

April 18, 2018

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Ex Parte* Letter: *Promoting Investment in the 3550-3700 MHz Band* –
GN Docket No. 17-258

Dear Ms. Dortch:

The American Petroleum Institute (“API”), Edison Electric Institute, Enterprise Wireless Association, the General Electric Company (“GE”), pdvWireless, Inc., the Port of Los Angeles, Southern Linc, the Utilities Technology Council (“UTC”), and Union Pacific (collectively, the “IIoT Coalition”)¹ hereby address key issues in the Commission’s pending proceeding on the 3.5 GHz Citizens Broadband Radio Service (“CBRS”) band and ongoing industry compromise discussions on a revised licensing framework for CBRS.² The Commission should maintain a CBRS licensing approach that enables industrial and critical-infrastructure entities and other non-traditional users to access meaningful amounts of 3.5 GHz spectrum throughout the United States, including in urban, suburban, rural, and remote locations. Specifically, the IIoT Coalition believes that in any revised CBRS framework, there should be at least three census-tract Priority Access Licenses (“PALs”) available in all areas of the United States.³ Most industry participants in compromise negotiations have been open to considering a minimum, reasonable level of census-tract licensing in the CBRS band, and, as discussions move forward, the IIoT Coalition urges *all* parties to work cooperatively toward a compromise solution that both provides benefits to and imposes costs on *all* parties.

¹ Attached at Exhibit A is additional information regarding the industry associations participating in the IIoT Coalition, including lists of their member companies where publicly available.

² See *Promoting Investment in the 3550-3700 MHz Band*, Notice of Proposed Rulemaking and Order Terminating Petitions, 32 FCC Rcd 8071 (2017) (“*NPRM*”).

³ While API and UTC generally support this IIoT Coalition letter, they believe that in order to realize sufficiently robust IIoT applications and services, there should be at least four census-tract PALs in all areas of the United States. In order to secure a fourth census-tract PAL in all areas, API and UTC would support the re-designation of 10 megahertz of GAA spectrum to interference-protected PAL usage. In this scenario, there would be enough spectrum for four census-tract PALs and four large-area PALs.

Support for the existing CBRS licensing framework. The IIoT Coalition strongly supports the Commission’s existing geographic licensing approach in the CBRS band, as its members have made clear in their filings in this proceeding. With full census-tract licensing at 3.5 GHz, the CBRS band is an ideal spectrum platform for the “Industrial Internet of Things” (“IIoT”). Under the current licensing rules, industrial and critical-infrastructure entities will be able to use their own licensed 3.5 GHz spectrum to “self-provision” IIoT wireless connectivity over geographically targeted, private TDD-LTE networks, rather than having to rely solely on commercial wireless carriers’ licensed spectrum and services. Self-provisioned private wireless networks at 3.5 GHz will allow industrial and critical-infrastructure entities to promote innovation, minimize costs, control service quality, optimize network performance, and enhance safety and security, including by protecting against foreign hacking efforts intended to disrupt American critical infrastructure. The 3.5 GHz band – the “Innovation Band” – can serve as a unique catalyst for accelerated growth in the U.S. industrial, manufacturing, and critical-infrastructure sectors and throughout the American economy more generally. As the Commission considers various licensing approaches for CBRS, the Commission should recognize that its “Innovation Band” at 3.5 GHz has been a dramatic success so far, triggering a surge in wireless industry involvement by non-traditional participants and sparking new investment and commercial activity, innovative business models, digital infrastructure development, and collaboration between stakeholders.

Unfortunately, just two years after its 2015 order on CBRS,⁴ the Commission last fall proposed to abandon its census-tract licensing approach and shift to Partial Economic Area (“PEA”)-based licensing in the CBRS band. The vast majority of interested parties in this proceeding – including IIoT Coalition members and other parties collectively representing a wide swath of the U.S. economy – has opposed this move to larger-area licensing and continues to support census-tract licensing in this band. In response, the Commission in recent meetings with industry representatives has strongly encouraged stakeholders to enter into discussions and seek agreement on a multi-party compromise framework for CBRS licensing that the Commission can consider. Given the importance of CBRS to the IIoT, GE has over the past several months eagerly and actively participated in various compromise negotiations with numerous other parties, including rural broadband providers, wireless carriers, cable operators, and technology companies. Its role in this process has been to represent the interests of the American industrial and critical-infrastructure sectors. Most parties have taken part in these discussions with the view that a genuine compromise will allow each stakeholder group to obtain value from the solution, but acknowledging that it necessarily means they will give something up in the process. Certainly, a balanced outcome will provide benefits to and impose costs on all participating industry stakeholders.

