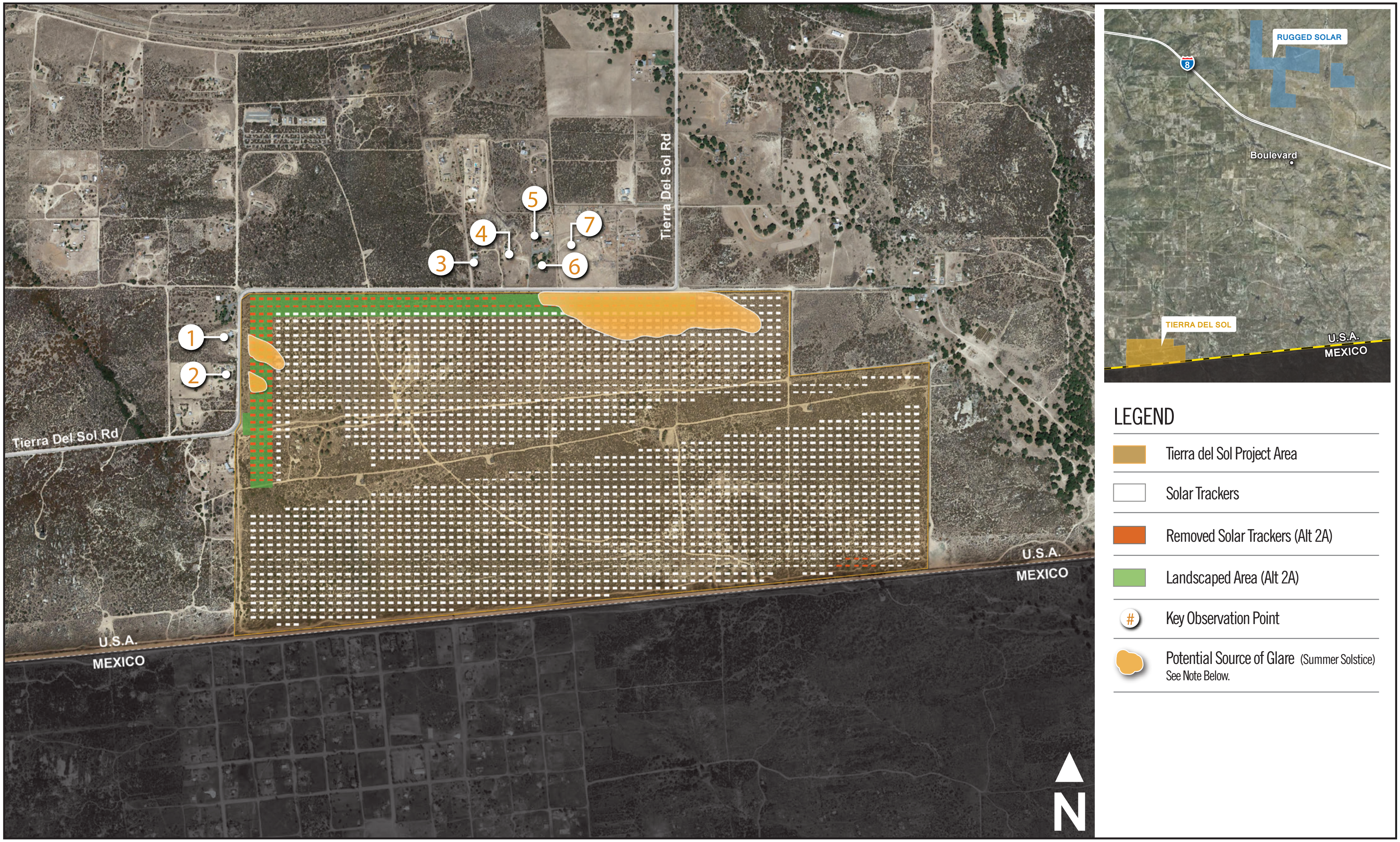

Note: Potential source of glare displayed in this image is representative of the glare experienced on the Summer Solstice date (6/21/13) ONLY, in an effort to capture a worst-case scenario snapshot in time. However, seasonal changes in solar behavior will cause the source of glare to change. Refer to memorandum accompanying this image dated 1/27/15 for further details.

