

**Before the
DEPARTMENT OF DEFENSE
Washington, D.C.**

In the Matter of)
Request for Information on Dynamic Spectrum)
Sharing)
)
)

**COMMENTS OF THE UTILITIES TECHNOLOGY COUNCIL AND THE EDISON
ELECTRIC INSTITUTE**

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SUMMARY

UTC and EEI strongly support the DoD's Request For Information (RFI) on innovative alternative approaches to enable spectrum sharing within the DoD's currently allocated spectrum and encourage the DoD to adopt a federal spectrum sharing approach. Sharing spectrum opens the opportunity for the DoD to create synergies with the electric sector to advance the nation's larger policy objectives and would benefit utilities and military branches of the government in numerous ways, both in practical and policy terms. Spectrum sharing would put the spectrum to effective use faster than reallocating the bands and relocating incumbents. Sharing spectrum with utilities also provides an opportunity to create synergies and promote more effective use of spectrum that will serve the public interest in both reliable and secure energy and water services, as well as stronger national security and more advanced, interoperable communications during emergency response in the aftermath natural disasters. Most importantly, utilities understand how to share federal spectrum without causing interference and without reallocation and relocation of government operations, thus avoiding the disruption of incumbent federal government communications systems and operations. Accordingly, there are significant opportunities and potential benefits for utilities and the DoD that could be realized through spectrum sharing. If the DoD shares spectrum with utilities, it may result in expanding the market for advanced communications equipment capable of operating in federal spectrum, thereby reducing the cost of deploying and operating these networks. Furthermore, spectrum sharing also opens up opportunities for partnerships between utilities and federal government agencies, whereby utilities and federal government agencies can combine resources and expertise to develop and deploy shared communications systems. Finally, nothing prevents DoD or other federal agencies from sharing spectrum with utilities or leasing the spectrum, subject to the mutually agreed terms and conditions of the parties and the approval by NTIA.

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The Utilities Technology Council (UTC) and the Edison Electric Institute (EEI) hereby file the following comments in response to the Department of Defense Request for Information.¹ UTC and EEI strongly support the Request for Information by the Department of Defense (DoD), and look forward to promoting opportunities for utilities to share federal spectrum with the DoD and other federal agencies.

In the RFI, the DoD is “seeking information regarding all methods and approaches, and feasibility, to best develop and deploy DSS across a broad range of capabilities and for future understanding of how spectrum may be utilized in both 5G and innovative technologies.”² The RFI broadly covers the range of spectrum DoD currently uses, and invites comment on all approaches to spectrum management, including the best methods for sharing spectrum with both military and civilian users.³ In that context, the DoD asks a series of questions pertaining to potential sharing approaches, including spectrum in the mid-band as well as low and high frequency ranges. UTC and EEI welcome the opportunity to work with the DoD going forward on this important RFI and spectrum sharing initiative.

¹ Request for Information on Dynamic Spectrum Sharing (DSS), Department of Defense (posted, Sept. 18, 2020) (“RFI”), available at https://beta.sam.gov/opp/4851a65e2b2d4d73865a0e9865b0c28a/view?keywords=spectrum&sort=-modifiedDate&index=&is_active=true&page=1

² *Id.*

³ *Id.*

I. Introduction and Background

UTC and EEI are trade associations whose members include electric generation, transmission and distribution utilities. These utilities own, manage and operate extensive communications networks that they use to support their mission to provide safe, reliable and secure electric service. Due to the essential nature of the electric services that they provide and the hazardous environment of their operations, these communications networks are designed, built, and maintained to extremely high standards to protect electric infrastructure and the people who work to establish, maintain and restore electric services.

Currently, utilities are undergoing increased demand for communications. The primary drivers for this increased demand is because utilities are undertaking a process of grid modernization, which entails the increased use of distribution automation and remote monitoring and control to conduct their electric service operations. Utilities are also implementing North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) mandatory standards for both physical and virtual security. Grid modernization and security implementation requires communications with intelligent devices all across the grid and with personnel throughout large and often times remote service territories. Not only does this require broader communications coverage with a proliferation of devices, critical assets and personnel in remote areas, but it also means an exponential increase in data that requires higher capacity, low latency communications networks.

