

CAISO

Transmission Planning Process

Clean Coalition comments on 2013/2014 Unified Planning Assumptions

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I. Introduction

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to local energy systems through innovative policies and programs that deliver cost-effective renewable energy, strengthen local economies, foster environmental sustainability, and enhance energy security. To achieve this mission, the Clean Coalition promotes proven best practices, including the vigorous expansion of Wholesale Distributed Generation (WDG) connected to the distribution grid and serving local load. The Clean Coalition drives policy innovation to remove major barriers to the procurement, interconnection, and financing of WDG projects and supports complementary Intelligent Grid (IG) market solutions such as demand response, energy storage, forecasting, and communications. The Clean Coalition is active in numerous proceedings before the California Public Utilities Commission and other state and federal agencies throughout the United States in addition to work in the design and implementation of WDG and IG programs for local utilities and governments.

The Clean Coalition is taking part in the TPP primarily to highlight the role that Non-Transmission Alternatives (NTA) can play, and to ensure that the requirements of FERC Order 1000 and the state's Loading Order are met.

A summary of our comments follows:

- We urge CAISO to adopt a more proactive approach to NTA
- We also urge CAISO to use realistic assumptions with respect to modeling energy efficiency, demand response, distributed generation and other non-transmission alternatives (NTA) – more realistic than those CAISO recently used in the CPUC's Long-term Procurement Proceeding (LTPP)
- Specifically, we support the CPUC's recent LTPP Track I proposed decision's arguments regarding the Environmentally-Constrained

Scenario. The proposed decision argues that the assumptions for energy efficiency, demand response, etc., in this scenario are more realistic than the CAISO's preferred scenario

- This proceeding should include consideration of the degree to which wholesale DG should be considered "demand reduction" for TPP purposes. This is the case because WDG facilities that comprises less than the minimum load on the circuit at issue should be considered, from CAISO's perspective, the same as energy efficiency, demand response or net-metered DG.

II. Comments

a. CAISO's Loading Order responsibilities should require additional attention to programmatic NTA

The state's long-established Loading Order, from Energy Action Plan I and II¹, require that all state energy agencies, including CAISO, fully consider preferred resources for meeting new energy needs, and in related planning procedures. Preferred resources are well-aligned with NTA in that the Loading Order prioritizes energy efficiency, demand response and renewable energy over fossil fuel generation. The degree to which the TPP focuses on NTA to meet all or a portion of transmission needs is the debate that will surely be a large part of this cycle of the TPP.

In accord with CAISO's Strategic Plan² and the Energy Action Plans, the ISO should proactively consider the value of NTA solutions, including programmatic approaches to support the development of local preferred resources such as

¹ Online at: http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF. Energy Action Plan II states, in part: "The state agencies must work closely with the CAISO to achieve [the Energy Action Plan] objectives and to benefit from its expertise in grid operation and planning."

² <http://www.caiso.com/Documents/2012-2016StrategicPlan.pdf>

energy efficiency (EE), demand response (DR), distributed generation (DR) and energy storage (ES) as alternatives to new transmission. While individual NTA projects submitted to CAISO are already considered under current procedures, there is currently no mechanism for evaluation of programmatic NTAs. Such alternatives reduce overall energy use in accord with state emissions reduction goals while also reducing peak loads and the need for transmission services. To only consider specific NTA proposals submitted to CAISO is overly reactive, and proactive pursuit of cost-effective alternatives is called for at this time.

As one programmatic option, we recommend that serious consideration be given to the relative cost of additional incentives, or procurement in targeted locations, which would provide a more cost-effective alternative to additional transmission investment. The cost of such support from CAISO should be compared not only to the simple capital cost of transmission investments, but the total ratepayer impact and contribution to Transmission Access Charges (TACs).

In examining NTAs, CAISO should assess the potential for cost-effectiveness, and for rapid, targeted, and scalable or phased deployment. In some cases, NTAs may face fewer obstacles than new transmission lines. An NTA may be less expensive than building new transmission and may be especially appealing in areas where transmission construction is more expensive and encounters more obstacles.³ Any/all future evaluations of NTAs should not only focus on specific proposals or individual projects, but should consider the impact of aggregated disbursed capacity that would be expected to result from current incentives and procurement policies, or from programs targeted to address specific transmission constraints.