Prepared For, Soitec

Prepared By, POWER ENGINEERS

GLARE BEHAVIORAL ANALYSIS

Exhibit 2 - Potential Sources of Glare: Tierra del Sol

California ISO
Shaping a Renewed Future

DEMAND RESPONSE AND ENERGY EFFICIENCY ROADMAP:

MAXIMIZING PREFERRED RESOURCES

DECEMBER 2013

ISO VISION

The ISO envisions demand response and energy efficiency becoming integral, dependable and predictable resources that support a reliable, environmentally sustainable electric power system.

Energy efficiency and demand response have a long history in California and are already contributing to lower costs and reduced environmental impacts. Utility demand response programs developed over a decade ago have offset the need for additional peaking generation.

Implementing new, more flexible and responsive resources will further advance California's goals of a more reliable and cleaner power system—with the added potential of replacing or deferring investments in more expensive energy infrastructure.

From an operational perspective, demand response resources will contribute to the low-carbon flexible capacity needed to maintain real-time system balance and reliability while also supporting the integration of increasing levels of renewable energy resources. As the main grid operator of a state leading the way to a greener grid and as a facilitator of the only open-market in the western United States, the ISO is keenly involved in leveraging alternative resources to the benefit of an efficient and reliable system.

Anticipating the magnitude, type, timing and geographic distribution of these rapidly growing resources is as critical as solving the challenges of short-term and long-term forecasting of load variability as large numbers of resources inject energy into literally thousands of locations on the grid. The ISO is preparing for the challenges because the environmental and sustainability benefits are enormous. We also believe the new resources can be blended into the current grid composition without compromising reliability.

We have a lot to look forward to in terms of positive benefits to California's economy and environment as long as this historic grid transition is managed thoughtfully and proactively through the coordinated efforts of all stakeholders.

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INTRODUCTION

Energy alternatives such as demand response (DR) and energy efficiency (EE) provide tools to help the California Independent System Operator Corporation (ISO) maintain a reliable and affordable power supply while minimizing the environmental impacts of conventional electricity generation. DR and EE resources are already contributing to the reliable and efficient management of a greener electricity grid, reducing the need to rely on more polluting power supplies. Recent technology trends point to a larger reliance on DR and EE as well as other forms of distributed energy resources (DER) such as microgrids, rooftop solar, electric vehicles as well as energy and thermal storage facilities. The ISO is working with the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) to create a market for DR and EE that builds upon the innovation that has characterized the state as a national leader of clean energy technology advancement.

A greater reliance upon DR/EE brings new complexities to transmission planning and real-time grid and market operations. The ISO is committed to harmonizing the unique attributes that come from clean, green resources into its market in a way that fully optimizes the benefits of DR and EE resources.

In collaboration with state energy agencies and stakeholders, the ISO is working to advance and modernize these resources through competitive mechanisms that will lower wholesale electricity costs while creating a less carbonized power grid.

The nature of DR and EE requires the ISO to think differently about how resources are planned and accounted for, and how they can best be procured to serve both the needs of the ISO as well as market participants and consumers at large. As we move toward a more decentralized and distributed energy future, it is the job of the ISO to make sure reliability is maintained.

Reflecting cross-agency coordination throughout its development, this roadmap is comprised of four interdependent paths that run from 2013 through 2020. It also highlights specific activities essential to building new market opportunities for DR and EE to meet the needs of end-use customers and the power system as a whole. Each path shows the activities and milestones necessary to bring greater DR and EE capacity into the system over the next several years.

Based upon input received during the roadmap's stakeholder process about the need for collaboration, the ISO, CPUC, and CEC are developing a cross-agency DR and EE workplan to ensure activity alignment and track progress. This roadmap assumes a degree of adaptation by all stakeholders – including the ISO – with each stakeholder engaging in the outcome. It is through positive resolution we will find innovative ways to realize the historic transformation of the electricity system now moving from a one-way to a highly sophisticated two-way network.

PATHWAYS FOR MAXIMIZING PREFERRED RESOURCES

The Load Reshaping Path focuses on applying DR and EE resources to the demand side of the supply-demand balance equation. These resources will create a flatter load shape for the ISO system generally and, in specific geographic areas, reduce ISO operating needs and complexity.

The Resource Sufficiency Path focuses on the supply-side of the balance equation to ensure sufficient resources, with needed operational characteristics, are available in the right places and at the right times. This path includes activities that specify needed resource characteristics—as well as policy developments—to guide and facilitate DR and EE procurement and program development.

