Before the
Department of Energy

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

REPLY COMMENTS OF T-MOBILE USA, INC.

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REPLY COMMENTS OF T-MOBILE USA, INC.

T-Mobile USA, Inc. ("T-Mobile") hereby submits these reply comments in response to the above-captioned Request for Information ("RFI")[1] issued by the Department of Energy ("DOE"). T-Mobile appreciates the opportunity to submit reply comments and commends the DOE for undertaking a comprehensive examination of the communications requirements necessary to deploy smart grid technology so consumers can experience the full breath of benefits that smart grid can offer, including environmental, public safety, economic growth and expanded broadband into unserved areas. T-Mobile supports the previous commenters who recognize that existing commercial wireless networks, built and operated by commercial wireless providers, are the best choice for achieving these goals with immediate benefits for consumers.[2]

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[1] *See* Request for Public Comment on the Department of Energy's Implementation of the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy, 75 Fed. Reg. 26206, 26208 (2010) ("Request for Information"); *see also* Notice of Department of Energy Extending Deadline for Submission of Smart Grid RFI Reply Comments to August 9, 2010.

[2] *See generally, e.g.,* Comments of AT&T, Inc., *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy,* dated July 12, 2010 ("AT&T Comments"); Comments of Verizon and Verizon Wireless, *In the*
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Use of commercial wireless networks can meet the stated goals of smart grid in a more cost efficient and operationally effective manner than the deployment of private networks as proposed by various utilities in this proceeding. Consumers of both utilities and wireless services, would benefit from the adoption of policies that support use of the core competencies and efforts of commercial wireless providers to partner with utilities to advance smart grid technology. Failure to consider and adopt policies that acknowledge the tangible benefits of utilizing existing commercial wireless networks will hinder and unnecessarily delay the objectives articulated for smart grid deployment by the Obama Administration and federal agencies.

I. INTRODUCTION

T-Mobile is the fourth largest nationwide facilities-based wireless service provider with approximately 33 million customers nationwide. As a leading communications provider, T-Mobile can offer extensive experience to utilities in building, operating and upgrading a communications network for the deployment of smart grid technologies throughout the United States. Contrary to assertions of utility commenters, existing communications providers' networks are considerably more reliable and secure than the facilities currently being built by utilities for smart grid pilot programs. And, communications providers' networks are far more cost effective, resulting in significant savings and benefits for consumers.

Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy, dated July 12, 2010 ("Verizon Comments"); CTIA Comments, *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy,* dated July 12, 2010 ("CTIA Comments").

As an existing commercial provider, T-Mobile has been actively involved in developing smart meter technology that uses SIM cards and transmitters embedded in meters to transmit information on electricity usage and outages to electric utilities over T-Mobile's network.[3] The SIM cards can be embedded in many different intelligent devices (such as reclosers, switches, and capacitor banks), allowing utilities to monitor and control them while using and leveraging T-Mobile's existing network footprint, communications infrastructure, and licensed frequencies to provide integrated network energy services for all smart grid applications.

To enhance its goal in partnering with utilities, T-Mobile has strategically partnered with Echelon Corporation, a company with extensive worldwide experience offering Advanced Metering Infrastructure ("AMI") and other smart grid services. Echelon uses carriers' IP-based networks for communications between a utility company and its Smart Grid devices.[4] Additionally, T-Mobile has partnered with SmartSynch to offer a point-to-point solution, which would work well in dense and more sparsely populated areas.

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[3] *See* CNet News, *T-Mobile Goes for Smart Grid*, dated April 23, 2009, (recognizing T-Mobile's announcement of embedded SIM to be used for smart grid technology), http://news.cnet.com/8301-1035_3-10226418-94.html.

[4] Echelon has already deployed and tested its smart metering solution --- Networked Energy Services ("NES") System with over 100 utilities around the world, including Duke Energy, Vattenfall in Sweden, E.ON in Sweden, NUON in the Netherlands, and Enel in Italy.

