UNITED STATES OF AMERICA
FEDRAL ENERGY REGULATORY COMMISSION

Reliability Technical Conference	Docket No. AD-12-1-000
North American Electric Reliability Corporation	Docket No. RC11-6-000
Public Service Commission of South Carolina and South Carolina Office of Regulatory Staff	Docket No. EL11-62-000

Prepared Statement of Deborah Le Vine
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Chairman Wellinghoff, Honorable Commissioners, Commission staff and fellow panel members:

Good afternoon. My name is Deborah Le Vine. I am presenting comments on behalf of the California Independent System Operator Corporation where I serve as the Director of System Operations. As you are aware, the California ISO operates the majority of California's electric transmission grid though an organized wholesale competitive market for energy and ancillary services. Approximately 80 percent of California's load is within the ISO's balancing authority area. In 2006, load in the ISO's balancing authority area peaked at 50,270 MW. We operate a system that is part of the Western Electricity Coordinating Council, which encompasses 14 western states, British Columbia and Alberta, Canada, and parts of Mexico.

My comments today respond to the topics identified by the Commission's agenda with respect to NERC's efforts to prioritize secure reliable operation of the bulk power system. First, I want to give credit to NERC where credit is due.

Second, I want to highlight that, at least in the West, the priorities of tomorrow are already the priorities of today. Third, I want to suggest ways in which NERC's standard development process can address these priorities and acknowledge that there is still work to do on the existing standards. I will also provide limited remarks in connection with Commissioner Moeller's request for evidence in connection with this technical conference.

We strongly support NERC's efforts to prioritize its programs and to work collaboratively with the industry to ensure electric grid reliability both in terms of standards development and compliance. NERC's priority issues list presented earlier this year demonstrates necessary leadership. And, while some details may still require resolution, NERC's recent find, fix, track and report proposal reflects a concrete evolution of NERC's compliance and enforcement program to a more reasoned approach with a greater focus on those potential violations that pose a risk to reliability of the bulk power system. NERC must continue to refine its compliance and enforcement program and ensure that its rules of procedure allow for participation of all affected registered entities in any inquiry that NERC or Regional Entities undertake.

In terms of NERC's stated priorities, we recommend that NERC remain agile with respect to which priority issues require attention and when. For example, throughout the West, and particularly in California, environmental policies are resulting in increasing numbers of intermittent resources seeking to interconnect to the bulk power system. NERC's priority issues list acknowledges that integration of these new resources is a forward looking issue and results in operating characteristics significantly different from conventional resources. NERC recognizes that all stakeholders need to examine how the bulk power system can secure reliability services, including for example, balancing services, ramping or regulating reserves, reactive supply, capacity and voltage control. The California ISO agrees but wishes to emphasize that securing these services is quickly becoming an immediate issue as California approaches a 20 percent Renewable Portfolio Standard in 2013, and continues toward a 33 percent Renewable Portfolio Standard in 2020, while during the same time period dispatchable capacity using once through cooling begins to retire. This year alone, based on an installed wind capacity of 3,598 MW, we have witnessed a drop in wind output of approximately 800 MW in less than one hour and an increase of approximately 800 MW in 30 minutes. Significant drops in solar production have also occurred over the course of a daylight operating hour. Attachment 1 to this prepared statement provides diagrams reflecting these fluctuations in supply.

As intermittent generation resources come on line, the ISO's transmission grid could experience far greater variability from supply resources over the course of one hour or several minutes. To complicate this problem, California is already implementing a policy that addresses the best technology available under the Clean Water Act to mitigate the environmental impact of once through cooling. This policy will likely cause some large natural gas fired steam plants to retire over the next 3 to 5 years. Many of these plants have provided California's electric system with needed ancillary services, including the ability to ramp in response to changes in load as well as voltage support and inertia that also support import transfer capability and reliability of the grid.