The Operations Path focuses on making the best use of any and all resources that are made available through the resource sufficiency path. This path is cast from a grid operator perspective. It involves changing some existing policies, modifying or developing new market products to expand DR market participation, and addressing relevant technical and process requirements to achieve operational excellence.

The Monitoring Path is the essential feedback loop for the other three paths. Systematic monitoring of each stage of activity will foster a deeper understanding of the operational capabilities of DR resources, the effectiveness of procurement programs in aligning with systemwide and locational needs, and the impacts of EE and other load-modifying programs in reshaping load profiles both locally and at the system level.

The LOAD RESHAPING PATH

Activities addressing the demand side of the supply-demand balance equation seek to modify the load shape by changing end-use consumption patterns, thereby reducing the need for additional and costly generation or transmission infrastructure. Such activities will both reduce overall energy consumption and alter the system or local load profile to reduce the severity of power demand peaks and valleys. Thus, the focus of this path is on EE and load-modifying DR resources; activities related to supply-side DR resources will be discussed within the resource sufficiency path.

These changes can benefit locally constrained areas as well as the overall transmission system. One strategy for this path is to provide locational and time-varying market signals to elicit demand-side responses that can respond to system conditions in a timely manner. For example, in conditions of over-generation, appropriate signals could trigger consumers to modify their consumption, such as the charging of electric vehicles or absorbing excess generation via various forms of battery energy storage.

Advance energy efficiency programs and incentives

California has been a leader in establishing EE programs and incentives. An expanded emphasis on EE will take advantage of the effectiveness of these demand-side resources in reducing greenhouse gas emissions. This renewed focus on EE can also impact the overall system load shape, thereby reducing the need for new conventional generating resources or transmission upgrades. The ISO sees great potential benefits that can be realized through a proactive approach that targets EE programs by using incentives to reshape the load profile in specific geographic areas of the system. In the Los Angeles Basin and San Diego areas, for example, the retirement of the San Onofre Nuclear Generating Station presents an immediate need, and opportunity, for collaboration among the state agencies, the ISO and the southern California investor-owned utilities (IOUs) to define and implement EE programs to help address the demand formerly met by the nuclear plant. The Demand Analysis Working Group (DAWG), a CEC-led collaborative stakeholder effort that estimates EE program impacts as an input into the Integrated Energy Policy Report (IEPR) demand forecast, will play an important role in assessing the load-shape impacts of different EE programs and identifying which ones would to be most effective in offsetting the need for new generating plants or transmission upgrades. The CPUC through its processes will authorize EE programs for the IOUs to implement that provide the most value.

Evolve demand forecasting

A critical need for the ISO is to account for EE and DR impacts in planning transmission upgrades and in determining future resource requirements (i.e., local capacity requirements for the resource adequacy program, and system-wide flexible capacity requirements). The state's demand forecast, developed biennially through the CEC administered IEPR process, is foundational to system planning and resource need determination. The CEC is working to increase the locational granularity of EE forecasts and will further that effort for the 2015 IEPR cycle.

Another high priority near-term activity is to develop criteria to assess DR programs as a load-modifying or a supply-side resource. Load-modifying DR should be properly accounted for in the demand forecast whereas DR supply resources should not. Each DR type or program should be classified in only one of these groups, and the classifications should be maintained consistently across the various applications of the demand forecast. This ensures that the benefits of each program are accurately captured, recognized and not double counted. Moreover, DR supply resources must be available to be called upon or dispatched when needed, and the ISO must have confidence that the response to the dispatch instruction will meet expectations with regard to response time, magnitude and duration.

Programs classified as load-modifying will then be included in the CEC IEPR while the programs classified as supply-side would be included as part of the supply-side resources available for grid planning and operations. In the recently published CEC 2013 IEPR draft, the CEC has included several existing load-modifying DR programs in its forecast.[1]

The recently issued CPUC order instituting rulemaking, takes up the question of demand response resource classification and has already held workshops to gather stakeholder input. The classification effort is expected to be completed in 2014.

