



ELCC Analysis and Observations

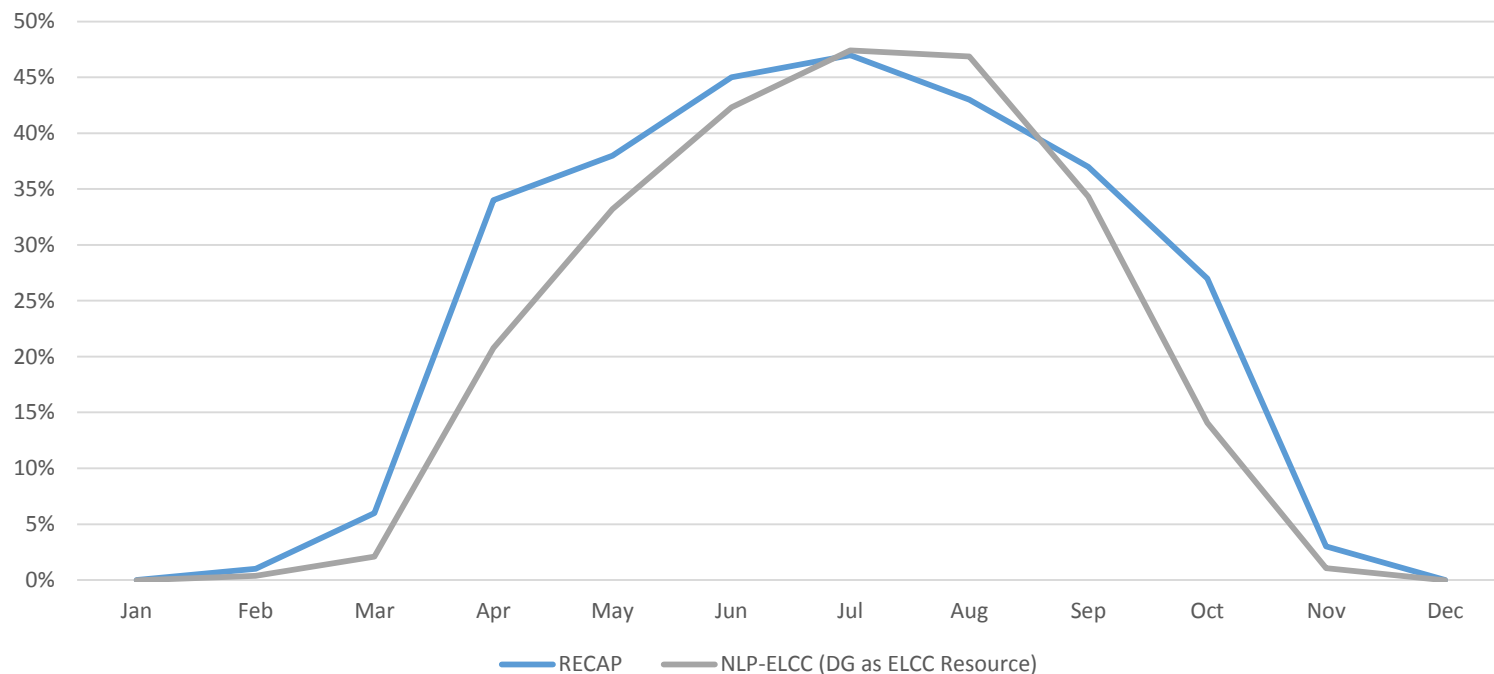
2/14/2017

Overview of ELCC Analysis and Observations

1. Calpine / E3 ELCC results seem to eliminate the gap problem (between net load and RA resources) that is caused by the exceedance methodology.
2. The method for assigning capacity value to new resources needs to be discussed (for example, marginal ELCC vs average ELCC for new resources).

Solar ELCC values are consistent between Calpine/E3 and the NLP-ELCC results.

