

Why GAO Did This Study

Electricity demand fluctuates throughout the day and year and, as GAO has reported, electricity is generated first at U.S. power plants with the lowest operating costs, and, as demand rises, at more costly plants. Prior to being sold to retail consumers such as households and businesses, electricity is traded in wholesale markets. Regulation of electricity markets is divided; states oversee retail markets, and FERC oversees wholesale markets. In 2004, GAO reported on the benefits of encouraging consumers to reduce demand when the cost to generate electricity is high. These activities are known as “demand-response activities,” which can reduce the costs of producing electricity, improve market functions, and enhance reliability.

GAO was asked to examine demand-response activities. This report provides an update since 2004 and discusses: (1) federal efforts to facilitate demand-response activities, (2) FERC efforts to collect and report data on demand-response activities, (3) changes in the extent of demand-response activities, and (4) key benefits and challenges of current efforts. GAO reviewed documents and conducted interviews with government officials and industry stakeholders with demand-response expertise.

What GAO Recommends

GAO recommends FERC review the scope of its data collection and improve the transparency of its reporting efforts. In commenting on a draft of this report, FERC stated that it would take the report’s recommendations and findings under advisement. GAO believes in the importance of fully implementing these recommendations.

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ELECTRICITY MARKETS

Demand-Response Activities Have Increased, but FERC Could Improve Data Collection and Reporting Efforts

What GAO Found

Since 2004, the federal government has made efforts to facilitate demand-response activities, including expanding their use in wholesale electricity markets. Among these efforts, the Federal Energy Regulatory Commission (FERC) issued regulatory orders affecting Regional Transmission Organizations (RTO)—entities that operate the transmission system and administer wholesale markets in some parts of the country. For example, FERC issued orders approving RTO rules for quantifying the extent of demand-response activities and compensating consumers for their demand-response activities.

FERC collects and reports data on demand-response activities in accordance with the Energy Policy Act of 2005, but these efforts have limitations. Electricity markets and demand-response activities have changed since FERC began collecting and reporting this data in 2006, but FERC has not reviewed the scope of its efforts to determine whether they could better reflect changes in electricity markets and demand-response activities. For example, FERC has reported that the limited number of retail consumers paying rates that vary with the cost of serving them is a barrier to expanding demand-response activities, but its report provides limited data on the number of consumers doing so. GAO has reported that evaluation of programs or efforts with a specific focus—such as FERC’s demand-response data collection efforts—can play a key role in management and oversight. FERC, in some cases, adjusts the data it collects before making them available to the public—using its judgment to improve the data’s consistency, for example—but does not fully document these adjustments. Best practices for data management advise that data modifications be documented. By not addressing these limitations, FERC is missing opportunities to make its data more informative and transparent to users for analysis of trends in demand-response activities and the extent to which progress has been made in addressing barriers.

Since GAO’s 2004 report, FERC data show that the extent of demand-response activities has increased, with demand-response activities in wholesale and retail markets more than doubling from a total of 29,653 megawatts (MW) of potential reduction in peak demand in 2005 to more than 66,350 MW in 2011—about 8.5 percent of total peak demand. Demand-response activities in retail markets have increased 81 percent from a reported 20,754 MW of potential reduction in 2005 to a reported 37,543 MW in 2011. In wholesale markets, demand-response activities more than tripled from 2005 through 2011—increasing from 8,899 MW of potential reduction in 2005 to 28,807 MW of potential reduction in 2011—but the extent of demand-response activities has varied by RTO region.

According to stakeholders, current demand-response efforts provide benefits for consumers, including increasing reliability and lowering prices, but these efforts also pose a number of challenges for wholesale markets. For example, FERC’s efforts to encourage demand-response activities in the markets it oversees have made these markets more complex by introducing administrative functions that, according to stakeholders, have led to challenges. Challenges include the need to develop estimates of the amount of electricity a consumer would have used in order to quantify the reduction in electricity use from demand-response activities. FERC has taken some steps to address these challenges, but it is too soon to tell whether these steps will be effective.