Consideration of alternatives to transmission or conventional generation to address local needs in the transmission planning process

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1 Executive summary

In this paper the ISO is presenting a methodology it has developed to support California's policy emphasis on the use of preferred resources – specifically energy efficiency, demand response, renewable generating resources and energy storage – by considering how such resources can constitute non-conventional solutions to meet local area needs that otherwise would require new transmission or conventional generation infrastructure. In addition to developing a methodology to be applied annually in the transmission planning process ("TPP"), this paper also describes how the ISO will apply the proposed methodology in the current (2013-2014) transmission planning cycle. In so doing, this initiative carries out an activity identified in the ISO's draft demand response and energy efficiency roadmap published on June 12.

The approach proposed in this paper will improve upon the ISO's past approach to considering non-conventional solutions, which was very labor-intensive, was reactive to specific proposals, and did not provide any criteria for such alternatives in advance that could serve as guidance to prospective developers of such proposals.

The general application for this methodology is in grid area situations where a non-conventional alternative such as demand response or some mix of preferred resources could be selected as the preferred solution in the ISO's transmission plan rather than the transmission or generation solution that would be avoided by implementing the non-conventional solution. This would be possible in situations where the timeline for an identified need allows time for monitoring the development of non-conventional alternatives before a conventional solution would be required to be approved. For a grid area where the ISO finds a non-conventional solution to be effective, this new approach will result in a validated non-conventional resource mix that would be selected as the preferred solution in the ISO's draft transmission plan (posted in January of any given TPP cycle), alongside the transmission or conventional generation solution that would be avoided or deferred by implementing the non-conventional solution. Once the comprehensive transmission plan, which includes identification of both the non-conventional solution and the transmission or conventional generation solution that could be avoided or deferred, is approved by the ISO Governing Board, the ISO would monitor the development of the resources that comprise the non-conventional solution to determine whether they will be in operation by the time they are needed. If the ISO determines that the non-conventional resource mix is not developing in a timely manner, then the ISO would consider whether to reinstate the avoided transmission solution or another appropriate alternative in a subsequent TPP cycle. That is how the ISO envisions this methodology being applied in general.

In the current cycle of the 2013-2014 transmission planning process, the ISO proposes to apply this new approach to several specific local areas in southern California: LA Basin, San Diego, and to a lesser extent the Moorpark subarea of the Big Creek/Ventura area. Although the application of this methodology may be relatively straight forward for the Moorpark subarea, the main focus will be on the LA Basin and San Diego where the application of the methodology will be somewhat different in this cycle. Because of the magnitude of the projected reliability needs in the LA Basin and San Diego, transmission options will be pursued to complement non-conventional alternatives (i.e., preferred resources), to reduce the need for conventional generation to fill the gap. Thus, unlike the generic application of the methodology in future transmission planning process cycles where preferred resources are considered as an alternative to transmission, the main focus of this effort with respect to the LA Basin and San Diego is to identify the volume of non-conventional alternatives and the needed performance attributes that could effectively address the local reliability needs in these two priority areas as part of a basket of resources. This information can then inform any CPUC decisions on authorizing procurement of additional preferred resources in these areas and ultimately inform the procurement activities of Southern California Edison and San Diego Gas & Electric. The 2013-14 transmission planning process will also be evaluating various transmission options for addressing the reliability needs of the LA Basin and San Diego areas and potentially recommending certain options for ISO Board approval. The ISO will plan to coordinate this transmission evaluation effort with the ongoing CPUC 2012 LTPP Track 4 proceeding.

Following the release of this paper, the ISO intends to hold a stakeholder web conference on September 18 to discuss the proposed methodology and obtain initial stakeholder feedback. The application of the methodology will be further discussed at the ISO's TPP stakeholder session scheduled on September 25th and 26th.

2 Introduction

To maintain a reliable transmission system that meets NERC and WECC reliability standards, the ISO annually assesses the needs of the transmission system as part of its Transmission Planning Process ("TPP"). As inputs to the studies the ISO relies on the CEC 10-year electricity demand forecast which incorporates energy efficiency programs, and behind the customer load meter distributed generation. Generation under construction is also modeled in the study base cases. These studies assess both system and local needs. The ISO then develops mitigation plans identifying specific solutions to satisfy the reliability standards. Historically, these mitigation plans have predominantly consisted of transmission upgrades and, in situations where planned development of new conventional generating capacity aligned with identified transmission needs, the addition of preconstruction status conventional generating capacity.

Given California's policy emphasis on the use of preferred resources – specifically energy efficiency, demand response, renewable generating resources and energy storage – the ISO is now proposing a methodology to support this policy in the context of the TPP by considering how such non-conventional solutions can meet local area needs that otherwise would require transmission or conventional generation solutions.[1] In addition to developing a methodology to be applied annually in the TPP, this paper also addresses how the proposed methodology will be applied in the current transmission planning cycle. In so doing, this initiative carries out an activity identified in the ISO's draft demand response and energy efficiency roadmap published on June 12.