At the same time that utilities are experiencing increasing demand for communications, they also are facing an increasing shortage in spectrum that is available and suitable to meet their performance requirements. Existing spectrum available for utility use includes land mobile radio and microwave bands, which are subject to congestion and interference. Moreover, some of these spectrum bands have been reallocated, realigned or made available for unlicensed operations, which has forced utilities to relocate their existing systems or protect them against potential interference. In many cases, utilities simply lack reasonable communications alternatives, which exacerbates the problems for utilities associated with interference and congestion due to increased use of their existing spectrum. Either alternative spectrum is not available or it is simply too expensive or ill-configured to conform to utility

service territories.

The electric industry's interest in spectrum sharing is also driven by international and domestic spectrum developments that are relevant. For example, internationally, utilities are coalescing towards 400 MHz LTE technologies in Europe and South America; and that in turn promotes opportunities for utilities in the United States to leverage the equipment that is available in those markets, which in turn creates a larger ecosystem that reduces equipment cost and increases availability.⁴ Domestically, utilities urgently need access to spectrum as an alternative to the 6 GHz band (5925-7125 MHz), which is being opened up for unlicensed operations that threaten to cause interference to utility mission critical communications carried over microwave systems that operate in the 6 GHz band.⁵ As described below, there are several potential federal spectrum bands that utilities could share in order to both leverage these opportunities internationally and respond to these challenges domestically.

Sharing federal spectrum with utilities would also help advance larger national policy objectives. The nation's military is dependent on the reliability of commercial power,⁶ and sharing spectrum with

⁴ See e.g. *Response to Consultation and Decision on the 400 MHz Band Spectrum Award* ComReg 19/69, Decision DT 12/69 (June, 2019) available at <https://www.comreg.ie/publication/response-to-consultation-and-decision-on-the-400-mhz-band-spectrum-award> (making available the 410 – 413 MHz / 420 – 423 MHz to network utility operators for the provision of wireless connectivity for Smart Grid in Ireland.); and *450 MHz Frequenzen für den drahtlosen Netzzugang (450 MHz Frequencies for the Fixed Power Supply)*, Presidential Chamber of the Federal Network Agency, (Aug. 2020) available at

https://www.bundesnetzagentur.de/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/OeffentlicheNetze/450MHz/450MHz-node.html (final consultation on award of 450 MHz spectrum for LTE network to facilitate smart grids with proposal to connect 35 million devices (including smart meters) in Germany. Spectrum award expected January 2021). “Nokia deploys private LTE at 450 MHz for Polish smart grid operator PGE Systems” *Energy IOT Insights* (Apr. 7, 2020) available at

<https://enterpriseiotinsights.com/20200407/channels/news/nokia-deploys-private-lte-for-polish-smart-grid>.

⁵ See *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295 35 FCC Rcd 3852 (2020) (rel. Apr. 24, 2020).

⁶ Headquarters, Department of the Army, “Electric Power Generation and Distribution” (July 2018) available at <https://fas.org/irp/doddir/army/atp3-34-45.pdf>. See also Department of Energy, Office of Electricity, *Departments of Defense and Energy Sign Memorandum of Understanding to Enhance Energy Resilience* (Sept. 28, 2020) available at <https://www.energy.gov/oe/articles/departments-defense-and-energy-sign-memorandum-understanding-enhance-energy-resilience> (establishing a framework to collaborate and partner on efforts related to energy resilience and the protection of military installations and defense critical electric infrastructure (DCEI)). In recognition of the importance of electricity to national security, the DoD has participated in GridEx recently and communications has been a central focal point of the executive reports. See e.g. North American Electric Reliability Corporation (NERC), *GridEx V Report Recommends Emergency Response Plan Reviews, Enhanced Cross-Sector Coordination* (March 31, 2020), available at <https://www.nerc.com/news/Headlines%20DL/GridEx%20V%20Report%20Media%20Release.pdf>

utilities will increase the reliability of commercial power by enabling SCADA, distribution automation and other utility applications that improve energy infrastructure and power delivery reliability and security.⁷ Moreover, sharing federal spectrum with utilities would make more efficient and effective use of spectrum and open up opportunities for partnerships between utilities and federal agencies to design, develop, deploy and operate state of the art shared communications networks cost effectively and securely, as described in more detail below. Utilities are compatible users of the spectrum and could share spectrum with federal operations without causing interference or other vulnerabilities, particularly as compared with other potential users of the spectrum, such as commercial communications service providers. Utilities and the DoD (as well as other federal agencies) both require highly reliable, resilient and secure communications in order to support their core operations, and sharing spectrum may produce overarching benefits far beyond spectrum efficiency, including synergies which can reduce costs and promote the availability of equipment from commercial manufacturers and suppliers, as described in more detail below.