Need for some census-tract licensing in all areas of U.S. In the various compromise negotiations to date, industry participants have discussed potential “hybrid” licensing approaches

⁴ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (“2015 Order”).

for CBRS in which some combination of census-tract PALs and larger-area PALs (such as PEA-based, county-based, or “urban cluster”-based licenses) is made available at auction. In certain discussions, parties have considered different hybrid structures in “urban” and “non-urban” (or “rural”) areas of the United States.⁵ The IIoT Coalition strongly supports a CBRS licensing approach that preserves spectrum accessibility for non-traditional users throughout the country, even if some amount of census-tract PALs are replaced with larger-area licenses. In particular, industrial and critical-infrastructure entities operate facilities in a diversity of urban, suburban, rural, and remote locations and have an urgent need for licensed spectrum in all types of geographic areas.⁶ **Accordingly, the IIoT Coalition believes that any true and fair compromise and revised CBRS framework adopted by the Commission must feature no fewer than three census-tract PALs in all areas of the United States.** This result would accommodate the basic spectrum needs of industrial and critical-infrastructure entities, rural broadband operators, enterprise solution providers, and commercial real estate interests while also meeting the needs of commercial wireless carriers and other parties that desire larger license areas.⁷

Ideally, industrial and critical-infrastructure entities would be able to access 40 megahertz of licensed CBRS spectrum in any area of the United States, given that significant bandwidth will be required to support next-generation IIoT services and applications such as HD video, imaging, audio, and other high-throughput content generated by new infrastructure inspection and monitoring technologies. Certainly, a shift from seven census-tract PALs (70 megahertz) to just three census-tract PALs (just 30 megahertz) in some areas would clearly impose costs and limitations on the industrial and critical-infrastructure sector, potentially restricting the scale and scope of the IIoT in affected regions. Given the urgent need for compromise in this proceeding, however, the IIoT Coalition is willing to accept substantially reduced census-tract licensing overall, as long as there is a minimum of three census-tract PALs available in all areas. In this scenario, industrial and critical-infrastructure entities (and other non-traditional users) would at least have an opportunity to compete for and obtain the foundation of CBRS spectrum needed for meaningful IIoT services and applications.⁸ With creative spectrum use at 3.5 GHz, industrial

⁵ In the various compromise discussions, there have been differing views and definitions regarding what constitutes an “urban” area. Different geographic models include varying amounts of geographic territory in the “urban” area category.

⁶ These industrial and critical-infrastructure operators include entities involved in power generation and distribution, oil and gas, critical manufacturing, health care, maritime port operations, freight rail, and aviation.

⁷ Industrial and critical-infrastructure entities of course do not represent the only category of entity that will seek CBRS spectrum to meet their commercial or organizational needs in all parts of the United States, including urban areas. Geographically-targeted CBRS deployments in urban areas are also likely to occur at schools, universities, hotels and resorts, commercial real estate locations, stadiums, arenas, and race tracks.

⁸ The IIoT Coalition is aware that concerns have been expressed regarding potential auction complexity resulting from a hybrid licensing approach, where geographic licenses of differing

and critical-infrastructure operators could hopefully achieve the bandwidth necessary to take advantage of ongoing advances in safety inspection, remote control, and performance and monitoring technologies, edge computing capabilities, and cloud-based Big Data predictive analytics.⁹

Census-tract licensing in compromise discussions. During compromise discussions, the industrial and critical-infrastructure sectors have emphasized the importance of maintaining a reasonable level of census-tract PAL licensing throughout the United States, so that industrial and critical-infrastructure entities have reasonable access to licensed CBRS spectrum where and when they need it. Most of the varied stakeholders groups and individual companies in these negotiations have understood this position and were at least willing to discuss and consider solutions involving some minimum level of census-tract licensing across all geographies, including urban areas. Unfortunately, some stakeholders have insisted that CBRS spectrum in urban areas be licensed exclusively on a large-area basis, whether by PEA, county, or some other urban-area construct. Moreover, some have argued that *all* PALs – urban and rural alike – should be licensed on a large-area basis.