The scope of this initiative is limited to the consideration of non-conventional alternatives to meet local area needs, not system needs. The set of potential alternatives envisioned includes demand response, energy efficiency, energy storage, and distributed generation.[2] (Conventional generation is already functioning as a non-transmission alternative in local capacity areas, and is not considered as a non-conventional alternative under this initiative.) Targeted energy efficiency, although not a supply-side resource, is viewed as a non-conventional alternative due to its preferred status in the loading order, and would be considered in the TPP as a load modifier. Taken together as a mix of resource types, these non-conventional alternatives could provide a means of responding to operational needs or modifying the load profile in local areas where the transmission system would otherwise need to be upgraded to meet all load reliability requirements in the area.

One important point to emphasize at the start of this initiative is that an effective program to utilize non-conventional alternatives to defer or eliminate the need for transmission upgrades or conventional generation requires that the selected mix of resources be developed in a timely manner and be able to deliver the needed performance characteristics and load shape impacts. Once the ISO identifies a potentially effective non-conventional solution—or mix of such solutions—to meet an identified local area need and presents this solution in an annual transmission plan alongside the transmission or conventional generation solution it could eliminate, the ISO must continue to monitor the progress of the various elements of the solution toward implementation and their readiness to provide the needed services. The ISO must be able to make a timely decision to revert to the best feasible solution in the event that the non-conventional alternative is not materializing as needed.

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[1] For purposes of this initiative, the ISO will use the term "non-conventional alternatives" to refer to solutions that do not rely on new transmission or new conventional generation facilities.

[2] Distributed renewable generation, in the form of local wind or solar generating facilities, would be considered a non-conventional alternative and could help mitigate local area needs. Out of area renewable generation would not be able to meet local area needs.

For the 2013-2014 TPP currently underway the ISO's intention is to evaluate non-conventional alternatives in specific pilot areas to gain experience with the proposed methodology and make any necessary refinements prior to applying it more broadly in subsequent TPP cycles. However, the magnitude of the projected reliability needs in the LA Basin and San Diego areas requires consideration of how both preferred resources and transmission enhancements can reduce the need for conventional generation. Thus, the initial application of this methodology in the 2013-2014 TPP will be somewhat different than its more general application in subsequent transmission planning process cycles. In this initial application, transmission will be pursued to complement non-conventional alternatives to reduce the need for conventional generation to fill the gap. Thus, unlike the generic application of the methodology in future transmission planning process cycles where preferred resources are considered as an alternative to transmission, the main focus of this effort with respect to the LA Basin and San Diego is to identify the volume of non-conventional alternatives and the needed performance attributes that could effectively address the local reliability needs in these two priority areas as part of a basket of resources. This information can then inform any CPUC decisions on authorizing procurement of additional preferred resources in these areas and ultimately inform the procurement activities of Southern California Edison and San Diego Gas & Electric. The 2013-14 transmission planning process will also be evaluating various transmission options for addressing the reliability needs of the LA Basin and San Diego areas and potentially recommending certain options for ISO Board approval. The ISO will plan to coordinate this transmission evaluation effort with the ongoing CPUC 2012 LTPP Track 4 proceeding.

The organization for the remainder of this paper is as follows. Section 3 describes the relationship between this initiative and the ISO's demand response and energy efficiency roadmap. Section 4 discusses the approach used by the ISO to assess non-conventional alternatives in past transmission planning process cycles. Section 5 presents the ISO's proposed new approach going forward – its proposed three-step methodology. Section 6 addresses how this methodology will be applied in the 2013-2014 transmission planning process. Finally, section 7 describes the stakeholder process schedule and next steps.

3 Relationship to ISO's DR and EE Roadmap

This initiative carries out an activity identified in the ISO's draft DR and EE roadmap posted on June 12, 2013.[3] The roadmap is comprised of four parallel and roughly concurrent paths or tracks that run from 2013 through 2020. One of these paths—the resource sufficiency path—focuses on clarifying the needed resource types and their performance and locational attributes, the planning and study processes that will quantify resource requirements, and the procurement processes that must ensure the identified resources will be available when needed. Within this path the roadmap

[3] http://www.caiso.com/Documents/Draft-ISODemandResponseandEnergyEfficiencyRoadmap.pdf

explained that as part of the 2013-2014 transmission planning cycle, the ISO would study two or three local areas to consider alternatives to transmission or conventional generation to address local area needs and develop a "catalog" of alternatives providing the needed performance characteristics to meet the local area needs. The present paper is intended to initiate stakeholder discussion of those activities.

4 ISO's past approach to assessing non-transmission alternatives

The approach employed by the ISO in past TPP cycles to assess non-transmission alternatives was to examine the effectiveness of each alternative proposed to meet a specific area need on a case-by-case basis. The area needs were based on the local load profile characteristics, transmission configuration in the area, and the types of other resources already serving the area. This approach required that each such assessment be scoped individually to fit the specific alternative that was proposed. As such it was very labor-intensive, was reactive to specific proposals, and did not provide any criteria for such alternatives in advance that could serve as guidance to prospective developers of such proposals.