[1] http://www.energy.ca.gov/2013publications/CEC-100-2013-001/CEC-100-2013-001-LCD.pdf

Supply-side resources versus load-modifiers

Q: *What is the difference between supply-side resources and load-modifiers and why does this matter to the ISO? How does this relate to preferred resources such as DR and EE?*

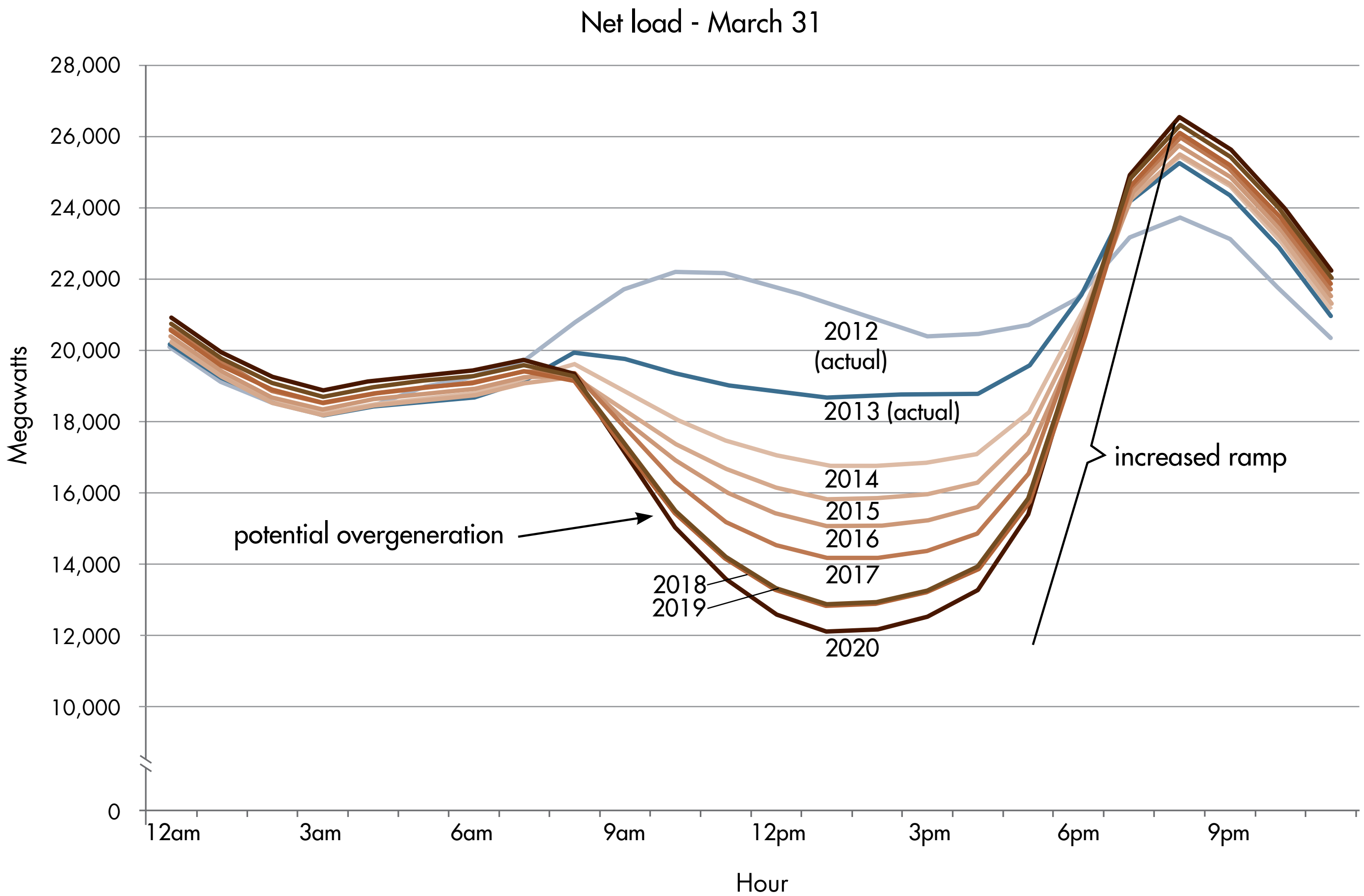
A: *The ISO's core responsibility is to maintain grid reliability, which it does by managing supply resources to match electricity demand. With increasing reliance on intermittent resources, the ISO is responsible for dispatching resources that can balance both load variability and the growing variability from non-dispatchable intermittent resources. Thus, the ISO must increasingly balance supply against a less predictable "net load," i.e., the load after subtracting the output of intermittent wind and solar resources.*

To manage the grid, each energy supplying or conserving resource and program, ranging from conventional generators to EE programs, must be consistently classified as either a supply-side resource or a load-modifier in order to be useful for the ISO management of the grid.