In terms of standards development, the California ISO supports the development of a near term plan to address priority issues. As part of that effort, NERC should consider examining its portfolio of reliability standards during 2012 and 2013 to determine whether there are sufficient tools to allow balancing authorities and transmission operators to manage a large volume of intermittent generation. In this respect, NERC should place equal focus on refining existing reliability standards as it does on the development of new reliability standards. There are, moreover, standard development initiatives from 2008 that have yet to be adequately addressed. For example, NERC still needs to assess whether reliability coordinators have adequate access to information on the black start capabilities of resources within their areas. NERC also needs to provide greater clarity with respect to the applicable scope of its communications and coordination standards: which communications from balancing authority area operators constitute *directives* as that term is used in the standards?

The priorities identified by NERC are in some cases already addressed in many reliability standards (e.g. protection and control standards address the miss-operation of relays and automatic controls; personnel performance, training and qualifications standards attempt to mitigate human error; communications standards govern voice communications). As such, the California ISO believes NERC recognizes that the industry may have opportunities to improve existing standards rather than only adopting new standards. For intermittent resources, NERC should clarify whether its resource and demand balancing reliability standards permit system operators to use contingency reserves to mitigate the loss of intermittent resources. If not, does NERC believe that system operators should develop a new reserve to help manage variable supply resources? Also, does NERC believe that intermittent resources should be counted similar to other conventional generators providing operating reserves, or does NERC need to establish a specific counting approach to determine whether and to what extent these resources can provide operating reserves. NERC should also review existing reliability standards that apply to generators and assess whether to update or clarify these standards for intermittent resources. For instance, do NERC's voltage and reactive control standards apply to intermittent resources? Should they in light of increasing supply from intermittent resources?

From our perspective, perhaps the largest challenge to conduct an assessment of whether there are gaps in current standards that will help address the priorities for the reliability of the bulk power system is the lack of a clear road map for such a project. Any such road map should have specific milestones for drafting committees as well as decision points and accountability metrics for Regional Entities, NERC and the industry as a whole. While we recognize such an effort is a complex task, it could serve to strengthen the reliability standards process and meet the expectations of FERC, Congress and the public.

Commissioner Moeller has asked a series of questions pertaining to the impact of upcoming rules of the Environmental Protection Agency, which may lead to the loss of resources that traditionally provide reliability services to the grid. I want to provide a brief response to this series of questions from a California perspective. As mentioned, California is already implementing once through cooling regulations for power plants. In connection with those regulations, the California State Water Resources Control Board has developed a mechanism by which it will suspend implementation of the final compliance dates for each generating unit under those rules for a period of time based on a reliability determination made by the ISO. This approach may serve as a model for the Environmental Protection Agency.[1]

We also have the nation's most ambitious renewable portfolio standard. We have just completed a system frequency response study under a 33 percent Renewable Portfolio Standard. That study reflects that we have sufficient capacity to meet system frequency needs even with high levels of wind and solar generation. But the study also finds that system performance in response to a frequency event will depend on generation participating in governor control and the maneuverable capacity of frequency responsive generation, i.e. headroom on the generator. A copy of that study may be found at the following Web site:
http://www.caiso.com/Documents/Report-FrequencyResponseStudy.pdf

In addition, the California ISO is conducting a series of studies to assess operational needs to meet energy requirements within any hour under a 33 percent Renewable Portfolio Standard. We are also examining the impacts, costs, and benefits of visibility and control of distributed energy resources. Without sufficient visibility and/or control, a significant increase in distributed energy resources may decrease the ability of the ISO to forecast load accurately.

As more intermittent and distributed resources supply power to the grid, ensuring that sufficient flexible resources that have attributes such as load following, up and down ramping flexibility, and fast start capabilities, are available becomes increasingly important. More than a simple capacity reserve margin is necessary.