The case-by-case study of past proposals tended to be unsuccessful because the proposed alternatives did not meet one or more of the required performance characteristics. Given these challenges, the ISO is proposing in this paper a new approach to assessing alternatives to transmission or conventional generation to address local needs in the TPP. In particular, the proposed approach will identify in advance the needed performance characteristics and load profile impacts that non-conventional solutions should be able to provide to effectively defer or eliminate the need for particular transmission additions or offset some or all of the need for particular conventional generation additions. With these features specified in advance, potential suppliers of non-conventional resources would be able to assess whether their resources could meet the local area needs and possibly develop resources that more closely align with the specified needs.

5 ISO's proposed three-step methodology

Given California's increasing policy emphasis on developing alternatives to transmission upgrades and conventional generating resources to meet local area needs, and given the drawbacks of the ISO's past approach to assessing non-conventional alternatives (including the lack of advance guidance to developers of such proposals), the ISO believes that a new approach is clearly needed.

In this paper the ISO suggests an improved three-step approach that (i) provides upfront a catalog or menu of generic resource types that can provide some or all of the required performance characteristics to meet local area needs; (ii) determines an effective mix of resource types to address specific needs in a particular local area as identified in the ISO's TPP study process; and, (iii) monitors the development of the selected mix of non-conventional alternatives to ensure their development is proceeding at the necessary pace.

Such an approach has a number of positive benefits including:

- Greater specificity and clarity about the types of non-conventional resources that could be effective in offsetting the need for a transmission upgrade or conventional generating facility;
- Improved opportunities for developers of non-conventional alternatives and improved ability for non-conventional alternatives to play an increasing role in fulfilling the state's preferred resource policy goals;
- Consistent framework for assessing non-conventional solutions for transmissions needs;
- Ability of the ISO to ensure that selected non-conventional alternatives included in the transmission plan can be operationalized to meet the required reliability needs; and,
- Greater transparency for stakeholders interested in offsetting transmission upgrades with non-conventional solutions.

The three components of this improved approach are discussed in more detail in sections 5.1 through 5.3 below.

5.1 Step One – Development of a generic resource catalog

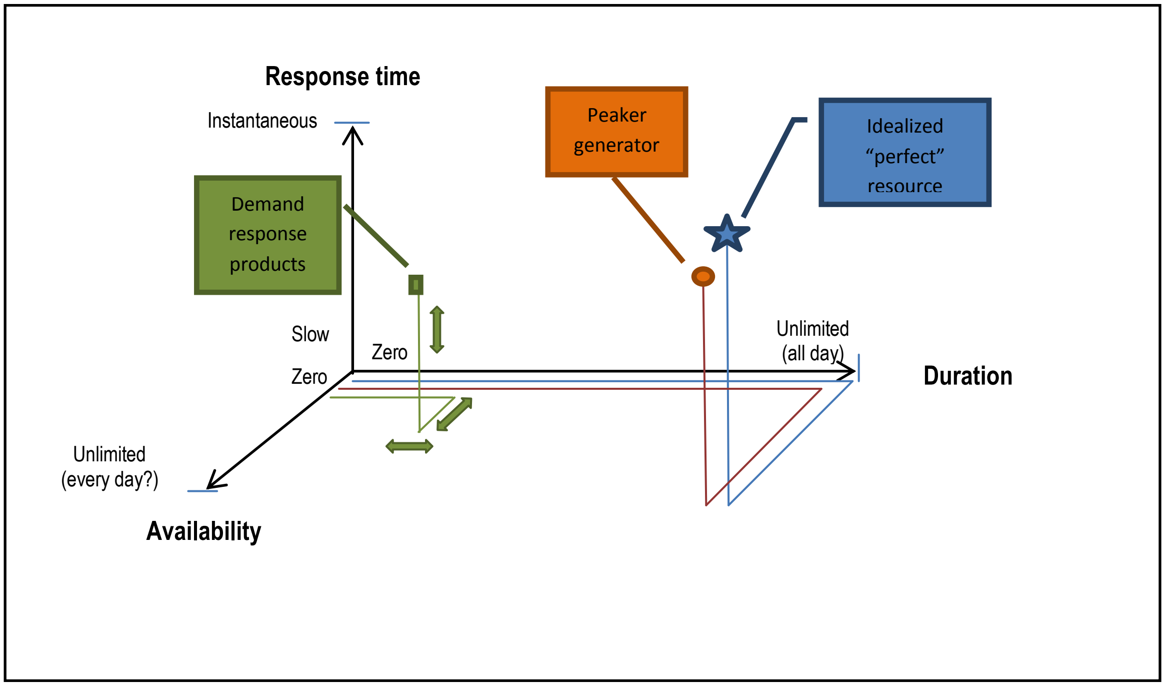
The first component of the proposed methodology entails specifying generic performance characteristics and developing a catalog of resource types and options that provide those characteristics to varying degrees.

The ISO suggests that there are three primary characteristics to be considered in developing a catalog of supply-side resources: response time, duration, and availability**.** These characteristics necessarily imply that the resource is dispatchable by the ISO and that the ISO can optimize and commit the resource through the market along-side all other resources.

