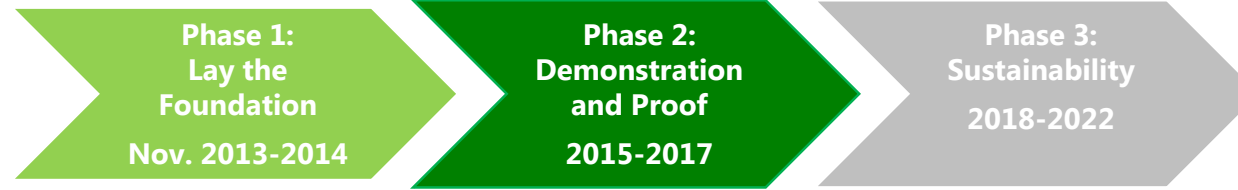
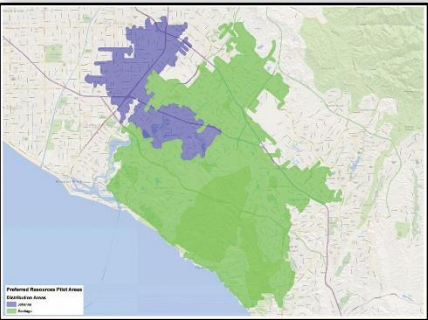


2015 SCE's Preferred Resources Pilot (PRP) Annual

Preferred Resources Pilot

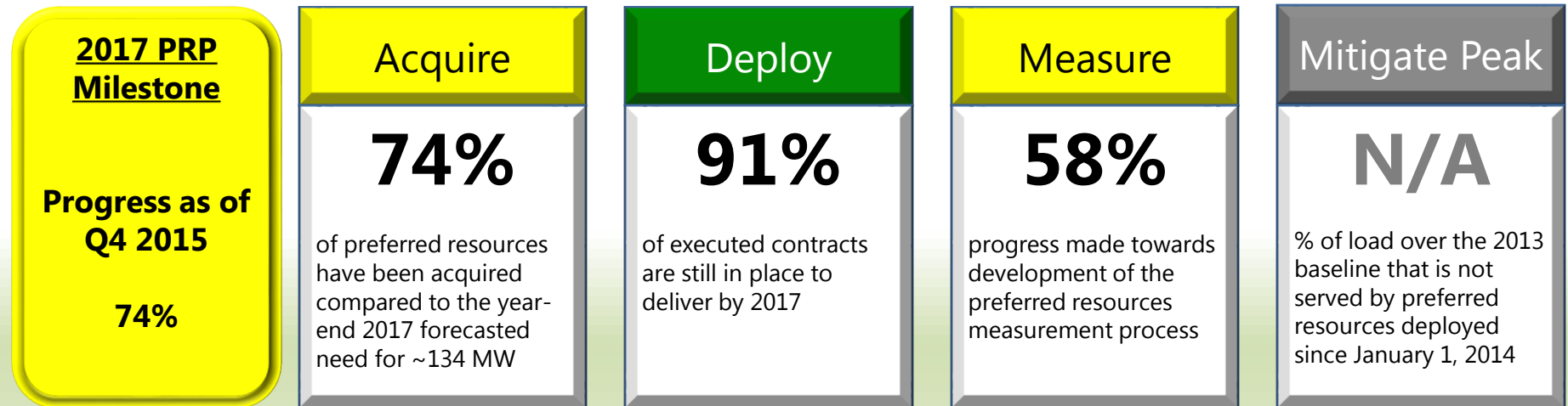


Southern California Edison's (SCE) [PRP](#) is a multiyear study designed to determine if clean energy resources can be acquired and deployed to offset the increasing customer demand for electricity in the central Orange County region. The pilot region is directly influenced by the closure of nearby ocean-cooled power plants and the San Onofre Nuclear Generating Station (SONGS). The loss of these traditional power resources have the potential to impact grid reliability.