As described above, utilities face increasing communications needs at the same time that the supply of suitable spectrum is decreasing. For these reasons alone, utilities are interested in sharing federal spectrum with the DoD and other agencies, and they believe that sharing federal spectrum is a faster, more cost effective and less-disruptive approach than other approaches involving reallocating the spectrum, auctioning it and potentially relocating incumbents. Utilities also recognize that sharing spectrum with the federal government provides an opportunity to create synergies and promote more effective use of spectrum that will serve the public interest in both reliable and secure energy and water services, as well as stronger national security and more advanced, interoperable communications during emergency response in the aftermath natural disasters. Most importantly, utilities understand how to share federal spectrum without causing interference and without reallocation and relocation of

⁷Vice Adm. Dennis McGinn, USN (ret.) and Roger Sorkin, Utility Dive, “Grid modernization is the best new deal,” (Apr. 9, 2019) <https://www.utilitydive.com/news/grid-modernization-is-the-best-new-deal/552268/>. See also Department of Energy, Grid Modernization and the Smart Grid”, available at <https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid>.

government operations, thus avoiding the disruption of incumbent federal government communications systems and operations. Accordingly, there are significant opportunities and potential benefits for utilities and the DoD that could be realized through spectrum sharing.

In addition to coexistence and compatibility, spectrum sharing also opens up opportunities for partnerships between utilities and federal government agencies, whereby utilities and federal government agencies can combine resources and expertise to develop and deploy shared systems. Utilities have already successfully deployed and operated shared systems with public safety entities in several states around the country.⁸ These types of shared systems could serve as models for partnerships between utilities and federal government agencies. They also demonstrate important synergies that can be achieved through partnering with each other, which in turn can make the deployment of better, more advanced communications systems cost effective. Utilities would welcome the opportunity to engage with the DoD and other federal government agencies to explore these opportunities, including using advanced network slicing technologies that ensure reliability and security over shared systems.

II. Responses to Specific Issues in the RFI

In the Request for Information, the Department of Defense asks for comment regarding various issues related to dynamic spectrum sharing, including how DoD could own and operate 5G networks for its domestic operations, as well as the potential issues involved with owning and operating such 5G networks. The RFI also invites comment on potential mid-band spectrum, as well as low and high-frequency ranges of spectrum that could be shared between federal and non-federal entities. In addition, the RFI asks about spectrum sharing technologies and potential security issues involved with spectrum sharing, as well as potential barriers to sharing federal spectrum with non-federal entities. Finally, the

⁸ See “*Nebraska is at the forefront of modern communications with its statewide interoperable trunking network*”, Motorola Solutions, available at https://www.motorolasolutions.com/content/dam/msi/docs/en-xu/Case_Study_Nebraska_Statewide_VHF_Project_25_Trunking_System.pdf; Nevada Shared Radio System (NSRS), available at https://dem.nv.gov/uploadedFiles/demnv.gov/content/homeland_security/State%20of%20the%20Radio%20System%20rev%20B.pdf; and Palmetto 800: South Carolina’s Public-Private Statewide Communications Network Partnership, available at <https://admin.sc.gov/sites/default/files/flipbook/PalmettoRadioNetwork/4/>.

RFI explores the potential for spectrum leasing arrangements, including any legal, policy, statutory and regulatory issues as well as potential incentives for DoD, including revenue from spectrum leases. UTC and EEI strongly support the DoD's RFI and are pleased to provide the following comments in response to its specific questions.

1. How could DoD own and operate 5G networks for its domestic operations? What are the potential issues with DoD owning and operating independent networks for its 5G operations?