The Clean Coalition advocates a “DG+IG” (Distributed Generation and

³ *Updating the Electric Grid: An Introduction to Non-Transmission Alternatives for Policymakers*, US Department of Energy, September 2009, pg. 1

Intelligent Grid) solution for modernizing California's grid.⁴ The DG+IG suite of solutions falls firmly within the FERC rubric of non-transmission alternatives. The technical means of achieving a DG+IG future are available now, with advanced inverters, high penetration of DG (both wholesale and retail), energy storage as well as other IG components, to meet all future energy, capacity and voltage and reactive power regulation needs.

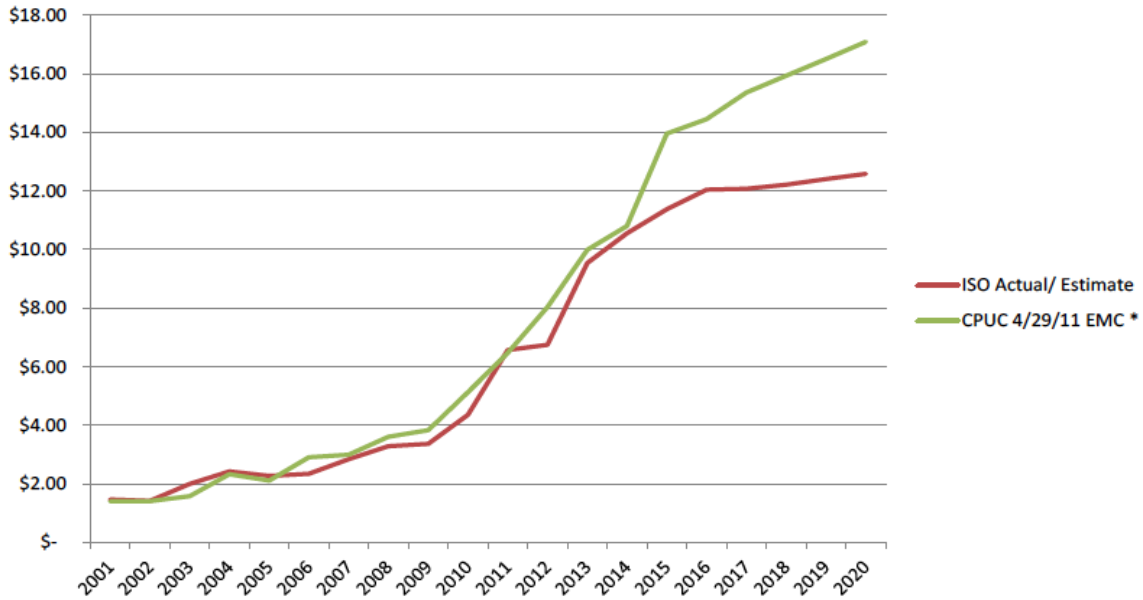
The costs and benefits of localized capabilities to address current and projected transmission constraints should be considered against the fully amortized cost of major capital investment in transmission. Included in such comparison should be the cost of maintaining the reserve capacity to meet reliability requirements related to the total loss of one or more network or large generation facilities – which are critical infrastructure risks that may be avoided with distributed generation and other NTAs. NTAs should be considered in the context of long-term as well as short-term transmission planning.

Rising Transmission Costs

As seen in the following two charts, rising costs of transmission facilities are driving ever growing and increasing significant additions to retail electric rates, and these costs are primarily due to additions to the transmission system that only marginally increase its existing capacity. High voltage transmission system costs are estimated by the CPUC to rise tenfold over 2001 levels by 2020, and the low voltage system represents a comparable additional cost to ratepayers.

