

*Effect of Market Changes on the Required Amounts of Frequency
Regulation Ancillary Services in Texas*

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Friday, October 26th, 2018, 2:00pm – 2:50pm, Location: EB 2.04.02

Abstract

In US electricity markets, there are multiple ancillary services, including frequency regulation and two or more types of contingency reserve. Frequency regulation is used to maintain supply-demand balance within each real-time market dispatch interval, which is either 15 or 5 minutes in duration, depending on region. As a general principle, as short-term load variability increases, greater quantities of frequency regulation are required to maintain electrical frequency within limits, ceteris paribus. Moreover, with additional renewable resources such as wind, the corresponding net load variation increases. That is, as wind capacity increases, we would also expect that more frequency regulation would be procured. The Electric Reliability Council of Texas (ERCOT) has experienced huge growth in wind over the last 20 years; however, the amount of frequency regulation ancillary service procured has decreased. We investigate why this has occurred, identifying a number of changes in the market design. The work highlights that market designs evolve to make better use of resources.

Biography



Ross Baldick is Professor and Leland Barclay Fellow in the Department of Electrical and Computer Engineering at The University of Texas at Austin. He has undergraduate degrees from the University of Sydney, Australia, and graduate degrees from the University of California, Berkeley. His current research involves optimization, economic theory, and statistical analysis applied to electric power systems, particularly in the context of increased renewables and transmission. Dr. Baldick is a Fellow of the IEEE and the recipient of the 2015 IEEE PES Outstanding Power Engineering Educator Award.