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Chairman Upton, Ranking Member Rush, and members of the Subcommittee, thank you for holding this hearing and for the invitation to appear before you today. My name is Robert Powelson and I am honored to serve as a Commissioner of the Federal Energy Regulatory Commission (FERC or Commission).

Before joining the Commission in August of 2017, I spent nine years as a member of the Pennsylvania Public Utility Commission. My experience as a state utility regulator and my interaction with colleagues at state commissions across the country have informed my appreciation and understanding of FERC's important mission. Since joining the Commission, I have approached each decision with a deep understanding of how our determinations impact families and businesses nationwide. I have also prioritized engagement with stakeholders from all backgrounds and geographic regions to ensure that I hear a variety of viewpoints and my decisions are fully informed.

Today, my testimony will focus on two key areas. First, I will discuss the evolving electric grid, and in particular, how the nation's generation resource mix is changing in light of technological innovation, evolving consumer preferences, and state

policy initiatives. Second, I will discuss the Commission's cybersecurity initiatives, and specifically highlight how interagency coordination has helped further our goals with respect to pipeline security.

The Changing Electric Grid

The electric grid has historically been a one-directional, centralized system designed for reliable service at least cost. However, evolving consumer preferences and technological innovation are forcing the grid to adapt to new realities.

One major driver behind the evolution of the grid is the changing generation mix. Led by advancements in production technologies, primarily in accessing shale reserves, domestic natural gas supplies have increased dramatically. The United States now has access to large deposits of affordable natural gas and many parts of the country are experiencing one of the greatest generation fuel shifts in our history. At the same time, consumer preferences have driven increased investment in, and deployment of, renewable energy resources and simultaneously set in motion energy policy discussions in states across the country. The integration of renewables into the grid has skyrocketed, and with the advent of large scale battery storage, microgrids, and smart cities, innovation has also been a key driver behind the changing electric grid. These resources have the potential to turn the one-directional, centralized electric grid into a multi-directional, de-centralized grid that utilizes technological innovation to produce consumer benefits and increase the reliability and resilience of the bulk power system.

In recognition of this trend, the Commission has undertaken efforts to foster continued innovation. To level the playing field and allow for new technologies to participate in wholesale markets, the Commission issued a final rule on energy storage that directed grid operators to remove barriers to the participation of electric storage resources in the capacity, energy, and ancillary services markets (Order No. 841). On April 10-11, 2018, the Commission also held a technical conference on the participation of distributed energy resources (DERs) in organized markets. These proceedings are examples of the Commission's efforts to proactively respond to the changing grid and any challenges that may arise.

States have also been influential in the evolution of the electric grid. Some states have proactively encouraged the changing resource mix by establishing goals or mandates for energy production from certain types of generation. Conversely, other states have reacted by creating mechanisms to ensure that certain generation resources remain operational. These decisions by states, whether proactive or reactive, have implications for FERC-jurisdictional wholesale markets.

Traditionally, the nation's electric utilities were vertically integrated. Under this model, state regulators engage in integrated resource planning to ensure there is sufficient generation to meet forecasted energy demand. However, in the late 1990s and early 2000s, many state legislatures across the country voluntarily restructured their electric utilities. These states moved away from integrated resource planning and instead began

to rely on centralized grid operators to ensure resource adequacy, largely through competitive energy and capacity markets.

Through competition, these markets have done exactly what they were designed to do: produce a reliable and affordable generation mix in a fuel-neutral manner. At the same time, the abundance of low-cost natural gas, combined with a reduction in demand for electricity, have placed downward pressure on wholesale energy prices. These low prices have been a factor in the retirement of some traditional baseload resources that cannot compete with gas-fired and renewable generation. In light of this, some states in restructured markets have enacted policies to assist or procure certain resources outside of the market.

These actions by states, regardless of their motivation, have implications for wholesale energy and capacity markets and determining how to respond to them is complicated. While FERC respects state authority, it is also obligated to ensure that rates in wholesale electricity markets are just and reasonable. In restructured states, competitive markets have led to increased efficiencies, environmental benefits, and reduced costs for consumers. Thus, a primary focus for FERC is ensuring that wholesale electricity markets continue to provide these benefits. At the same time, we recognize there is always room for improvement, and the Commission is willing to consider changes to market mechanisms that effectively balance the often competing interests of states, market participants, and consumers.

Today, numerous proceedings to address the impacts of state policy initiatives in wholesale electricity markets are pending before the Commission and federal courts. In mid-2017, following a series of complaints filed at FERC regarding out-of-market state subsidies, the Commission held a two day technical conference to explore the impacts of state policies on FERC-jurisdictional capacity markets. In addition, the Second and Seventh Circuits of the U.S. Court of Appeals have cases pending regarding the potential preemption of state Zero Emissions Credit (ZEC) programs.

Recently, the Commission approved a proposal by ISO-New England, Inc. to accommodate state-subsidized resources in its capacity market. As evidenced by a 3-2 vote and my separate statement, the Commission has varying views on how to address this issue going forward. Even so, it is time for the Commission to provide much needed certainty to market participants on this matter. The open proceedings discussed above provide the procedural vehicle through which the Commission can provide this regulatory certainty and ensure that it effectively responds to the changing marketplace.