Though it is deeply frustrating to be engaged in Commission-encouraged compromise discussions when some parties are unwilling to give *any* ground on the key policy issue in the proceeding, the IIoT Coalition remains hopeful that, going forward in this process, all parties will recognize that a genuine compromise solution allows *all* parties to obtain some value and requires that *all* parties bear some costs.

Alternative mechanism for industrial/critical-infrastructure access to CBRS spectrum. If the Commission adopted a CBRS licensing scheme featuring less than three census-tract PALs out of the seven PALs available at auction, industrial and critical-infrastructure entities would be able to access only a limited amount of licensed CBRS spectrum (or possibly none at all).¹⁰ Without further Commission action, it would be more costly and difficult (and in some

sizes are assigned within the same area (*i.e.*, three census-tract PALs and four wide-area licenses in a particular area). Concerns regarding auction complexity should not deter the Commission from adopting an appropriate hybrid licensing approach, however. The Commission has the requisite technical expertise, experience, and incentive to conduct an auction involving different-size PALs in urban areas. The IIoT Coalition and other stakeholders stand ready to participate constructively and actively in proceedings around auction design. Good and fair policy – one that will allow the benefits of this valuable band to flow to the largest number of key U.S. sectors and stakeholders – should not be sacrificed to avoid some level of complexity.

⁹ Self-provisioned private wireless networks in the CBRS band should enhance critical infrastructure owners' and operators' ability to recover from and respond to all types of incidents, thereby furthering U.S. national and homeland security, as described in another *ex parte* letter that the IIoT Coalition expects to file soon with the Commission.

¹⁰ Licensing PALs exclusively on a PEA, county, or other wide-area basis in urban areas would exponentially raise the cost of PALs in those areas. In this scenario, industrial and critical-infrastructure entities would be highly unlikely to be able to bid for, and even if they did,

cases impossible) for industrial and critical-infrastructure operators to self-provision effective and fully functional IIoT networks in the 3.5 GHz band.

Under one potential alternative approach, the Commission could adopt a “Managed Access Facility” (“MAF”) policy that GE has proposed in recent compromise discussions. This MAF proposal incorporates features of the “Contained Access Facility” (“CAF”) concept that the Commission previously considered before adopting its seven census-tract PAL licensing scheme in 2015. GE’s proposed MAF construct is more narrowly focused than the CAF, however; the MAF would specifically enable critical- and core-mission infrastructure users to receive PAL-level interference protection in a limited portion of GAA spectrum for private LTE network operations *only within the narrow physical confines or boundaries of their indoor and outdoor property*.¹¹ Under this proposal, eligible MAF users would be particular businesses and organizations with critical- and/or core-mission infrastructure operations that require self-provisioned and self-operated private wireless networks.¹² The level of interference protection granted to MAF users would be the same as that granted to a PAL user today under the Commission’s rules.¹³ The boundary of the MAF user area – based on the borders of an entity’s operating area or property – would be provided in electronic form to the spectrum access system (“SAS”), with the SAS then treating the MAF as a PAL Protection Area. While additional details regarding MAF authorizations and operations would obviously have to be determined,

to win urban PALs at auction, no matter how many industrial and critical-infrastructure facilities were located in a given urban area. It would simply not be economically rational for industrial and critical-infrastructure entities to obtain licenses covering urban territory extending far beyond their geographically focused deployments. In addition, industrial and critical-infrastructure entities cannot count on cost-effectively obtaining such wireless functionality from commercial mobile operators. The major carriers have traditionally emphasized consumer-based services rather than data-intensive IIoT-type offerings, and they have long been reluctant to allocate a meaningful volume of spectrum with certainty of access to critical-infrastructure and other non-traditional users through the secondary market. Finally, even where available on the secondary market, CBRS spectrum would likely come at an uneconomic cost, given that the transaction costs for such arrangements would likely fall asymmetrically on non-traditional spectrum users such as IIoT customers.