II. EXISTING COMMERCIAL WIRELESS PROVIDERS HAVE IN PLACE NETWORKS THAT ARE WELL POSITIONED TO EXCEED THE COMMUNICATIONS REQUIRED FOR SUCCESSFUL DEPLOYMENT OF SMART GRID

Several of the utilities' comments, including Utilities Telecom Council ("UTC"), have claimed that use of existing commercial wireless networks cannot meet the needs of utilities and, therefore, it is necessary for utilities to have access to dedicated licensed spectrum to effectively deploy smart grid technologies.[5] This claim is unfounded and fails to provide any specific examples of how existing commercial networks are not meeting the goals and objectives to deploy smart grid technology. No commenter references an example where a utility had launched a smart grid pilot using an existing commercial network with unsuccessful results. In contrast, several utilities are in fact experiencing difficulties in launching smart grid plans due, in some part, to the difficulties with the communications technology deployed.[6]

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[5] *See generally, e.g.,* Comments of Pepco Holdings, Inc., *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy,* dated July 12, 2010 ("Pepco Comments"); Comments of San Diego Gas & Electric Company, *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy,* dated July 12, 2010 ("SDG&E Comments"); Comments of Baltimore Gas & Electric, *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy,* dated July 12, 2010 ("BG&E Comments").

[6] *See generally,* Letter of Hawaiian Electric Company, Inc., Docket # 2008-0303: Hawaii Electric Light Company, Inc., Maui Electric Company, Ltd. for Approval of the Advanced Metering Infrastructure (AMI) Project and Request to Commit Capital Funds, to Defer and Amortize Software Development Costs, to Begin Installation of Meters and Implement Time-of-Use Rates, for approval of Accounting and Ratemaking Treatment, dated May 4, 2010 (discussing some technology issues relating to building out private network using Sensus Metering Systems, Inc.; *see also* Hawaii Public Utilities Commission Order Closing Docket, Docket #2008-0303, Hawaii Electric Light Company, Inc., Maui Electric Company, Ltd. for Approval of the Advanced Metering Infrastructure (AMI) Project and Request to Commit Capital Funds, to Defer and Amortize Software Development Costs, to Begin Installation of Meters and Implement Time-of-Use Rates, for approval of Accounting and Ratemaking Treatment, dated July 26, 2010 (denying Hawaiian Electric permission to continue a pilot AMI rollout, requesting instead that the utility complete a detailed smart grid plan). *See generally, In the Matter of the Application of Public Service Company of Colorado For An Order Approving a Smart Grid City CPCN,* Docket No. 10A-124E
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Most of the commenters' concerns in using existing networks focused on three general areas: network reliability/quality of service, coverage, and security of networks. T-Mobile appreciates the importance of these concerns since they are identical to T-Mobile's existing efforts to address the ever-growing and specific needs of its own customers in the competitive marketplace, including customers in the government and financial sectors, who rely on its services. T-Mobile can further partner with utilities and meet each of the utilities concerns in a manner that is beneficial for all consumers, including utility customers who are required to pay for the deployment of smart grid.

A. Network Reliability/Quality of Service

Commenters have provided extensive evidence of the reliability of commercial networks.[7] Commercial wireless networks have redundant systems and disaster recovery protocols in place for emergency events.[8] T-Mobile's facilities, for example, employ various tools to ensure the reliability of the network, including, but not limited to, battery back-up at cell sites, dedicated generators and fuel supply at mobile switching centers, and routine access to a dispatch of generators, cells on wheels and more. T-Mobile's switching stations also maintain spare equipment inventory for critical network elements. In contrast to the specialized networks, run by entities that have a different core business, T-Mobile's and other wireless carriers' core

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(requiring utility to file CPCN due to significant costs and request to increase rates). The SmartGrid City project in Boulder, CO has been recently cited to cost at least $42.1 million (originally thought to be $15.3 million), which doesn't even include operations and maintenance, which some projections are saying the project could cost in excess of $100 million. *See* Earth2Tech, *Smart Grid City is a Flop,* dated August 4, 2010, http://earth2tech.com/2010/08/04/smartgridcity-is-a-smart-grid-flop/.

[7] *See* AT&T Comments at pages 11-13; 15-19 (providing extensive details of how wireless carriers place highest level of importance on service quality and reliability of wireless networks); Verizon Comments at pages 10-12 (detailing extensive resources placed on ensuring reliability of networks).

