

# Memorandum

**To:** ISO Board of Governors

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

**Date:** October 28, 2015

**Re:** Update on renewables in the generator interconnection queue

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***This memorandum does not require Board action.***

## EXECUTIVE SUMMARY

This briefing provides the status of renewable generation in the ISO's generator interconnection queue as of October 9, 2015. Key highlights include:

1. The current ISO queue contains approximately 35,900 MW (23,900 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 July 9, 2015 include 911 MW of project capacity that reached commercial operation, 1,348 MW of project withdrawals, and one new 35 MW independent study project.
3. Compared to the amount of new generation needed to meet the year 2020 33% Renewables Portfolio Standard mandate, the ISO queue currently contains approximately four times the additional capacity needed. Currently 53% of the project capacity has completed the study process, which is lower than normal due to the large number of cluster 8 projects that entered the study process in April.
4. While not considered renewable generation, energy storage projects represent a significant portion of the capacity in the ISO queue. Currently there are 61 energy storage projects totaling 7,437 MW in clusters 7, 8 and the independent study 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 June to October 2015 period, the queue experienced a net reduction of 2,224 MW in renewable projects.

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

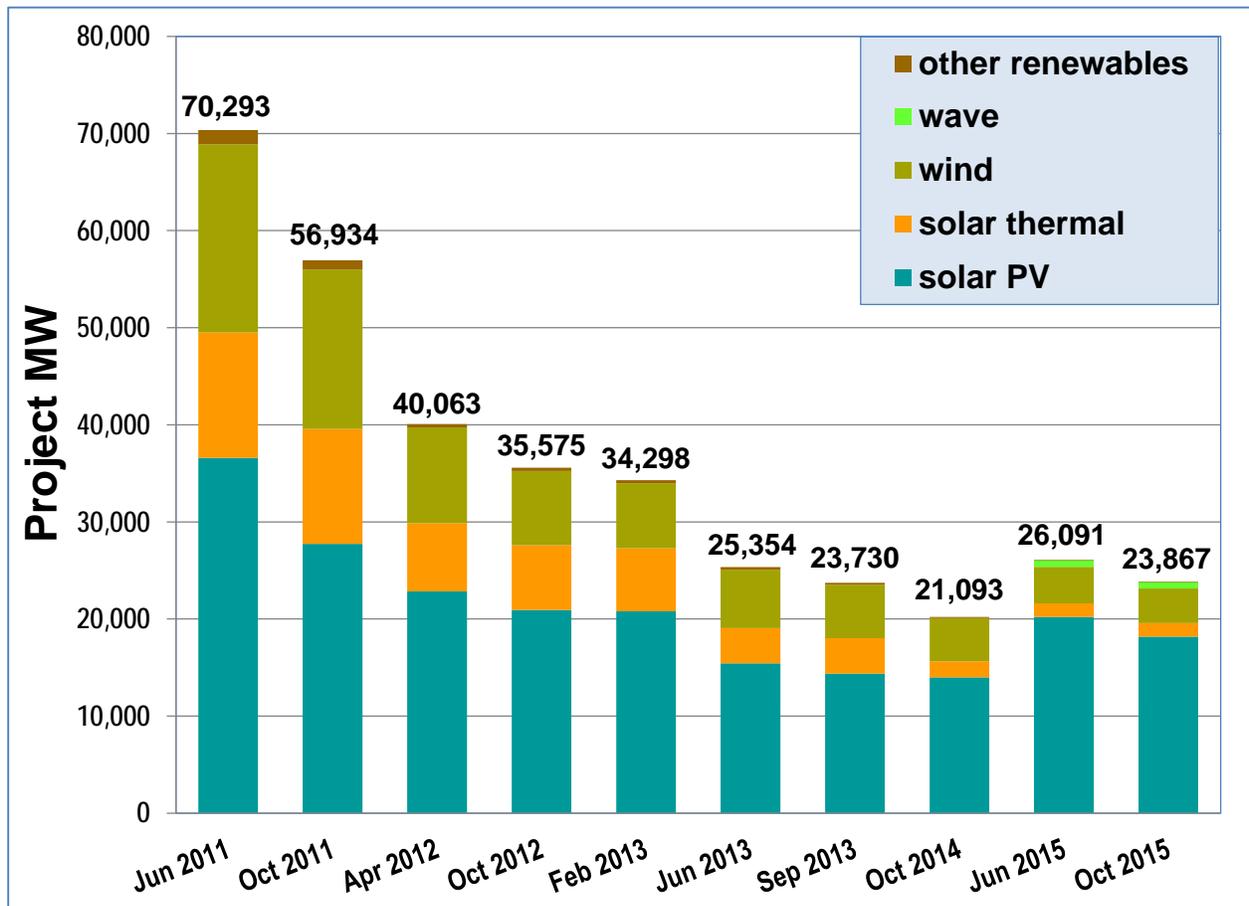


Figure 2 displays the amount of renewable capacity in the queue by study group and shows the capacity reductions within each study group. The active project portion of each bar, shown in blue, represents the October 2015 capacity that remains in the each study group. Since the June 2015 update, 2,259 MW of renewable capacity exited the queue, 1,348 MW coming from project withdrawals, and 911 MW from projects that reached commercial operation. One 35 MW independent study process project entered the queue during the period.

**Figure 2**  
**Renewable generation capacity in the ISO queue by study group**  
**(changes by study group since June 2015 update)**

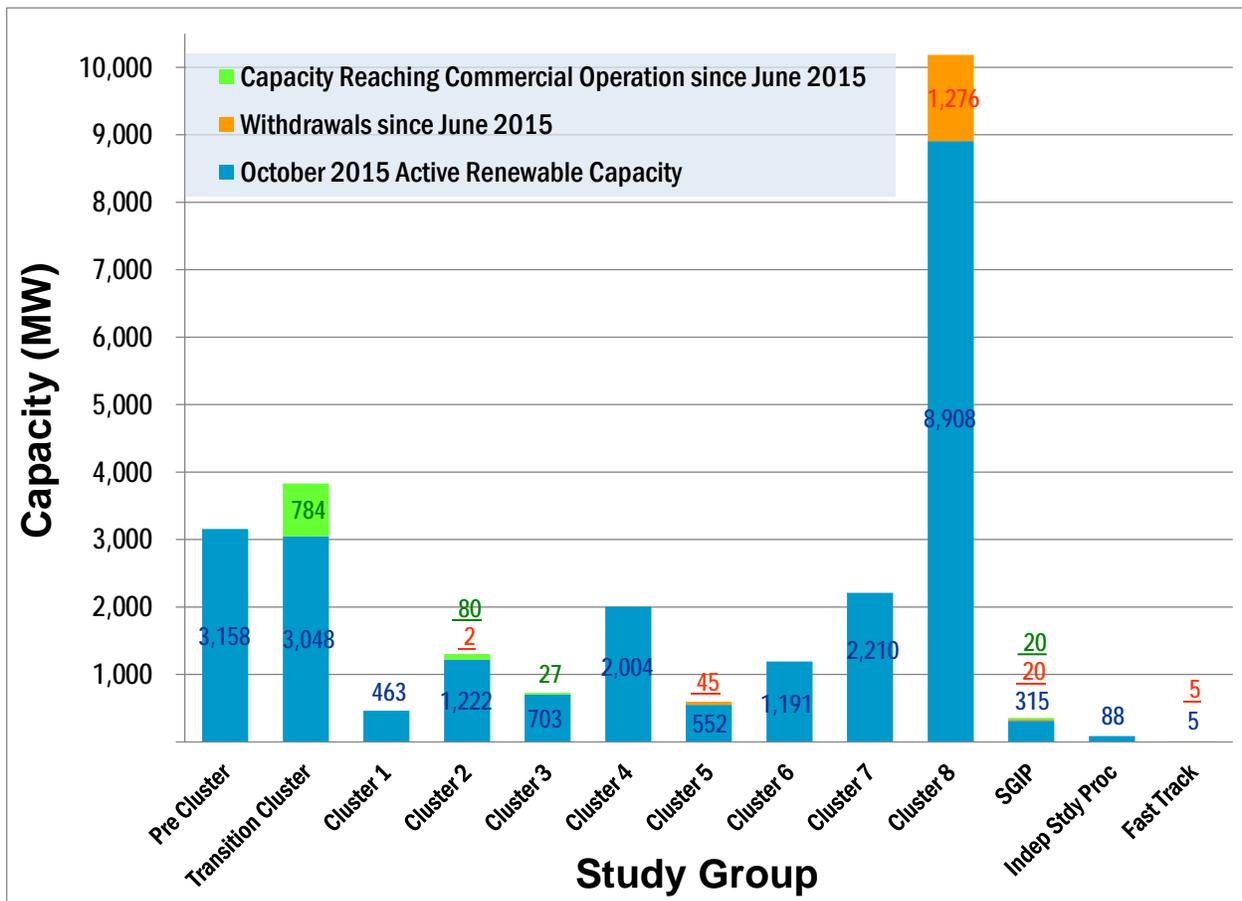


Figure 3 provides insight into the amount of generation capacity in the ISO queue by project size and type. Solar PV is the dominant generating technology for all size ranges except for the 500 to 1,000 MW category. Figure 3 also provides a breakdown of the capacity in the ISO queue by the number of projects for each project size category. Projects in the 100 to 500 MW category make up 76% of project capacity.

