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US Department of Energy
Office of the General Counsel
1000 Independence Avenue, SW
Room 6A245
Washington, DC 20585

Re: NBP RFI-Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy

The Telecommunications Industry Association (TIA) is pleased to provide comments on the communications requirements of electric utilities relevant to smart grid policy. TIA appreciates the proactive role the Department of Energy (DOE) is taking in executing the recommendations from the FCC in the National Broadband Plan. Electric utilities and the ICT industry share a long tradition of partnering to build and maintain the communications networks contributing to the security and reliability of the grid. Representing the ICT companies that innovate, manufacture and supply the ICT products and services that will make the smart grid a reality, TIA appreciates the opportunity to provide our perspective on the development of the smart grid.

While this RFI is primarily focused on communications requirements for utility-driven smart grid solutions, the DOE should also take into consideration the potential development of consumer-driven solutions with regard to consumer-facing smart grid devices. Initial smart grid projects will primarily be driven by utilities often working in partnership with third parties to provide standard offer home energy management

services for consumers on both sides of the meter. TIA sees the potential for the development of a consumer market for smart grid devices and solutions on the consumer's side of the meter, which will provide greater competition and innovation in how consumers interact with the grid. TIA recommends that the DOE in their review and development of smart grid policies and best practices leave open the opportunity for the development of a consumer market for devices and solutions on the consumer's side of the meter.

Technology Overview:

Electric utility smart grid communications requirements will vary significantly based on the function, geography, and service territory of each utility. Each utility will need to assess their technology requirements on a case by case basis. Because of the diversity of applications and the evolving nature of the smart grid, there is no single technology or platform best suited for smart grid applications. For each application, there is a choice of more than one technology that may be suitable depending on the needs of the utility. Smart grid deployments may include a combination of Private Wireless, Commercial Wireless, Unlicensed Mesh, Point to Point Microwave, Private Fiber, Leased Wireline, PLC, Land Mobile Radio and Satellite Communications based on application requirements, availability, and cost. These technologies can roughly be divided between those better suited for point-to-point core (e.g. Fiber and Microwave) or point-to-multipoint access (e.g. Unlicensed Mesh, Private/Commercial Wireless (WiMAX, LTE, CDMA 2000 EvDO, HSPA), Fiber, PLC or a customer's existing broadband connection) applications based on utility requirements for reliability, security, latency, bandwidth, coverage and cost of deployment. In short, there are a multitude of technologies that can

compete and are actively competing to provide smart grid solutions, and utilities will adopt technologies based on their requirements.

In addressing the current and future smart grid communications needs for electric utilities, TIA recommends that the DOE take into account the following points addressing questions raised in the National Broadband Plan RFI and in comments:

Technology Neutrality Across an Open Smart Grid Architecture is Critical for Innovation of Smart Grid Solutions

At this early stage, it is impossible to predict which technology or combination of technologies will ultimately be the most successful. TIA recommends that federal and state governments either through the policy-making, regulatory or standards-setting process avoid excluding viable technologies or architectures and instead focus on the coexistence and interoperability of a group of viable technologies. As we have seen at the early stages of other developing technologies, technology neutrality is critical to create an ecosystem of competition and innovation. Technology neutrality will lead to increased innovation in smart grid technologies, increased options for a range of customer needs and preferences, and provide a reliable and secure grid that reduces energy consumption and costs for consumers. Allowing multiple technologies to compete to achieve the goals of a smart grid will increase investment in the market, spur more innovation in products and solutions, and future proof the grid allowing it to realize its potential. An open architecture where multiple interoperable technologies can coexist and compete is the most beneficial approach for both consumers and the development and deployment of the smart grid in the short and long term.

Internet Protocol Should be the End-to-End Network Layer for Smart Grid Communications

TIA recommends the use of Internet Protocol (IP) as an end-to-end network layer for smart grid communications where feasible. IP has many qualities ideal for the development of the smart grid:

- IP is secure with a proven and mature system of cybersecurity tools and applications.
- IP is interoperable, which minimizes costs and discourages technology silos.
- IP is reliable and self-healing as the technology will automatically avoid failed transmission links to ensure delivery of communications.
- IP is scalable and flexible allowing for loose coupling between the physical communications network and the applications on the network regardless of the underlying physical infrastructure.