Now in Phase 2, the pilot is working to achieve the following 2017 milestones:

- Demonstrate the ability to acquire and deploy a mix of preferred resources that meets the 2022 forecasted local electricity needs
- Measure the performance capabilities of those resources to defer or eliminate the need for new gas-fired generation in the PRP region

Based on activities in 2015, SCE is making progress toward the 2017 milestone. The acquisition and measurement activities planned for 2016 are expected to bring the performance indicators to "blue" performance. The high-level actions are defined herein and leverage location-focused incentives and offerings, increasing tactical engagement with customers and implementing the measurement process development roadmap.



Activity Legend	≥ 90%	Objective is met	≥ 75%	Objective likely to be met	≥ 50%	Objective is at risk	< 50%	Objective not met	No data
Milestone Legend		PRs are likely to offset growth		PRs may offset growth		PRs at risk for not offsetting growth		PRs unable to offset growth	

Status	Objective	Target
74%	Demonstrate the ability to acquire the preferred resources in the amount needed to serve the 2017 forecasted growth.	Percent of acquired preferred resources compared to the YE 2017 forecasted need for ~134 MW.

2016 Plans

Acquisition Targets	MW
Energy Efficiency through SCE Customer Programs	7.0
Distributed Generation through SCE Customer Programs	6.4
PRP RFO 2 solicitation	100
Total	113.4

- Continue to monitor the distributed generation interconnections associated with Net Energy Metering-only and the 19.60 MW biogas fueled combined heat and power unit.
- Continue to seek preferred resources in upcoming solicitations by highlighting the PRP area as preferred location in upcoming solicitations.
- Apply for cost recovery of PRP RFO contracts.
- Evaluate and design options to overcome barriers to adopting localized preferred resources.

2015 Progress

PRP Specific Request For Offers (RFOs)

PRP DG RFO was completed in late 2015. Bids for the PRP RFO 2 seeking up to 100 MW (Distributed Generation, Demand Response, Energy Storage, and hybrids¹) are due February 19, 2016. SCE continues to work with vendors to solicit input on how best to increase the adoption of preferred resources. For example, information was compiled and will be shared with building owners to address some of their solar adoption concerns.

Acquisition Progress

Acquisition fell short by 0.52 MW of the 2015 100 MW objective. The MW sources are:

- 63.14 MW of preferred resources contracted to be online by 2017.
- 24.16 MW acquired and deployed through existing energy efficiency and distributed generation programs.
- 9.18 MW acquired and deployed through the Net Energy Metering (NEM) tariff.
- 3 MW acquired through grants, partnership and SCE pilots.

Updated Portfolio Design

Peak load in the PRP region is expected to grow ~27 MW/yr, a decrease of 4 MW/yr from the previous forecast. More importantly, the peak attributes (based on the 24-hour, 365-day load forecast) found a change in the overall number of days expected above the baseline. Additionally, the Santiago substation resource need now extends past hour ending 19 into hour ending 21. These changes are found in the portfolio design report. SCE will continue to study the year to year load variability and adjust acquisition efforts accordingly.

2015 Objective



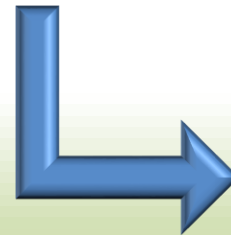
2016 Objective



2017 Objective



2018 Objective



Resource Type Acquired	MW
Energy Efficiency	39.40
Demand Response	26.60
Distributed Generation	30.46²
Energy Storage	3.0
Total	99.46

2 - This number does not include a non-SCE resource of a 19.60 MW biogas-fueled Combined Heat and Power unit with a planned connection at Santiago substation in 2016.

Status

Objective

Target

91%

Determine the success rate for acquired resources to reach deployment.

Percent of executed contracts that are still in place to deliver by 2017.



2015 Progress

Deployed MW Through 12/31/2015

Resource	2014 Achieved	2015 Achieved /Target	Total Achieved
Energy Efficiency	8.5	8.5/8.0	17
Demand Response	0	0.0/3.0	0
Distributed Generation	8.3	8.0/4.6	16.3
Energy Storage	0.0		

*Deployed amount is from SCE's customer programs and participants in NEM-only tariff.

