

The Duck Pond: An opportunity for gas turbines

Summary of an article "The Duck Pond", Power Engineering magazine, 3/22/16 by Bonnie Marini

Electric power generation from renewable sources continues to grow worldwide. The challenge is that the amount of renewable power fluctuates greatly during a 24-hour period. Without a solution for large-scale cost effective energy storage, the only way to meet the actual demand at any point in time is partnering with rapid-response dispatchable power generation.

The California Duck Curve is a projection by CAISO of the impact of increasing renewable power generation on the rapid ramping requirements for non-renewables in California, see figure 1.

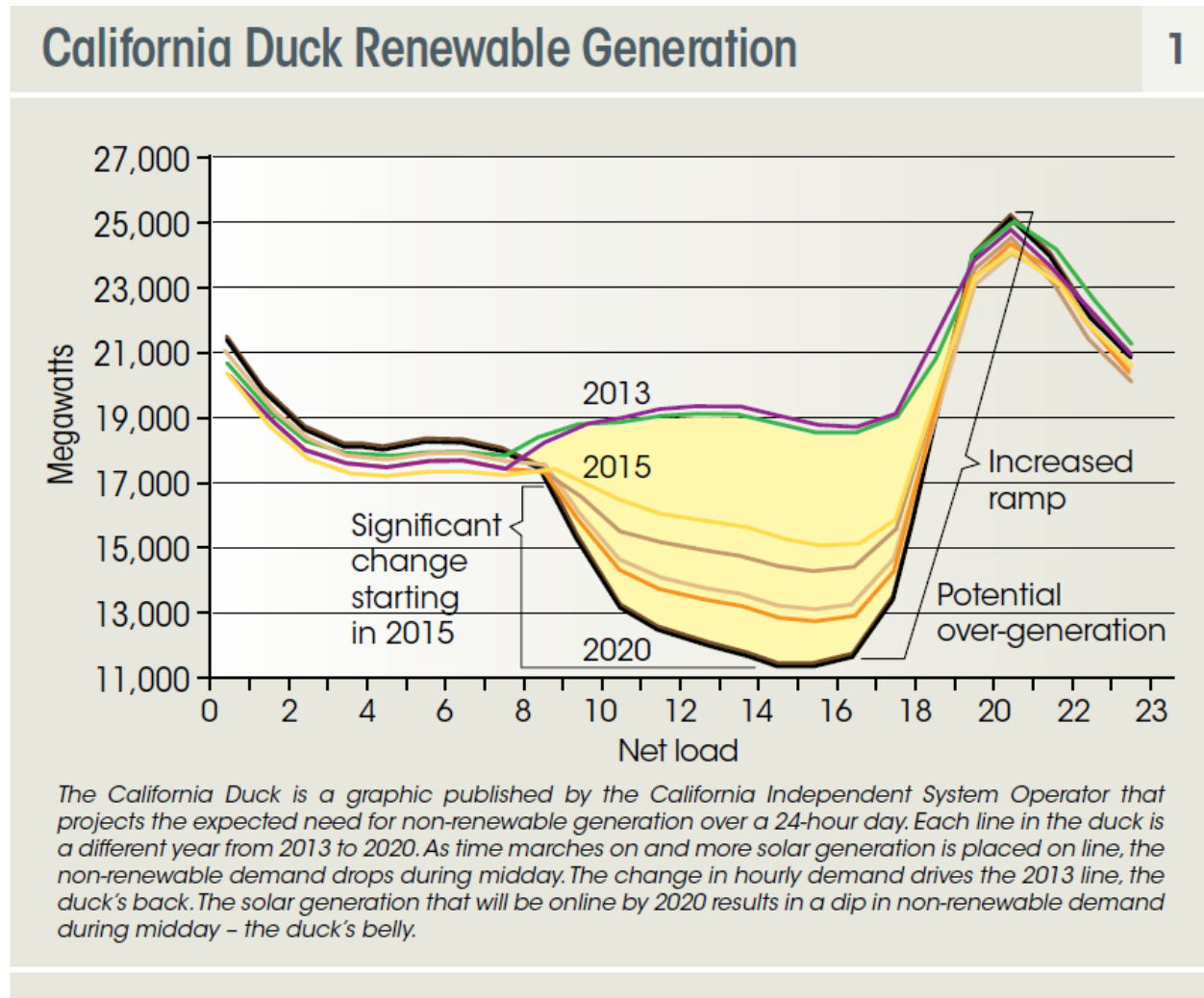


Figure 2 puts this into broader perspective, showing the total of renewable and non-renewable loads. It is clear that the total fluctuations and severity of them are increasing with time.