Supply-side resources are those energy supplies available to the ISO to balance net load. These resources can take different forms, ranging from conventional generators to demand response. Supply-side resources are used to directly balance load, manage congestion and satisfy reliability standards. Supply-side resources inject or curtail energy in specific locations, and can be modeled, optimized, and dispatched when and where needed by the ISO.

Load-modifiers are those resources or programs not seen or optimized by the ISO market, but they modify the fundamental system load shape, preferably in ways that harmonize with ISO grid operations. Examples of load-modifiers are dynamic rates, and EE programs. An effective load-modifying program helps create a flatter system load profile, attenuating high energy peaks and valleys and reducing extreme upward and downward ramps. The benefit of load-modifying actions is captured in the natural load, which is incorporated into the CEC load forecast. A more favorable load profile can benefit the ISO by creating a more manageable and stable system, and it can benefit ratepayers by deferring or avoiding the need for future capacity additions and lowering resource adequacy (RA) requirements.

THE DUCK CURVE
(Net load chart)



DR and EE may play a new role in the future as flexible resources to respond to new grid fluctuations brought on by added levels of wind and solar power that, by its nature, is more variable than conventional generation. The ISO has identified a growing need for operational flexibility as renewable power is added to the grid, demonstrating through its "duck curve" how the electric system is likely to evolve as more energy is produced from renewables. The chart illustrates the "net load" that shows the actual demand on the system minus variable generation production. The net load is calculated by taking the forecasted load and subtracting the forecasted electricity production from wind and solar generation resources.

These curves capture the total variability the ISO must match or follow with controllable resources. Two ways to ensure reliable grid management include applying EE and DR resources as behavior-modifying mechanisms to change the net load shape and procurement of resources in response to the grid needs. The activities discussed in the load-modifying path seek to attenuate the peaks and valleys and make the ramps less steep, while the resource sufficiency path discusses ensuring needed flexible resources, including DR, that will be included in future planning and procurement processes. Working with the industry and policymakers, the ISO is collaborating on rules and new market mechanisms that support and encourage measures to modify the net load shape and develop flexible resources to ensure a reliable future grid.

Align retail signals with grid conditions

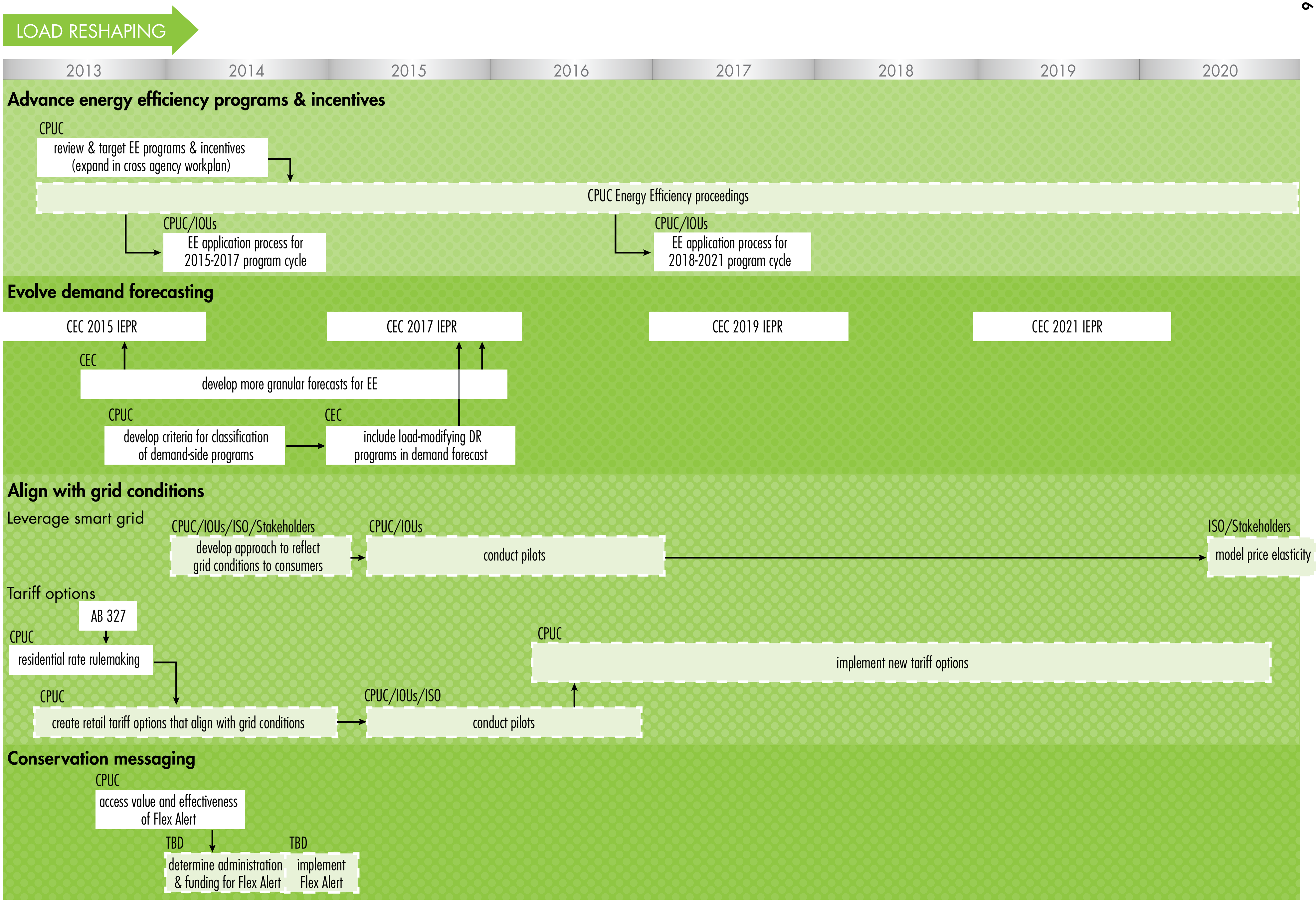
Aligning retail signals with wholesale grid conditions is a strategy to give end-users the incentives and the capabilities to modify their energy consumption to respond quickly to the changing needs of the transmission system without requiring explicit instructions from a load serving entity, distribution utility or the ISO. The needed alignment entails at least three primary approaches: smart grid automation; retail tariff changes; and energy conservation messaging during times of extreme grid stress. The right combination of technology, policy reform and active consumer participation will be needed to elicit demand-side responsiveness to meet grid resource needs efficiently and sustainably.