[8] *Id.*

business depends on maintaining state-of-the-art equipment and ensuring its availability as needed. It would be difficult, if not close to impossible, for utilities to replicate these core competencies required of existing wireless carriers. Maintenance of such inventories by utilities, which lack such core competency, will increase the costs of operating private networks and thereby likely increase the assessments on utility consumers. In sum, it is a win-win for consumers if smart grid depends on a commercial network such as T-Mobile's, because they receive the most advanced services at a substantially lower cost than if utility companies attempted to duplicate T-Mobile's efforts.

B. Coverage

Almost all of the utilities have claimed they cannot use existing commercial networks due to lack of coverage in a utilities' given footprint.[9] As noted by CTIA, approximately 99.6 percent of the total U.S. population lives in a census block in which one or more operators offer mobile telephone services.[10] In areas where T-Mobile's network does not cover a utility's grid footprint, T-Mobile has commercially negotiated for the use of the utility's existing infrastructure as micro-tower sites (e.g. pole-attachments to utility distribution poles, transmission facilities) in exchange for the use of T-Mobile's commercial network. The employment of such terms and conditions ensures ubiquitous coverage within the utility footprint for both parties, as well as providing additional material benefits to both utility and wireless consumers. In particular, utility customers would receive the full benefit of smart grid

[9] *See e.g.*, SDG&E at page 24; Comments of Tacoma Public Utilities, *In the Matter of Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities to Inform Federal Smart Grid Policy*, dated July 12, 2010 ("Tacoma Comments") at pages 5-6.

[10] *See* CTIA Comments at page 8, *citing Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, WT Docket No. 08-27, *Thirteenth Report*, DA 09-54 (rel. WTB Jan. 16, 2009).

technology without paying for a utility-owned and privately-operated network. And, the utility customers would have immediate access to smart grid technology using licensed, encrypted spectrum. Further, in some instances, the commercial provider may be able to expand commercial wireless broadband services into underserved or unserved areas through a highly cost-efficient model that utilizes existing utility infrastructure.[11] In the end, commercial wireless providers can provide the ubiquitous coverage required by utilities with multiple benefits to the consumers of both smart grid technology and wireless services.

C. Security

Several commenters claim – without support – that existing commercial wireless providers do not meet the specialized security needs of electric utilities.[12] As explained in detail by CTIA, commercial wireless service providers have been operating secure networks for years and have developed the necessary protocols and safeguards to secure data transported on their networks.[13] T-Mobile operates a licensed network with encrypted spectrum, and is vigilant in protecting its network against cyberattacks by using cutting-edge technologies. In contrast, most utilities wanting to build private networks are on the verge of spending millions on smart grid deployment by relying on the use of unlicensed spectrum. Such unlicensed deployments can face significant interference problems because they would be required to avoid interference with any licensed operations and to accept interference from unlicensed operations such as baby

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[11] *See* Verizon Comments at page 1 (noting that use of existing wireless networks can increase deployment of broadband, especially in rural areas where it is difficult to make business case for build-out).

[12] SDG&E Comments at page 22.

[13] CTIA Comments at page 9.

monitors and cordless telephones in homes.[14] Moreover, the use of utility-based private networks would have increased risk and exposure to denial of service and man-in-the-middle attacks[15] and would be vulnerable to hacking because thousands of prewritten scripts are already available that can be accessed and used to exploit unlicensed networks.

Most of the utility commenters have asked the DOE to work with the FCC in recommending a separate allocation of 30 MHz of licensed spectrum solely for the use of smart grid to address some of the cybersecurity, interference and latency problems associated with use of unlicensed spectrum.[16] Not only is implementation of this allocation inefficient, as the amount of spectrum being asked for here is out of proportion to the types of uses needed, but it also takes spectrum away from other more bandwidth-intensive broadband needs at a time when spectrum is in high demand.[17] Commercial carriers can easily accommodate the limited bandwidth needs of utilities by managing and sharing spectrum in terms of time, geography and peak usage.

Utilities simply have no need to obtain additional spectrum for smart grid communications because, as explained above, commercial wireless networks, have sufficient

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[14] *See In the Matter of the Application of Baltimore Gas and Electric Company for Authorization to Deploy a Smart Grid Initiative and to Establish a Surcharge for the Recovery of Cost,* Maryland Public Commission, Case No. 9208, Order No. 83410, dated June 21, 2010, pages 36-37 (expressing concern with technology to be used in plan and risk of wireless interference and hacking of customer information).