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[1] See, Section 2.B. of Statewide Water Quality Control Policy on the use of Coastal and Estuarine Waters for Power Plant Cooling available at the following Web site: http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/policy.shtml#adoption

Balancing authority areas will need to identify flexible operating capacity requirements over a long-term period so that that load serving entities may secure this capacity. Attachment 2 to this prepared statement includes a diagram of our initial assessment of capacity needs in the California ISO balancing authority area under a 33 percent RPS as well as a briefing on renewable integration provided to the California ISO Board of Governors in August 2011 and the expected increase in regulation and load-following capabilities due to intermittent resources. This increase in load flexibility requirements may double between now and 2020 while the flexibility of the fleet will decrease by about 15%. This will also significantly increase costs from today's portfolio.

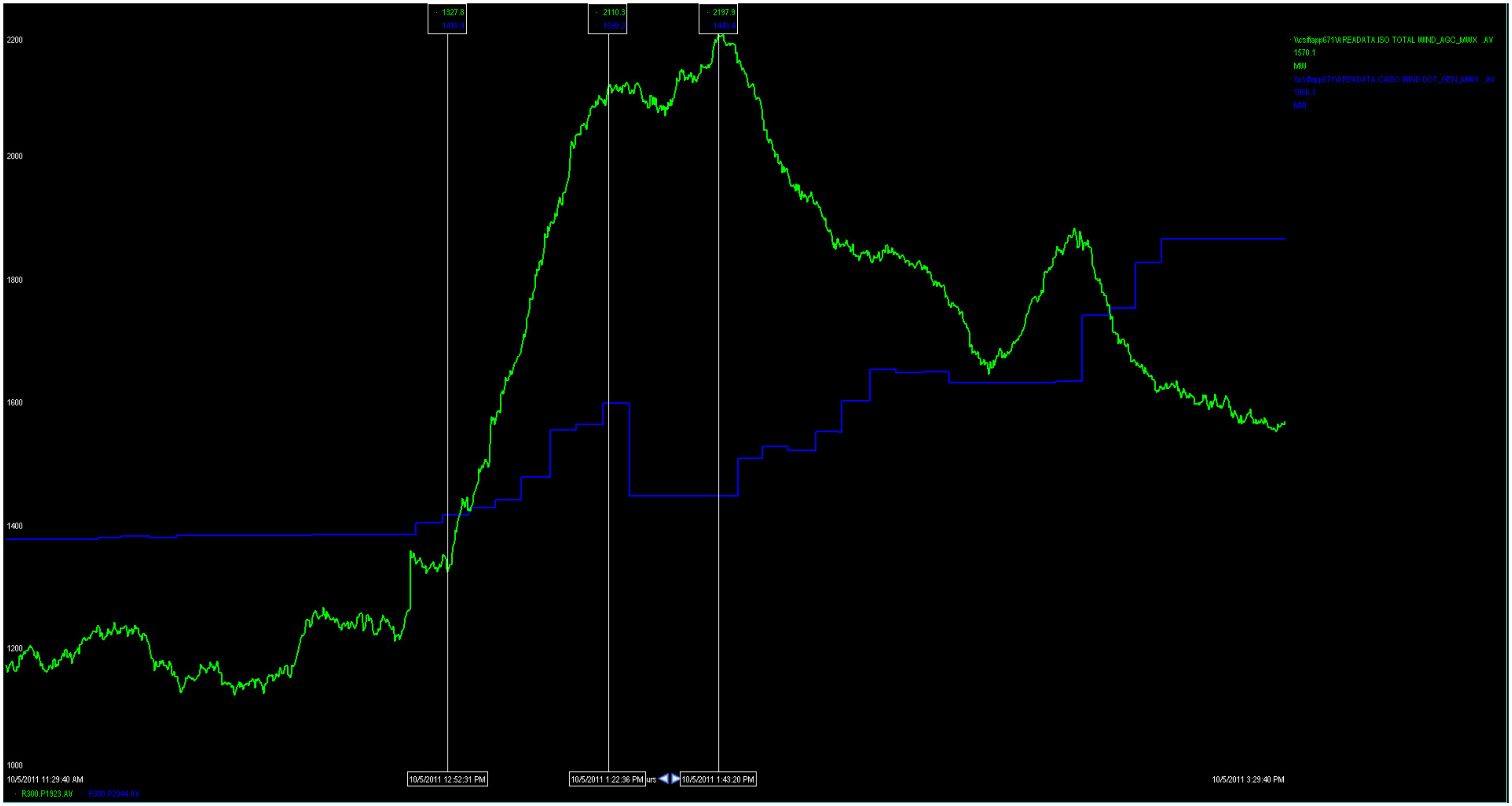
For capacity with flexible operating characteristics (*e.g*. fast starting or efficient ramping capability) that is currently interconnected to the grid, operators will also need procurement backstop authority to ensure this capacity stays on the grid. The California ISO is already working with stakeholders, including California state agencies, to address this issue and expects to initiate a stakeholder process in the near term to establish a backstop procurement mechanism that will be designed to retain flexible resources needed in future years that are at risk of retiring in the near-term.