In the 2014-15 timeframe, the ISO will work with stakeholders including utilities, aggregators and others, to develop practical approaches for conveying signals to customers to elicit beneficial shifts in energy consumption. During 2015-16, the ISO will actively participate in stakeholder conducted pilot programs that will provide insights into the effectiveness of these approaches in reducing load during times of high wholesale prices or contingency events. These same pilot programs can also investigate how best to increase loads under low cost or excess generation conditions. The goal is to test out and validate effective approaches and then place the fully vetted technologies in operation by 2020. When these technologies are standardized across a broad population of consumers, the ISO will be able to model the price-elasticity of this DR in its real-time market optimizations, so that the demand-side response to very high or very low prices can be predicted with a high degree of confidence.

Retail rate structures that realistically reflect the real-time cost of electricity can send a highly effective direct signal to customers to respond accordingly. As customers, aided by technology, change their consumption behavior in response to such price signals, the system load shape will have a lower peak that will also be less deep, and less steep. This, in turn, reduces the need for generating plants and transmission infrastructure. California Assembly Bill 327 recently signed by Governor Brown represents an important first step to enabling wider options for residential rate structures that can be made consistent with grid conditions.[2] The CPUC is conducting proceedings to gather input and decide on rate modification.

The last of the three alignment approaches involves voluntary conservation programs such as the *Flex Alert* campaign. This educational and emergency alert program was designed to develop consumer responsiveness by communicating specific actions to reduce load during tight grid conditions. Although it has proven quite useful, its voluntary nature makes its actual impact in any given hour less predictable than the impact of either technology-enabled DR or time-varying retail rates.