Cybersecurity

The Commission takes seriously its role in protecting the nation's energy infrastructure, both from physical and cyber vulnerabilities. Pursuant to the Energy Policy Act of 2005 (EPAct 2005), the Commission is responsible for overseeing mandatory, enforceable reliability standards for the bulk power system. The reliability standards, which apply to the users, owners, and operators of the bulk power system, are developed by the North American Electric Reliability Corporation (NERC) in

consultation with stakeholders and approved by the Commission. The requirements pertaining to cybersecurity, the Critical Infrastructure Protection (CIP) standards, specify mandatory requirements for utilities, including: how to identify and categorize cyber assets and systems; processes and procedures for maintaining these systems; and ensuring that only appropriate personnel have access to these systems, among others.

Cybersecurity threats are continually evolving. In response, the Commission must remain vigilant in refining its standards and developing new standards to address emerging threats. Recent actions by the Commission include work by its Office of Electric Reliability (OER) initiating rulemaking proceedings to propose: (1) approving new mandatory reliability standards to bolster supply chain risk management protections for the grid; and (2) the development of a revised CIP standard to improve mandatory reporting of cybersecurity incidents.

In addition to developing reliability standards, the Commission conducts outreach to other federal agencies, state utility commissions, and the private sector on cyber related issues. Through its Office of Energy Infrastructure Security (OEIS), the Commission works with outside entities to help identify threats to energy infrastructure, share information, and promote voluntary mitigation practices that complement the mandatory security standards. Engaging with the community in this way, outside of a traditional FERC proceeding, facilitates a useful exchange information and sharing of best practices.

Agencies the Commission works with include the Department of Energy (DOE), the Department Homeland Security (DHS), the Federal Bureau of Investigation (FBI), the Nuclear Regulatory Commission (NRC), the Department of Defense (DOD), National Security Agency (NSA), U.S. Coast Guard (USCG), and the Transportation Safety Administration (TSA). The Commission assists these agencies in maintaining an awareness of emerging threats and the capabilities of adversaries who may initiate a cyber or physical attack on the nation's energy infrastructure.

One example of an interagency project the Commission was involved in is with USCG and TSA. The Cybersecurity Architecture Review program (Review Program) is a collaborative, non-regulatory approach that promotes secure and resilient infrastructure through the sharing of information and best practices. The goal of the Review Program is to gain a comprehensive understanding of an entity's overall cybersecurity posture, identify potential areas of concern, and articulate actionable recommendations and observations that promote positive change to the security of the organization.

The Commission also participates in DHS's National Cybersecurity Communications and Integration Center, a round-the-clock center for cyber situational awareness, incident response, and management, which serves as a national nexus of cyber and communication integration for the federal government, intelligence community, and law enforcement. At the state and regional level, OEIS staff provides targeted support and involvement with State Fusion Centers to assist with incidents and mitigation, as well as adoption of best practices using new approaches and technology.

The Commission, through its OEIS staff, also works with Information Sharing Analysis Centers (ISACs),[1] including NERC's E-ISAC (electric and hydroelectric), ONG-ISAC (oil and natural gas and LNG terminals), and DNG-ISAC (downstream natural gas facilities). Together with NERC's E-ISAC, the Commission has worked to initiate, develop, and issue security alerts and other vehicles (e.g., bulletins, blogs) to industry in near real-time to address cyber and physical security threats. Thus, the Commission makes interagency coordination a priority and participates extensively in intelligence-related collaboration efforts on cyber issues.

The Commission also plays a role in pipeline security. Pursuant to section 7 of the Natural Gas Act, the Commission reviews applications for construction and operation of interstate natural gas pipelines. Under this review, the Commission ensures that applicants certify that they will comply with Department of Transportation (DOT) safety standards. FERC itself has no jurisdiction over pipeline safety or security, but actively works with other agencies with safety and security responsibilities.

For example, the Commission has actively been engaged with TSA as they update their Pipeline Security Guidelines. TSA developed these guidelines to provide a security structure for pipeline owners and operators to voluntarily use in developing their security plans and programs. The guidelines also serve as a standard for TSA's pipeline security

[1] An ISAC is a nonprofit organization that provides a central resource for gathering information on cyber threats to critical infrastructure and providing two-way sharing of information between the private and public sector.

assessments. TSA is currently working with stakeholders to update these guidelines and the Commission has provided technical review and assistance.

The frequency of cyber and physical threats to the nation's energy infrastructure is only increasing. The Commission is aware of this and has made cyber and physical security a top priority. Through OER and OEIS, the Commission will continue to update its reliability standards and coordinate with its interagency partners to prevent cyber and physical security risks to jurisdictional energy infrastructure.

Chairman Upton, Ranking Member Rush, and members of the Subcommittee, thank you again for the opportunity to testify today. I look forward to answering your questions.