Coincident with these efforts, there is an opportunity for NERC to examine its reliability standards to ensure operators have adequate tools to identify operating flexibility needed to support projected ramp increases arising from intermittent resources, as well as adequate capacity to provide voltage and inertia support to the grid. In light of the known changes occurring to electricity infrastructure today, NERC's reliability standards should have sufficient direction to plan for the reliable operation of the grid over a long-term time period and in a manner that accounts for changes in today's electricity infrastructure.

Thank you for the opportunity to present these comments. I welcome any questions that you may have and look forward to a productive panel discussion.

ATTACHMENT 1

October 5, 2011 wind event: 781 MW increase in 31 minutes – 22% of installed wind capacity



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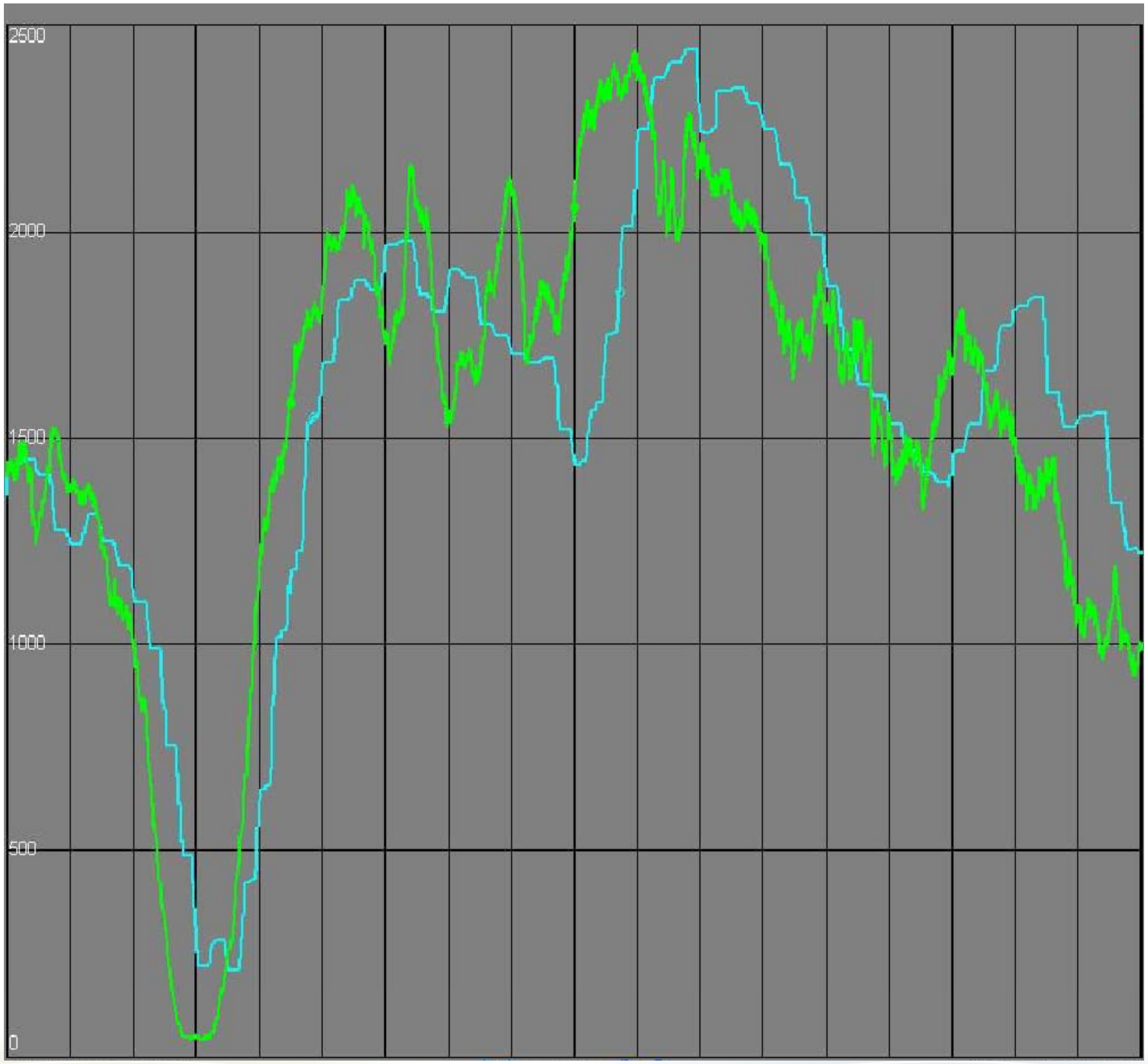
June 10, 2011 – current all-time peak wind event