[2] http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327



LOAD RESHAPING
2013
2014
2015
2016
2017
2018
2019
2020
Advance energy efficiency programs & incentives
CPUC
review & target EE programs & incentives (expand in cross agency workplan)
CPUC Energy Efficiency proceedings
CPUC/IOUs
EE application process for 2015-2017 program cycle
CPUC/IOUs
EE application process for 2018-2021 program cycle
Evolve demand forecasting
CEC 2015 IEPR
CEC 2017 IEPR
CEC 2019 IEPR
CEC 2021 IEPR
CEC
develop more granular forecasts for EE
CPUC
develop criteria for classification of demand-side programs
CEC
include load-modifying DR programs in demand forecast
Align with grid conditions
Leverage smart grid
CPUC/IOUs/ISO/Stakeholders
develop approach to reflect grid conditions to consumers
CPUC/IOUs
conduct pilots
ISO/Stakeholders
model price elasticity
Tariff options
AB 327
CPUC
residential rate rulemaking
CPUC
implement new tariff options
CPUC
create retail tariff options that align with grid conditions
CPUC/IOUs/ISO
conduct pilots
Conservation messaging
CPUC
access value and effectiveness of Flex Alert
TBD
determine administration & funding for Flex Alert
TBD
implement Flex Alert

The RESOURCE SUFFICIENCY PATH

The supply side of the supply-demand equation identifies a portfolio of resources in specific locations that will provide the operational capabilities necessary to reliably operate during both normal and emergency power grid conditions. Resource sufficiency must be assessed in light of grid physics and the portfolio of supply-side resources that are expected to be in service over the course of the planning period. This path focuses on clarifying resource types and locational attributes and the planning and study processes that will quantify resource requirements. It also examines the procurement processes that ensure the resources will be available when needed.

Define DR resource attributes

Traditionally, transmission upgrades and generating capacity additions have been determined through engineering studies focused on meeting stressed system conditions such as extreme spikes in demand and contingencies. The ability to reliably operate the grid during stressed conditions assumes that the procured generating resources either run continuously as base load resources or can be controlled to operate as needed. With reduced controllability resulting from the greater presence of variable renewable generation such as wind and solar, plus the increased and fluctuating load impacts of load-modifying distributed energy resources, grid operating needs can no longer be adequately assessed by looking at only system peak or traditional contingency conditions.

The ISO's efforts to study the operational requirements of integrating renewable resources have led to the formulation of certain resource performance characteristics. This new category of necessary resources is generally referred to as "flexible capability."

This unique operating resource is required to manage the expected system load shape during both peak and off-peak seasons and during contingency conditions, which is one of the primary challenges facing the ISO today. As the ISO further assesses the possibilities of DR as a supply-side resource, it must also consider flexibility requirements and the capability of different DR resource types to meet the operational needs created by the frequency and voltage swells and sags associated with variable resources.

To support inclusion of DR and EE in transmission planning studies, the ISO is capturing DR resource types with descriptions of their operational attributes in a base catalog. As part of the 2013-2014 transmission planning cycle, the ISO is working with stakeholders to develop methodologies and procedures for considering DR and targeted EE as candidate alternatives to a local transmission upgrade or constructing a conventional generator. This information will inform the 2013-2014 planning cycle and could also provide study support for local resource procurement decisions in future long-term procurement planning proceedings.

The ISO, CEC and CPUC released a Preliminary Reliability Plan for LA Basin and San Diego *that recommends a blend of options for maintaining local reliability following the shutdown of the San Onofre Nuclear Generating Station and meet compliance dates for the once-through-cooling water regulation. The plan includes a goal to meet the incremental need of 2,800 MW through the use of renewables, storage technologies, and "preferred resources" including local energy efficiency, and demand response. Regulatory proceedings are underway or planned to determine the procurement authorization that will meet the identified needs.*

Q: What is Flexible Capability?

A: A resource's flexibility can be described as the ability to respond to ISO dispatch instructions. The "flexibility" or "dispatchability" of a resource is determined by the following:

- How fast can the resource ramp up or down?
- How long can the resource sustain an upward or downward ramp?
- How quickly can the resource change its ramp direction?
- How far can the resource reduce output and not encounter emission limitations?
- How quickly can the resource start?
- How frequently can the resource be cycled on and off?

A resource's flexibility at any particular time can vary depending on the resource status (e.g., on-line or off-line) and other operating parameters (current megawatt) output or consumption level, operating range, etc.). To simplify the assessment of a resource's flexibility, the ISO describes three unique operational attributes that reasonably capture its needs for flexible capability. These attributes are derived from three types of operational needs the ISO expects to manage: 1) steep, system ramps in either upward or downward direction, which may vary by month or season and occurs multiple times a day; 2) severe intra-hour system variability in either the upward or downward direction, which may vary by month or season; and 3) second-to-second regulation service to maintain standard frequency in accordance with established reliability requirements. Based on these needs, the three types of flexible capability and their definition and benefits are as illustrated below.

