

Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: July 9, 2015

Re: Update on renewables in the generator interconnection queue

This memorandum does not require Board action.

EXECUTIVE SUMMARY

This briefing provides the status of renewable generation in the California Independent System Operator Corporation's generator interconnection queue as of June 18, 2015.

Key highlights include:

1. The current ISO queue contains approximately 43,900 MW (26,100 MW renewable) actively seeking to interconnect to the ISO controlled grid.
2. Changes in renewable projects in the queue since the last generator interconnection queue update on November 7, 2014 include 10,193 MW of new project capacity, primarily from the new projects entering during the cluster 8 open window, 1,404 MW of projects that reached commercial operation, 2,274 MW of project withdrawals, and 639 MW of capacity reductions from projects participating in the 2015 downsizing process.
3. Compared to the amount of new generation needed to meet the mandated 33% Renewables Portfolio Standard by 2020, the ISO queue currently contains approximately four times the additional capacity needed. Currently 51% of the project capacity has completed the study process, a reduction from the last report because of the large number of new cluster 8 projects.
4. While not considered renewable generation, energy storage projects represent a significant portion of cluster 8. Currently there are 79 energy storage projects totaling 8,076 MW in clusters 7, 8 and the fast track process. The technologies include battery, pump storage, molten salt, flywheel and rail energy storage.

DISCUSSION

The following graphs illustrate the renewables in the ISO queue from several perspectives.

Figure 1 shows the amount of renewable generation in the interconnection queue over time and breaks out the types of renewable capacity. During the October 2014 to June 2015 period, the queue experienced an increase of 5,876 MW in renewable projects.