Just as DoD is interested in owning and operating 5G networks for its domestic operations, utilities are also interested in upgrading their communications networks to support increased capacity, coverage and security requirements, including using LTE or 5G technologies.⁹ Utilities have a unique perspective to provide with respect to owning and operating private internal networks, as well as upgrading those networks, which may help to inform DoD with regard to owning and operating 5G networks. Specifically, utilities understand the criticality of these communications networks and the need to maintain reliability, availability and security. Utilities also understand the need to upgrade these communications networks in order to expand coverage, capacity and security. Utilities also understand the need to deploy and operate these networks on a cost-effective basis, and the challenges of doing so while upgrading these networks going forward. Utilities are strategizing on ways to upgrade their communications systems, which involves the deployment of additional infrastructure and utilizing and promoting the expansion of markets for commercially available standardized equipment to meet network performance requirements.¹⁰ This helps to reduce costs and technology risk by leveraging existing infrastructure and ecosystems, while also providing a migration path to support legacy networks while

⁹See e.g. "Mission Accomplished – CriticalLinc™ is a critical win," Southern Linc (Fall, 2019) available at <https://southernlinc.com/2019-fall-newsletter/> and see "Mission Critical LTE Coverage", Southern Linc available at <https://www.southernlinc.com/coverage.aspx>. See also Cutting Through the Hype: 5G and Its Potential Impacts on Electric Utilities https://utc.org/wp-content/uploads/2019/03/Cutting_through_the_Hype_Utility_5G-2.pdf. and see "Why Utilities Should Harness the Power of Private LTE Networks, T&D World (May 8, 2020), available at <https://www.tdworld.com/digital-innovations/article/21130892/why-utilities-should-harness-the-power-of-private-lte-networks>.

¹⁰ "Private LTE Getting Traction with Utilities," Inside Towers, available at <https://insidetowers.com/cell-tower-news-private-lte-getting-traction-with-utilities/>.

upgrading to advanced technologies, using dynamic spectrum sharing and carrier aggregation.

The need for communications reliability and security is one of the primary reasons that utilities own and operate private internal communications networks.¹¹ Utilities need these networks to remain up and running, particularly in the aftermath of hurricanes, earthquakes, wildfires and other natural disasters when the need for communications becomes even more critical and when commercial communications networks are often times rendered unavailable. When upgrading these communications networks to increase capacity, coverage and security, the need for communications reliability and infrastructure resiliency must be maintained. The cost of upgrading communications networks can be substantial, due to additional infrastructure and new equipment that is required.¹² In order to reduce costs, utilities are strategizing to reduce the extent to which additional infrastructure is required and to leverage equipment ecosystems that are available using standardized equipment in the marketplace.

As the DoD considers owning and operating 5G communications networks, it could benefit from sharing spectrum with utilities, owing to synergies that could be created. First, if utilities are sharing federal spectrum, it may expand the market for advanced communications equipment capable of operating in federal spectrum, which in turn will help to reduce the cost and increase the availability of equipment for federal government agencies that operate in shared spectrum. Second, if utilities partner with government agencies to deploy and operate shared systems together using shared federal spectrum, they can achieve synergies that will further reduce the cost of deploying and operating these networks. For

¹¹ “Private LTE for Utilities: Key requirements for your Private LTE transport network,” Aviat Networks, *available at* <https://blog.aviatnetworks.com/the-industry/public-safety-the-industry/private-lte-for-utilities-key-requirements-for-your-private-lte-transport-network/> (listing reliability at the first performance requirement, and stating “Like public safety networks, utility networks are built for maximum uptime.”); *and* “The Call Is Coming From Inside the House: Private Utility Networks Bring Efficiency, Control and Reliability” CSR Wire, *available at* https://www.csrwire.com/press_releases/43706-the-call-is-coming-from-inside-the-house-private-utility-networks-bring-efficiency-control-and-reliability. (referring to Smart Utilities Report, Black & Veatch (2020), *available at* <https://www.bv.com/UTC-smart-utilities#report>, based on survey of utilities.)

