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Committee on Science, Space and Technology
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Thank you for the opportunity to speak before the Committee today. My name is Bill Magness, and I am the General Counsel and Senior Vice President for Governance, Risk, and Compliance for the Electric Reliability Council of Texas, Inc. (ERCOT). ERCOT is the independent system operator (ISO) for the ERCOT Interconnection, which encompasses approximately 90% of electric load in Texas. ERCOT is the independent organization established by the Texas Legislature to be responsible for the reliable planning and operation of the electric grid for the ERCOT Interconnection. ERCOT also administers and maintains a forward-looking open market to provide affordable and reliable electricity to consumers in Texas. Existing market policies and investments in transmission in the ERCOT region have incentivized market participants to maximize the efficiency of the generation fleet and develop new technologies including renewable generation. With recent investments in transmission, more than 14 gigawatts of wind capacity have been successfully integrated into the ERCOT grid.

ERCOT recently released an analysis of the impacts of the Clean Power Plan (CPP) final rule on generation resources and grid reliability in the ERCOT Region, which I would like to share with you today. The analysis uses planning processes and methodologies consistent with ERCOT's Long-Term System Assessment studies. Based on this analysis, we see the potential for significant impacts on the planning and operation of the ERCOT grid resulting from compliance with the CPP.

The results indicate that the final CPP, by itself, will result in the retirement of at least 4,000 MW of coal generation capacity. This creates a risk that the ERCOT Region could see multiple unit retirements within a short timeframe, which could result in implications for reliability. When the impacts of the CPP are considered in combination with the requirements of EPA's proposed Regional Haze Federal Implementation Plan (FIP) for Texas, there are additional unit retirements, many of which occur even before the start of CPP compliance in 2022. The Regional Haze FIP was proposed by EPA in November 2014, and would require seven coal-fired units in Texas to upgrade their existing scrubbers and seven units (five of which are located in ERCOT) to install new scrubbers. If future unit retirements occur before the market has time to respond with new investment, there could be periods of reduced system-wide resource adequacy and an increased risk of system scarcity events.

The retirement of legacy coal-fired generation could also result in localized reliability issues and require transmission system upgrades. A recent reliability analysis conducted by ERCOT of potential retirement scenarios resulting from compliance with the Regional Haze FIP requirements showed that the retirement of 4,200 MW of coal-fired capacity, comparable to the amount expected to retire due to the CPP alone, would have a significant impact on the reliability of the transmission system. Model results indicated power-flows exceeding the thermal capacities of 10 circuits (143 miles) of 345 kV transmission, 31 circuits (147 miles) of 138 kV transmission, 6 circuits (39 miles) of 69 kV transmission, and 11 transformers. As a general estimate, new 69 kV and 138 kV lines cost on the order of one million dollars per mile and new 345 kV lines cost on the order of three million dollars per mile. Additionally, in the ERCOT Region, it takes at least five years for a new major transmission project to be planned, routed, approved, and constructed.

The CPP study also predicts a sizeable amount of renewable capacity additions, due both to the improving economics of these technologies as well as the impacts of regulating CO_2 emissions. In 2014, 10.6% of the ERCOT Region's annual generation came from wind resources. At its highest levels of instantaneous penetration, wind has provided enough energy to serve 40.58% of system load. The modeling results predict further growth in both wind and solar resources. Under CPP compliance, intermittent renewable generation would constitute 27% of annual generation by 2030. In hourly operations, this level of renewables would result in intermittent generation serving more than 50% of load in over 400 hours of the year, and a peak instantaneous penetration of 67%. During these periods, the need to maintain operational reliability could require the curtailment of renewable generation resources, and delay achievement of compliance with the CPP limits.

As a specific example, wind production in West Texas often results in high renewable penetration during early morning hours, when customer demand for electricity is lowest. During these periods, non-intermittent (dispatchable) resources may need to stay online to provide electricity later in the morning when demand increases and wind production decreases. If generation from wind is sufficiently high during off-peak hours, the need to keep non-intermittent resources committed at minimum operating levels – where unit efficiencies are lower and CO_2 emissions rates are higher – can make it necessary to curtail some of the production from wind resources to keep generation output and customer demand in balance. Yet curtailing the wind resources may delay compliance with CPP emission limits. In this way, CPP compliance could place system reliability needs in opposition to emissions requirements in periods when generation from intermittent renewable resources serves a large percentage of customer demand.

The CPP will also result in increased wholesale and retail energy costs in the ERCOT Region. Based on ERCOT's analysis, energy costs for customers may increase by up to 16% by 2030 due to the CPP alone, without accounting for the associated costs of transmission upgrades, higher natural gas prices caused by increased gas demand, procurement of additional ancillary services, and other costs associated with the retirement or decreased operation of coal-fired capacity in the ERCOT Region. Consideration of these factors would result in even higher energy costs for customers.

Thank you for the opportunity to testify before this committee today. I would be happy to answer any questions you have about this study and the impacts of environmental regulations on grid reliability in the ERCOT Region.