Figure 1
Change in renewable capacity in the ISO queue since June 2011

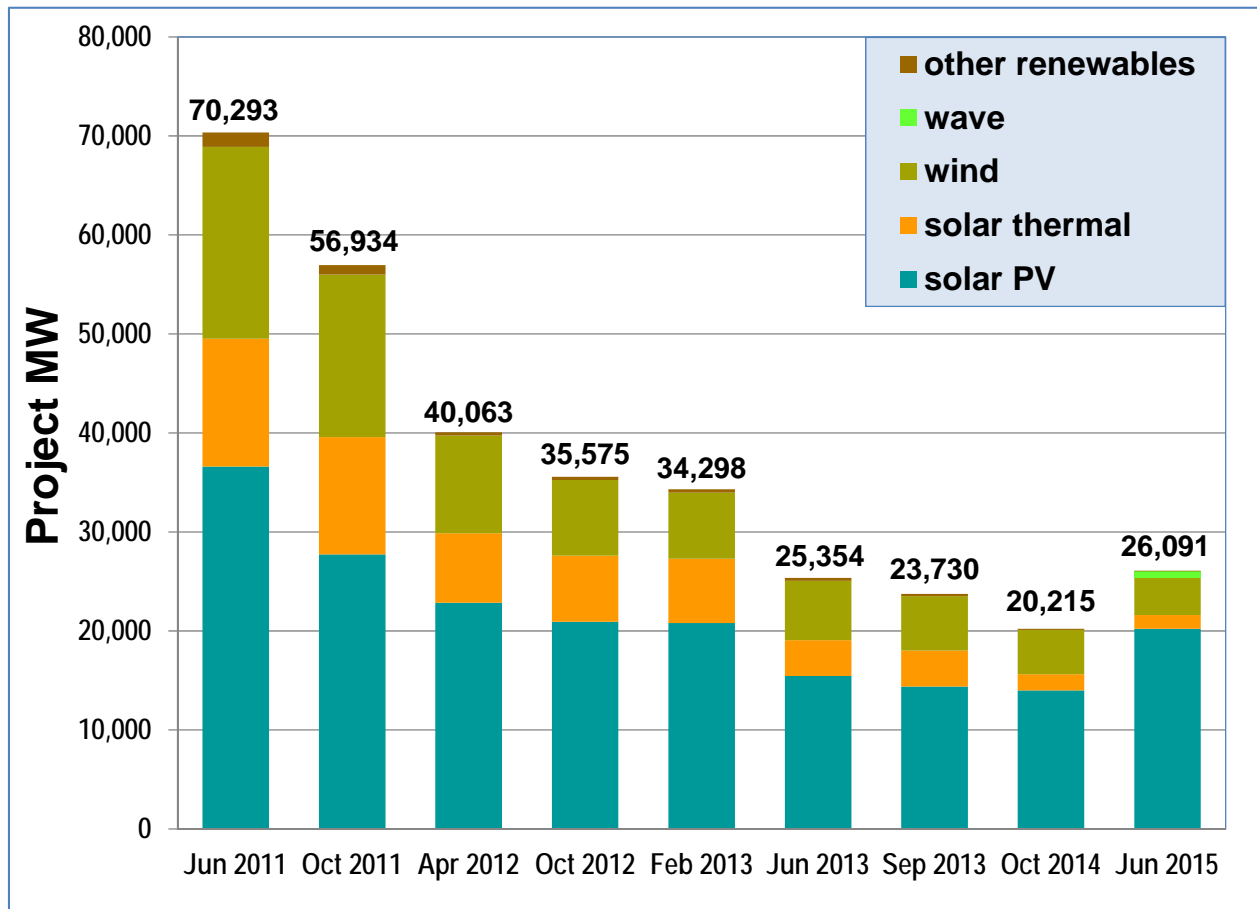


Figure 2 displays the amount of renewable capacity in the queue by study group and shows the capacity reductions within each study group. The active project portion of each bar, shown in blue, represents the June 2015 capacity that remains in the queue. Cluster 8 is new to the chart, with 10,184 MW of new renewable projects that came into the queue during the cluster 8 window that closed April 30, 2015. Although not shown in Figure 2, cluster 8 also contains 7,300 MW of storage capacity. Since the November 2014 update, 4,317 MW of renewable capacity exited the queue, 2,274 MW coming from project withdrawals, 1,404 MW from projects that reached commercial operation, and 639 MW from projects that downsized their project capacity in the 2015 downsizing process. There was also a net increase of 9 MW in fast track and independent study process projects.

Figure 2
Renewable generation capacity in the ISO queue by study group
(changes by study group since November 2014 update)