- **Response time** – how quickly can the resource respond to an ISO dispatch and achieve its full capacity?
- **Duration** – how long can the resource sustain its response once called?
- **Availability** – how many times can the resource be called during a time period?

To help illustrate how different resource types may be compared with respect to these three primary performance characteristics, Figure 1 provides a graphic way to map relative combinations of the characteristics, depicting a hypothetical demand response product, a peaking generator, and an idealized resource that maximizes all three characteristics. A demand response product (green box) may have limited availability and limited duration, but have relatively good response time. In contrast, a conventional peaking generator (orange box) offers a more effective combination of characteristics—it is available at any time, once called can remain on-line for extended periods of time, and has very quick response time. The idealized "perfect" resource (blue box) would provide an even more optimal combination of these characteristics. As discussed further below, it will likely take a combination or portfolio of non-conventional resource types in the area of concern to effectively offset the need for a transmission upgrade or conventional generator.

Figure 1



Of course, even though location is not listed here as a primary characteristic, it is a fundamental requirement that resources selected to offset a needed transmission upgrade must be modeled at specific locations within the topology of the grid. Up to now alternative resources such as demand response have typically been applied for system-wide needs, so that the specific location of the resource has been less critical. However, in examining the use of alternative resources to address local transmission needs, the location of the resource becomes more critical as do the performance characteristics.

The ISO recognizes that there are many demand response resource types in existence today and does not intend for this effort to start from scratch and ignore these programs. However, in assessing some of these existing demand response programs, the ISO has found that they tend to have limited availability – they are only available for certain hours of the day, on certain days of the week, or for a limited number of dispatches in each day, week or month, or only in certain seasons – which limits their effectiveness in meeting local area needs. These limitations may be addressed by developing a combination or portfolio of individual resources to meet a specific need, and must be considered in assessing the effectiveness of a given mix of resources.

Assessment of energy efficiency (EE) and behind-the-meter (e.g., residential rooftop) solar PV as non-conventional alternatives would follow a different approach to the above because EE and rooftop solar PV are not supply-side resources and would not be dispatchable by the ISO in the course of system operation. Therefore, instead of considering the characteristics listed above, in assessing EE and distributed solar PV solutions to transmission needs the ISO would need to be able to predict the impact of any particular EE and distributed solar PV program on both the peak load and the load profile in the local area. These resources should have load impacts that reduce the residual need, which perhaps can then be addressed by smaller amounts of dispatchable preferred resources. The ISO's assessment of the required characteristics in various areas will ideally inform and influence decision-makers in the procurement of EE and distributed solar PV in those areas.

This first step as described above would be conducted during Phase 1 of any given TPP cycle, essentially by updating the generic resource catalog from the previous TPP cycle to reflect new information or new resource types that might become available.

5.2 Step Two – Determining an effective mix of resources

Once a preliminary catalog of generic resources is developed, the second component of this methodology is to carry out a process of selecting, refining, and validating a potential mix of resources that could best provide the performance characteristics needed for a particular local area. This step would be carried out during Phase 2 of any given TPP cycle.

This step consists of a number of sub-steps. The first requires specifying the performance characteristics (i.e., response time, duration, availability) and amounts of each required to meet the identified transmission needs for each local area, given the attributes and temporal operating conditions for that area (e.g., load profile, transmission limitations, and existing local resource mix). Following this, the ISO would develop and propose an initial preferred volume and mix of generic resource types from the catalog to provide the performance characteristics needed for a particular local area. This consists of aligning the required characteristics for each local area with the catalog of generic resource types. Consultation with stakeholders and submitted comments could identify additional potential resource mixes, and the ISO would consider these for refining its initial proposal to arrive at the resource mix that best meets the need.[4] Once the ISO settles on a preferred mix of resources, the ISO would perform an analysis to test the mix of resources to validate that it will meet the identified reliability needs in that local area.

The validated non-conventional resource mix would then be placed in the draft transmission plan (posted in January of any given TPP cycle) alongside the transmission or conventional generation solution that would be avoided or deferred by implementing the non-conventional solution. The

[4] This process could also lead to modifications of the generic resource types maintained in the catalog. Any information received about new resources or evolving characteristics of existing resources would be incorporated into the catalog for future reference in the subsequent transmission planning process cycle.

draft transmission plan would also be the vehicle for the ISO to indicate any instance where a previously-selected non-conventional resource mix was falling behind the implementation timeline required for it to meet the identified transmission need, and propose to reinstate the appropriate transmission solution to meet the need. The next sub-section describes this part of the proposed methodology.

5.3 Step three – Monitoring development of the non-conventional solution

Selection and Board approval of a non-conventional alternative in the transmission plan means that a transmission or conventional generation solution to address the same local need is eliminated or deferred. This makes the ISO dependent on the non-conventional alternative getting developed and placed in service and operating as expected to ensure that the identified local need is met. To ensure that the identified local need is actually met in a timely manner, the ISO will need to continually assess the progress of the selected non-conventional alternative against the timing of the local need. If a selected non-conventional alternative is not making satisfactory progress, the ISO would have no choice but to "de-select" it and return to the previously identified or suitably modified transmission or conventional generation solution.