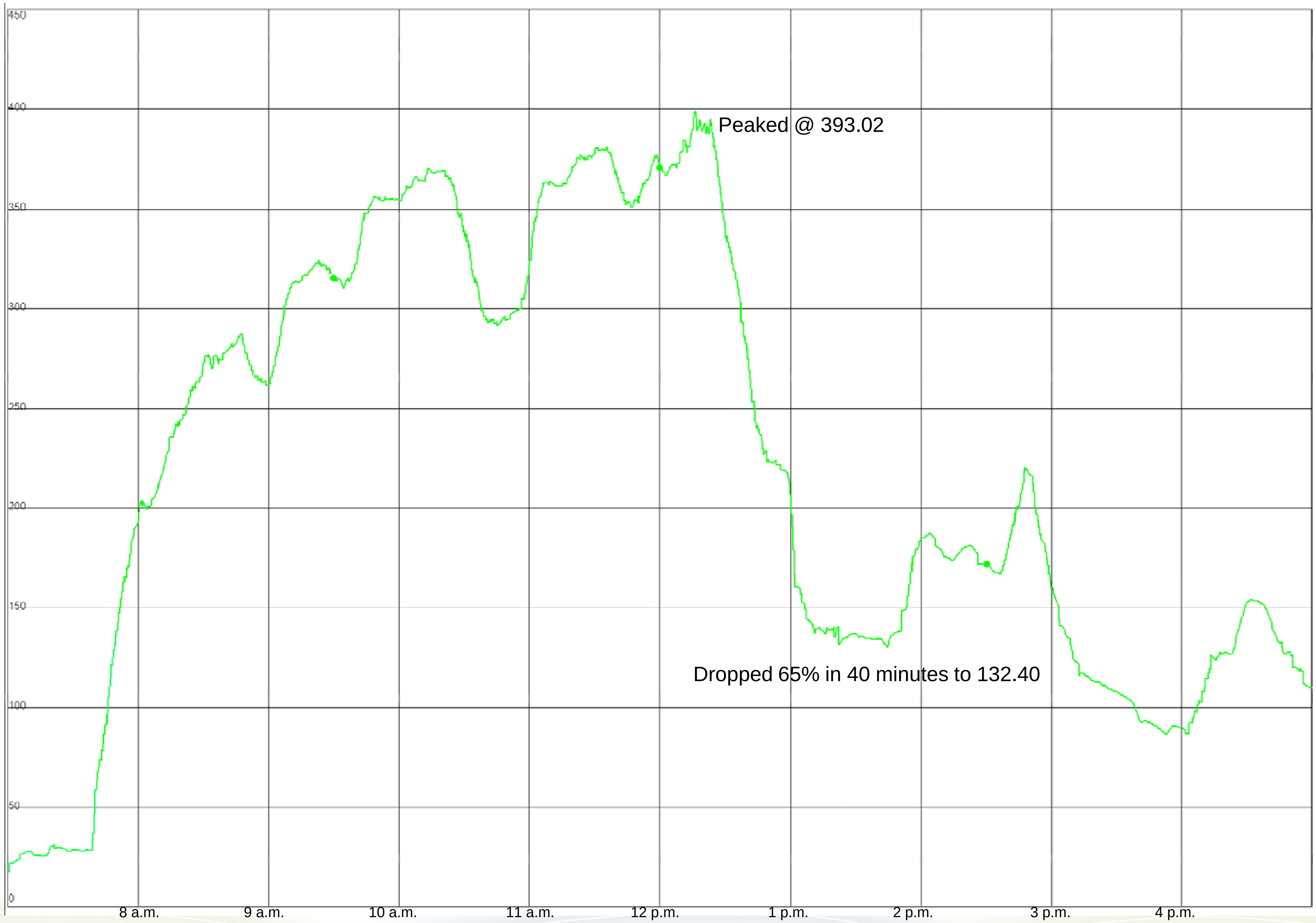
Each cell is 2 hours – chart duration is 36 hours