¹² See e.g. *The Public Safety Nationwide Interoperable Broadband Network: A New Model for Capacity, Performance and Cost*, Federal Communications Commission June 2010, *available at* <https://docs.fcc.gov/public/attachments/DOC-297709A1.pdf> (estimating the cost of building out the 700 MHz Public Safety Broadband Network, and stating that “by increasing the required data-rate-per-device to 1.2 Mb/s, a nationwide network that would have cost only \$14 billion would instead cost \$40 billion.”)

example, utilities could contribute access to infrastructure, such as fiber, towers and poles that could help to defray deployment costs.¹³ Similarly, they could share the cost of the equipment, thus further reducing the capital costs of deployment. Finally, it should be noted that utilities have extensive experience with owning and operating private internal communications systems, and they also deploy highly resilient communications networks and they have the dedicated resources available to restore communications, if they are disabled during hurricanes and other natural disasters.¹⁴ DoD could benefit from partnering with utilities by gaining this expertise and resiliency of operations.

2. While the Department has made available the 3450-3550MHz spectrum band for 5G, are there new technologies or innovative methods as to how additional mid-band spectrum currently allocated to DoD can be made available for 5G faster?

UTC and EEI applaud the DoD for its efforts to share mid-band spectrum, including the 3450-3550 MHz spectrum band.¹⁵ Utilities were among the early entrants to the 3.5 GHz band (3550-3700 MHz) when the Commission made it available on a lightly licensed basis, under Part 90 of the FCC's Rules.¹⁶ Moreover, several utilities participated and won licenses in the FCC's recent auction of Priority Access Licenses (PALs) in the 3.5 GHz band. Finally, utilities will likely deploy many more systems in the 3.5 GHz band that will operate on a General Authorized Access (GAA) basis. Given this activity and investment in the 3.5 GHz band, there may be opportunities for utilities to share adjacent spectrum in the 3450-3550 MHz band that is made available by DoD for 5G. The utility industry looks forward to

¹³ "Global Toolkit on Cross-Sector Infrastructure Sharing" World Bank (Feb. 2017) available at <https://ppiaf.org/documents/4709/download> (describing how utilities have shared infrastructure to promote wireless deployment).

¹⁴ "Utility Uses for Wireless Spectrum" The Shpigler Group (Oct. 2018) available at <https://utc.org/wp-content/uploads/2018/10/UTC-Utility-Uses-for-Wireless-Spectrum.pdf> (describing utility wireless communications networks, including use cases by Southern Company and Southern California Edison).

¹⁵ See e.g. See White House Fact Sheet, *President Donald J. Trump Is Unleashing America's 5G Potential* (Aug. 10, 2020), available at <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unleashing-americas-5g-potential/>; DoD Press Release, *White House and DOD Announce Additional Mid-Band Spectrum Available for 5G by the end of the Summer* (Aug. 10, 2020), available at <https://www.defense.gov/Newsroom/Releases/Release/Article/2307275/white-house-and-dod-announce-additional-mid-band-spectrum-available-for-5g-by-t/>. See also NTIA, *Feasibility of Commercial Wireless Services Sharing with Federal Operations in the 3100-3550 MHz Band* (July 2020), available at <https://go.usa.gov/xG4HV>; and see Edward Drocella, Robert Sole, Nickolas LaSorte, *Technical Feasibility of Sharing Federal Spectrum with Future Commercial Operations in the 3450-3550 MHz Band*, NTIA Technical Report 20-546, at ix (rel. Jan. 2020), available at <https://www.its.bldrdoc.gov/publications/details.aspx?pub=3236>.

¹⁶ See 47 C.F.R. §90.1301 *et seq.* See also *Wireless Operations in the 3650-3700 MHz Band*,

engaging with the DoD to discuss such opportunities, as well as the sharing models for doing so.

In addition to possible interest in sharing the 3450-3550 MHz band, utilities are interested in sharing other mid-band spectrum, particularly spectrum that could serve as an alternative to the 6 GHz band (5925-7125 MHz). Utilities currently use the 6 GHz band for microwave communications to support the safe, reliable and secure delivery of essential energy and water services. The FCC has recently made this band available for unlicensed operations, and utilities are concerned about the potential for interference and congestion from potentially hundreds of millions of unlicensed devices that are expected to operate in the band, most of which will not be controlled by automated frequency coordination (AFC). As an alternative to the 6 GHz band, utilities are interested in sharing federal spectrum in the 7/8 GHz band (7125-8500 MHz), and look forward to exploring opportunities with federal agencies to discuss possible sharing models in this spectrum. The 7/8 GHz band appears to be suitable for utilities to share and migrate out of the 6 GHz band, due to its similar propagation characteristics. Although some information is publicly available about the 7/8 GHz band, UTC and EEI would be interested in engaging with the DoD to learn more about existing federal use of the band and possible sharing models and use cases for utility operations.¹⁷ If there is other mid-band spectrum that DoD believes would be available for spectrum sharing, utilities would be interested in learning about those options, as well.

