

economic by a substantial margin given the real-time energy price. A participant can economically withhold resources, as measured by the output gap, by raising its energy offers so as not to be dispatched.

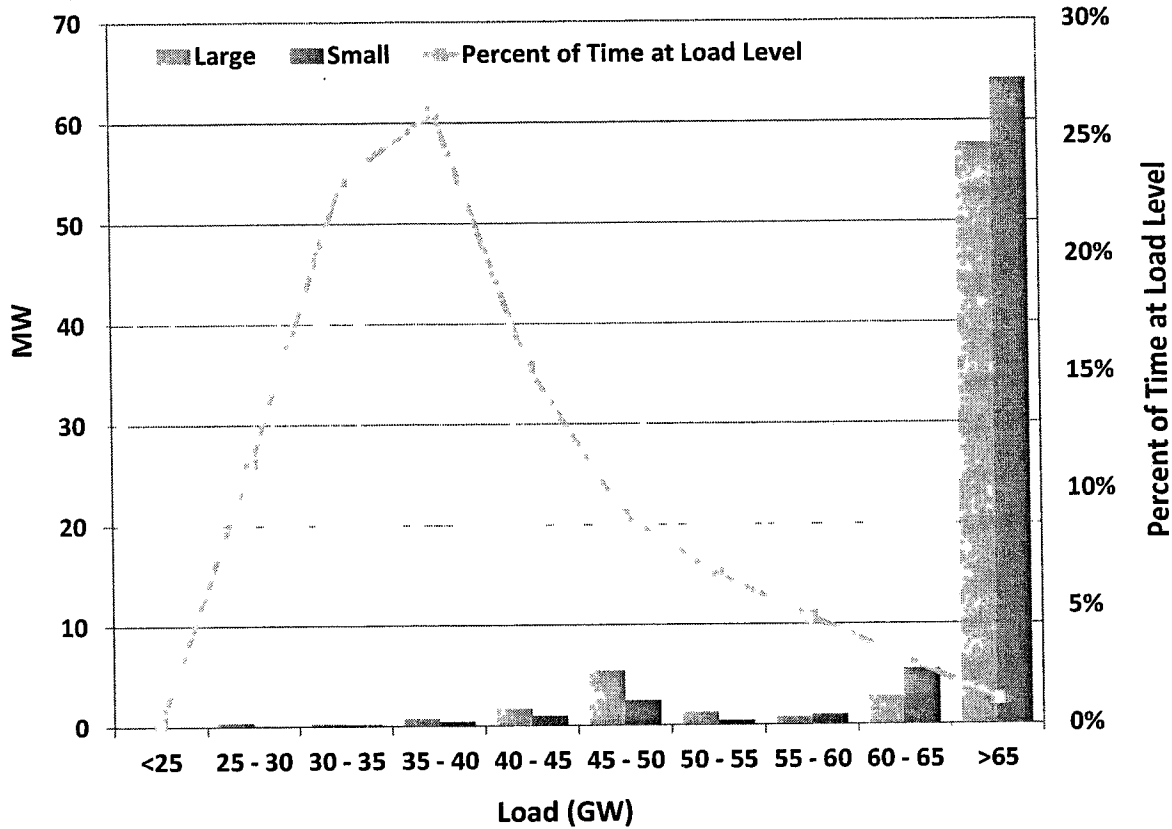
A resource is evaluated for inclusion in the output gap when it is committed and producing at less than full output. Energy not produced from a committed resource is included in the output gap if the real-time energy price exceeds that unit's mitigated offer cap by at least \$30 per MWh.³⁸ The mitigated offer cap serves as a proxy for the marginal production cost of energy from that resource.

Before presenting the results of the output gap analysis, a description of ERCOT's two-step dispatch software is required. In the first step, the dispatch software calculates output levels (Base Points) and associated locational marginal prices using the participants' offer curves and only considering transmission constraints that have been deemed competitive. These "reference prices" at each generator location are compared with the generator's mitigated offer cap, and the higher of the two is used to formulate the offer curve for that generator during the second step in the dispatch process. The resulting mitigated offer curve is used by the dispatch software to determine the final output levels for each generator, taking all transmission constraints into consideration.

If a market participant has sufficient market power, it might raise its offer in such a way to increase the reference price in the first step. Although in the second step the offer appears to be mitigated, the market participant has still influenced the market price. This output gap is measured by the difference between the capacity level on a generator's original offer curve at the first step reference price and the capacity level on the generator's cost curve at the first step reference price. However, this output gap is only indicative because no output instructions are sent based on the first step. It is only used to screen whether a market participant is withholding in a manner that may influence the reference price.