¹¹ Under GE’s MAF proposal, a MAF user’s interference-protected spectrum rights would encompass no more than 30 megahertz of GAA spectrum, ensuring that at least 20 megahertz of spectrum remained for public GAA use in the broader area surrounding the MAF user area.

¹² For instance, eligibility for MAF authority could be limited to U.S. entities identified in the North American Industry Classification System (“NAICS”) Code listings, which include hospitals, public safety organizations, power utilities, airport operations, oil and gas operations, and other entities that own, operate and or manage critical or core-mission infrastructure, machinery or medical equipment. See Office of Management and Budget, *North American Industry Classification System, United States* (2017), <https://www.census.gov/eos/www/naics/index.html>.

¹³ 47 C.F.R. § 96.41.

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preliminary discussions with SAS providers indicate that it would be technically feasible to incorporate this proposed MAF mechanism into the CBRS operational framework and extend PAL-level interference protection to these MAF areas.

In the spirit of compromise, industrial and critical-infrastructure entities have been willing to consider a variety of potential CBRS licensing approaches that yield substantial ground and are much less favorable to their interests than the existing CBRS framework featuring seven census-tract licenses. Beyond the MAF construct, these entities have been open to a number of different hybrid licensing schemes and even new license-area proposals for CBRS, such as Public Use Microdata Areas (“PUMAs”). Ultimately, in any compromise solution being considered, the key criterion for the IIoT Coalition is whether industrial and critical-infrastructure operators have a reasonable opportunity to compete for, acquire, control, and utilize a core amount of CBRS spectrum across all areas of the United States, so they can self-provision private wireless networks that support robust IIoT services and applications and generate substantial benefits for America’s critical infrastructure and economy.

* * *

As the Commission considers different licensing approaches for CBRS, the IIoT Coalition urges the Commission not to forego this unique opportunity in U.S. economic and spectrum policy to generate enormous economic benefits in the industrial and critical-infrastructure sphere. The public interest will benefit greatly if industrial and critical-infrastructure companies are able to gain access to 3.5 GHz spectrum in small geographic units through a competitive auction, including in urban, suburban, rural, and remote areas of the United States. These companies are eager to utilize the CBRS band to bring the full benefits of the IIoT revolution to the American public and the U.S. industrial and manufacturing sectors. If these entities are denied this opportunity, the Commission’s CBRS auction will be less robust and critical IIoT innovation will be inhibited.

Respectfully submitted,

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Exhibit A

Membership Associations Participating in the IIoT Coalition

The American Petroleum Institute (“API”) is the only national trade association representing all facets of the oil and natural gas industry, which supports 10.3 million U.S. jobs and nearly 8 percent of the U.S. economy. API’s more than 625 members include large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine businesses, and service and supply firms. A list of its members can be found at <http://www.api.org/membership/members>.

The Edison Electric Institute (“EEI”) is the trade association that represents all U.S. investor-owned electric companies. Its 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 over seven million jobs in communities across the United States. In addition to its U.S. members, EEI has more than 60 international electric companies, with operations in more than 90 countries, as International Members, and hundreds of industry suppliers and related organizations as Associate Members. A list of its U.S. members is attached.

The Enterprise Wireless Association (“EWA”) is a national trade association with over 600 member companies, representing business enterprises, wireless sales and service providers, hardware and software system vendors, and technology manufacturers.

The Utilities Technology Council (“UTC”) is a global trade association dedicated to serving critical infrastructure providers that represents electric, gas, and water utilities, as well as natural gas pipelines, critical infrastructure companies, and other industry stakeholders. A list of its members is attached.