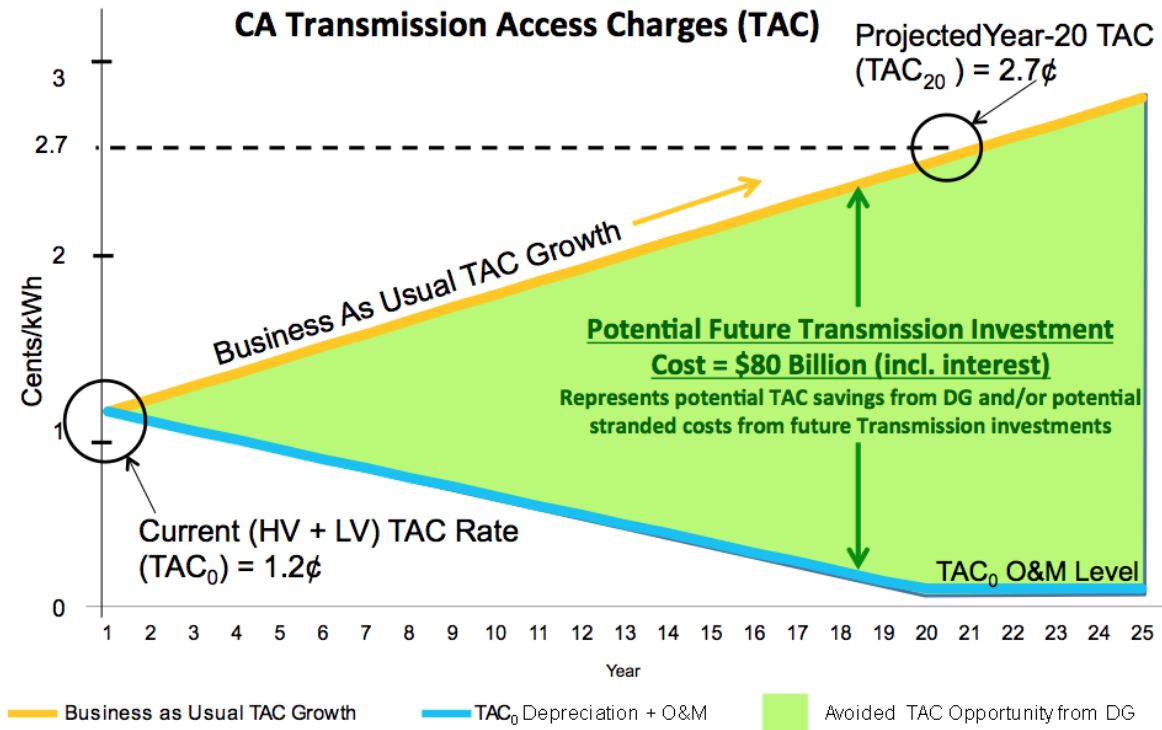
Figure 1. Historical and Projected High Voltage Transmission Access Charges (sources: CAISO and CPUC).

⁴ *Clean Coalition Comments on TPP to the California ISO*, Tam Hunt, Kenneth Sahn White (authors), December 26th, 2012.



When current investment trends are projected forward over the next 25 years, the full cost of new transmission, including the authorized 11-12% ROI on slowly depreciating 40-year capital investments, reaches \$80 Billion. These costs are rarely discussed by policymakers and much of this ratepayer impact could be more cost-effectively redirected toward Non-Transmission Alternatives.

Figure 2. Potential Transmission Investment Savings (source: Clean Coalition).



New transmission investments will cost the ratepayers billions of dollars in the continuing decades if transmission investments are allowed to continue at the status quo.⁵ This set of facts should be a major consideration in determining the future of transmission and in evaluating more cost-effective NTAs proactively, especially since the ratepayer is directly responsible for funding transmission investments and ratepayers generally don't pay directly for NTA. The State's Loading Order and Energy Action Plan are essential factors in the consideration of transmission investment and NTA. Once large capital commitments are sunk into any one option, those existing facilities will influence the relative marginal cost of future alternatives.

