Testimony of Woody Rickerson

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Before the Subcommittee on Energy, Climate, and Grid Security

"Powering America's Economy, Security, and Our Way of Life:
Examining the State of Grid Reliability"

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Summary of Statement

- The biggest challenge to grid reliability in future years will come from the changing mix of resources providing power.
- Solar and wind generation, while clean and inexpensive, provide unique problems to reliable grid operation.
- Batteries are useful for providing quick responses to system events, mitigating the variability of wind generation, and helping to dampen the effect of solar ramps.
- Almost half of all projects currently in the ERCOT interconnection queue, are for new grid-scale solar projects and another one third are for batteries.
- There is very little development interest in new gas-fired generation and no projects for coal or nuclear fueled generation.
- Severe winter weather presents challenges for all types of generation.
- The energy transition currently underway must keep reliability and cost in constant focus and will require careful planning, time, and meaningful advancements in technologies.

Good morning, Chairman Duncan, Ranking Member DeGette, and Members of the Subcommittee. Thank you for inviting us to be here today.

My name is Woody Rickerson, Senior Vice President and Chief Operating Officer for the Electric Reliability Council of Texas, Inc. or ERCOT. I have been with ERCOT for over 20 years. ERCOT is a membership-based 501(c)(4) nonprofit corporation, governed by a 12-Member independent Board of Directors and subject to oversight by the Public Utility Commission of Texas. ERCOT provides recommendations to the PUCT and the Texas Legislature and then we ultimately implement their policy decisions. We are the Independent System Operator for the Texas grid.

The Texas grid serves 90% of the overall load in Texas and covers approximately 75% of the state's land mass. This summer, Texas saw a peak demand of 85,464 MW, which represents close to a 7% increase over last summer (80,148 MW). On September 8 this year, ERCOT set a new September peak demand record of 84,182 MW – a 16% increase from our previous September record in 2021. There were also over 40 days this summer where load exceeded last year's all time peak. That remarkable load growth is a result of new businesses and people moving to Texas, the electrification of existing load, extremely hot weather throughout the summer, and the addition of new types of industrial loads.

As we look into the near future, we see a grid that is undergoing a transformation – with load growth, new types of load, and new types of generation. Perhaps the most overarching challenge in future years will come from the changing mix of resources that provide power. The bulk of my remaining remarks will focus on that challenge.

In 2008, the Texas grid had about 2,000 MW of wind generation. There are now over 37,000 MW of interconnected wind generation. In 2022, energy from wind exceeded the amount of energy from either coal-fired generation or nuclear generation. While clean and inexpensive, wind generation does present challenges. First, wind generation on the Texas grid tends to be in areas far from load centers resulting in the need for substantial investments in transmission. Second, wind output is variable, and even when it

is dispersed over a state as large as Texas there are times when the overall output can be very low. During the peak of the summer heat, there were many instances where wind delivered less than 1,000 MW. Finally, wind generation provides its power to the grid using inverters or power electronics. Reliably integrating inverter-based generation has proven challenging in multiple ways. One key example being the ability for inverter-based resources to remain stable during system voltage fluctuations.

In 2016, ERCOT began to see the rapid increase in the interconnection of grid-scale solar generation. At that time, ERCOT had about 500 MW of grid-scale solar. Today, there are over 18,000 MW of installed solar capacity. Like the challenges experienced with wind generation, grid-scale solar also uses inverters and in Texas, it also tends to be located far from load centers. Unlike wind, solar has predictable ramping periods in both the morning and evening, but these ramps present grid operators with their own significant balancing issues. Beginning this year, solar moved ERCOT's tightest summer hours from the traditional late afternoon load peak to later in the evening during and after the sun sets.

The newest addition to the resource mix have been batteries. With almost 5,000 MWhrs of capability, batteries have moved into the ERCOT ancillary service market and become valuable contributors during ERCOT's tightest hours. Batteries are extremely useful for providing quick responses to system events, mitigating the variability of wind generation, and helping to dampen the effect of solar ramps. However, batteries also present new challenges for control systems and forecasting, one of the most pressing being their duration limitations with current and expected energy demands. The large-scale integration of these resources remains a complex issue requiring additional changes to ERCOT operating rules and systems.

Looking ahead, almost half of all projects currently in the ERCOT interconnection queue are for new grid-scale solar projects and another one third are for batteries. However, there is very little development interest in gas-fired generation and no projects for coal or nuclear fueled generation. Wind, solar and battery resources are providing much needed capacity and benefits to the Texas grid, but to meet the rapidly growing electric demand, it's critical that the generation supply be balanced with long duration

dispatchable generation, like natural gas and nuclear. Those thermal generation resources still supply almost 70% of the energy needs in our growing interconnect. We must have markets and regulations that allow and foster investment in these generation types to continue to operate.

As we look at grid reliability this winter there are several important factors to consider. Severe winter weather presents challenges for all types of generation. Wind turbines can be forced offline due to icing of turbine blades. Solar panels can be covered with snow and peak load hours during winter storms will likely occur in the early morning hours before generation from solar is online or in the evening hours after the sun sets. Thermal plants are also more susceptible to forced outages and fuel deliverability issues during winter storms. However, since winter storm Uri, ERCOT has put programs in place to help mitigate these risks. We now have a winterization inspection program that made more than 600 plant inspections last winter to ensure good winter performance, and during winter storm Elliot, we did see improved results. ERCOT also has a firm fuel program to provide an incentive for units to store fuel onsite when possible. Even with these changes, severe winter storms remain a challenge.

Finally, the energy transition currently underway must keep reliability and cost in constant focus and will require careful planning, time, and meaningful advancements in technologies that are still being developed and standardized. Thank you for this opportunity to provide these opening remarks, and I look forward to answering any questions.