Edison Electric Institute

US Investor-Owned Utilities

AES Corporation
 Dayton Power & Light
 Indianapolis Power & Light
ALLETE
 Minnesota Power
 Superior Water, Light and Power
Company
Alliant Energy Corporation
Ameren Corporation
 Ameren Illinois
 Ameren Missouri
American Electric Power
 AEP Ohio
 AEP Texas
 Appalachian Power
 Indiana Michigan
 Kentucky Power
 Public Service Company of
 Oklahoma
 Southwestern Electric Power
Company
American Transmission Company
AVANGRID
 Central Maine Power
 New York State Electric & Gas
 Rochester Gas & Electric
 Corporation
 The United Illuminating Company
Avista Corporation
 Avista Utilities
 Alaska Electric Light and Power
 Company
Berkshire Hathaway Energy
 MidAmerican Energy Company
 NV Energy
 PacifiCorp
 Pacific Power
 Rocky Mountain Power
Black Hills Corporation
 Black Hills Energy
CenterPoint Energy
Central Hudson Gas & Electric Corporation
Cleco Corporate Holdings
 Cleco Power

CMS Energy
 Consumers Energy
Consolidated Edison
 Consolidated Edison Company of
 New York
 Orange and Rockland Utilities
 Rockland Electric Company
Cross Texas Transmission
Dominion Energy
 Dominion Energy Virginia
 Dominion Energy North Carolina
DTE Energy
Duke Energy
Duquesne Light Company
Edison International
 Southern California Edison
El Paso Electric
Entergy Corporation
 Entergy Arkansas
 Entergy Louisiana
 Entergy Mississippi
 Entergy New Orleans
 Entergy Texas
Eversource Energy
Exelon Corporation
 Baltimore Gas and Electric Company
 Commonwealth Edison Company
 PECO
 Pepco Holdings
 Pepco
 Atlantic City Electric
 Delmarva Power
FirstEnergy
 The Illuminating Company
 Jersey Central Power & Light
 Met-Ed
 Mon Power
 Ohio Edison
 Penelec
 Penn Power
 Potomac Edison
 Toledo Edison
 West Penn Power
Florida Public Utilities
Great Plains Energy

Kansas City Power & Light
Company
Green Mountain Power
Hawaiian Electric Industries
 Hawaiian Electric Company
 Hawaii Electric Light
 Company
 Maui Electric Company
IDACORP
 Idaho Power
InfraREIT
ITC Holdings Corp.
 ITC Great Plains
 ITC Michigan
 ITC Midwest
Liberty Utilities
 Empire District
MDU Resources Group
 Montana-Dakota Utilities Company
MGE Energy
 Madison Gas and Electric Company
Mt. Carmel Public Utility Company
National Grid
NextEra Energy
 Florida Power & Light Company
NiSource
 Northern Indiana Public Service
Company
NorthWestern Energy
OGE Energy Corporation
 Oklahoma Gas & Electric Company
Ohio Valley Electric Corporation
Oncor
Otter Tail Corporation
 Otter Tail Power Company
PG&E Corporation
 Pacific Gas & Electric Company
Pinnacle West Capital Corporation
 Arizona Public Service Company
PNM Resources
 PNM
 TNMP
Portland General Electric
PPL Corporation
 PPL Electric Utilities
 LG&E and KU Energy

Public Service Enterprise Group
 Public Service Electric & Gas
Company
 PSEG Long Island
Puget Sound Energy
San Diego Gas & Electric
SCANA Corporation
 South Carolina Electric & Gas
Sharyland Utilities
Southern Company
 Alabama Power Company
 Georgia Power Company
 Gulf Power Company
 Mississippi Power Company
Tampa Electric
Tennessee Valley Authority – *EEI Strategic
Partner*
UGI Corporation
 UGI Utilities
Unitil Corporation
UNS Energy Corporation
 Tucson Electric Power
 UniSource Energy Services
Upper Peninsula Power Company
Vectren Corporation
 Vectren South
Vermont Electric Power Company
WEC Energy Group
 We Energies
 Wisconsin Public Service
 Upper Michigan Energy Resources
Westar Energy
Xcel Energy

Associates
CLEAResult
GE Power
Navigant Consulting, Inc.
Oracle Utilites
Aclara
Ernst & Young LLP
Mitsubishi Electric Power Products, Inc.
Nest Labs, Inc.
Pike Electric
Regulated Capital Consultants
Troutman Sanders LLP