3. What are other innovative ideas as to how 5G can share spectrum with high-powered airborne, ground-based and ship-based radar operations in the 3100-3550 MHz spectrum band?

Eleven utilities who won Priority Access Licenses in a total of 170 counties in the FCC's recent CBRS auction, and there are many more utilities who are expected to operate systems on a GAA basis, including utilities who operated grandfathered 3.65 GHz Part 90 systems in the band.¹⁸ Therefore, utilities are expected to be interested in sharing spectrum in the 3100-3550 MHz band, particularly

¹⁷ See Letter from Scott K. Bergmann, CTIA to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295 (filed Feb. 24, 2020), attaching Comsearch, "Analysis for 6 GHz Relocation" (6525-7125 MHz)(Feb. 3, 2020).

¹⁸ See "FCC Announces Winning Bidders of 3.5 GHz Band Auction," Public Notice, DA 20-1009 (Sept. 2, 2020) available at <https://www.fcc.gov/document/fcc-announces-winning-bidders-35-ghz-band-auction>.

utilities with systems in the 3.5 GHz band. Utilities with systems in the 3.5 GHz band would be the most likely ones to be interested in sharing the 3100-3550 MHz spectrum band, but they are certainly not the only ones. The interest of these utilities would extend beyond the 3450-3550 MHz band to include spectrum in the 3100-3450 MHz segment of the spectrum, some of which may be able to be shared, according to preliminary assessments by NTIA.¹⁹ Ideally, such spectrum would be shared contiguously, but carrier aggregation may allow for other segments of the spectrum to be combined with spectrum at 3.5 GHz, even if the spectrum is not available for sharing on a contiguous basis.

NTIA concluded that frequency-based and geographic-based sharing approaches for sharing the 3450-3550 MHz band would result in significant restrictions on commercial services, but that a dynamic, time-based sharing mechanism could present a potentially attractive approach to both protecting federal systems and providing viable commercial operations.²⁰ Such time-based sharing mechanisms would represent one innovative approach to sharing the 3450-3550 MHz band, and utilities may be able to implement such a sharing approach to be able to dynamically share this spectrum. Other mid-band spectrum may be able to be shared more easily, either using geographic or frequency separation approaches, depending on the degree to which the spectrum is already being used. Such approaches may prove to be practically effective, both in terms of their impact on performance capabilities and cost-effectiveness. This is particularly true for communications that would require high reliability and low latency, which is the case for several types of utility mission critical applications such as SCADA and protective relaying. UTC and EEI look forward to working with the DoD to develop innovative approaches to sharing spectrum with utilities that protect federal incumbent operations while supporting grid modernization and energy security.

¹⁹ See also NTIA, *Feasibility of Commercial Wireless Services Sharing with Federal Operations in the 3100-3550 MHz Band* at 1 (July 2020), available at <https://go.usa.gov/xG4HV> (stating that “although ultimately some sharing of spectrum below 3450 MHz may be possible as well, additional analysis of the entire band should be conducted to assess the various sharing mechanisms and the potential for relocating incumbents from some portion of the remainder of the band for commercial use.”)

²⁰ Edward Drocella, Robert Sole, Nickolas LaSorte, *Technical Feasibility of Sharing Federal Spectrum with Future Commercial Operations in the 3450-3550 MHz Band*, NTIA Technical Report 20-546, at ix (rel. Jan. 2020), available at <https://www.its.bldrdoc.gov/publications/details.aspx?pub=3236>.