33.3*

Contract Performance Challenges

- 29 of the original 32 contracts remain to deliver 60.11 MW by 2017.
- Developers have expressed the desire for more co-branding with SCE and barriers, based on a limited customer population.

FDA Leverages Available Offers

- The Food and Drug Administration facility in Irvine, CA serves as an example of how a customer can integrate distributed generation, demand response, and energy efficiency to manage and control costs.

Energy Efficiency Locational Incentives

- An energy efficiency incentive of an additional \$30/kW was offered for customized project applications in the PRP area. Study showed increase in savings claimed and customer participation, but unable to definitively tie to incentive change.

Engaging Customers

- Owner Direct Incentives: The modified application process that allows building owners to directly receive incentives for energy efficiency projects was made available to one building owner. Since no applications were received, the process will be opened up to the entire PRP region to test the process.
- LED Tube Pilot: Three month pilot tested the performance of LEDs, resulting in 22 installations for savings of 609 kW. SCE is exploring expansion of this offering.
- SCE launched several enhanced customer engagement campaigns focused on increasing the adoption of preferred resources including:
 - First Fuel No Touch Audits,
 - Integrated Demand Side Management workshop,
 - "Feet on the Street" campaign in the proposed DRP Demonstration Project D region, and
 - Co-branded marketing efforts with vendors, which produced a [flyer highlighting preferred resources products and offers](#).

2016 Plans

Focused Incentives by Location

- Based on the activities in 2015, SCE will continue to pursue:
 - Expansion of 3rd party program offers and increase in incentives up to 50 percent to target hard to reach customers,
 - Continuation of energy efficiency locational incentives, including elimination of the project minimum spend threshold.
 - Owner Direct Incentives testing with any PRP building owner, and
 - Obtaining approval to provide a LED Tube Retrofit offer to PRP customers.

Irvine Ranch Water District

- Continue partnership and help bring projects to fruition that contribute to peak reduction in PRP area.

Facilitating Interconnection

- SCE is evaluating PRP distribution grid reinforcement needs to support increased preferred resources interconnection. Results are expected in mid-2016.

Sharpening the Customer Engagement Approach

- Feedback and lessons learned from SCE's deployment strategies in 2015 will be used to improve the approach to engage customers in the PRP area to adopt preferred resources.

SCE's PRP Measurement Progress

Status	Objective	Target
58%	Establish the capability to measure the contribution of each preferred resource.	Percent completion of the measurement process, including determination of a confidence factor for the performance expectations of each resources.



2015 Accomplishments

2015 Peak Measurements on 09/09/2015

Resource Type	MW	Comments
Distributed Generation	28.91	Based on metered and modeled information.
Demand Response	~30	Demand response tool is being refined.*
Energy Storage	0.00	SGIP energy storage systems are deployed but not metered.
Energy Efficiency	0.00	~12 MW of mid- and downstream energy efficiency savings based on program measures were installed in PRP region.

*Demand response from SCE's Base Interruptible Program was not called on 09/09/15 but delivered 19.54 MW when called on 09/24/2015.

Improved Understanding of Solar Dependability

- Used metered solar generation data to determine the hourly capacity at which at least 95 percent of solar resources are generating. The results are used to inform the amount of installed solar that may be required to offset load.