Utilities International
 ABB Inc.
 Accenture
 AECOM
 AEGIS Insurance Services, Inc.
 Agora Communications, Marketing and
 Business Development Expos LLC
 Akin Gump Strauss Hauer & Feld, LLP
 Alliance for Deaf Services, LLC
 Alston & Bird LLP
 Altec Inc.
 Altran US Corp
 Amec Foster Wheeler
 American Water
 American Wind Energy Association
 Anixter Inc.
 Aon Global Power
 APC Construction, LLC
 APTIM
 ARCOS LLC
 Asplundh Brush Control Co
 AST
 Atwell, LLC
 Babcock & Wilcox Company, The Bain &
 Company, Inc
 Baker Botts L.L.P.
 Balch & Bingham LLP
 Bekaert Corporation
 Black & Veatch
 Borden Ladner Gervais LLP
 Bracewell LLP
 Bright Investments, LLC
 Brooks Utility Products
 Burns & McDonnell Engineering Co. Inc.
 Cargill, Inc.
 Carmen L Gentile, PLLC
 CBRE Clarion Securities
 Centrus Energy Corp.
 Chapman and Cutler LLP
 Charles River Associates
 Choate, Hall & Stewart LLP
 Citi
 Commonwealth Associates, Inc.
 Comverge
 Concentric Energy Advisors, Inc.
 Cool-eez, LLC
 Credit Suisse LLC
 Crowell & Moring LLP
 CS Week
 CTC Global Corporation
 D&D Power Inc
 Davey Tree Expert Company, The Davis
 Wright Tremaine LLP
 Day Pitney LLP
 DDC Advocacy Deloitte LLP
 Disaster Resource Group
 Distributed Energy Financial Group
 DNV GL Energy Services USA
 Doble Engineering Company
 Dorsey & Whitney LLP
 E Source
 Eaton Corporation
 Ecology and Environment, Inc.
 Ecova, Inc.
 EHS Partners, LLC
 Electrical Consultants, Inc.
 EN Engineering, LLC
 Energy Management Collaborative, LLC
 EnergySavvy
 Enovation Partners, LLC
 Environmental Consultants, Inc.
 Ephektiv
 ERM
 Espen Technology
 Evercore
 Eversheds Sutherland
 Evolution Energy Partners LLC
 Exponent, Inc.
 Faegre Baker Daniels, LLP
 FDH Velocitel
 Ferreira Construction Co Inc
 First Solar, Inc.
 Fluor Corporation
 Foley & Lardner LLP
 GB Energie LED, LLC
 Gibson Dunn & Crutcher
 HDR, Inc.
 Heidrick & Struggles
 Henkels & McCoy Group
 Hexagon Safety and Infrastructure
 Hogan Lovells US LLP
 Holland & Knight LLP

Honeywell
Houlihan Lokey Hunton & Williams LLP
IBM Corp
ICF
Idaho National Laboratory
IHS Global Inc.
IMCORP
Infor
Information Services Group, Inc. (ISG)
Innogy Consulting Americas
Innovari, Inc.
International Technology and Trade
Associates, Inc. (ITTA)
Internet Security Alliance
INTREN, LLC
ITRON, Inc.
J. J. White Incorporated
Japan Electric Power Information Center,
Inc.
Jenner & Block LLP
K&L Gates LLP
Kiewit Corporation
KPMG LLP
Landis+Gyr Inc.
Leidos
Lignite Energy Council
Lindsey Manufacturing Co.
Lockheed Martin Corporation
Loeb & Loeb LLP
M&S Engineering, LLC
MacLean Power Systems
MaintenX International
Marison Energy Systems Corporation
maslansky + partners
MasTec Transmission - Substation Group
McCarter & English, LLP
McGuireWoods LLP
McKinney Drilling Company
McKinsey & Co
Mercer Thompson LLC
Merjent Inc.
Michael Best & Friedrich LLP
MICHELS Corporation
Microsoft Corporation
Midwest Energy Efficiency Alliance
Milbank, Tweed, Hadley & McCloy LLP

