Before the
National Telecommunications and Information Administration
Department of Commerce
Washington, DC 20230

In the Matter of	)
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Implementation of the National Spectrum Strategy	)
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COMMENTS OF THE UTILITIES TECHNOLOGY COUNCIL

The Utilities Technology Council ("UTC") hereby responds to the Notice of Opportunity for Public Input by the National Telecommunications and Information Administration ("NTIA") regarding the Implementation of the National Spectrum Strategy ("NSS").[1] Consistent with the objectives of the NSS, UTC supports ensuring that spectrum resources are available to support private wireless communications for utilities and other critical infrastructure industries ("CII") and maintaining the spectrum pipeline by applying guiding principles and leading program management practices to identify additional spectrum bands for use by utilities and other CII. This will require a collaborative long-term planning process, which includes ongoing planning that is supported by scientific studies with the data from those studies; evidence-based decision-making methodologies; and specifications and industry requirements. UTC supports the use of technologies to improve spectrum efficiency and bolster coexistence, but spectrum efficiency should not be the sole criterion upon which the NSS establishes spectrum policies. Utilities and CII efficiently use spectrum to support mission critical communications that support the safe,

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[1] U.S. Department of Commerce, National Telecommunications and Information Administration, *Implementation of the National Spectrum Strategy*, 88 Fed Reg. 85266 (Dec. 7, 2023)(hereinafter "Request for Input"), *available at* https://www.govinfo.gov/content/pkg/FR-2023-12-07/pdf/2023-26810.pdf. *See also* The White House, National Spectrum Strategy, Nov. 13, 2023 (hereinafter "NSS"), *available at* https://www.ntia.doc.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf.

reliable and secure delivery of essential electric, gas and water services and protect the safety of personnel in the field. The importance of these communications to energy security and national security underscores the need to ensure that utilities have access to sufficient and suitable spectrum to meet their increasing communications requirements for both wideband capacity and wide area coverage. The NSS must ensure that the nation's national security is not compromised by short term strategies that serve near term commercial interests. The United States has a leadership role in the world, and it needs to protect its national security interests as a first principle in the NSS.

I. Introduction

UTC is the international association for the telecommunications and information technology interests of electric, gas and water utilities and other critical infrastructure industries.[2] UTC's members include large investor-owned utilities who may serve millions of customers usually across large multi-state service territories, and its members include smaller rural electric cooperatives and municipal utilities who may serve only a few thousand customers in isolated communities or rural areas. All of these utilities own, maintain and operate their own private internal communications networks that they primarily use to support their internal operations to ensure the safe, reliable and secure delivery of essential energy and water services. These systems are designed, built and maintained to extremely high standards of reliability because utilities rely on these communications systems, particularly during emergencies such as hurricanes and other natural disasters. Utilities rely on their private internal communications systems because commercial communications systems are typically unavailable during

[2] *See* www.utc.org.

emergencies, and they do not provide the coverage that utilities need into remote areas where critical infrastructure assets may be located.

UTC supports the NSS, and it is providing its comments on the Implementation Plan to emphasize the need to support utility communications, which underpin the nation's security and its economic stability. At a time when utilities are under increasing demands to promote clean energy and protect against a variety of physical and cyber security threats, the need for access to spectrum to support these efforts has never been greater or more important. Utilities need communications to remotely monitor and control the generation, transmission and distribution of electricity as well as the delivery of gas and water services. Communications are central to smart grid, and technologies like distributed automation and protective relaying must be able to communicate with remote devices to constantly maintain the balance of power as well as the pressure of gas and water services.[3] Any disruption of the communication systems can have potentially catastrophic consequences on the underlying electric, gas and water operations that these communications systems help to support. Moreover, they need to meet extremely high standards for reliability and low latency in order to instantly isolate an electric fault on the grid or shut off a valve in the pipes delivering gas or water.

These communications systems must provide two-way, real-time connectivity throughout utility infrastructure all the way to the customer premises. This enables utilities to both command and control their operations automatically and securely so that they can detect and locate an outage and potentially predict it before it happens and either mitigate the extent and duration of its impact or avoid the outage altogether. It also is important to protect the safety of personnel to

[3] *See* https://www.energy.gov/smart-grid. *See also* "Invisible Infrastructure: How Utility Telecommunications Networks Underpin the Grid," Utilities Technology Council, *available at* https://utc.org/wp-content/uploads/2018/10/About-Utility-Comms-101.pdf.

ensure that voice communications are transmitted and received accurately and instantaneously, particularly when working in hazardous environments including during emergency restoration, often times in coordination with police, fire and rescue first responders.

The world is changing under our feet. For many years utilities have been deploying advanced metering infrastructure (AMI), which has required the simultaneous deployment of communications systems that must be capable of carrying traffic back and forth to the utility for applications such as outage detection as well as demand response and remote connect and disconnect which perform essential functions to maintain operational safety and service reliability. This serves as the most visible example of how utilities increasing depend on communications, but there is also an increasing array of distributed energy resources, such as solar, wind and other forms of renewable generation, and the advent of DER requires greater communications capabilities to maintain the balance of power on the grid to prevent system overloads and to ensure power quality overall.[4] Last but not least, there are an increasing number of electric vehicles that are operating over more of the country every day, and utilities need to extend their communications systems to reach charging stations in remote areas and to ensure the efficient, safe and secure recharging of these vehicles at homes and at businesses.