4. Are there other spectrum bands that can be made available to share quickly in the low and high band spectrum ranges?

In addition to mid-band spectrum, utilities also are interested in sharing spectrum in low band spectrum. Specifically, utilities are interested in sharing spectrum in the 400 MHz spectrum bands that are currently allocated exclusively for federal government operations. Some of this spectrum was identified as candidate bands for spectrum sharing, and it appears that it would be suitable to support utility spectrum needs for wide-area communications systems. Moreover, and as described previously herein, utilities are coalescing around the use of spectrum in the 400 MHz bands in other parts of the world. This presents an opportunity for the development of a wider equipment ecosystem using standards-based technologies that would increase the capacity and coverage of utility communications systems. Also as noted above, these benefits would extend to federal government operations in the band, by promoting access to advanced technologies that would be more cost-effective by virtue of tapping into this expanding market worldwide.

Sharing this spectrum would appear to be technically feasible using a geographic or frequency separation approach. There appear to be few incumbent federal systems operating in the band, and they may be limited to certain geographic areas. Consequently, it may be possible to share spectrum using different channels in areas where incumbent systems are located, and it may be possible to share more spectrum in certain geographic locations where there are few or no incumbent systems in operation at all. Finally, there may be opportunities for utilities and federal government agencies to partner with each other to deploy and operate shared systems, using dynamic spectrum sharing and network splicing technologies to efficiently allocate available bandwidth on the system. Channel aggregation may also enable spectrum sharing in the band by combining the bandwidth from discrete segments of spectrum that are available in certain geographic areas. UTC and EEI look forward to working with DoD to understand the art of the possible in addition to current industry trends in spectrum utilization.²¹

²¹ See *DOD Seeks Industry Input Into Dynamic Spectrum Sharing*, Sept. 18, 2020 available at <https://www.defense.gov/Newsroom/Releases/Release/Article/2353932/dod-seeks-industry-input-into-dynamic-spectrum-sharing/> (stating that the “scope of the effort, according to the RFI, is to have vendors look at the “broad

5. What types of technologies exist, or are anticipated, that will allow civilian users to share spectrum faster?

UTC and EEI believe that the technology exists already today to enable spectrum sharing, and that other technologies are in development that will enable non-federal users to share spectrum even faster. Specifically, spectrum access database technology has been developed for use in other bands, which could be carried over to coordinate operations in certain federal spectrum bands.²² The use of spectrum access database approaches could be and likely would be less complex and more centrally controlled when coordinating operations between federal incumbents and utilities, compared to the framework that has been implemented in the 3.5 GHz band for the Citizens Broadband Radio Service (CBRS).

In reality and as noted above, it may be far easier to share spectrum with utilities than it would be to share spectrum with other entities, such as commercial licensed and unlicensed wireless service providers. As noted above, utilities are compatible users of the spectrum and enjoy a mutually-shared interest with federal government agencies in operating their own private internal communications networks to ensure the reliability, safety and security of their mission critical operations. To be sure, technologies such as dynamic spectrum sharing and network slicing are developing and will further promote the potential to share spectrum, leverage legacy systems and promote spectral efficiency, but UTC and EEI believe that there are already various available technologies and approaches for utilities and DoD and other federal government agencies to share spectrum quickly and relatively easily today. UTC and EEI look forward to working with DoD to explore these technologies and spectrum sharing approaches with utilities.

range of spectrum DOD currently uses in order to understand both the art of the possible, as well as current industry trends in spectrum utilization.”)

²² See e.g. Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015)(providing for spectrum access system database coordination of operations in the 3550-3700 MHz band).

6. Do you foresee any national security concerns/issues with DoD sharing with commercial 5G?

Utilities share the federal government's interest in strong security. As noted previously herein, utilities are subject to mandatory, cyber standards that are developed through NERC and enforced by FERC, and those standards extend to supply chain issues as well. In addition, the Department of Energy has initiated a Request for Information in response to Executive Order (EO) 13920, "Securing the United States Bulk-Power System." Owing to their shared interest in protecting the security of their infrastructure against physical and cyber-attacks, utilities understand DoD's interest in protecting the security of its communications and its concern with creating potential vulnerabilities through sharing. Some of these potential vulnerabilities from spectrum sharing and network slicing have been documented by the DoD already.²³

Given utilities' experience and expertise with security issues, particularly related to communications networks, UTC and EEI believe that utilities can bring a unique perspective to the issue of security with respect to spectrum sharing. Some of these issues are already discussed with DoD as part of GridEx, and UTC and EEI look forward to working with exploring the specific security issues related to spectrum sharing. Moreover, UTC and EEI believe that security is another major reason why the DoD should share spectrum with utilities. Traffic management issues alone would be far less complicated with sharing spectrum with utilities because traffic would be limited primarily to utility enterprise communications and operations technologies and the amount of data would be far less than sharing with a commercial communications service provider, as well. Moreover, utility communications networks include high reliability and resiliency, so communications stay up and running and if they go down, they are restored quickly. That provides additional benefits for federal government agencies that are sharing systems with utilities.