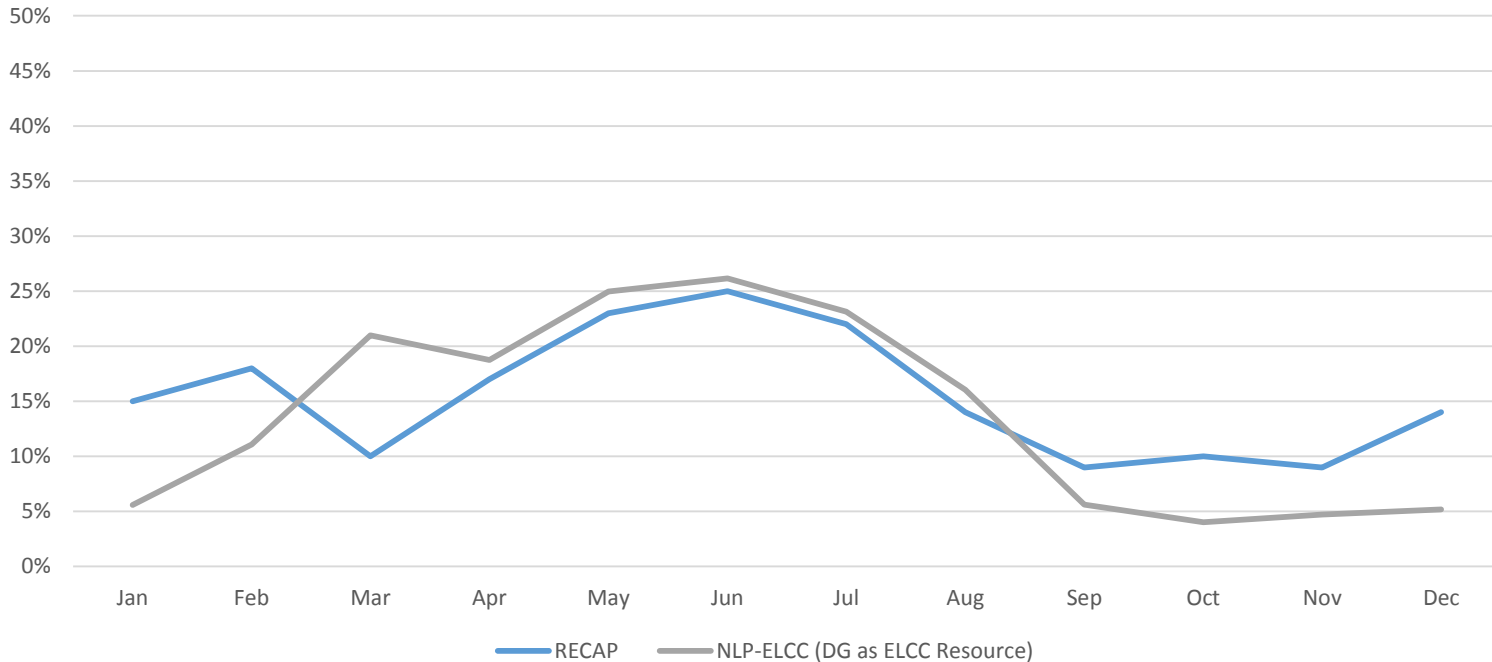
Comparison of 2018 Average Monthly Solar ELCC Values



- When using the same inputs and treatment of DG PV, Solar ELCC values align consistently with the exception of a few shoulder months.
- Magnitude of results (approx. 45% in summer) are consistent with 2016 NLP-ELCC results (approx. 30% in summer) when accounting for DG PV as an equivalent ELCC technology.

Wind ELCC values are consistent between Calpine/E3 and the NLP-ELCC results.

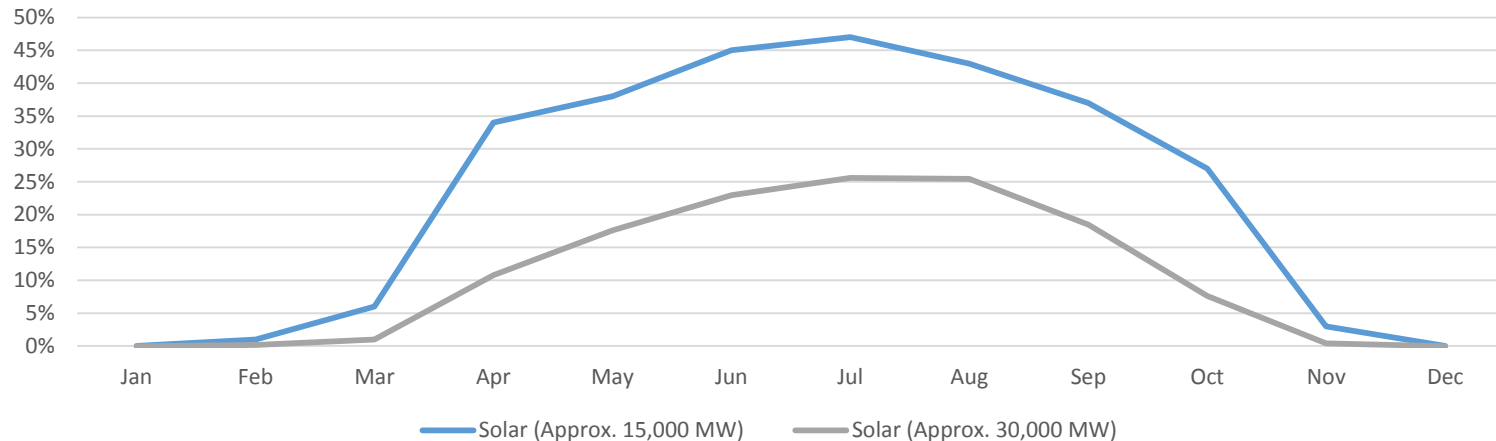
Comparison of 2018 Average Monthly Wind ELCC Values



- When using the same inputs and treatment of DG PV, Wind ELCC values generally align.