Blue line – Day-ahead schedule (what market expected)

Green line- actual production

Max production – 2,517 MW
Min production – 40 MW

July 3rd Solar Event – 65% Production Drop



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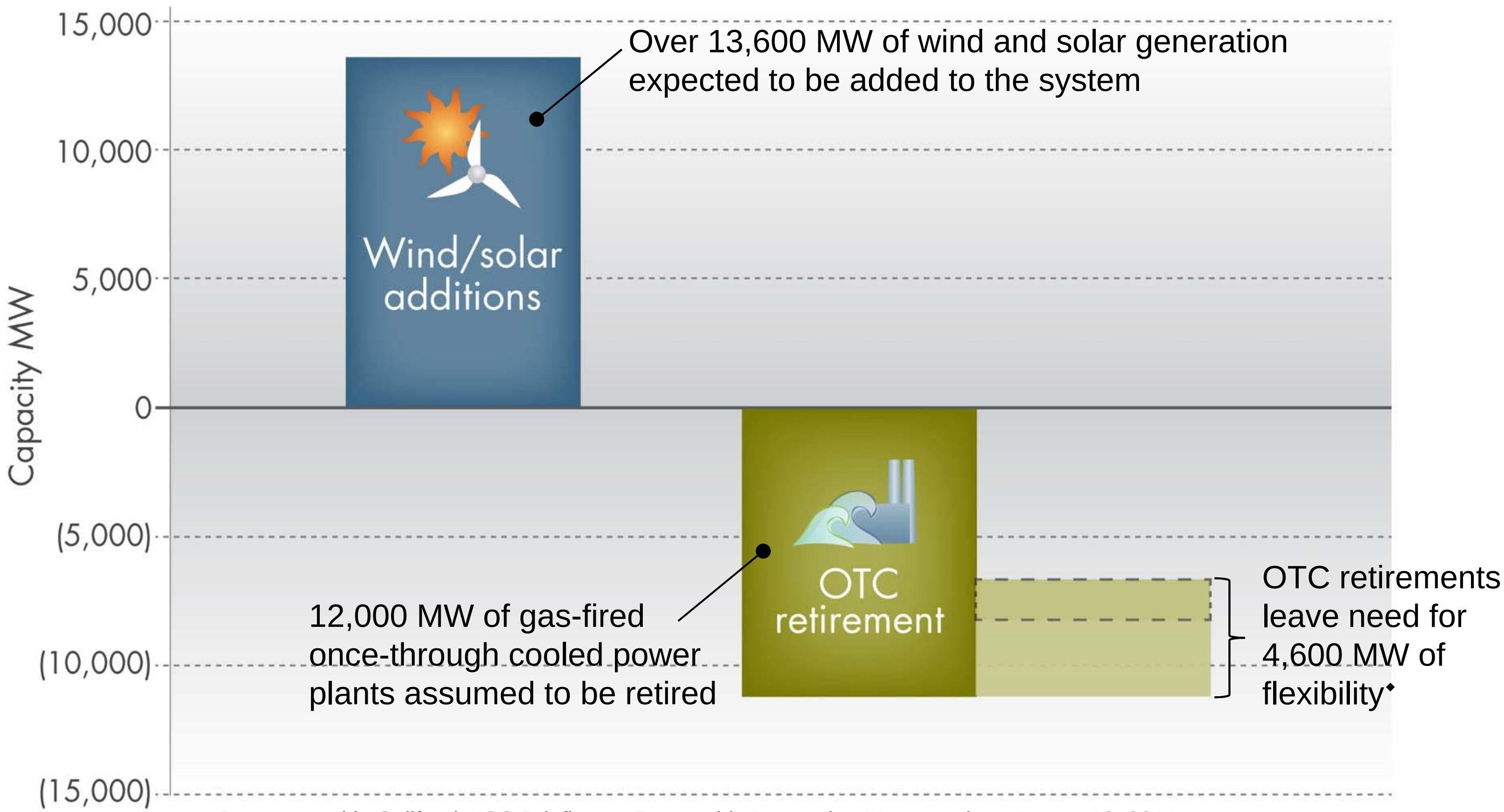
ATTACHMENT 2

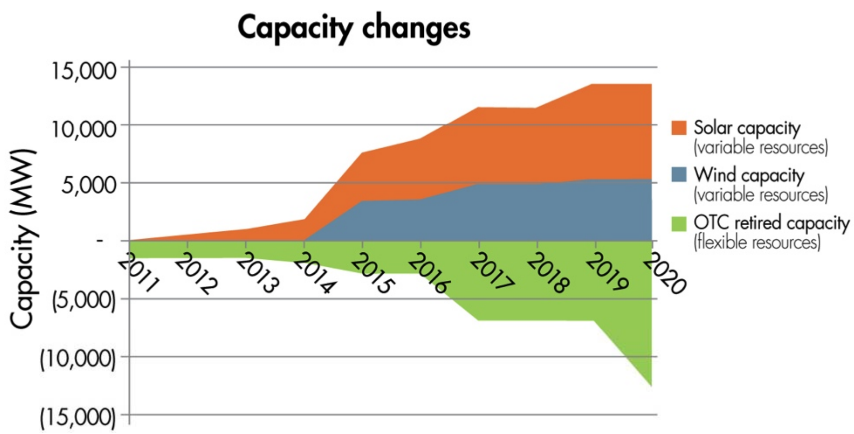
Capacity changes and needed additions by 2020 to meet state policy goals*