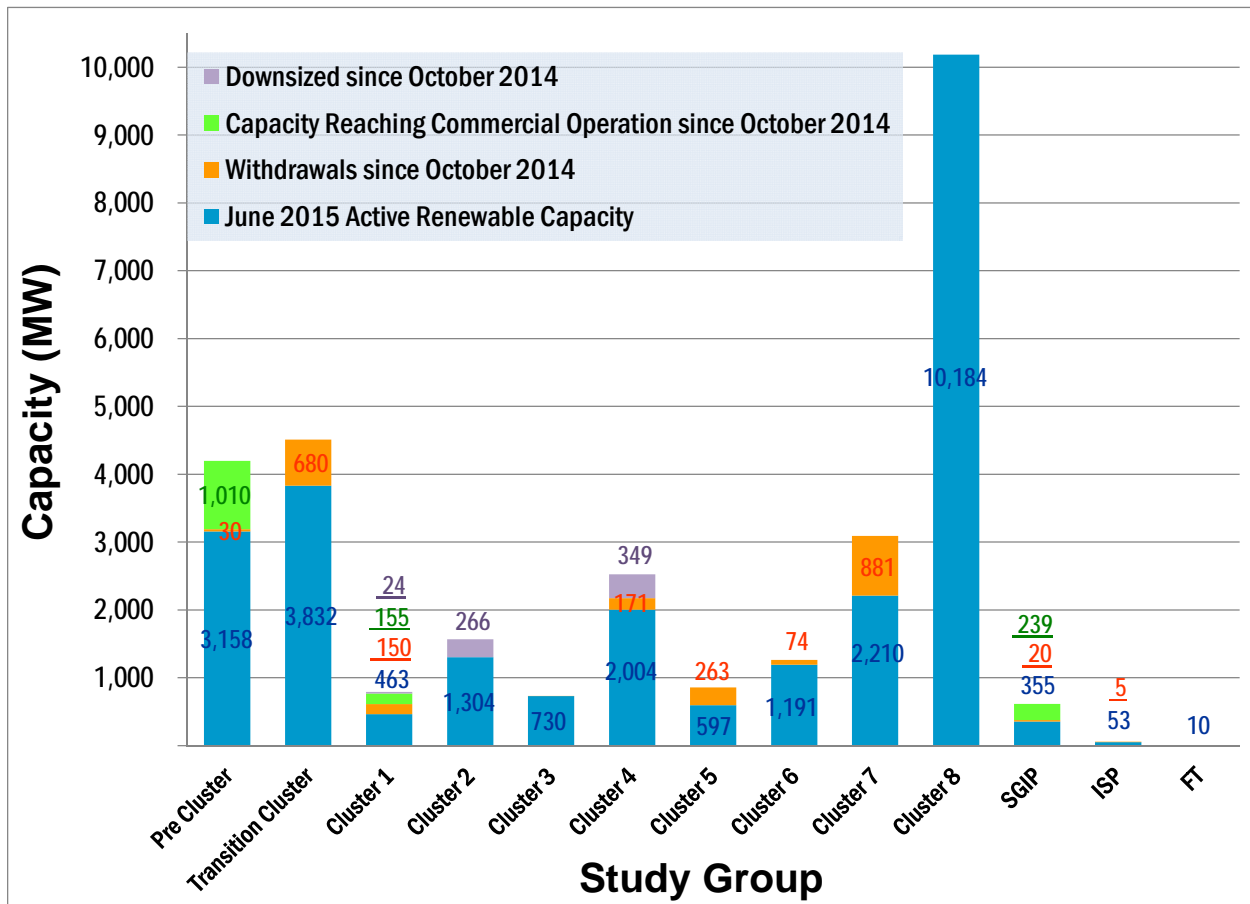


Figure 3 provides insight into the amount of generation capacity in the ISO queue by project size and type. Solar PV is the dominant generating technology for all size ranges except for the 500 to 1,000 MW category. Figure 3 also provides a breakdown of the capacity in the ISO queue by the number of projects for each project size category. Projects in the 100 to 500 MW category make up 75% of project capacity.

Figure 3
MW of renewable projects in ISO queue
as of June 2015 by size and type

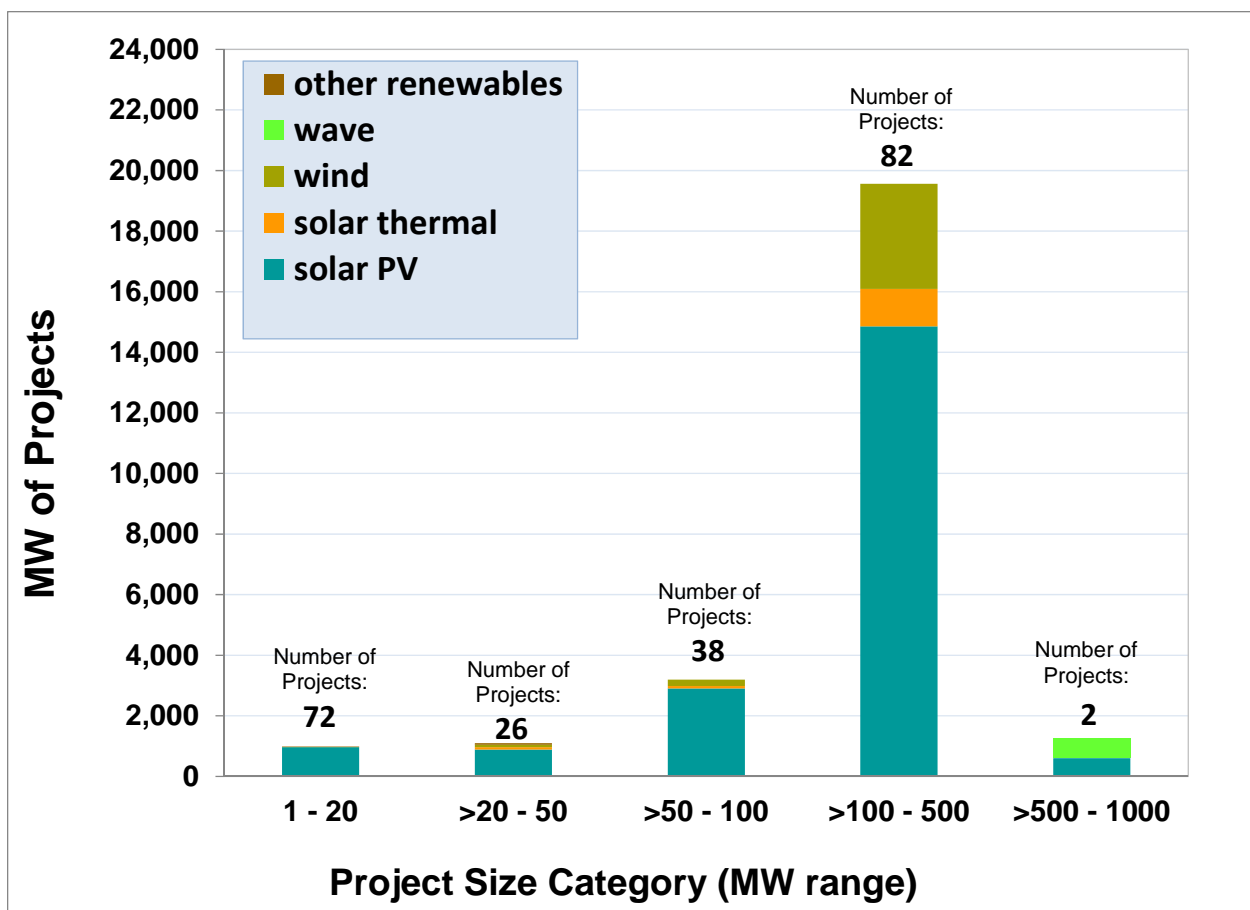
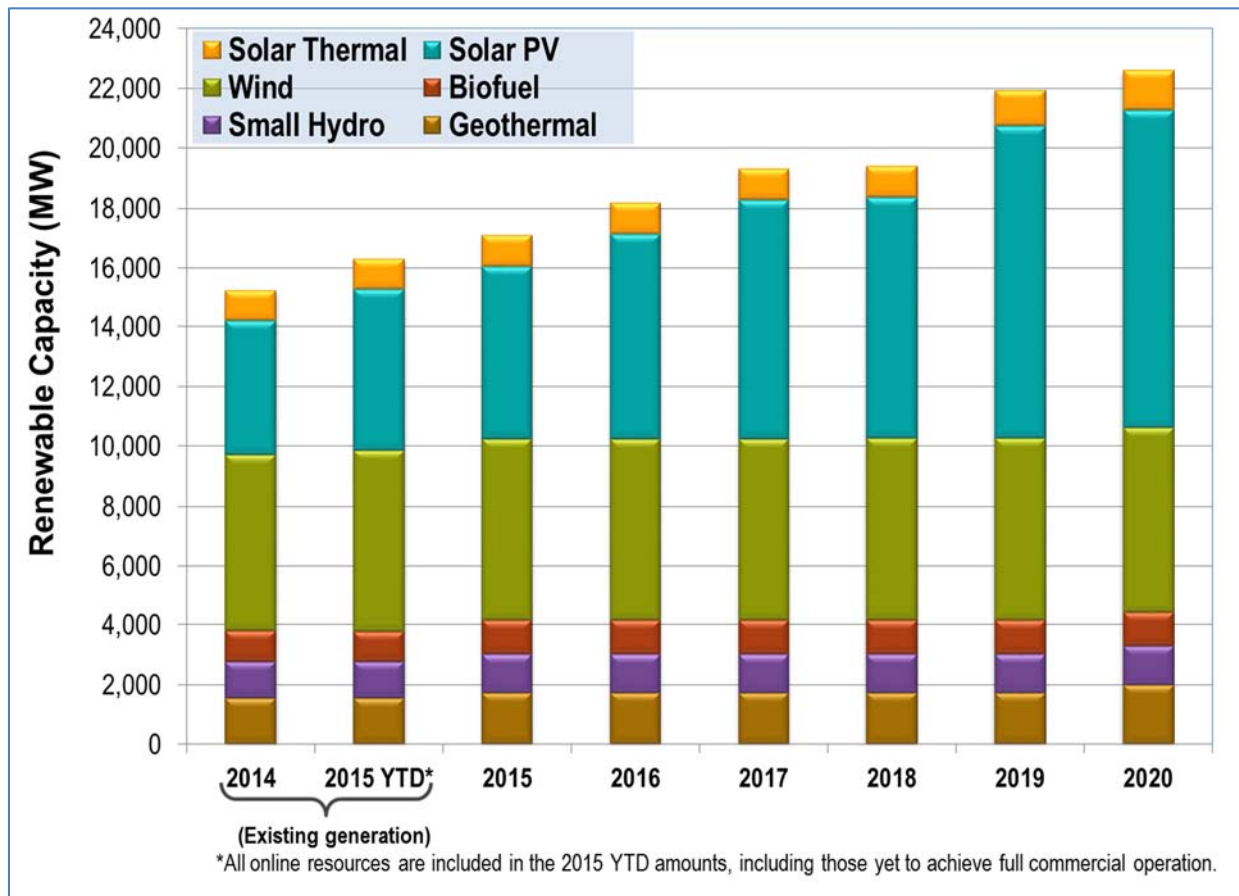


