the CPUC, and state policies that make DER investments more attractive.

Influencing generation decisions through transmission rates is challenging because simplified rates do not adequately reflect location- and time-specific transmission system investment drivers.
As described previously, numerous factors drive transmission system expenditures. As discussed, the CPUC's Least Cost Best Fit evaluation criteria address the selection of a resource that requires significant transmission system network upgrades over one that does not. However, this comparison is not the same as the evaluation process the Clean Coalition suggests. The comparison the Clean Coalition appears to suggest involves the selection of a resource that needs transmission compared to one that does not need the transmission system at all. All resources, even behind the meter resources, require the use of the transmission system, unless they serve load completely off the grid or have 24x7x365 islanding capabilities. Due to the inherent interconnected nature of the grid, it is extremely difficult to link an amount of transmission investment or avoided transmission investment to individual resource procurement decisions. This difficulty is not solved a change in rate design, as the challenge is more associated with the interconnectedness of the grid and how planning decisions associated with generation and transmission are made.

In addition, CAISO transmission is built, operated, and maintained by Participating Transmission Owners, but these PTOs may not be the LSE or only LSE serving customers in that PTO area. Even if a total benefit of DG in avoiding transmission could be established, which is still unclear, the benefits of that investment would not accrue to the LSE's customers alone. For example, assume a PTO's total High Voltage Transmission Revenue Requirement (HV TRR) is $1 Billion. If an LSE is 10% of the PTO's total load, its respective customers would have a hypothetical TRR of $100 million. Assume that the CAISO could establish a methodology for determining the avoided cost associated with a particular DG project, and that project is determined to reduce the PTO HV TRR by $100 million. The LSE's customers would only get a $10 million benefit from that DG project in terms of avoided transmission costs. Therefore, when assessing competitive offers, the LSE would only be incented to procure DG to avoid transmission rates if the DG were less than $10 million dollars more expensive compared to the other competitive offers in the LSE's procurement solicitations. This is because the LSE could not get credit for the other $90 million of avoided transmission. This identifies that the IOU procurement process is incapable of assigning value unless the total avoided transmission associated with individual projects can be 1) clearly identified and 2) fairly allocated across LSEs. This is starkly different from the existing process, which simply allocates costs across PTOs and where all customers for all LSEs within that PTO share the same transmission rates.

<u>Conclusion</u>
Reducing overall customer energy bills will require more than a reduction in new transmission projects. As both a CAISO Participating Transmission Owner and a Load Serving Entity scheduling on the CAISO grid, PG&E recognizes the importance of making smart transmission investments and avoiding unnecessary cost. PG&E along with the CAISO, is reassessing previously approved projects to determine 1) if the scope previously approved is still needed, 2) if a revised scope (either the investment and/or timing) is more appropriate, or 3) if the original scope is still needed to meet the reliable operation of

the grid, and seeking opportunities to find clean, cost-effective solutions to meeting identified transmission needs (for an example, see the Oakland Clean Energy Initiative proposal submitted by PG&E as part of the 2017-18 TPP). Even if PG&E stopped building any new projects, however, transmission costs would persist. The change in transmission investment trends will be a result of changing system needs, and, as they are now, reflected in the CAISO's Transmission Planning Process and PTOs' own planning processes.

Before turning to cost allocation, CAISO and stakeholders need to build a shared understanding of the transmission investment landscape, and how transmission cost drivers have or are expected to change compared to historical data. PG&E encourages the CAISO and stakeholders to ground the stakeholder initiative process in a review of the California transmission landscape. It will be inefficient for stakeholders to attempt to identify and discuss all of the complexities of how and why transmission in California was and is built and maintained. Still, laying a solid foundation that recognizes some of the nuance involved will help the CAISO and stakeholders make informed decisions and develop a TAC structure most likely to achieve the desired outcomes identified by the stakeholder process.