The Duck Pond of Non-Renewable Generation

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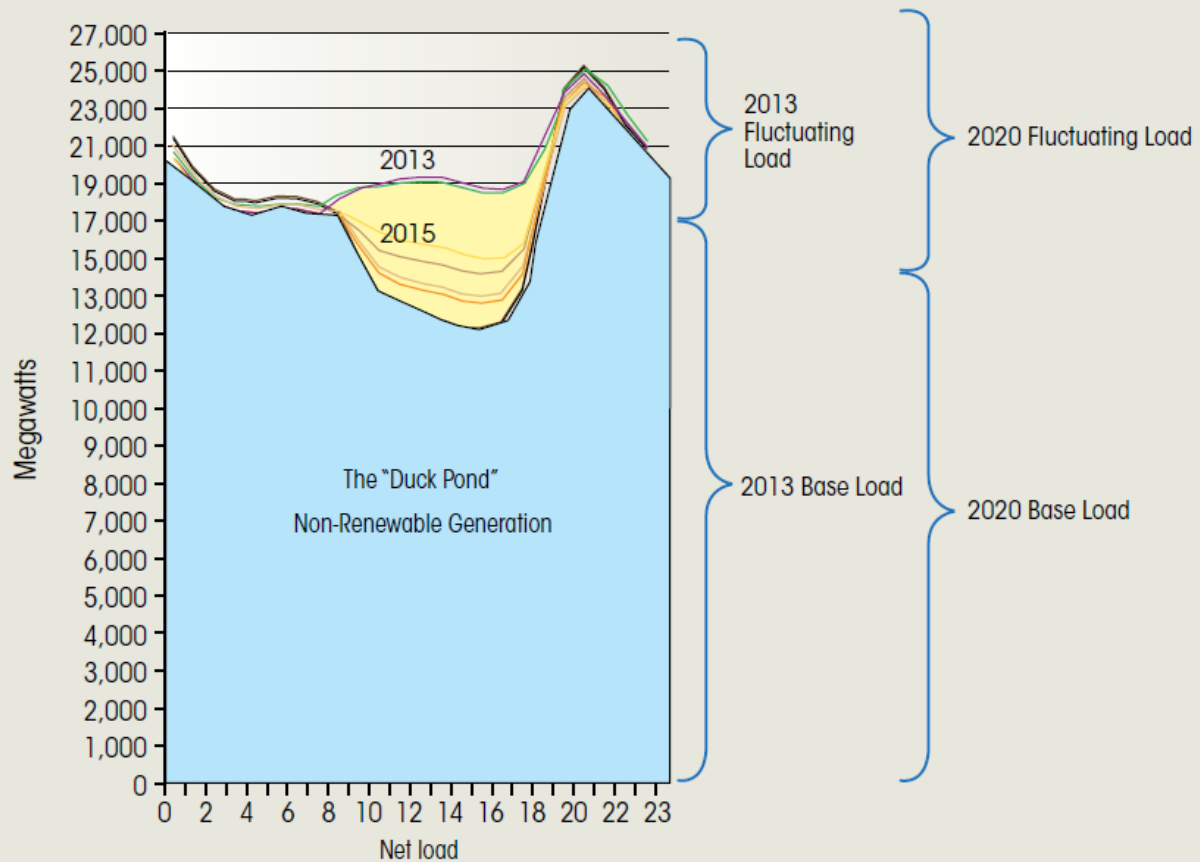
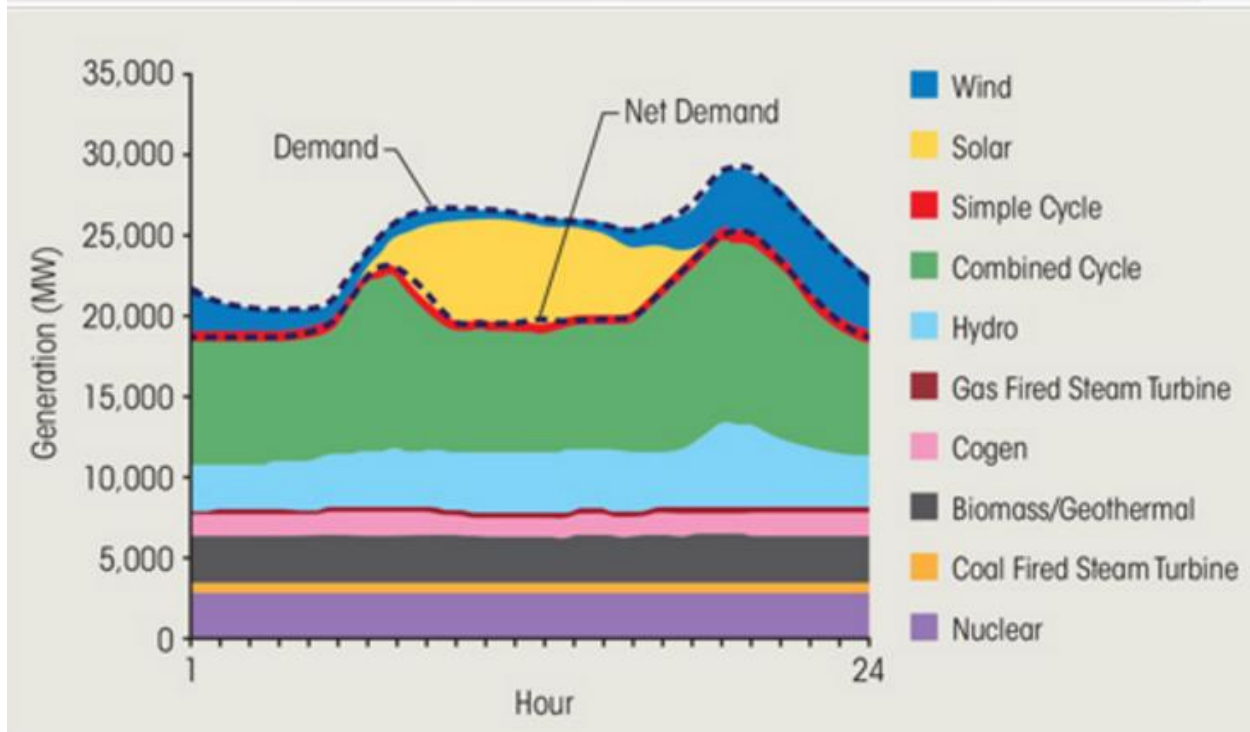


Figure 2 is an expansion of Figure 1, showing the amount of generation under the duck.

The article goes on to consider different sources of dispatchable generation sources: Simple cycles, conventional combined cycles (slow starting, capable of fast load changes) and the newer flex-plant combined cycles capable of fast start and fast load changes. Evaluating the California situation and several others the conclusion is that while simple cycles will support low dispatch (<20% of the time) peaking demands, the majority of dispatchable sources will be flex-plant combined cycles. An illustration of this is shown in figure 5.

Examples of Dispatch on a Grid with Renewables

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For the complete article visit Power Engineering at <http://www.power-eng.com/index.html> and search for duck pond.