PUBLIC NOTICE

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COMMENT SOUGHT ON THE IMPLEMENTATION OF SMART GRID TECHNOLOGY
NBP Public Notice #2

PLEADING CYCLE ESTABLISHED

GN Docket Nos. 09-47, 09-51, 09-137

Comment Date: October 2, 2009

In the American Recovery and Reinvestment Act of 2009 (Recovery Act), Congress directed the Commission, in its development of a National Broadband Plan, to include "a plan for the use of broadband infrastructure and services in advancing . . . energy independence and efficiency."[1] Smart Grid technology has been identified as a promising way to use broadband and other advanced communications to promote energy efficiency,[2] reduce greenhouse gas emissions,[3] and encourage energy independence.[4] Parties commenting on the *National Broadband Plan NOI* have described other potential benefits of Smart Grid technology, including the creation of new jobs,[5] increased network performance and reliability,[6] and the advancement of new, environmentally-friendly technologies.[7] Accordingly, we seek tailored comment on how advanced infrastructure and services could help achieve efficient implementation of Smart Grid technology.

1. **Suitability of Communications Technologies.** Smart Grid applications are being deployed using a variety of public and private communications networks. We seek to better understand which communications networks and technologies are suitable for various Smart Grid applications.

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[1] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Stat. 115 (2009) (Recovery Act).

[2] *See, e.g.*, Eric Lightner, Presentation at the Energy, Environment, and Transportation Broadband Workshop (Aug. 25, 2009) (presentation available at http://www.broadband.gov/docs/ws_eng_env_trans/ws_eng_env_trans_lightner.pdf); Eric Miller, Presentation at the Energy, Environment, and Transportation Broadband Workshop (Aug. 25, 2009) (presentation available at http://www.broadband.gov/docs/ws_eng_env_trans/ws_eng_env_trans_miller.pdf); Future of Privacy Forum Comments at 10; Dell Comments at 16.

[3] *See, e.g.*, Communications Workers of America (CWA) Comments at 32; Digital Energy Solutions Campaign Comments at 1-2; Intel Comments at 14-15.

[4] *See, e.g.*, NASUCA Comments at 77; Alcatel-Lucent Comments at 23.

[5] *See, e.g.*, Motorola Comments at 35; CWA Comments at 32.

[6] *See, e.g.*, Mark Dudzinski, Presentation at the Energy, Environment, and Transportation Broadband Workshop (Aug. 25, 2009) (presentation available at http://www.broadband.gov/docs/ws_eng_env_trans/ws_eng_env_trans_dudzinski.pdf); National Rural Electric Cooperative Association Comments at 14.

[7] *See, e.g.*, Utilities Telecom Council and the Edison Electric Institute Comments at 5; Motorola Comments at 35; Joby Lafky, Presentation at the Energy, Environment, and Transportation Broadband Workshop (Aug. 25, 2009) (presentation available at http://www.broadband.gov/docs/ws_eng_env_trans/ws_eng_env_trans_lafky.pdf).

a. What are the specific network requirements for each application in the grid (e.g., latency, bandwidth, reliability, coverage, others)? If these differ by application, how do they differ? We welcome detailed Smart Grid network requirement analyses.
b. Which communications technologies and networks meet these requirements? Which are best suited for Smart Grid applications? If this varies by application, why does it vary and in what way? What are the relative costs and performance benefits of different communications technologies for different applications?
c. What types of network technologies are most commonly used in Smart Grid applications? We welcome detailed analysis of the costs, relative performance and benefits of alternative network technologies currently employed by existing Smart Grid deployments, including both "last mile," backhaul, and control network technologies.
d. Are current commercial communications networks adequate for deploying Smart Grid applications? If not, what are specific examples of the ways in which current networks are inadequate? How could current networks be improved to make them adequate, and at what cost? If this adequacy varies by application, why does it vary and in what way?
e. How reliable are commercial wireless networks for carrying Smart Grid data (both in last-mile and backhaul applications)? Are commercial wireless networks suitable for critical electricity equipment control communications? How reliably can commercial wireless networks transmit Smart Grid data during and after emergency events? What could be done to make commercial wireless networks more reliable for Smart Grid applications during such events? We welcome detailed comparisons of the reliability of commercial wireless networks and other types of networks for Smart Grid data transport.

2. **Availability of Communications Networks.** Electric utilities offer near universal service, including in many geographies where no existing suitable communications networks currently exist (for last-mile, aggregation point data backhaul, and utility control systems). We seek to better understand the availability of existing communications networks, and how this availability may impact Smart Grid deployments.
    a. What percentage of electric substations, other key control infrastructure, and potential Smart Grid communications nodes have no access to suitable communications networks? What constitutes suitable communications networks for different types of control infrastructure? We welcome detailed analyses of substation and control infrastructure connectivity, potential connectivity gaps, and the cost-benefit of different alternatives to close potential gaps.
    b. What percentage of homes have no access to suitable communications networks for Smart Grid applications (either for last-mile, or aggregation point connectivity)?
    c. In areas where suitable communications networks exist, are there other impediments preventing the use of these networks for Smart Grid communications?
    d. How does the availability of a suitable broadband network (wireless, wireline or other) impact the cost of deploying Smart Grid applications in a particular geographical area? In areas with no existing networks, is this a major barrier to Smart Grid deployment? We welcome detailed economic analyses showing how the presence (or lack) of existing communications networks impacts Smart Grid deployment costs.