The flexibility and maturity of IP as a network layer will enable competition between multiple technologies and platforms to provide interoperable smart grid solutions while enhancing the security of the grid.

Advanced Metering Infrastructure (AMI) Will Need to Transition from Use of Unlicensed Mesh to Broadband as Data Rate Requirements Increase

Utilities currently rely significantly on 900 MHz Unlicensed Mesh for basic Advanced Metering Infrastructure (AMI) for last-mile communications to customer premises. Unlicensed Mesh is a cost effective, point-to-multipoint technology in high density urban and suburban deployments because of the short distance between meters. Basic AMI functions like meter reading can currently be accommodated on 900 MHz Unlicensed Mesh as they are delay-insensitive, lower bandwidth and require significantly lower data rates than other smart grid applications. As AMI becomes more advanced, however, increased data rate requirements and potential spectrum interference in unlicensed bands will present challenges for the use of 900 MHz Unlicensed Mesh for

future smart grid applications and will require migration to other wireless technologies that support broadband communications.

Existing Licensed Spectrum is Inadequate to Support Future Smart Grid Applications

Wireless broadband is an essential technology for the current and future operation of the smart grid. Utilities have stated a strong preference to transition to wireless broadband smart grid systems where possible, citing coverage, low cost of deployment and proven reliability during storm events. Technology advances in wireless broadband are improving latency and increasing data rates, enabling the technology to be used to serve more critical core grid functions.

TIA believes that existing licensed spectrum for utilities is inadequate to support core smart grid applications. Availability of more licensed spectrum for broadband will become critical as smart grid applications require more bandwidth. TIA believes that the DOE needs to work with the FCC to develop a path forward to increase availability of licensed spectrum for wireless broadband applications, taking into account the spectrum needs that will arise from smart grid developments.

Carrier Networks will Become an Increasingly Important Option for Smart Grid Deployments

TIA believes utilities will rely on commercial networks for many low risk and high capacity smart grid applications such as AMI and electric vehicles. Improvements in wireless technology and carrier-utility service level agreements will make carrier networks a significant resource for utility smart grid deployments. With a demonstrated

record of incorporating robust cybersecurity into their networks, carrier networks are able to meet the security requirements for smart grid applications.

Policymakers Should Seek Technical Expertise from a Qualified and Neutral Third Party in Decisions Relating to Cybersecurity

By addressing cybersecurity early in the process, smart grid stakeholders can benefit by instituting optimal security policies and principles prior to the deployment of new technologies. Cybersecurity requires significant resources and ongoing management to mitigate current and developing threats. Utility regulators can benefit from best practices developed in other industries such as finance and healthcare that rely on ICT to protect assets and information.

On technical matters, TIA encourages policymakers and utility regulators to seek the opinion of a qualified and neutral third party when evaluating and rendering smart grid decisions that involve ICT. The convergence of ICT and energy services represents a major transformation of our energy infrastructure and TIA believes that consumers would be best served if the capabilities of ICT are well understood by regulators and leveraged where appropriate. In particular, the technical aspects of securing smart grid and smart meter communications and protecting customer data are highly complex. Smart grid decisions based on inadequate information may result in system vulnerabilities that negatively impact the reliability of energy services, the privacy of consumers, and the ability of the smart grid to deliver on its full potential. It may further result in undesirable post-deployment costs to remediate security shortcomings that could have been avoided through an independent information security assessment during the planning stage. Seeking the opinion of a qualified, neutral third party is an industry best

practice in the ICT sector, and it is well established practice among many utility regulatory bodies.

DOE Funding for Both R&D and Off the Shelf Smart Grid Deployments will Serve as an Important Catalyst for the Smart Grid Market

TIA encourages additional funding for the DOE for both R&D and off the shelf smart grid deployments. The DOE received 565 applications totaling requests of $14.6 Billion USD for the Smart Grid Investment Grant (SGIG) program and the Smart Grid Demonstration program, which were only budgeted $4.5 Billion. The initial funding provided significant stimulus and investment in the smart grid market, and TIA encourages additional funding in both R&D and actual deployments.

Conclusion

TIA appreciates this opportunity to provide our perspective on the the smart grid and looks forward to working with the DOE and other stakeholders moving forward.

Respectfully Submitted,

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