As mentioned in previous comments (Dec. 26, 2012), it appears that NTA were

⁵ The Clean Coalition estimates that as of Q1 2012, approved transmission investments have already committed ratepayers to nearly \$40 Billion in payments over this period. The balance of future investment remains available for NTAs to reduce total ratepayer costs.

not considered in the economic planning studies completed by CAISO thus far in this cycle. CAISO's Dec. 7 presentation described three alternatives studied for relieving congestion on Path 26. It doesn't appear that NTA were considered in this analysis and we urge CAISO to remedy this oversight.⁶ The degree to which CAISO must consider NTA after parties like the Clean Coalition have urged such consideration is, in our view, the gray area with respect to Order 1000. In the particular case of Path 26 congestion, our view is that the Clean Coalition's assertion that NTA should be considered in this context requires that CAISO do so. We look forward to further discussion on this issue and we will provide additional details as this proceeding develops.

Slide 202 of the CAISO's Dec. 7 presentation states, with respect to congestion relief for Path 26: "It has been a challenge to find economic justification to relieve this congestion bottleneck. In this situation, we shall also explore other justifications, such as policy and reliability needs." We note that the economic assessment appears to only look at the capital expenditure and fails to consider the full ratepayer impact of the rate-based ROI over the extended depreciation schedule, nor does it appear to consider O&M costs. Again, we urge CAISO to fully consider NTA as an alternative for relieving the congestion bottleneck. It is unclear from the CAISO presentation where the revenues and benefits are

⁶ The Clean Coalition remains concerned that CAISO is not fully complying with the requirements of FERC Order 1000 with respect to considering NTA. Order 1000 (para. 148) states in relevant part: "When evaluating the merits of ... alternative transmission solutions, public utility transmission providers in the transmission planning region also must consider proposed non-transmission alternatives on a comparable basis." The Clean Coalition and other parties have previously urged CAISO to, as a general matter, consider the ability of NTA to meet regional transmission needs. The key word here is "proposed" and the Clean Coalition interprets this language to mean proposed by any party, including intervenors, and including programmatic proposals, particularly when based on state-level assumptions about energy efficiency and other preferred resources. Last, FERC's new rule doesn't make sense if interpreted as requiring consideration only of actual project proposals by parties, rather than programmatic NTAs also, because many NTAs, such as energy efficiency or demand response, depend on many smaller projects/upgrades to comprise a far broader program. There is zero chance that project "developers" of these types of NTAs will intervene at CAISO and propose their very small projects be included in transmission planning. Therefore, we feel strongly that programmatic proposals by parties like the Clean Coalition should be considered "proposed" for FERC purposes.

attributed. Following a goal of reducing ratepayer impacts, a reduction in congestion charges would be generally considered a benefit. It is far better if this goal can be achieved in coordination with the implementation of other State policies such as the Loading Order, GHG and other emissions reductions, and system resilience. As such, CAISO should include in its economic analysis an alternative that invests at least the amount required for Alternative 1 toward NTA, and analyze the relative merits of this alternative to California's grid, policy goals, and ratepayers.

We do not at this time, and nor does any party, know with any certainty whether congestion as a general matter can be relieved economically through NTA alone. Nevertheless, it is incumbent upon CAISO to fully consider NTA in this and other transmission planning efforts. While projected improvements in energy efficiency, local energy storage, and demand response include "uncommitted" programs, and such projects present challenges in modeling, broadly distributed projects may be reasonably assumed at appropriately discounted levels based on trends in development and procurement. The fact that the ISO has no ability or authority to ensure that any proposed NTA are actually implemented does not mean that NTA should be discounted or ignored.

b. Realistic assumptions for preferred resources and energy storage should be modeled in the TPP

In a parallel effort, we have also been concerned by the conservativeness of CAISO's assumptions in the LTPP (R.10-05-006 and R.12-03-014) modeling that CAISO completed in partnership with the CPUC, particularly with respect to energy efficiency, demand response and DG. Current procurement programs and active interconnection queues (GIP, WDAT/WDT, and Rule 21) indicate markedly higher DG development than CAISO has adopted in its previous

modeling. The CPUC's Dec. 24th Proposed Decision in LTPP Track 1 includes procurement of substantial energy storage and other preferred resources, as well as conventional gas-fired generation, in order to support local capacity requirements for the LA Basin. The CPUC and CAISO jointly modeled a number of scenarios for the LTPP, including a "replicating TPP" scenario and a high DG DSM (Demand Side Management) scenario.