OPERATIONAL NEEDS	DEFINITION	BENEFIT
Continuous ramping	ability to sustain continuous upward or downward ramps	ensures that there is sufficient ramping capacity to meet the ISO's largest continuous ramp and multiple ramp conditions throughout the operating day
Load following	respond to ISO 5-minute dispatch and meet expected operating levels within an hour	ensures there is enough capacity with a defined ramping capability available to be dispatched on a five-minute basis through the ISO real-time dispatch market application
Regulation	follow 4-second ISO control signals and meet performance expectations	ensures the ability to balance net loads and maintain system frequency on a continuous basis, in accordance with established reliability criteria

As a first step toward ensuring the system has these three operational capabilities, the CPUC released a proposed decision in its resource adequacy proceeding, which would add a mechanism that establishes a flexible capacity procurement obligation.[3] In coordination with this procurement obligation, the ISO is conducting a stakeholder process to establish must offer obligations for these resources to participate in the ISO markets. In both of these efforts, flexibility is defined as the greatest three-hour continuous amount of ramping power needed in each month by the ISO to manage grid reliability. Resources that can sustain or increase output when flexibility is needed will be considered flexible capacity. In the future, these interim solutions will be replaced with a more holistic solution to address the system's specific needs for each type of flexible capability.

Coordinate procurement and planning processes

This path includes a strategic activity to align the processes that support resource sufficiency. Stakeholders agree this is a high priority. On January 30, 2013, California state senators Alex Padilla and Jean Fuller issued a letter to the ISO and the state's energy agencies as a follow-up to an informational hearing on EE. It asked for changes that would advance the goal for the state's energy efficiency investments to reduce the need for new power plants. Key to realizing this goal are process improvements that include common assumptions and a single consistent forecast for planning and procurement. These pivotal processes include the ISO's annual transmission plan that incorporates associated studies to estimate future resource requirements, the CPUC's long-term procurement process and RA proceedings, and the CEC's IEPR, which includes the biennial statewide demand forecast.

As the ISO develops its approaches for considering DR and EE alternatives in transmission planning, a much tighter linkage with the relevant procurement activities by the CPUC and CEC will be needed. Tracking the development of these DR and EE resources is essential to ensure their availability by the time the transmission upgrade is needed.

The CPUC, CEC and ISO must establish a clear classification of each DR program types as either a load-modifier or a supply-side resource. This ensures that the resource is accounted for either as 1) a reduction in the demand forecast or 2) as a supply resource eligible to provide RA capacity. Once a DR program or resource is classified as a supply-side resource, it can no longer be counted as a reduction in the demand forecast or it will result in double counting. As a supply-side resource, a DR program must be available to be called upon or dispatched when and where needed and must meet reasonable and reliable performance requirements. The recently issued CPUC DR OIR, takes up the question of demand response resource classification and has already held workshops to gather stakeholder input. The classification effort is expected to be completed in 2014.

Develop and refine procurement mechanisms

The ISO and CPUC are working on a multi-year joint reliability framework that would combine multi-year resource adequacy obligations for load serving entities (LSEs) with a multi-year, market-based ISO backstop capacity procurement mechanism. The three elements of the proposed framework include a 3-year resource adequacy (RA) program and a Reliability Services Auction (RSA) that provides a backstop procurement mechanism, combined with a long-term planning assessment of years 4-10. This provides a continuous review of resource procurement until implementation of a long-term procurement plan (LTPP) that assesses needs 10-years forward.

In response to the recommendation provided by the draft 2013 CEC IEPR that the ISO implement a multi-year forward DR auction in the region impacted by San Onofre and to further understand the availability of DR that could satisfy grid needs, the ISO recently proposed a pilot DR auction. This auction is envisioned to be a voluntary pilot that complements the joint reliability framework. This pilot auction seeks to enable the procurement of preferred resources to satisfy local resource adequacy procurement while serving ISO local reliability capacity needs. The DR auction pilot is currently under discussion.

An additional opportunity to procure demand response tailored for grid needs is through the SCE "living pilot" filed pursuant to a CPUC decision in the current LTPP proceeding. It contemplates competitive procurement of preferred resources and energy storage. The living pilot will specify performance attributes to support reliability needs, measurement and evaluation protocols to report efficacy of the portfolio of resources and methods for applying lessons learned for improvement. The ISO is actively engaged in CPUC workshops and SCE activities to support procurement and pilots that include demand response.

[3] CPUC's RA Proposed Decision: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=70423172