**Statement of**

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Chairman Murkowski, Ranking Member Cantwell, and members of the Committee, I am Phil Moeller of the Edison Electric Institute (EEI), and I thank you for the opportunity to speak before you today. EEI is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. In addition to our U.S. members, EEI has more than 60 international electric companies as International Members, and hundreds of industry suppliers and related organizations as Associate Members. I have previously addressed this Committee several times as a two-term member of the Federal Energy Regulatory Commission (FERC).

Thank you also for holding this hearing and focusing on perhaps the most unappreciated segment of our nation's vital infrastructure: the electric transmission grid. I was asked to provide a brief high-level history of how transmission developed in the nation, with an emphasis on lessons learned to inform future policy decisions.

First, why is this an important topic? Our nation's energy grid has been called the most complex machine in the world[1], and it serves as the bulk power backbone that delivers electricity instantly to more than 320 million customers. It is perhaps unappreciated because of its amazing reliability and its contribution to resiliency. According to the North American Electric Reliability Corporation (NERC), even with all the changes underway in the electricity sector, the bulk power system remains highly reliable and resilient, showing improved reliable performance year over year.[2]

[1] See Phillip F. Schewe, The Grid: A Journey Through the Heart of Our Electrified World (Joseph Henry Press 2006). See also Jack Casazza and Frank Delea, Understanding Electric Power Systems (Wiley-IEEE Press, 2d ed. 2010).
[2] Testimony of Gerry Cauley, Subcommittee on Energy, House Committee on Energy and Commerce, September 14, 2017. See also "State of Reliability 2017" (NERC, June 2017).

The nation's energy grid consists of some interconnections with Mexico and extensive connections with Canada, which has much more of a north to south delivery system with the United States than between the Provinces. It currently comprises three major "interconnections" consisting of roughly the Eastern two-thirds of the continent (the Eastern Interconnection), the rest of the continent (the Western Interconnection), and an interconnection within the boundaries of Texas known as the Electric Reliability Council of Texas (ERCOT). Under the Federal Power Act, Alaska and Hawaii are not considered part of this "bulk power" system.

Transmission serves such a vital role because it provides optionality similar to a robust system of highways for transportation. A robust transmission system alleviates costly congestion, provides access to lower-cost generation, increases the reliability and resiliency of electricity delivery, and can flexibly adapt to changes in public policy and sources of electricity generation. This optionality value comes at a surprisingly small cost: on average about 11 percent of the total amount of a customer's total electricity bill.[3]

Our transmission system was first developed more than 100 years ago as policy makers and energy companies realized that the optionality created by increased connectivity would provide greater reliability over a wider area and would provide access to more affordable electricity depending on the resources available over a larger transmission footprint. Of note, most providers of electricity were vertically integrated and owned generation, transmission, and the distribution network. The first "Power Pool" as it was known consisted of assets located in Pennsylvania, Maryland, and New Jersey and was formed in 1927. It was the predecessor to the "PJM Interconnection" that presently consists of transmission assets in 13 states and the District of Columbia.

After the formation of PJM, other power pools formed throughout the nation. Over the decades, the transmission system expanded as the nation grew and more electricity was produced at centralized power plants often located outside of metropolitan areas, leading to more affordable electricity. A pivotal event was the 1965 Northeast blackout that resulted in the loss of electricity service in several states and Ontario. This event highlighted the interconnected nature of the system and the need for better coordination, and led to the formation of NERC's predecessor in 1968. Voluntary standard operating procedures were developed.

Due in part to policies promoted in the 1992 Energy Policy Act, momentum grew during the 1990s to provide more wholesale electric competition. This was enabled by the concept of "open access", which allows generation assets to access the transmission network under comparable rates, terms, and conditions. Open access was the driving principle behind FERC's landmark Order No. 888, adopted in 1996. Order No. 888 led to the creation of Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs), essentially two

[3] U.S. Energy Information Administration, Annual Energy Outlook 2017, Reference Case, Table 8: Electrical supply, disposition, prices, and emissions.

terms describing the same concept: independent operators of regional transmission systems that implement the concept of open access through system operations and the rules that govern these operations. FERC revisited Order No. 888 in 2005, leading to an updated version of these policies focusing on transmission planning through the 2007 issuance of Order No. 890.

The 2003 blackout, affecting more than 50 million customers throughout the eastern United States and Ontario, highlighted the importance of transmission system standards and rules. Congress responded with language in the 2005 Energy Policy Act (EPAct 2005) directing FERC to designate an entity as the Electric Reliability Organization, the role that NERC has today. Since 2006, FERC has adopted scores of mandatory reliability standards that are developed in the NERC standard-setting process.