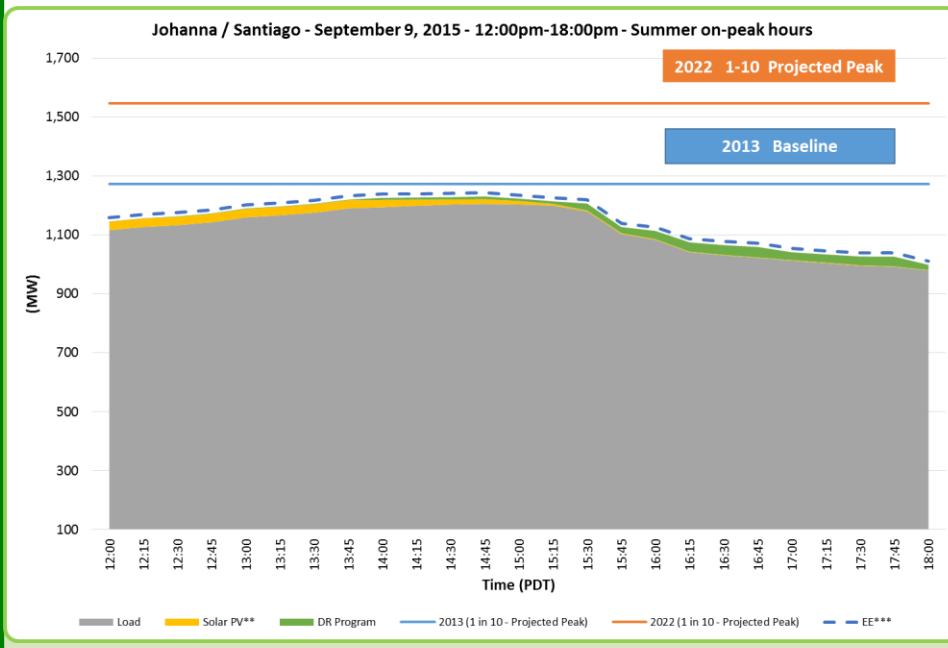
2016 Plans

- Measure all Preferred Resources**
- Complete execution of the Measurement Process Development Road Map. The schedule of activities establishes the measurement capability prior to resources coming online in the PRP and will be completed in 2016, except for energy storage resources from utility behind the meter programs.
- Energy Efficiency Measurement Methodology**
- Test an energy efficiency measurement approach to yield results at a customer- and circuit-specific level.
- Resource Delivery Forecasting**
- Test local measuring of resource performance in comparison to the performance expectations to refine forecasting accuracy.

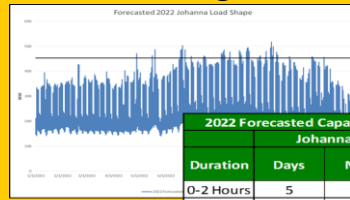
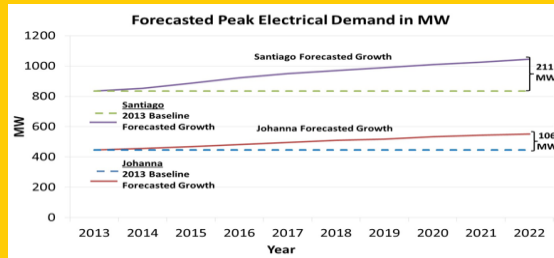
PRP Peak Mitigation

Status	Objective	Target
N/A	To use preferred resources to serve load above the 2013 Baseline.	% of load over the 2013 baseline and below the 2022 1-in-10 year projected load that is served by preferred resources deployed since January 1, 2014.

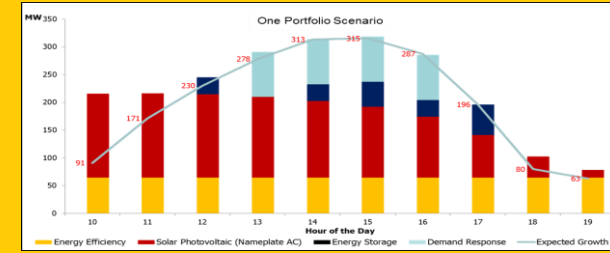
The PRP objective is to ensure sufficient PRs to offset the 1 in 10 year peak. Over time, the electrical use by PRP customers is expected to exceed the 2013 baseline. The graph below depicts the contribution of preferred resources in reducing the load seen at the distribution level. In 2014 and 2015, the load in the PRP region did not exceed the 2013 baseline.