³⁸ Given the low energy prices during 2015, the output gap margin was reduced to \$30 for purposes of this analysis. In past years, the State of the Market report used \$50 for the output gap margin.

Figure 83: Incremental Output Gap by Load Level and Participant Size – Step 1

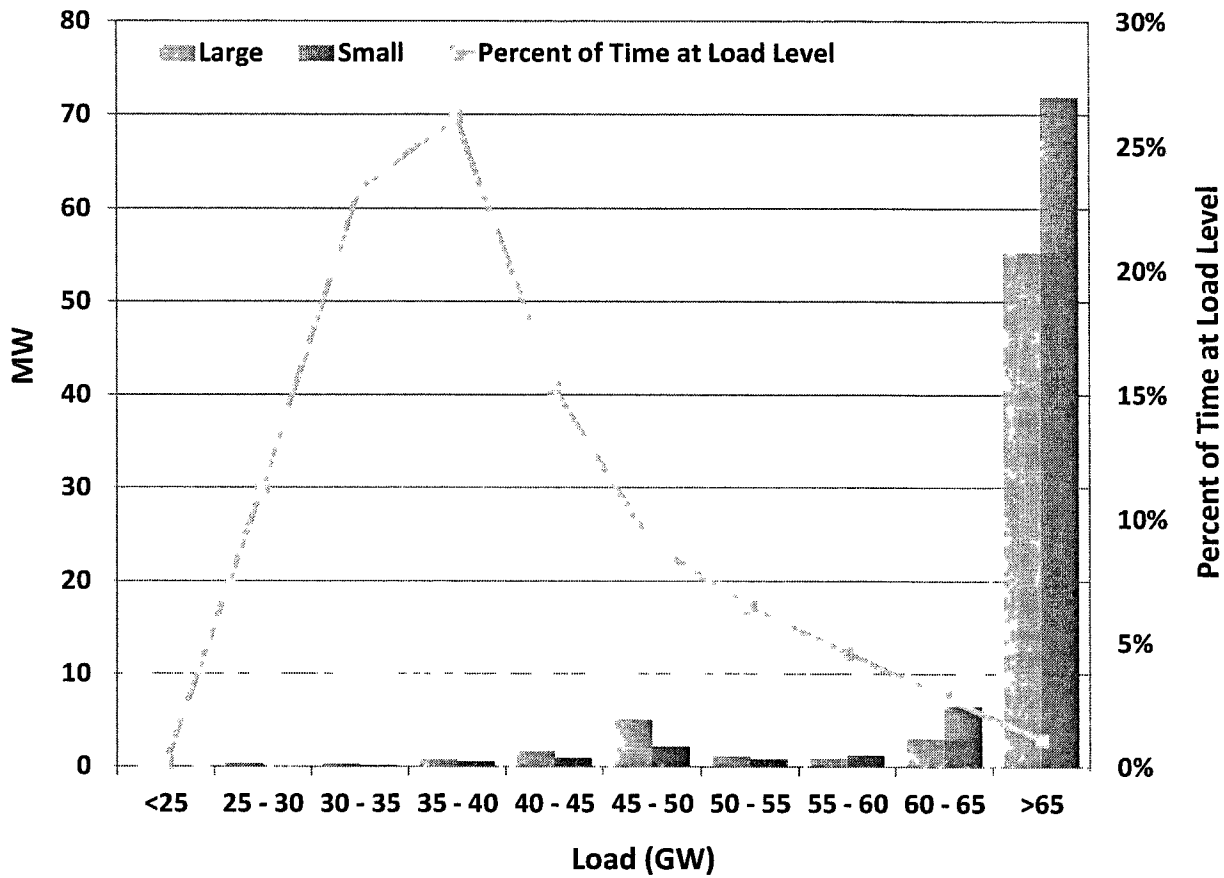


The results of the analysis shown in Figure 83 indicate that only very small amounts of capacity would be considered part of the first step output gap.

Figure 84 shows the ultimate output gap, measured by the difference between a unit’s operating level and the output level had the unit been competitively offered to the market. In the second step of the dispatch, the after-mitigation offer curve is used to determine dispatch instructions and locational prices. As previously illustrated, even though the offer curve is mitigated there is still the potential for the mitigated offer curve to be increased as a result of a high first-step reference price being influenced by a market participant raising prices.

Similar to the previous analysis, Figure 84 also shows very small quantities of capacity that would be considered part of this output gap.

Figure 84: Incremental Output Gap by Load Level and Participant Size – Step 2



The output gap of several of the largest suppliers were also examined for 2015, and unlike the findings in 2013, found to be consistently low for the largest suppliers across all load levels. These results, together with our evaluation of the market outcomes presented in this report, allow us to conclude that the ERCOT market performed competitively in 2015.