Miller & Chevalier Chartered
Milwaukee Tool
Mitsubishi Heavy Industries America
Moelis & Company
Moran Environmental Recovery, LLC
Morgan, Lewis & Bockius LLP
Mortenson Construction
MOSAIC
Motive Power Inc.
Munger, Tolles & Olson LLP
Murray Energy Corporation
MYR Group Inc
Nexans High Voltage USA Inc.
Novar
Nuclear Electric Insurance Limited
Oliver Wyman
OMICRON electronics Corp. USA
Osborn Maledon P.A.
Osrose Utilities Services, Inc.
Pace Global
Parker Poe Adams & Bernstein, LLP
Pegasus Global Holdings, Inc.
Perkins Coie LLP
Philips Lighting Co
PLH Group, Inc.
POWER Engineers, Inc.
PowerAdvocate, Inc.
PowerPlan, Inc.
PricewaterhouseCoopers LLP
Primera Engineers, Ltd.
ProSumerGrid
Quanta Services
Recurrent Energy
RHR International LLP
Rooney Rippie & Ratnaswamy LLP
Russell Reynolds Associates, Inc.
SAP America, Inc.
Sargent & Lundy, LLC
Saulsbury Industries Schiff Hardin LLP
Schweitzer Engineering Laboratories, Inc.
(SEL)
ScottMadden, Inc.
Sensus Sharper Shape Inc
Shelton Group Sidley Austin LLP
Siemens Energy, Inc.
Silver Spring Networks, Inc.

Skadden, Arps, Slate, Meagher & Flom LLP
Smart Electric Power Alliance Smart Wires,
Inc.

SNC Lavalin Telecom Inc.

SparkCognition

Spencer Stuart

SPIDA Software

Stanley Consultants, Inc.

Stanley Tree Service, Inc.

Stantec Consulting Services, Inc.

Stem, Inc.

Steptoe & Johnson, LLP

Sterling Group

Stikeman Elliott LLP

Stinson Leonard Street LLP

Stoll Keenon Ogden PLLC

Storm Services, LLC

SunPower Corp

Taft Stettinius & Hollister LLP

Talon Aerolytics, Inc

Tech Products, Inc.

Tenaska Marketing Ventures

Tendril

Terex Utilities

Terracon

The Energy Professionals Association

Thoreact, LLC

The Townsend Corporation

TPI Corporation

Transventure Energy

Trilliant Inc.

UC Synergetic, Inc.

United States Energy Association

UtiliCon Solutions, Ltd.

Utilidata, Inc.

Van Ness Feldman, LLP

Varentec LLC

Vinson & Elkins LLP

Volkert, Inc.

Wartsila North America, Inc.

Waste Management, Inc.

WESCO Distribution Inc.

West Monroe Partners

White & Case LLP

Wilson Construction Co

Winston & Strawn LLP

Witt OBriens LLC

Wright & Talisman, P.C.

Utilities Technology Council

Access Energy Cooperative
Alabama Gas Corporation
Allamakee-Clayton Electric Cooperative, Inc.
Alliant Energy
Ameren
American Electric Power Company, Inc.
Arizona Electric Power Cooperative
Arkansas Electric Cooperative Corp.
Avista Corp.
BARC Electric Cooperative
Barry Electric Cooperative
Basin Electric Power Cooperative
Berkeley Electric Cooperative, Inc.
Black Hills Energy
Blue Ridge Electric Membership Corporation
Boardwalk Pipeline Partners, LP
Brazos Electric Power Cooperative, Inc.
Brunswick Electric Membership Corporation
Buckeye Power Inc.
Burbank Water and Power
Callaway Electric Cooperative
CenterPoint Energy
Central Electric Power Cooperative (MO)
Central Iowa Power Cooperative
Central Lincoln People's Utility District
Central Nebraska Public Power & Irrigation District
Central Virginia Electric Cooperative
Chugach Electric Association Inc.
Citizens Electric Corporation
City of Folsom, Environmental & Water Resources Department
City of Lakeland / Lakeland Electric
City Utilities of Springfield
Clay Electric Cooperative Inc.
Cleco Corporate Holdings LLC
Cleveland Utilities
CO-MO Electric Cooperative Inc.
Colquitt Electric Membership Corporation
Columbia Water & Light
Consumers Energy
Consumers Power Inc.
Conway Corporation
Corn Belt Power Cooperative
Dairyland Power Cooperative
Dayton Power & Light Company
Decatur (TX)
Delta-Montrose Electric Association
Dixie Electric Power Association
Dominion Resources, Inc.
Duck River Electric Membership Corp.
Duke Energy Corporation
East River Electric Power Cooperative
El Dorado Irrigation District
Energy Northwest
Entergy
Escambia River Electric Cooperative
Eugene Water & Electric Board
Eversource Energy
Excelsior Electric Membership Corporation
FirstEnergy Corporation
Flathead Electric Cooperative Inc.
Florida Power & Light Company
Forked Deer Electric Cooperative
Gainesville Regional Utilities
Gascosage Electric Cooperative
Georgia Public Web, Inc.
Georgia System Operations Corp.
Gibson Electric Membership Corporation
Great River Energy
Harrisonburg Electric Commission
Hawaiian Electric Company, Inc.
Holston Electric Cooperative
Hoosier Energy Rural Electric Cooperative
Huntsville Utilities
Idaho Power Company
Illinois Rural Electric Cooperative
ITC Holdings Corp
JEA
Joe Wheeler Electric Membership Corporation
Kamo Power
Kansas City Power & Light
KCK Board of Public Utilities
Kenergy Corp.
Lake Region Electric Cooperative, Inc.
(OK)