We recommend that CAISO adopt the assumptions from the high DG DSM scenario in this iteration of the TPP, with one exception: the proposed decision adopted a 50% discount of projected energy efficiency and we recommend that CAISO model 100% of this potential in the TPP. See our joint comments with NRDC and the Community Environmental Council at the below link⁷ and our separate comments.⁸

To demonstrate the large difference in outcomes between the CAISO's TPP scenario and the high DG DSM scenario we include two charts from the CPUC's summary of its LTPP scenarios:

Figure 3. *Comparing LTPP scenarios: Managed demand net load.*

⁷ <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M042/K157/42157346.PDF>.

⁸ <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M042/K159/42159445.PDF>.

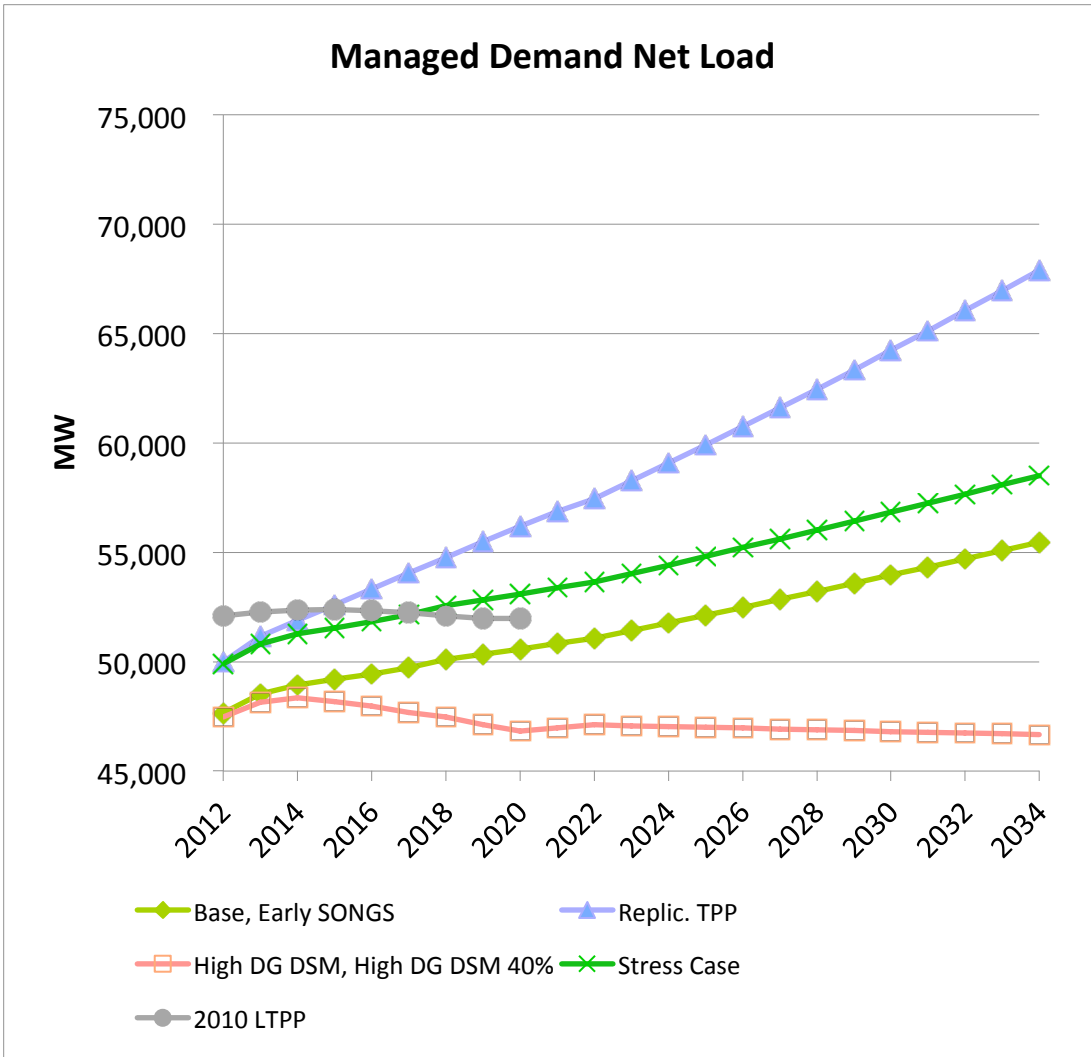
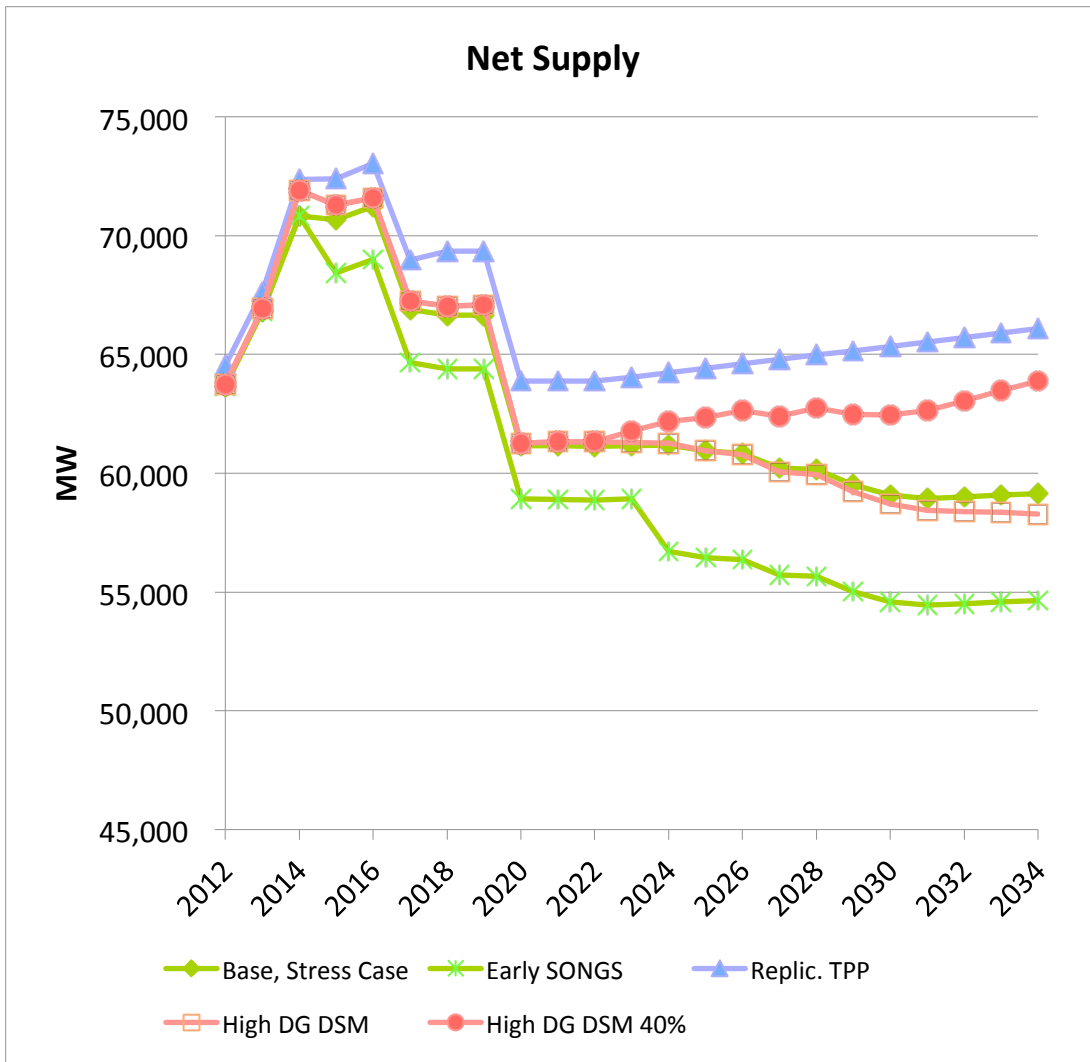


Figure 4. Net supply.