²³ Defense Innovation Board, "The 5G Ecosystem: Risks & Opportunities for DoD (Apr. 2019), *available at* https://media.defense.gov/2019/Apr/04/2002109654/-1/-1/0/DIB_5G_STUDY_04.04.19.PDF (describing "security challenges in 5G").

7. Is industry aware of any statutory, legal, regulatory or policy hurdles that need to be altered or reconsidered to allow DSS? If so, what are those?

UTC and EEI are unaware of any restrictions that would prevent DoD from sharing spectrum with utilities or others. Although it is true that non-federal use of spectrum is managed by the FCC, there is nothing that prohibits federal agencies from allowing non-federal entities to use federal spectrum. Moreover, while NTIA is authorized to manage the federal use of spectrum, nothing prohibits an individual agency like the DoD to allow non-federal use of spectrum that is allocated for DoD use. In fact, the DoD's Electromagnetic Spectrum Strategy establishes the policy of promoting spectrum sharing and includes "increasing the ability to share spectrum with other systems (domestic or foreign, federal, or non-federal)."²⁴ Even if there are restrictions generally on non-federal use of DoD spectrum, utilities are distinctly different from other entities, because they do support the Defense Critical Energy Infrastructure (DCEI) and should be considered eligible to share the spectrum as critical infrastructure entities. Accordingly, UTC and EEI support the DoD's authority to share spectrum with utilities.

8. Previously, when federal spectrum has been reallocated, federal operations have been required to share or relocate to other bands and commercial licensees have received exclusive licenses via auction. The following questions relate to the above statement:
 - a. Should DoD consider spectrum leasing as an alternative to reallocation? If so, how could it be implemented?
 - b. What, if any, legal, policy, statutory and regulatory changes would be required to implement the proposed leasing approach?
 - c. How could revenue be shared with DoD under a DSS leasing agreement or any type of leasing agreement?

In response to the question of whether DoD should consider spectrum leasing as an alternative to spectrum reallocation, UTC and EEI strongly support leasing as a better alternative to reallocation and relocation of incumbents. As a practical matter, leasing puts the spectrum to use much more quickly and effectively than reallocation and relocation of incumbents, which is not only costly and time consuming, but also extremely disruptive to federal communications. In response to the question of any legal, policy,

²⁴ See *DoD Electromagnetic Spectrum Strategy* at 11 (2013), available at <https://dodcio.defense.gov/Portals/0/Documents/Spectrum/ESS.pdf>.

statutory or regulatory changes that would be necessary, UTC and EEI believe that nothing prohibits DoD or NTIA for that matter from leasing spectrum for non-federal use. Absent any restriction, it should be permitted as a policy matter, because it is consistent with DoD's overriding policies to promote spectral efficiency through spectrum sharing. As long as federal systems are protected against interference and they are not otherwise disrupted, spectrum leasing should not only be permitted – it should be encouraged. In response to the question of how revenue could be shared with DoD under a leasing agreement, this would be subject to contractual negotiation between the parties and approval by NTIA. Finally, the leasing agreement could provide for in-kind contributions in lieu of monetary fees for use of the spectrum.

CONCLUSION

WHEREFORE, the premises considered, UTC and EEI strongly support the DoD's RFI and utilities look forward to the opportunity to share spectrum with DoD and other federal government agencies. This would benefit utilities and military branches of the government in numerous ways, both in practical and policy terms. Moreover, spectrum sharing would put the spectrum to effective use faster than reallocating the bands and relocating incumbents. Most importantly, spectrum sharing can be implemented while protecting federal government operations, and utilities are uniquely positioned to do so because they are compatible users of the spectrum and they share a common interest with the DoD in owning and operating private internal communications systems. Moreover, utilities and military operations need to upgrade their communications systems and they can partner with each other to do so through a shared system.

Respectfully,

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