Design

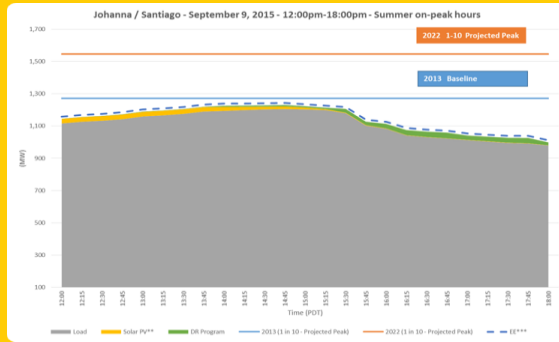


Duration	Johanna		Santiago	
	Days	MW	Days	MW
0-2 Hours	5	5	2	8
2-4 Hours	6	17	8	51
4-6 Hour	15	11	13	49
> 6 Hours	13	32	17	103



The PRP developed a new approach to resource planning that starts with traditional distribution planning and then develops a location-specific, bottom up 24 hour, 365-day load forecast and, more importantly, defines the peak demand attributes that will be met by distributed energy resources.

PRP Opportunity



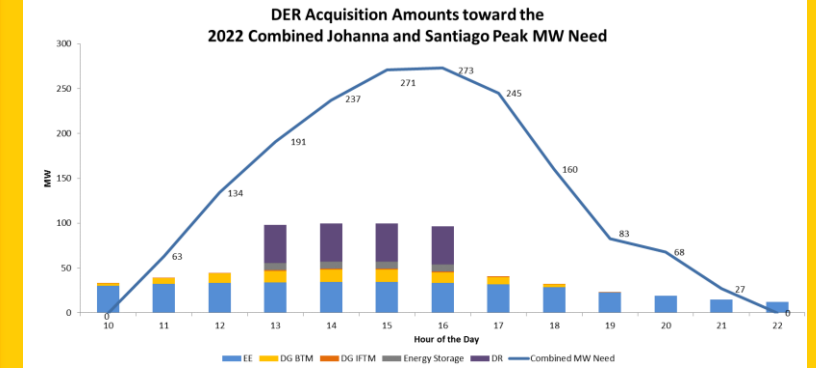
Milestones

- 2017:** Demonstrate ability to acquire, deploy and measure the performance capability of preferred resources.
- 2022:** Offset the PRP region load growth through the integrated operation of preferred resources.

Preferred Resources Pilot Big Picture



Acquire



To acquire a portfolio of preferred resources, the PRP leverages acquisition through 1) utility programs 2) existing solicitations and 3) unique location specific solicitations and transactions.

Measure

The PRP will validate the assumptions that remain largely untested about the performance capabilities of preferred resources to address energy and reliability needs.

PR Tracking by Substation

A-Level Substation	B-Level Substation
Peak (9/17/15): 432 (MW)	Peak (9/17/15): 73.88
Solar PV (MW): 11.21	FAIRVIEW: 66/12
EE (MW) (BTH & IFTH): 0.88	Solar PV (MW): 1.43
DR (#) PAVEN/SPLIT: 274	ES (MW) (BTH & IFTH): 0.88
EE (MW): 5.25	DR (#) PAVEN/SPLIT: 57
	EE (MW): 0.82