Seeking to end a two-decades-long period of underinvestment in transmission, Congress dedicated several sections of EPAct 2005 to promoting the expansion and modernization of the nation's energy grid. Among many other policy provisions, EPAct 2005 included a directive to FERC to incorporate specific transmission incentives, recognizing that capital investments in electric transmission infrastructure produce significant benefits for electric customers and society as a whole.

A period of transmission investment began. Recognizing that, from inception, major transmission facilities often take more than 10 years to complete, EEI's member companies invested $20.8 billion in transmission infrastructure in 2016 and expect to invest an additional $90 billion in the transmission system through 2020 to make it more efficient, more dynamic, and more secure and to continue to provide customers with the affordable, reliable, safe, and increasingly clean energy they need. However, looking at an aggregate national projection for investment does not mean all transmission needs are being met in all regions or that the level of investment is adequate, particularly as we look toward the future. Moreover, planned investment and actual investment are not the same; we have seen planned investments canceled.

In 2010, FERC released Order No. 1000, an attempt to create more competition in the transmission sector by promoting additional regional planning processes and requiring competitive bidding on certain projects within regions. Around the same timeframe, anticipated transmission investment slowed in response to a slower economy and reduced load growth. From my perspective, uncertainty over the implementation of Order No. 1000, along with uncertainty over the pace and extent of environmental regulations, contributes to the slowdown of expected transmission investment.

This is problematic. Looking forward, increased transmission investment is needed for both the expansion of the system to bring energy from new resources to demand centers and to maintain, enhance, and replace aging infrastructure. Much of the nation's transmission system is more than 40 years old, with some facilities many decades older.

EEI members are not advocating for additional federal funds for transmission investment, but rather increased certainty when proposing to make these significant, long-term infrastructure investments. Again, as these assets usually will be in use for 40 years or longer, increased certainty at the time of the investment, as well as over its long lifetime, is crucial.

Several factors have created uncertainties in the present investment climate. As stated earlier, the process of planning, siting, and constructing major transmission facilities often takes more than 10 years to complete. Siting and permitting reform is crucial for investment, as well as for effective operation and maintenance after facilities are built. These efforts should emphasize better coordination of state and federal agency reviews, with reasonable deadlines for agency action and increased decisional accountability. Congress can help by passing legislation to improve permitting and siting processes and other regulatory reviews under the National Environmental Policy Act (NEPA) and other statutes without undermining important environmental protections.

Specific areas for improvement include FERC hydropower relicensing, permitting and siting of transmission lines and natural gas pipelines, and vegetation management on and adjacent to rights-of-way across federal lands. The bipartisan Energy and Natural Resources Act (S. 1460) introduced by Chairman Murkowski and Ranking Member Cantwell includes provisions addressing many such energy infrastructure issues, as do other Senate and House bills.

FERC also can improve the climate of certainty by addressing several areas. Topping this list is the need to reform the process of estimating the allowed Return on Equity (ROE) for transmission investments, which is also necessary based on the DC Circuit's April 14, 2017, remand of Order No. 531. EEI, along with ScottMadden, recently has released a White Paper entitled "Transmission Investment: Revisiting the Federal Energy Regulatory Commission's Two-Step DCF Methodology for Calculating Allowed Returns on Equity." The paper outlines several options for FERC to create a more stable environment for the ROE component of these infrastructure investments.

Related, but separate from the issue of ROEs, is the future of transmission incentives mandated under EPAct 2005. Due to the formula currently in place for ROEs, incentives are often inappropriately capped. Incentives also have been reduced inappropriately or threatened after they have been awarded and after long-lived investment decisions have been made based on those very incentives. Because incentives are a key factor when transmission investments are made, certainty will be increased when FERC clarifies that previously approved incentives are allowed to remain in place.

FERC also can address the current practice of allowing multiple ongoing transmission rate complaint cases, often referred to as "serial" or "pancaking" of these cases. Under the Federal Power Act, the refund periods for transmission rate complaints specifically are limited to 15 months after cases are filed. Under current Commission processes, these cases rarely, if ever, are concluded within 15 months. In the absence of Commission determinations within 15 months, complaints subsequently have been filed shortly after the 15-month statutory limit,

effectively extending the refund period indefinitely. For the transmission owners in New England, this practice has led to uncertainty over the actual transmission rates and revenues dating back to 2011. My observation is that this outcome may not be in line with the original intent of Congress. This increased uncertainty places burdens on energy companies and customers, who ultimately face higher borrowing costs. EEI soon will release another White Paper suggesting ways FERC can address this ongoing practice that again creates uncertainty surrounding these major infrastructure investments.

In addition to the challenges of siting, permitting, and financing these infrastructure investments, figuring out who pays and how much, known as "cost allocation," is a challenging process. Over the lives of these investments, electric load will change and electricity flows change. Very generally, to the extent FERC can increase certainty in cost allocation formulas, investment certainty will increase.

Thank you again for the opportunity to testify before the Committee, and I look forward to any questions you may have.