3. **Spectrum.** Currently, Smart Grid systems are deployed using a variety of communications technologies, including public and private wireless networks, using licensed and unlicensed spectrum. We seek to better understand how wireless spectrum is or could be used for Smart Grid applications.
    a. How widely used is licensed spectrum for Smart Grid applications (utility-owned, leased, or vendor-operated)? For which applications is this spectrum used? We welcome

detailed analyses of current licensed spectrum use in Smart Grid applications, including frequencies and channels.

b. How widely used is unlicensed spectrum? For which applications is this spectrum used? We welcome detailed analyses of current unlicensed spectrum use in Smart Grid applications, including frequencies and channels.
c. Have wireless Smart Grid applications using unlicensed spectrum encountered interference problems? If so, what are the nature, frequency, and potential impact of these problems, and how have they been resolved?
d. What techniques have been successfully used to overcome interference problems, particularly in unlicensed bands?
e. Are current spectrum bands currently used by power utilities enough to meet the needs of Smart Grid communications? We welcome detailed studies and discussion showing that the current spectrum is or is not sufficient.
f. Is additional spectrum required for Smart Grid applications? If so, why are current wireless solutions inadequate?
    i. Coverage: What current and future nodes of the Smart Grid are not and will not be in the coverage area of commercial mobile operators or of existing utility-run private networks? We welcome detailed descriptions of the location, number and connectivity required of each node not expected to be in coverage.
    ii. Throughput: What is the expected throughput required by different communications nodes of the Smart Grid, today and in the future, and why will/won't commercial mobile networks and/or private utility owned networks on existing spectrum be able to support such throughputs? We welcome detailed studies on the location and throughput requirements and characteristics of each communications node in the Smart Grid.
    iii. Latency: What are the maximum latency limits for communications to/from different nodes of the Smart Grid for different applications, why will/won't commercial mobile networks be able to support such requirements, and how could private utility networks address the same challenge differently?
    iv. Security: What are the major security challenges, and the relative merits and deficiencies of private utility networks versus alternative solutions provided by commercial network providers, such as VPNs? Do the security requirements and the relative merits of commercial versus private networks depend on the specific Smart Grid application? If so, how?
    v. Coordination: Are there benefits or technical requirements to coordinate potential allocation of spectrum to the Smart Grid communications with other countries? What are they?
    vi. Spectrum allocation: Are there any specific requirements associated with Smart Grid communications that require or rule out any specific band, duplexing scheme (e.g., FDD vs TDD), channel width, or any other requirements or constraints?
g. If spectrum were to be allocated for Smart Grid applications, how would this impact current, announced and planned Smart Grid deployments? How many solutions would use allocated spectrum vs. current solutions? Which Smart Grid applications would likely be most impacted?

4. **Real-time Data.** The Smart Grid promises to enable utility companies and their customers to reduce U.S. energy consumption using a variety of technologies and methods. Some of the most promising of these methods use demand response, in which utility companies can directly control loads within the home or business to better manage demand, or give price signals to encourage load shedding. Other methods reduce energy consumption simply by providing consumers access

to their consumption information, via in-home displays, web portals, or other methods. Central to all of these techniques is energy consumption and pricing data.

a. In current Smart Meter deployments, what percentage of customers have access to real-time consumption and/or pricing data? How is this access provided?
b. What are the methods by which consumers can access this data (e.g., via Smart Meter, via a utility website, via third-party websites, etc.)? What are the relative merits and risks of each method?
c. How should third-party application developers and device makers use this data? How can strong privacy and security requirements be satisfied without stifling innovation?
d. What uses of real-time consumption and pricing data have been shown most effective at reducing peak load and total consumption? We welcome detailed analyses of the relative merits and risks of these methods.
e. Are there benefits to providing consumers more granular consumption data? We welcome studies that examine how consumer or business behavior varies with the type and frequency of energy consumption data.
f. What are the implications of opening real-time consumption data to consumers and the energy management devices and applications they choose to connect?

5. **Home Area Networks**. We seek to understand the ways in which utilities, technology providers and consumers will connect appliances, thermostats, and energy displays to each other, to the electric meter, and to the Internet.

a. Which types of devices (e.g., appliances, thermostats, and energy displays, etc.) will be connected to Smart Meters? What types of networking technologies will be used? What type of data will be shared between Smart Meters and devices?
b. Which types of devices (e.g., appliances, thermostats, and energy displays, etc.) will be connected to the Internet? What types of networking technologies will be used? What type of data will be shared between these devices and the Internet?
c. We welcome analyses that examine the role of broadband requirements for Home Area Networks that manage energy loads or deliver other energy management services.

This matter shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules. *See* 47 C.F.R. §§ 1.1200, 1.1206. Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations and not merely a listing of the subjects discussed. More than a one- or two-sentence description of the views and arguments presented generally is required. *See* 47 C.F.R. § 1.1206(b). Other rules pertaining to oral and written *ex parte* presentations in permit-but-disclose proceedings are set forth in section 1.1206(b) of the Commission's rules, 47 C.F.R. § 1.1206(b).

All comments should refer to GN Docket Nos. 09-47, 09-51, and 09-137. Please title comments responsive to this Notice as "Comments—NBP Public Notice #2." Further, we strongly encourage parties to develop responses to this Notice that adhere to the organization and structure of the questions in this Notice.

Comments may be filed using (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies.[8] Comments filed through the ECFS can be sent as an electronic file via the Internet to http://www.fcc.gov/cgb/ecfs/

[8] *See* Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24121 (1998).

or the Federal eRulemaking Portal: http://www.regulations.gov .[9] Generally, only one copy of an electronic submission must be filed. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form." A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four copies of each filing.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- The Commission's contractor will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

- U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, S.W., Washington, D.C. 20554.

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For further information about this Public Notice, please contact Randy Clarke at (202) 418-1500.

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[9] Filers should follow the instructions provided on the Federal eRulemaking Portal website for submitting comments.