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

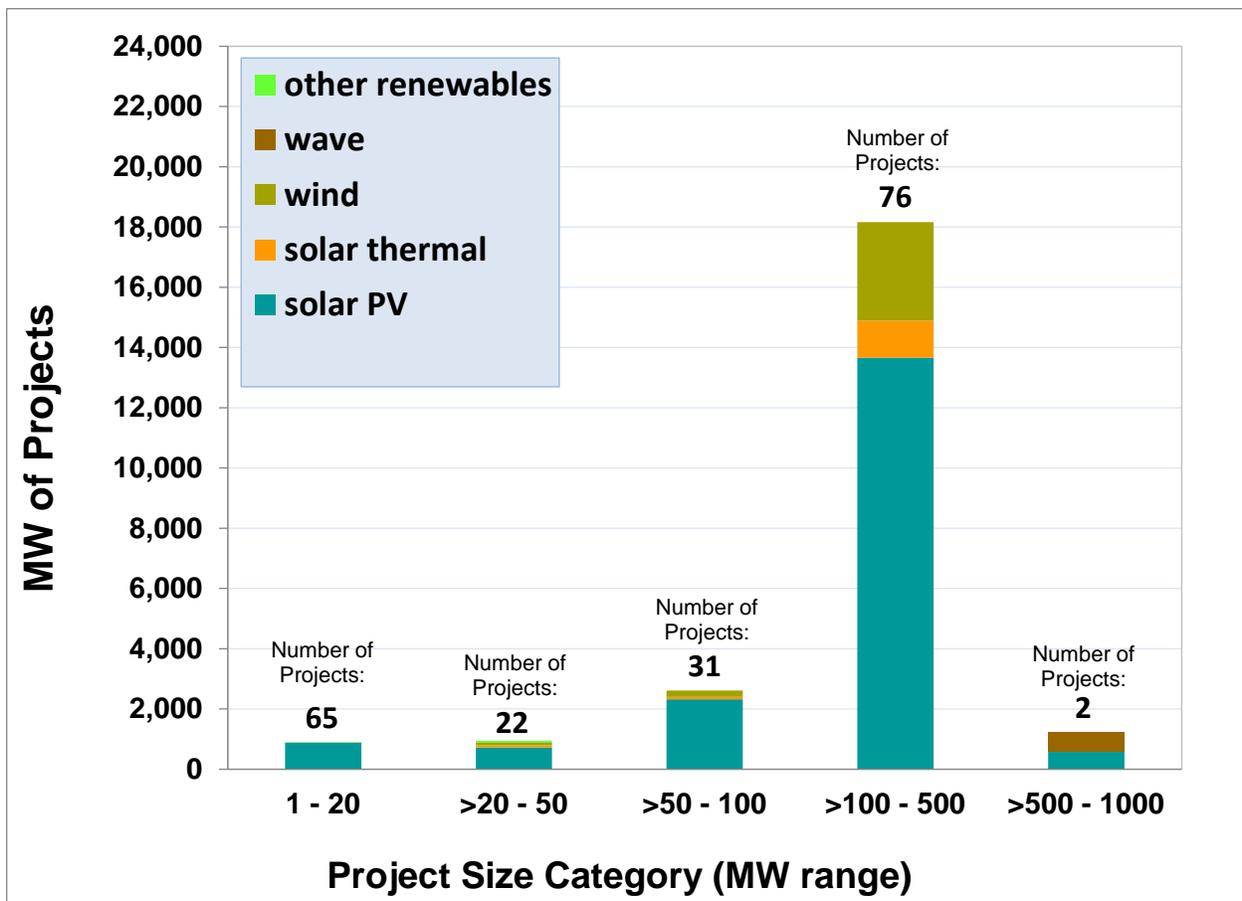
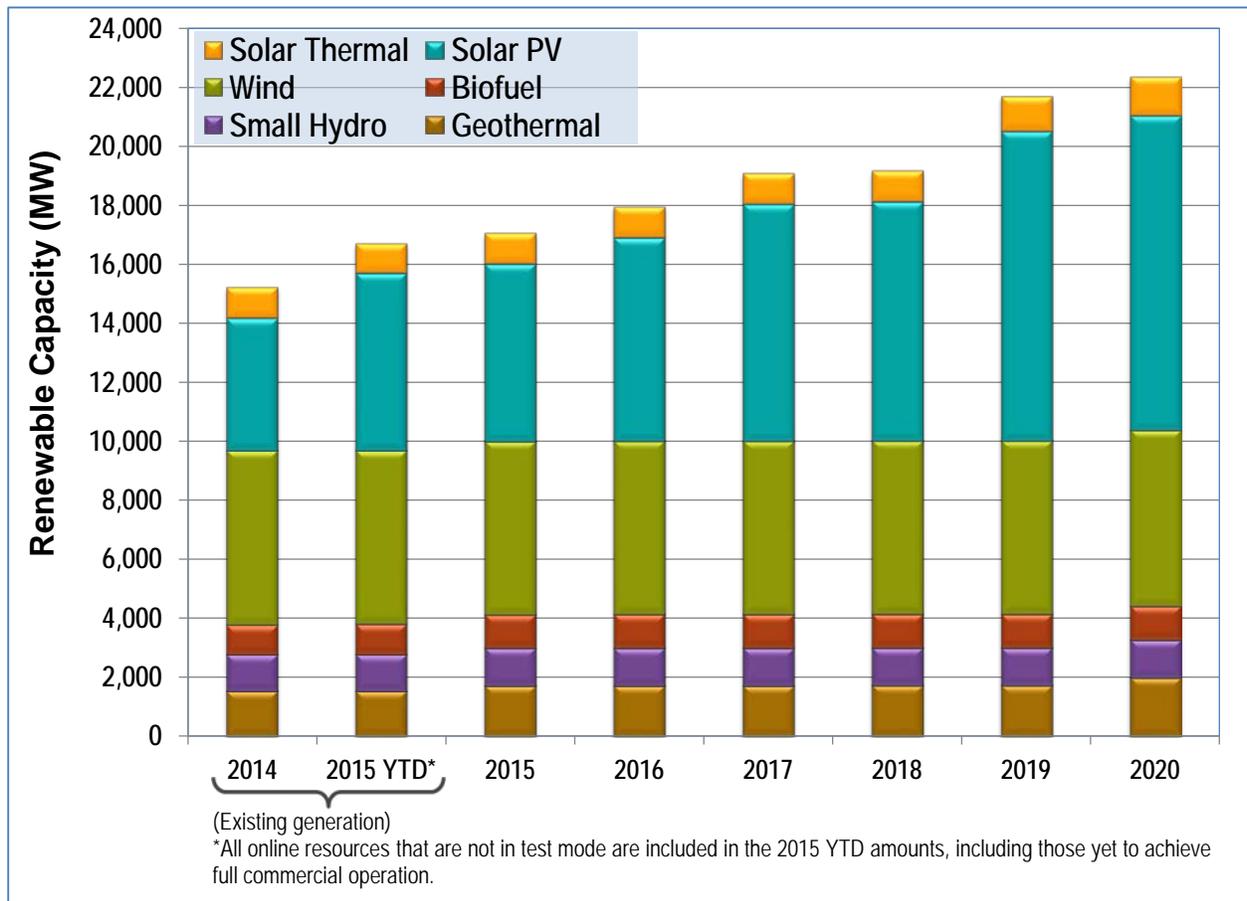


Figure 4 shows the projected build-out of renewable capacity by technology type based on projections from the investor owned utilities through 2018 and using the CPUC RPS calculator<sup>1</sup> thereafter. The 22,400 MW estimated amount shown for 2020 is the projected renewable generation to be in operation in 2020, and approximates the amount needed to reach the 33% RPS requirement for that year. The ISO currently has approximately 16,700 MW of operating renewable generation within its footprint, which leaves approximately 5,700 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)**



<sup>1</sup> 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 and storage project capacity, which is included in the conventional category. Kern County, key code 22, represents the Tehachapi area and contains the largest amount of renewable projects in the ISO queue. Some storage capacity is associated with other generation technologies within a single project, typically solar PV. Where this is the case, the total project's net dependable capability may not exceed the capacity of the solar portion of the project. However, in this table all technology types are provided at their full capability on a stand-alone basis. As a result, the total capacity of all projects shown here is greater than the total project capacity in the ISO generation interconnection queue report.

**Figure 5**  
**ISO Queue Map – Conventional & Renewables**  
**As of October 9, 2015**