Figure 4 shows the projected build-out of renewable capacity by technology type based on projections from the investor owned utilities through 2018 and using the CPUC RPS calculator¹ thereafter. The 22,600 MW estimated amount shown for 2020 is the projected renewable generation to be in operation in 2020, and approximates the amount needed to reach the 33% RPS requirement for that year. The ISO currently has approximately 16,300 MW of operating renewable generation within its footprint, which leaves approximately 6,300 MW of additional renewable capacity needed between now and 2020 to reach 33%. The majority of this need is presently under contract with the three California IOUs and is expected to satisfy the majority of the yearly amounts depicted in the 2015 through 2020 timeframe in Figure 4.

Figure 4
Projected RPS capacity build-out through 2020
(IOU projections through 2018 and RPS Calculator data 2019 – 2020)



¹ The 33% RPS calculator is a model developed for the CPUC by Energy + Environmental Economics (E3) to aggregate renewable resource cost and performance data and select renewable resources needed to meet the RPS target.

Figure 5 is a map of all projects in the generation interconnection queue and shows the general location and capacity by project type, including conventional generation projects. Kern County, key code 22, represents the Tehachapi area and contains the largest amount of renewable projects in the ISO queue.

Figure 5
ISO Queue Map – Conventional & Renewables
As of June 18, 2015