Thus, the third component of this methodology is to monitor the development of the mix of selected non-conventional resources. This monitoring would be similar to that which the ISO conducts today on an annual basis to review the progress of transmission facilities, operating procedures, and special protection schemes and develop alternatives as needed if the initial solutions are not advancing. Gaps identified would be addressed in the current or a subsequent TPP cycle.

An additional aspect of this annual monitoring should address the cumulative effects on grid reliability and market stability of increased reliance on non-conventional alternatives over the longer term. Historically, overall system and market performance were based on transmission elements (with high availability) and dispatchable generators (with high availability). This resulted in systems that met criteria with little excess margin at peak load conditions, but with considerable margin the rest of the year. Adding to this, the operating margins in off-peak seasons were further increased by the fact that much of the load in California is summer peaking, when both thermal plants and transmission line capacities are based on seasonally-derated numbers.[5] In contrast, increased reliance on non-conventional alternatives may have comparatively less availability such that the implicit cushion or margin that previously existed for much of the year is no longer there. If this were in fact the outcome, the cumulative effects on grid reliability and market stability would need to be closely monitored.

[5] Admittedly, planned maintenance of both transmission elements and generators resulted in reductions in load serving ability outside of the peak stress periods, but overall margins stayed far above the "minimum" for most of the year.

6 Applying the proposed methodology in the 2013-2014 transmission planning process

For the 2013-2014 transmission planning process, the ISO proposes to apply this methodology to several local areas on a pilot basis before applying it to all local areas in subsequent TPP cycles. The ISO believes that a pilot program approach will be necessary to gain experience from the initial use of this methodology and make any necessary adjustments before applying it more widely.

In selecting the proposed pilot areas, the ISO considered the results from the final 2012-2013 transmission plan as well as the following criteria:

- The timeline for the identified need allows time for monitoring the development of non-conventional alternatives such as demand response before a conventional solution would be required to be approved if needed;
- The local area is sufficiently large to offer substantial procurement potential for the non-conventional resources; and,
- The binding constraints and the net load profile in the area appear to be suitable for mitigation by the non-conventional alternatives identified in the generic resource catalog (see Table 2).

Based on these criteria, in the current cycle of the 2013-2014 transmission planning process, the ISO proposes to apply this new approach to several specific local areas in southern California: LA Basin, San Diego, and to a lesser extent the Moorpark subarea of the Big Creek/Ventura area. Although the application of this methodology may be relatively straight forward for the Moorpark subarea, the main focus will be on the LA Basin and San Diego where the application of the methodology will be somewhat different in this cycle. Because of the magnitude of the projected reliability needs in the LA Basin and San Diego, transmission options will be pursued to complement non-conventional alternatives (i.e., preferred resources), to reduce the need for conventional generation to fill the gap. Thus, unlike the generic application of the methodology in future transmission planning process cycles where preferred resources are considered as an alternative to transmission, the main focus of this effort with respect to the LA Basin and San Diego is to identify the volume of non-conventional alternatives and the needed performance attributes that could effectively address the local reliability needs in these two priority areas as part of a basket of resources.

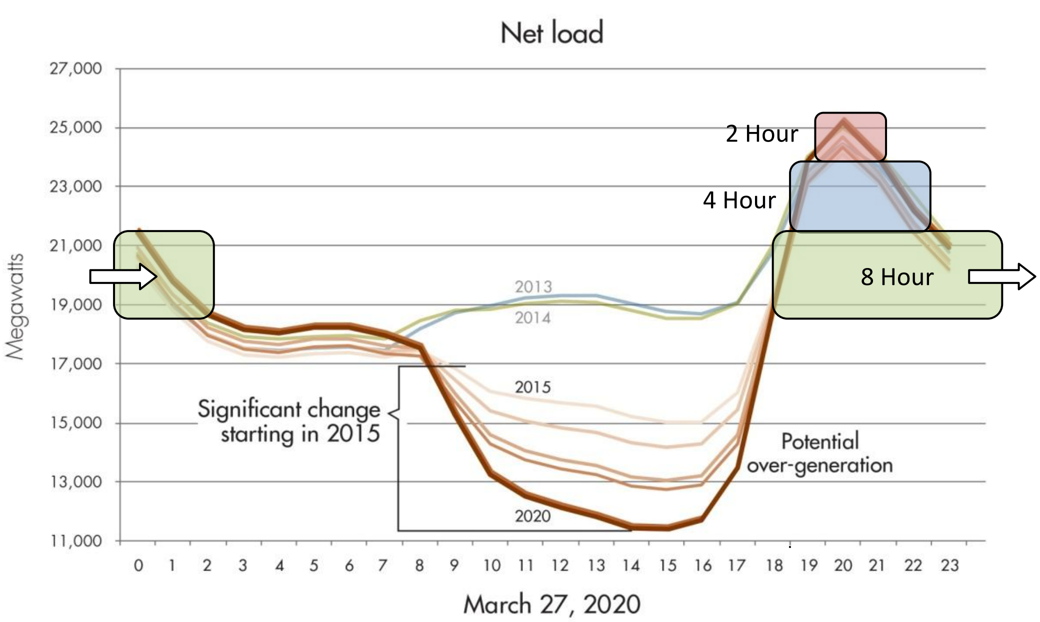
This information can then inform any CPUC decisions on authorizing procurement of additional preferred resources in these areas and ultimately inform the procurement activities of Southern California Edison and San Diego Gas & Electric. The 2013-14 transmission planning process will also be evaluating various transmission options for addressing the reliability needs of the LA Basin and San Diego areas and potentially recommending certain options for ISO Board approval. The ISO will plan to coordinate this transmission evaluation effort with the ongoing CPUC 2012 LTPP Track 4 proceeding.