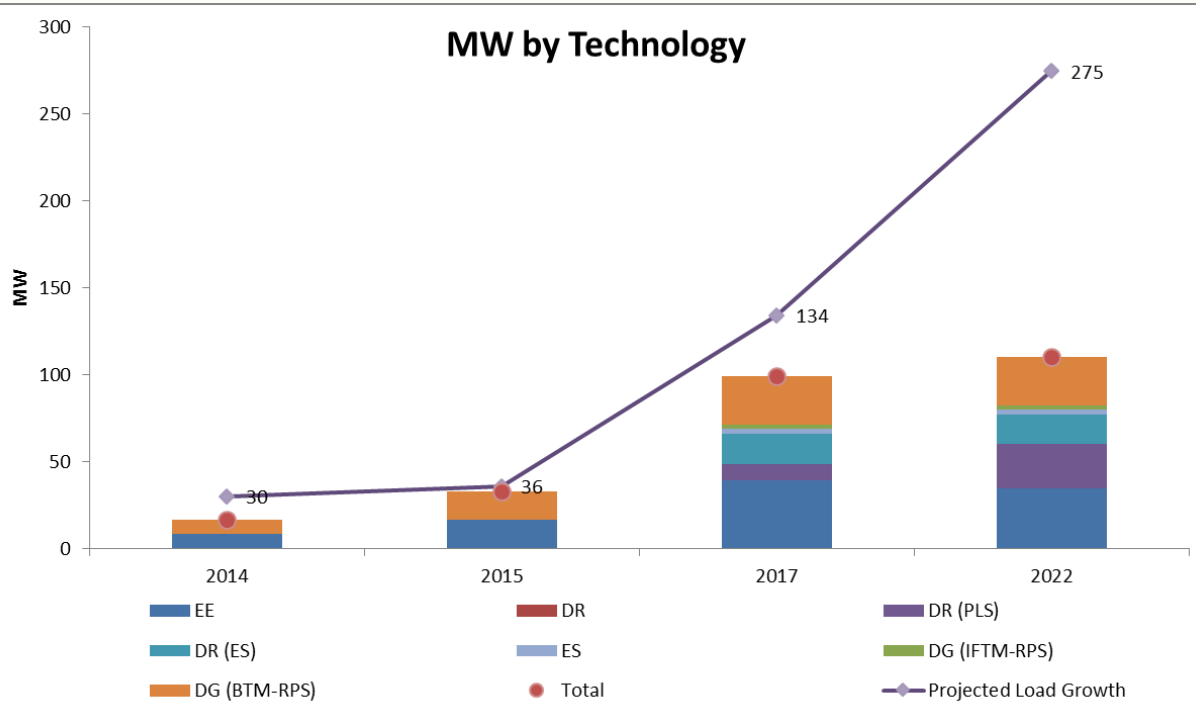
Deploy

The PRP works to identify and develop solutions to overcome the barriers to deployment of preferred resources. Solutions include the areas of interconnection and customer outreach.

Back-up

Acquisition Progress

MW by Technology



Situation

- Load is expected to grow approximately 275 MW by the year 2022.
- PRP set a 2015 interim goal of acquiring 100 MW with deliveries by the end of 2017.
- For 2016, the PRP is seeking to increase the size of its acquired preferred resources portfolio to 150 MW for delivery by year-end 2018.

Activity

- At the end of 2015, the PRP cumulatively acquired 99.48 MW.
- In 2015, preferred resources were acquired from:
 - Demand Side Management programs (EE and DG): 10.13 MW;
 - DG (NEM Tariff Only): 6.43 MW;
 - PRP DG RFO: 2.17 MW.

Findings

- In 2015, the CPUC rejected 10 MWs in the PRP area finding that the projects would rely on gas-fired generation to reduce load. The PRP team is working closely with all its SCE partners to ensure the acquisition of resources aligns with the established PRP-eligibility criteria.
- A 1.4 MW project procured from the SPVP 4 solicitation was terminated by the developer.
- Securing sites and overcoming building owners' concerns are prevalent challenges in the PRP. These examples illustrate some of the difficulties in deploying preferred resources where needed, especially in moderately urban areas.

Key Takeaways

- If solar PV adoption is flat, portfolio mix may rely more on energy storage and/or the portfolio may broaden to include other distributed generation-type resources.
- To improve the adoption for solar PV generation, SCE worked with the Clean Coalition to develop a [solar solution guide for building owners](#) that provides solutions to some of their major concerns.
- Based on early indications from PRP RFO 2 market response, the PRP team will determine the need for additional activities to overcome barriers to localized preferred resources adoption.