[15] In denial of service attacks, hackers flood the network with so many data packets that they use up all of the network's resources and force it to shut down. In man in the middle attacks, a hacker places a rogue access point within range of wireless stations, causing wireless users to unknowingly connect to an unauthorized access point, giving the attacker valuable unauthorized information about the wireless network.

[16] *See* UTC Comments at page 1.

[17] *See generally*, Federal Communications Commission, National Broadband Plan, Chapter 5, Spectrum, released March 16, 2010 (recognizing spectrum as a scare resource and importance of government to ensuring efficient use of spectrum).

capacity, coverage and reliability to provide secure smart grid services for utilities and consumers.[18] With demands for new spectrum constantly increasing, it is neither necessary nor prudent to allocate additional spectrum for power utilities when commercial wireless providers can meet their smart grid needs.

III. PUBLIC COMMUNICATIONS NETWORKS ARE THE MOST COST EFFECTIVE AND ECO-FRIENDLY TECHNOLOGY OPTION TO IMPLEMENT SMART GRID

For consumers to fully benefit from the implementation of smart grid technology, it is essential that implementation be cost-effective, efficient and eco-friendly. CTIA's comments included estimates of the costs to build and manage a dedicated network used for the purposes of implementing smart grid.[19] As a facilities-based wireless service provider, T-Mobile has internally estimated that it would cost utilities nearly $11 million annually to keep a private network of approximately 1.5 million smart grid wireless connections operating smoothly, including $5.1 million in personnel and engineers; an additional $1.5 million for employee benefits; $3 million in repair and maintenance costs; $800,000 in vehicle expenses; and $564,000 for other costs associated with the management of a wireless network. Moreover, running a network would require an estimated 87,000 gallons of fuel each year. This adds up to $110 million over 10 years to manage a relatively small specialized network. As CTIA has noted, utility consumers, the ultimate payer for implementation of smart grid, could reap the benefits of these future technologies at a fraction of the costs if utilities use commercial wireless networks.

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[18] *See* CTIA Comments at pages 14-15.

[19] *See id.* at pages 12-13.

Utility ratepayers are just a segment of the consumers using public networks and that the costs of general purpose networks are shared among all sectors of society.[20]

The DOE's own publication sponsored by the Office of Electricity Delivery and Energy Reliability, titled *Smart Grid: An Introduction*, prepared in 2008, highlights the importance of ensuring that smart grid technology is efficiently implemented and promotes a more environmentally conscious future. In areas where commercial wireless networks cover a region served by multiple utility companies (*e.g.*, electric, water, gas), this could mean that multiple utilities are building their own private networks, imposing billions of unnecessary costs on consumers and releasing excessive carbon emissions to implement a technology that is intended to be implemented for the very purpose of reducing both energy consumption and carbon emissions.[21] Building out multiple private networks is contradictory to these goals due to the inefficiently of creating overlay broadband networks with the significant energy consumption required to maintain the same -- all at a cost to consumers. In the end, the most efficient and environmentally friendly solution for the deployment of smart grid technology is one that includes use of existing commercial wireless networks.

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[20] *Id.* (explaining how use of general purpose networks will cost electricity consumers significantly less compared to building and maintaining specialized networks such as the ones several utilities are in the process of building today).

[21] If multiple utility companies deploy communications networks using different technology and devices, there is a danger that each such network and the devices operating on those networks will not be able to talk to each other. Such inefficiencies can be avoided by using existing wireless networks such as T-Mobile's GSM network, an internationally recognized technology with approximately 4 billion users worldwide as of August 2009. *See* 3G America, *GSM Technologies to Reach 4 Billion Mobile Connections Worldwide*, dated August 2009, http://www.3gamericas.org/index.cfm?fuseaction=pressreleasedisplay&pressreleaseid=2451.

IV. CONCLUSION

There is no reason that utility consumers should absorb the costs of expensive private networks when many of these costs are unnecessarily duplicative of investments already being made by today's commercial wireless providers within their existing commercial networks. T-Mobile and other wireless carriers can deliver a reliable and secure network within a given utility's footprint at a competitive price, allowing consumers to reap the full benefits of smart grid technology.

Respectfully submitted,

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