Lee County Electric Cooperative, Inc.	Peoples TWP
LG&E and KU Services Company	Platte River Power Authority
Lincoln Electric System	Plumas-Sierra REC
Louisiana Generating LLC	PowerSouth Eneergy Cooperative
Lower Colorado River Authority	PREPA Networks
M & A Electric Power Cooperative	Public Service Enterprise Group
Madison Gas & Electric Company	Puget Sound Energy
Memphis Light, Gas & Water Division	Ralls County Electric Cooperative
Metropolitan Water District of Southern California	Rappahannock Electric Cooperative
Mid-Carolina Electric Cooperative	Regional Water Authority
Mid-South Synergy	Richland Electric Cooperative
Midwest Energy Cooperative	Rushmore Electric Power Cooperative
Minnkota Power Cooperative, Inc.	Sacramento Municipal Utility District
Modesto Irrigation District	Salem Electric
Montana-Dakota Utilities Co.	Salt River Project
Nashville Fuel Gas Distribution Corporation	San Bernard Electric Cooperative
National Fuel Gas Distribution Corporation	Santee Cooper
National Grid USA Service Company, Inc.	SCANA Corporation
Navajo Tribal Utility Authority	Sho-Me Power Electric Cooperative
Nebraska Public Power District	Silicon Valley Power
New York Power Authority	Soquel Creek Water District
NextEra Energy Seabrook	South Central Indiana REMC
North Attleborough Electric Department	South Feather Water & Power
North Georgia Network	South Plains Electric Cooperative
Northeast Rural Services	South Texas Electric Cooperative
Northern Electric Cooperative (SD)	Southern California Edison Company
Northern Neck Electric Cooperative	Southern Company
Northern Virginia Electric Cooperative	Southern Illinois Power Cooperative
Northwest Iowa Power Cooperative	Sunflower Electric Power Corporation
Northwest Open Access Network	Sunny Slope Water Company
NorthWestern Corporation	Sweetwater Utilities Board
NV Energy	Tacoma Power – Utility Technologies Services
NW Energy	Talquin Electric Cooperative, Inc.
Ohio Valley Electric Corporation	Tampa Electric Company
Omaha Public Power District	Tennessee Valley Authority
Oncor Electric Delivery Company	Texas Lone Star Network
Orange & Rockland Utilities, Inc.	Tri-County Electric Cooperative (OK)
Orlando Utilities Commission	Tri-State Generation and Transmission Association, Inc.
Otter Trail Power Company	Tripp County Water User District
Owen Electric Cooperative Inc.	Turlock Irrigation District
Ozarks Electric Cooperative	United Electric Cooperative (MO)
Pacific Gas & Electric Company	Vermont Electric Power Company
PacifiCorp	VOAM Electric Cooperative
Parke County Rural Electric Membership Corporation	Wabash

Valley Power Association
Warren Rural Electric Cooperative
Corporation
WEC Energy Group
West River Electric Association
Westar Energy
Western Area Power Administration
Wolf Creek Nuclear Operating Corporation
Wolverine Power Cooperative, Inc.
Woodbury County Rural Electric
Cooperative
Xcel Energy Service, Inc.