With respect to CPUC LTPP modeling, CAISO stated in comments in the LTPP on standardized planning assumptions and scenarios (p. 2)⁹: “... for the purpose of analyzing the need for new system resources that will be conducted in Phase II [of the LTPP], the ISO is willing to use the Revised Scenarios in its studies, as long as at least one of the scenarios contains reasonable operating assumptions that can be used to provide a reference point for other visions of the future.” However, CAISO added in the same comments (p. 6): “...the role that the various scenarios are expected to play in the ISO’s TPP is less than clear.” We

⁹ Online at: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M030/K326/30326555.PDF>.

urge CAISO to reflect these scenarios will play in the TPP, and related assumptions.

The CPUC’s Proposed Decision for Track I of the LTPP was issued on Dec. 21, 2012. This decision challenges a number of the CAISO’s planning assumptions by determining that the following conclusions are more reasonable than those adopted by CAISO in its base case scenario (LCR PD, Table 2, p. 18):

Figure 5. Table 2 from the LTPP LCR PD.

Summary of ISO Studies by RPS Portfolio

Local Area	Local Area Requirements (MW)				Replacement OTC Generation Need (MW)			
	Trajectory	Environmentally Constrained	ISO Base Case	Time Constrained	Trajectory	Environmentally Constrained	ISO Base Case	Time Constrained
LA Basin (this area includes sub-area below)	10,743	11,246	11,010	12,165	2,370 – 3,741	1,870 – 2,884	2,424 – 3,834	2,460 – 3,896
Western LA Basin (sub-Area of the larger LA Basin)	7,797	7,564	7,517	7,397				
Big Creek/Ventura (BCV) Area	2,371	2,604	2,438	2,653	(Need is for Moorpark only, a sub-area of the Big Creek/Ventura Local area)			
					430	430	430	430

And Table 4 in the PD shows the assumptions for the Environmentally-Constrained Scenario with respect to the LA Basin.

Figure 6. Table from the LTPP LCR PD.

Portfolios	Area	Local Area Req'm't			Replacement OTC Units Needed?	Constraint	Contingency
		Non-D.G. (MW)	D.G. (MW)	Total (MW)			
Environmentally Constrained	Overall LA Basin	11,048	1,519	12,567	Yes	Mira Loma West 500/230 bank #1 (24-Hr rating)	Chino-Mira Loma East #3 230kV line + Mira Loma West 500/230 kV bank #2
		9,727	1,519	11,246	Yes	Eagle Rock-Sylmar S 230 kV line	Sylmar S - Gould 230 kV line + Lugo - Victorville 500 kV line
	Western	6,695	869	7,584	Yes	Serrano- Villa PK #1	Serrano-Lewis #1 / Serrano-Villa PK #2
	Ellis	225	124	349	Yes	Voltage Collapse	Barre-Ellis 230kV Line + SONGS - Santiago #1 and #2 230 kV lines
	El Nido	494	91	585	No	La Fresa-Hinson 230 kV line	La Fresa-Redondo #1 and #2 230 kV lines

The CPUC essentially adopted the Environmentally-Constrained Scenario as the most reasonable of the scenarios studied, at least for the purposes of determining the appropriate LCR for Track I. However, as mentioned above, the PD deviated from these assumptions with respect to energy efficiency potential in the LA Basin and we recommend that CAISO in the TPP assume the full 100% of EE potential.