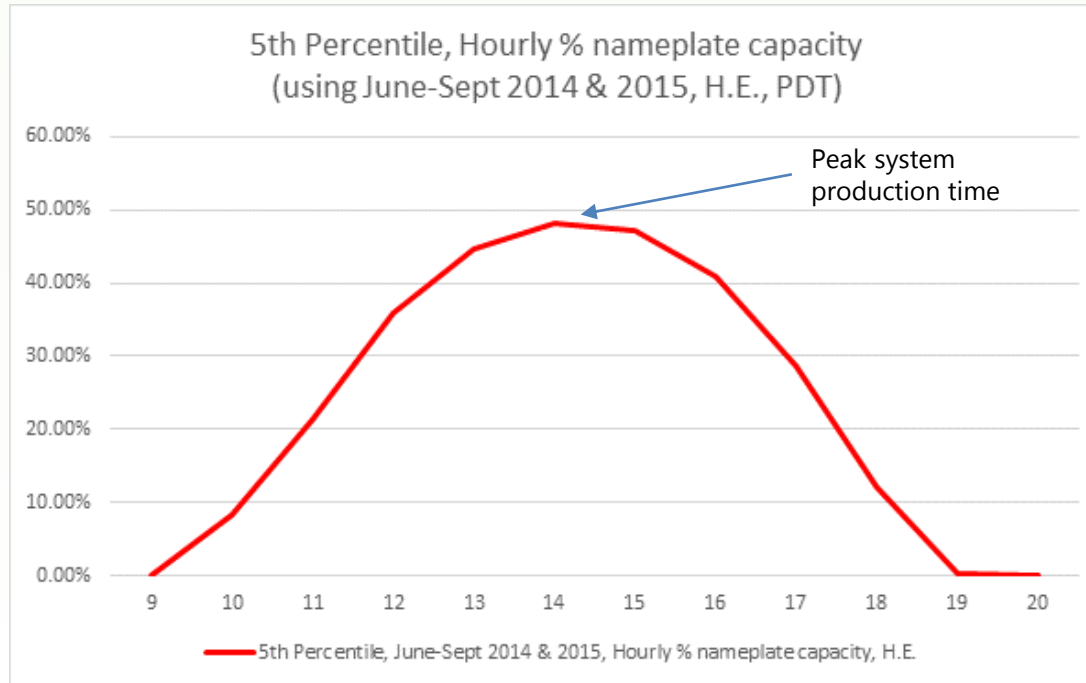
Measurement Process Development Status

Resource Type	Procurement Type	Status	PRP Deployment Date
Solar PV	DG programs	↑ Monitoring Phase	Systems Deployed
	Contracted BTM ¹	⚠ Need to determine data collection process	Q3 2016
	Contracted IFTM ²	⚠ Need to complete database update	Q1 2017
Energy Efficiency	DSM programs	⚠ EE Measurement model in development	Systems Deployed
	Contracted	⚠ EE Measurement model in development	Q2 2016
Demand Response	DSM programs	⚠ Testing Phase	Systems Deployed
	Contracted PLS ³	⚠ Measurement model in development	Q3 2016
	Contracted DR	⚠ Testing Phase	Q3 2017
	Contracted ES as DR	⚠ Testing Phase	Q3 2016
Energy Storage	BTM programs	↓ Systems are not metered; process is TBD	Systems Deployed
	Contracted BTM	↓ Developing data field requirements	Q1 2018
	Utility-owned IFTM	↓ Developing data field requirements	Q4 2016
	Contracted IFTM	↓ Need to complete database update; will test against similar systems in SCE territory	Q1 2018
Overall Status:		⚠	

Key Takeaways

- Since data is being used in ways not previously contemplated, more rigorous process controls are needed. These controls apply to SCE, developers and customers.
- A lack of separate metering of customer-sited resources reduces SCE's ability to measure preferred resource contributions.
- Measurement processes can be tested on similar systems in SCE territory and verified when the resources come online in the PRP area.

Dependable Solar



Situation

- Traditionally, planning activities use conservative assumptions to determine the contribution of future solar installations to the peak need.

Activity

- SCE used actual solar generation data to calculate a curve of capacity factors at each hour, above which 95 percent of the solar systems are typically generating.
 - The curve was created using two summers of metered PV data in PRP area and abnormalities were removed.