6.1 A preliminary catalog of generic resources

This is step one of the proposed methodology developed by the ISO. Using Figure 2 as a starting point (the ISO's now familiar "duck" chart), the net load curve and the extreme system ramps expected in the future provide some insight into the performance characteristics that will be needed. Although this chart was developed to characterize anticipated ISO system-wide load, it is conceivable that a particular local area could have a similar net load profile. In that context, this chart assumes a very large volume of distributed solar PV is located in the local area. An area without this solar PV would have a need for different set of generic resources.

The figure suggests that a stack of several generic resource products with varying durations – e.g., a two-hour product, a four-hour product and an eight-hour product – could conceivably meet the system peak and mitigate the severity of the ramp up to the peak. Although this examination is insightful relative to potential durations required, it does not indicate the needed response time and frequency of availability of the resources, nor does it get into the specifics of local area requirements. It nonetheless illustrates the strategy of procuring a portfolio of non-conventional resources to meet the extreme peaks that may become increasingly more severe with increased renewable generation on the system.

Figure 2



Based on an examination of the load curve in Figure 2, the ISO has developed a preliminary catalog of generic resources and presents this in Table 1 for stakeholder consideration. These are presented as 'generic' because this preliminary catalog is not intended at this point to dictate the resource types (e.g., demand response, energy storage, distributed generation, etc.) that may best fit the need. Energy efficiency programs and distributed solar PV targeted towards peak load, load shape and specific local areas could of course reduce the need in the area for either non-conventional or conventional resources (because of their effect on changing the load profile). However, such targeted energy efficiency and distributed solar PV would appear in the analysis as a load modifier rather than a supply resource, and thus is not presented as part of Table 1. That said, the ISO believes that energy efficiency and distributed solar PV targeted to modify the load profile in a local area could play a useful role in meeting local area needs and should be considered as part of a thorough assessment of non-conventional solutions.

It must be emphasized that this is a preliminary attempt at a resource catalog, and considerable stakeholder input will be required to refine these generic products and then identify specific resource types that would fit these generic categories. It will also be necessary to examine the existing fleet of demand response products for their ability to provide these characteristics, notwithstanding that they were originally developed primarily as system wide balancing tools and have thus far not been applied for addressing local issues.

Table 1 – Preliminary catalog of generic resources

Type	Duration (hours)	Response Time (minutes)*	Availability (calls per period)**
Short-duration – Annual	2	20	10
Short-duration – Seasonal	2	20	20
Mid-duration – Annual	4	20	10
Mid-duration – Seasonal	4	20	20
Long-duration – Annual	8	20	10
Long-duration – Seasonal	8	20	20

Notes:

* Response time and other performance characteristics will need to be assured through strict compliance requirements and periodic testing.

** One suggestion is to characterize availability in terms of a minimum number of times in a given period (e.g., week or month) that the resource can respond to an ISO dispatch. If a resource is willing to be called down more frequently, it could sell the extra blocks of curtailment availability as additional products. Although the ISO suggests that it may make sense to differentiate between seasonal and annual availability, the suggested availability (calls per period) presented here are preliminary and stakeholder feedback is invited on this concept.

Other implementation characteristics will play a role in determining what resource types can participate. An important issue is commitment to perform, and whether a non-conventional solution to a transmission need could include voluntary demand response such as non-automated response to real-time prices or other system condition signals. If program participation is voluntary then ISO operators need time to see if the demand response is meeting the need, and if not, order other measures to meet the 30 minute requirement timed from when the first contingency occurred. Since the total window for action cannot increase beyond 30 minutes from when the first contingency occurred, lower confidence demand response programs must have faster response times so that the operator can see the response and have time to take other actions if the program does not perform as expected. It is conceivable that extremely fast-acting resources would have to be standing by as backstop measures to the extent the ISO relies on voluntary demand response resource types. In contrast, if the resources are more reliable and firmly committed to perform—for example those with significant financial consequences for lack of performance or those with automation—then required response times can be lengthened and a broader range of resources may be able to participate. This may suggest that the MW values of programs with voluntary actions (e.g., responses to price signals) may need to be discounted rather than counted at their nominal MW amounts.