In the present context, preferred resource assumptions have not yet been made explicit by CAISO and we urge these assumptions to be made explicit early in this cycle. We further note that the CPUC's High DG DSM scenario (in the LTPP) incorporates the same cost weighting as the cost-constrained scenario that comprises CAISO's Base Case. This incorporation increases the likelihood of additional DG deployment consistent with this scenario. We will comment further regarding our views on the appropriate assumptions once CAISO makes its modeling and economic analysis assumptions explicit.

c. The TPP should include consideration of the degree to which Wholesale DG is operationally the same as energy efficiency, demand response and net-metered DG

A key point that should be fleshed out in the TPP is to establish what constitutes “demand reduction.” Traditionally, only on-site energy efficiency, demand response or net-metered (NEM) renewables have been considered demand reduction. With respect to generation, determining what constitutes demand reduction hinges on the degree to which CAISO “sees” any distinction between EE, NEM generation or WDG (which interconnects to the distribution grid, by definition). It seems that there should be no distinction between traditional demand-side resources and WDG, from CAISO’s perspective, as long as the WDG comprises less than the minimum coincident load on the substation at issue. This test is in fact the new supplemental review screen (Screen N) for Fast Track interconnection eligibility under Rule 21.¹⁰ If the facility at issue, or the aggregate of facilities on that substation, generates less than the minimum coincident load, power will not normally flow back onto the CAISO-controlled grid. Accordingly, it seems that WDG that comprises less than the minimum coincident load should rightly be considered demand reduction in the same way that EE, DR and NEM renewables reduce demand.

As we look toward California’s future energy system CAISO should plan for utilizing advanced inverter functionalities, which already exist in most inverters on the market today and are already employed effectively in many parts of Europe. These functionalities can transform distributed renewables from simply being seen as reducing load to highly flexible “grid assets,” and

¹⁰ Screen N states, in part: “[I]s the aggregate Generating Facility capacity on the Line Section less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the Generating Facility?” Note 2 of Screen N also requires that the technology type must be considered in determining minimum load, such that, for example, solar facilities require minimum load from 10 AM to 4 PM to be the relevant time period because this is when solar power is produced. This is known as “minimum coincident load.”

facilitating much higher penetrations of variable distributed generation in utility distribution networks at lower integration costs. The specific inverter functions that are most relevant to renewable energy grid integration include reactive power support, voltage support, fault ride-through, and ramp rate control.

There are many lines of evidence that bolster our suggestion to consider WDG at least operationally the same as other preferred resources. For example, a recent E3 analysis¹¹ for the CPUC of the benefits of DG to ratepayers found that DG on average enjoys a 7% improvement in power production when compared to transmission-interconnected resources due to mitigating line losses – and up to 15% for peak power delivery. This is itself a very substantial benefit and there are many others, some of which are quantifiable, including those providing direct value to the delivery of energy, and others more broadly supporting state energy and climate change goals:

- Security, Reliability and Resilience: DG inherently provides multiple local sources of generation. Major generation facilities and transmission corridors create critical infrastructure risk with wide ranging consequences from the loss of a small number of large facilities. DG avoids creating critical infrastructure risk by providing discrete and locally available generation such that the loss of multiple components would have negligible impact on the system, unlike the loss of a single large generation or transmission facility on a traditional system.
- Emissions Compliance Costs: Cap and trade markets for regional air quality and GHG compliance set emission permit prices based on demand. Siting renewable generation close to load avoids emissions impacts from regional conventional generation without requiring new transmission for remotely sited renewables. Reduced regional demand for emission

¹¹ Slide 7 of the following presentation:
http://www.westgov.org/wieb/meetings/crepcfall2012/briefing/present/a_olson1.pdf.

permits reduces compliance costs for all other businesses in the air quality district.

- Reduced/avoided environmental footprint impact: reduced generation and transmission impact on environmentally or visually sensitive areas, and no new transmission corridors.
- Dual use of existing built environment: Added value and income from secondary use of existing built up areas, including rooftops, parking lots, transportation easements, and compatible agricultural and recreational lands.
- Increased local employment and increased local economic activity: Local generation returns consumers' energy payments back to communities, bringing with it the economic benefits of energy production, including capital investment and the direct, indirect, and induced employment from development and operation of facilities and associated local services and supply streams.

Increased local and state revenues from local capital and labor investment: Income, sales, and property improvements yield associated tax revenues for government operations, allowing lower tax rates or increased services.

Respectfully submitted,

TAM HUNT

A handwritten signature in black ink, consisting of stylized, overlapping letters that appear to read 'TH' followed by a long, sweeping horizontal stroke.

Attorney and Policy Advisor for the
Clean Coalition

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