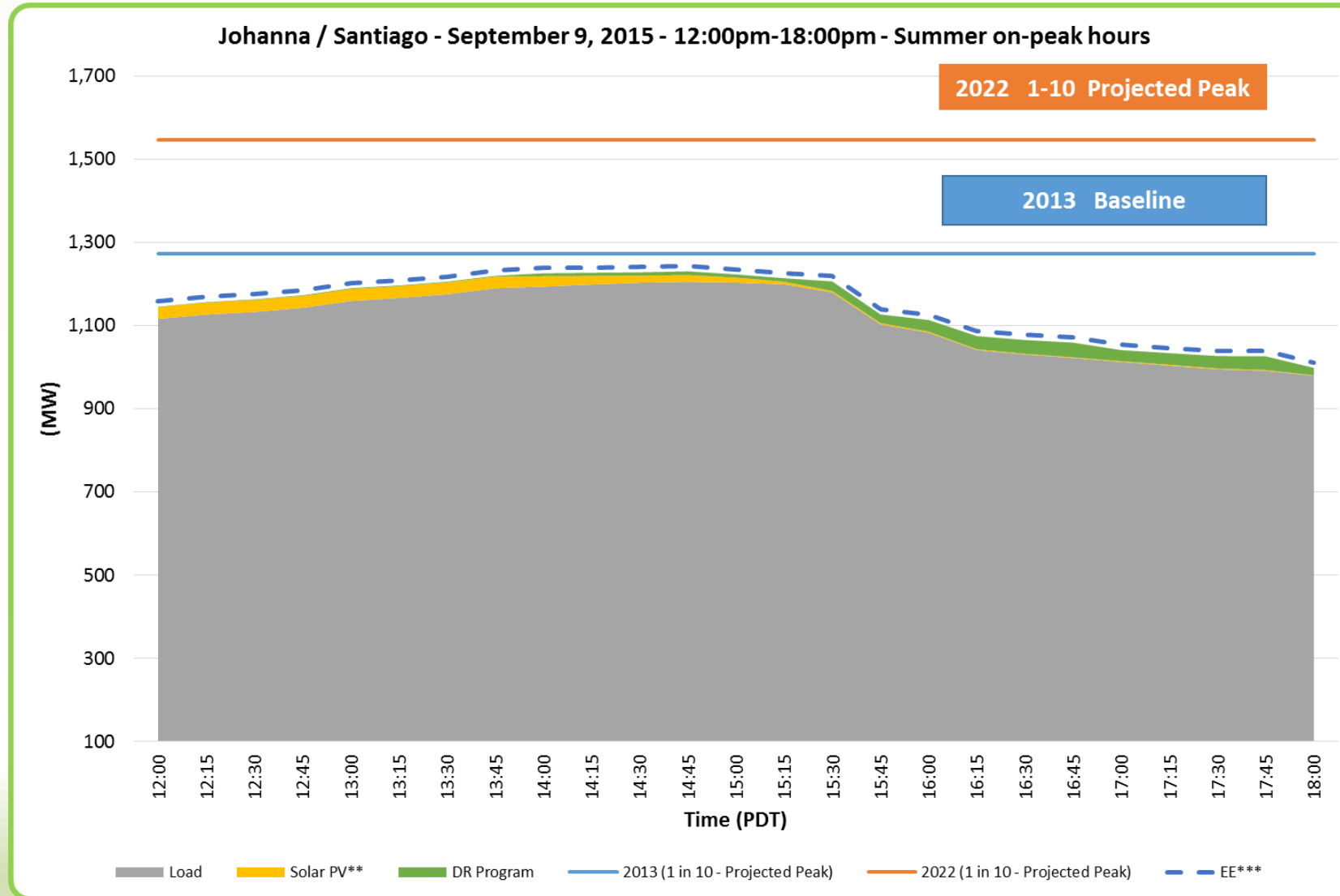
Findings

- Based on this analysis, a peak production of 48 percent of the installed capacity of solar was used in the PRP Portfolio Design Report.

Key Takeaway

- Improving the planning assumptions for behind-the-meter solar resources will allow SCE to plan with statistical confidence and prevent over-procurement of energy and over-building of the electrical system.

Peak Mitigation



The graph depicts the contribution of preferred resources in reducing the load seen at the distribution level. In 2014 and 2015, the load in the PRP region did not exceed the 2013 baseline.

** - Solar PV is the estimated impact from all tracked NEM solar PV generation in region which includes 28 MW of solar acquired prior to start of the PRP.

*** - Expected EE contribution is based on 2015 deployment amounts from mid-stream and down-stream programs.