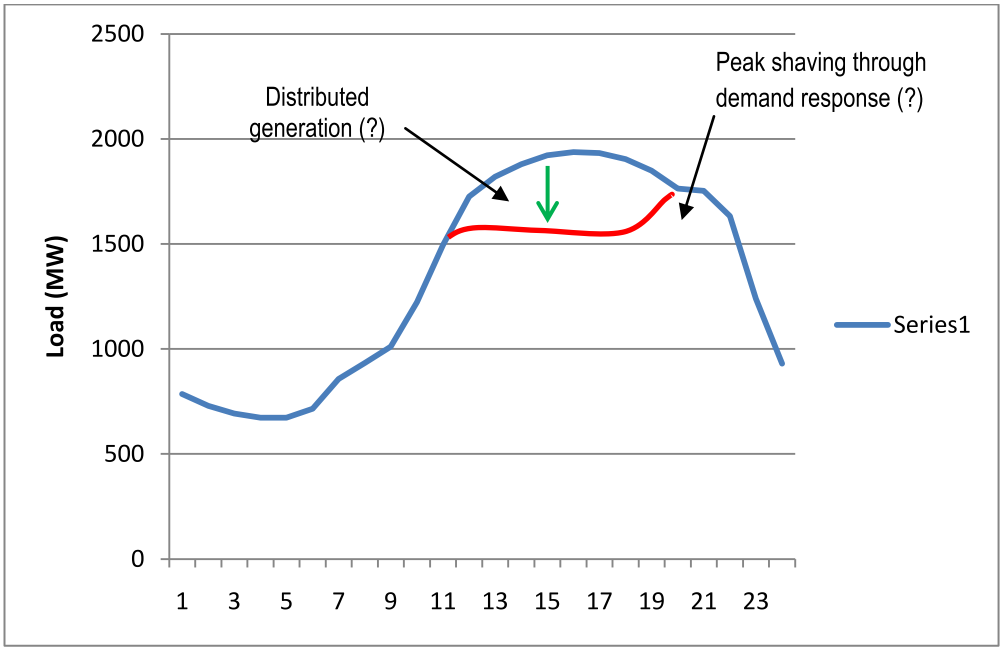
6.2 Determining an effective mix of resources for each pilot area

This is step two of the proposed methodology. From this preliminary catalog of generic resources, the ISO intends to develop an initial mix of resource types for each pilot area and present this information as part of the 2013-2014 transmission planning process.

To partially illustrate the approach that the ISO intends to use, consider the Moorpark area in southern California. A summer peak day load shape for Moorpark is represented by the blue curve in Figure 3. This load shape takes into account existing customer-side-of-the-meter distributed generation (which is counted as a load modifier rather than as a supply resource),[6] but does not take into account existing system connected distributed generation or potentially planned distributed generation (which are counted as supply resources). If behind-the-meter distributed generation or energy efficiency were used to shift the afternoon demand downward, as indicated by the red curve, then the feasibility of using shorter duration resources such as demand response to address the evening peak increases.

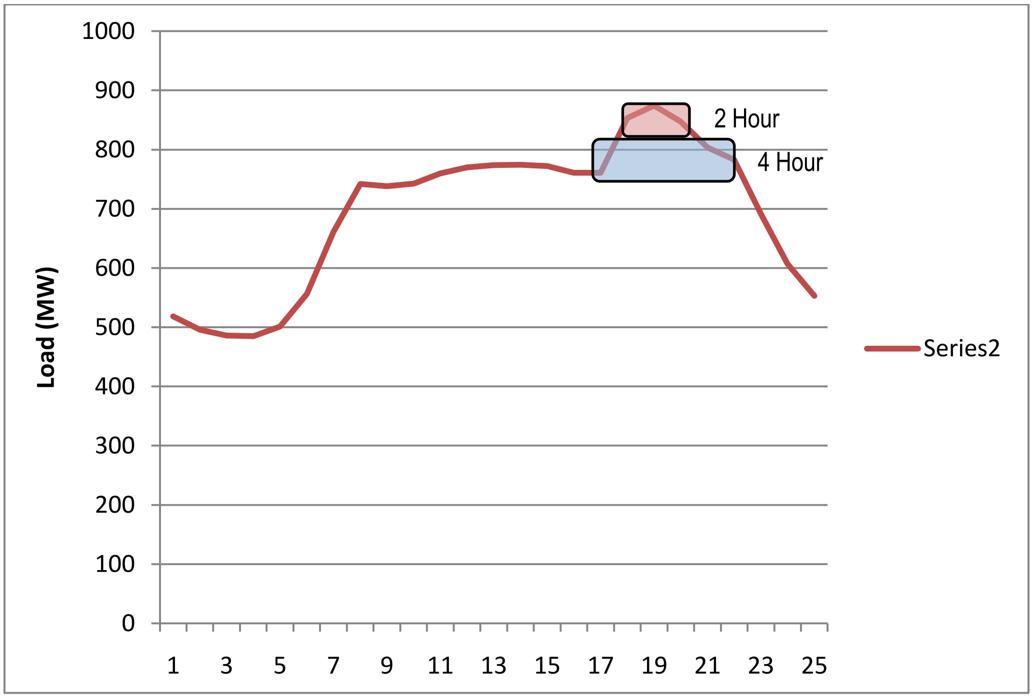
[6] To simplify this conceptual illustration the ISO is ignoring for the moment the fact that certain qualifying facilities (QFs), which are typically behind the customer meter, may be counted both as load modifier for the portion of capacity dedicated to serving the host load and as a resource for the portion of capacity that provides RA. In any actual assessment within the TPP the ISO would, of course, take such resource types into consideration.