Counting all resources at an average ELCC provides some counter intuitive incentives for RA capacity value.

Comparison of Average Solar ELCC at Different Penetration Levels



- If all resources receive the average ELCC:
 - Existing resources could see a significant drop in capacity value even if their production does not change.
 - New resources could receive a high RA value even if they do not add any capacity value to the system.

Summary of Observations

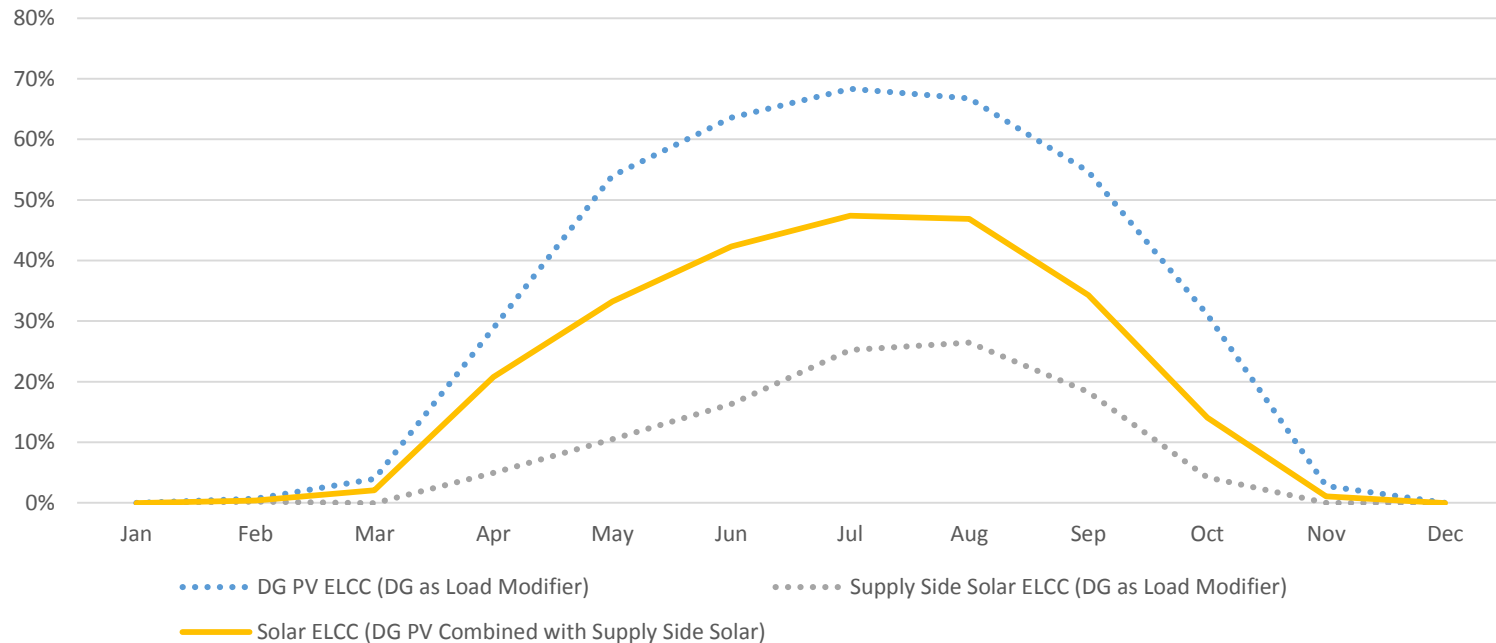
- Calpine / E3 ELCC results could be ready for implementation in 2018.
- If implemented, Calpine / E3 model results should continue to be checked in future years to verify they result in a reliable system.
- Work should continue to determine how to count new resources for their capacity value (for example, marginal or average ELCC values).



Backup Slides

The treatment of DG PV can significantly change individual ELCC results but should not affect the overall ELCC value of an entire portfolio.

Comparison of Average Solar ELCC values with Different DG PV Treatment



- Treating DG PV as a load modifier can result in a shift of ELCC capacity between technologies. Treating DG PV as a load modifier should not affect the overall ELCC MW capacity of the entire ELCC portfolio (Large Scale Solar, DG PV, Wind, etc.)