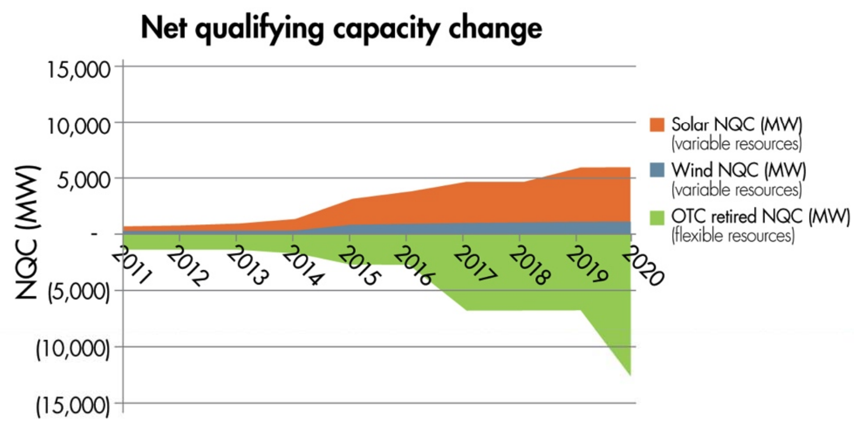


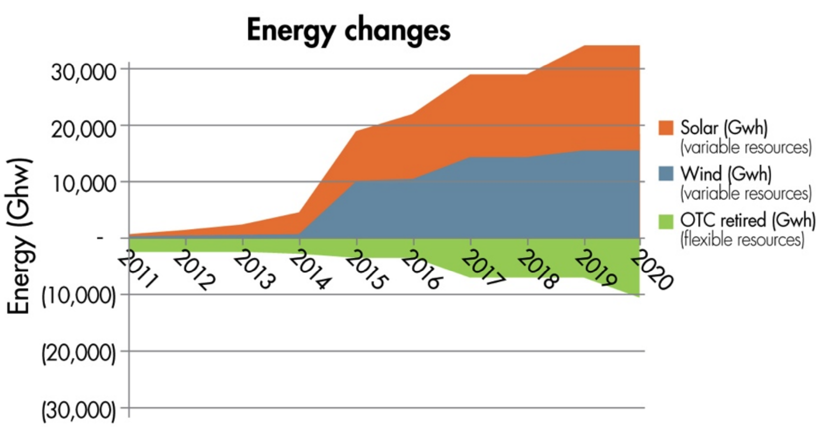
* Documented in California ISO Briefing on Renewable Integration Memorandum, August 18, 2011, http://www.caiso.com/Documents/Board%208%29%20Briefing%20on%20renewable%20integration

◆ Preliminary studies show 2,000 MW of local capacity needs, which could be met by replacement of once-through cooling units with flexible generation.

Supply variability and uncertainty will increase while the flexible capability of the fleet is decreases







- Operational requirements for flexible capacity will approximately double due to increase of variable resources
- Approximately 15% of the fleet's flexible capability will retire by 2020

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Expected increase in regulation and load-following capacity requirements for increased intermittent resources

	Spring			*Summer*			*Fall*			*Winter*		
	2006	**2012**	**2020**	**2006**	**2012**	**2020**	**2006**	**2012**	**2020**	**2006**	**2012**	**2020**
Maximum Regulation Up Requirement (MW)	277	502	1,150	278	455	1,156	275	428	1,323	274	474	1,310
Maximum Regulation Down Requirement (MW)	-382	-569	-1,112	-434	-763	-1,057	-440	-515	-1,278	-353	-442	-1,099
Maximum Load Following Up Requirement (MW)	2,292	3,207	6,797	3,140	3,737	7,015	2,680	3,326	6,341	2,624	3,063	6,457
Maximum Load Following Down Requirement (MW)	-2,246	-3,275	-6,793	-3,365	-3,962	-6,548	-2,509	-3,247	-7,303	-2,424	-3,094	-6,812

Load, wind and solar forecast errors are the same as experienced today
2012 Case = 20% RPS (2,246 MW of solar and 6,688 MW of wind)
2020 Case = 33% RPS (12,334 MW of solar and 11,291 MW of wind)