Figure 3 – Summer peak day for Moorpark



Looking at a different season, a winter peak day load shape for Moorpark is provided in Figure 4. For this season, the afternoon demand is relatively flat but a short duration peak occurs in the evening. Shorter duration resources such as demand response would appear to be a viable means of addressing this steep but short duration peak. This load shape appears to indicate that a ten percent demand reduction could be achieved with a combination of mid-duration (4 hour) and short-duration (2 hour) demand response products.

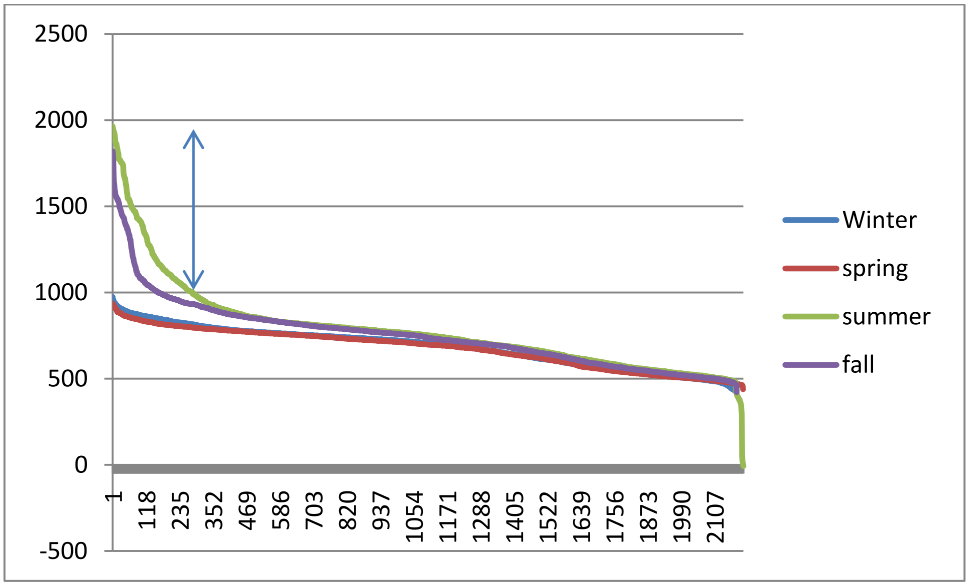
Figure 4 – Winter peak day for Moorpark



Lastly, four load duration curves for Moorpark—one for each season—are provided below in Figure 5. Note the significant variation in the number of peak days between seasons – it would appear that mitigation is far more likely to be needed in the summer and early fall periods (top two curves) than in winter or spring.

Using such information for each pilot area, the ISO could estimate the likely number of calls for each season based on an assessment of the number of peak days coupled with the statistical likelihood of a transmission contingency (driving the need to call on a resource). Subject to further analysis, it would be reasonable to assume that for the Moorpark area, demand response programs available only in the summer and early fall would be viable provided that they are tailored to the net load profiles for these periods.

Figure 5 – Load duration curves for Moorpark



7 Stakeholder process and next steps

Following the release of this paper, the ISO intends to hold a stakeholder web conference within the next few weeks to discuss the proposed methodology and obtain initial stakeholder feedback. The application of the methodology will be further discussed at the ISO's TPP stakeholder session scheduled on September 25th and 26th.

Table 2 provides a summary of this stakeholder process and next steps.

Table 2 – Stakeholder process schedule

Date	Milestone
August 15	ISO posts preliminary reliability study results and proposed mitigation solutions, as a regular part of the TPP
September 4	ISO posts paper on consideration of non-conventional alternatives
September 16	PTOs submit proposed reliability projects to the ISO as a regular part of the TPP.
September 18	Stakeholder web conference on paper
September 25-26	ISO hosts transmission planning process public stakeholder meeting #2, as a regular part of the TPP. The application of the methodology proposed in this paper will be further discussed at this stakeholder meeting.
Sept 26 – Oct 10	Comment period for stakeholders to submit comments on the public stakeholder

Date	Milestone
	meeting #2 material, as a regular part of the TPP.
October - January	ISO to produce results regarding potential volumes and performance attributes of non-conventional alternatives for each pilot area.
January 2014	The ISO posts its draft 2013-2014 transmission plan as a regular part of the TPP. The plan will include results regarding potential volumes and performance attributes of non-conventional alternatives for each pilot area.