No longer are utility communications systems used simply to support one-way slow speed remote meter reading or to provide narrowband radio for routine dispatch with personnel. Now, utility communications systems are using state of the art digital communications technologies, and utilities are implementing private LTE and 5G communications solutions that

[4] *See* U.S. Department of Energy, Office of Electricity "Communications in the Electric Grid: An Evolving Interdependent Ecosystem between the Grid and Communications Utilities," (Nov. 2023) *available at* https://www.energy.gov/sites/default/files/2023-06/Communications_in_the_Electric_Grid_An_Evolving_Interdependent_Ecosystem_between_the_Grid_and_Communications_Utilities.pdf

require much more spectrum and bandwidth to support a wider variety of mobile data applications as well as communications for fixed operations.[5] The benefits for consumers and America's economic and national security are enormous, and the implications for the NSS are clear. We must as a country support utility communications or we will not realize the benefits of improved clean energy services and reliability that these communications systems provide. Moreover, we risk falling behind the rest of the world which is already moving ahead with private LTE for utilities and policies that provide access to spectrum that utilities need to support these new technologies.[6] Now is the time and the NSS is the opportunity to provide utilities with the spectrum they need in the near and long term.

The National Spectrum Strategy adopts and describes four pillars with several corresponding strategic objectives for immediate and sustained effort, and the Implementation Plan will establish specific outcomes associated with each strategic objective of each of the following four pillars.

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[5] *See* Warren Westrup, "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. *See also* John Engel, "Utilities embrace private communication networks as the backbone of the energy transition," Power Grid International (Nov. 21, 2023), *available at* https://www.power-grid.com/td/communication-technology/utilities-embrace-private-communication-networks-as-the-backbone-of-the-energy-transition/#gref.

[6] Letter from the Edison Electric Institute, Utilities Technology Council, National Rural Electric Cooperative Association, American Public Power Association, Utility Broadband Alliance, Southern Company Services, Inc., Dominion Energy, Inc., Evergy, Inc., National Grid, Pacific Gas & Electric Company, Hawaiian Electric Company, Florida Power & Light Company, and PPL Corporation to Scott Blake Harris, Senior Spectrum Advisor, Office of the Assistant Secretary, National Telecommunications and Information Administration, U.S. Department of Commerce (Oct. 19, 2023), *available at* https://www.ntia.gov/sites/default/files/2023-10/electric-utility-letter-written-input_0.pdf. ("Internationally, other countries are further along than the U.S. in recognizing the importance of spectrum for utilities. Canada, multiple European nations, and countries across North Africa and the Middle East have all taken steps towards making spectrum available for utilities. Not only do their actions underscore these countries' recognition of the importance of spectrum to critical infrastructure communications, but they also represent progress towards economies of scale and scope for equipment achieved by focusing on common spectrum bands, another key aspect of dedicated utility spectrum. While more work remains to be done globally around spectrum availability for utilities, the U.S. should not continue to lag behind the efforts accomplished thus far."

- Pillar One regarding the spectrum pipeline provides three strategic objectives.

    1) Ensure that Federal agencies have sufficient spectrum access to support their missions now and in the future. This objective recognizes that relying on nongovernmental entities or services is infeasible or can be materially detrimental to national interests, such that sufficient spectrum resources should be provided for agencies and their supporting entities to conduct their missions and protect their operations from experiencing harmful interference. Moreover, it envisions an assessment that accounts for factors, including the *availability* of a spectrum assignment for immediate use and alternative metrics for assessing the "efficiency" of spectrum usage, as well as the need for increased transparency and addition data to make informed decisions.

    2) Ensure that the private sector has access to spectrum resources now and into the future, and NTIA has identified five spectrum bands for in-depth study in the near term for expanded governmental and non-governmental use. Among the bands is the 7125-8400 MHz band, which is one of the bands that UTC identified in its initial comments on the NSS for potential access by utilities. UTC reiterates and underscores the importance of providing access to this band for use by utilities and the potential for coexistence between utilities and Federal government incumbents, which will increase efficiency and provide ancillary benefits for national security and other overriding policies.

    3) Apply guiding principles and leading program management practices to identify additional spectrum bands that will maintain the spectrum pipeline into the future.

        These guiding principles and program management practices, include:

        i. providing relevant and timely information from all stakeholders to sustain decision-making processes in support of the spectrum pipeline;
        ii. following best practices for transition of spectrum bands such as tracking progress, identifying risks and addressing issues early to minimize any disruption to implementation; and
        iii. assessing the spectrum pipeline periodically to ensure its sufficiency, suitability, viability and feasibility for all stakeholders until the long-term spectrum planning process under Pillar Two is established and implemented.

- Pillar Two regarding collaborative long-term planning provides the following three strategic objectives.

    1) Establish a persistent strategic spectrum planning process guided by the best available science and data, including working through the Interdepartment Radio Advisory Committee (IRAC) and the Spectrum Advisory Council as well as the Commerce Spectrum Management Advisory Committee (CSMAC) and following the Memorandum of Understanding (MOU) between the NTIA and FCC to work together on spectrum policymaking. The resulting collaborative framework will

expand opportunities for spectrum access and harmonious coexistence by whatever licensing and allocation mechanism, for all sectors (e.g., terrestrial, satellite, in-space, launch, aviation, public safety, scientific research, Federal missions); and it will implement an ongoing process for solicitation of new and future spectrum requirements based upon supporting data information submitted in a standard format by spectrum users, which will be used to update the NSS as required to coordinate the U.S. domestic and international technical and policy work.

2) Develop and document an evidence-based national spectrum decision-making methodology. This data will be analyzed systematically to develop national priorities to drive policy decisions using best practices that include at a minimum, greater transparency around reported findings to the extent practicable in which Federal and non-Federal stakeholders collaborate with each other and comply with existing laws and policies and follow the MOU between the NTIA and FCC.

3) Define requirements and implement capabilities to capture essential data and information on spectrum use. This data collection and analysis using the collaborative framework will enable long-term planning and provide sufficient lead-time for proper planning and implementation of changes to authorized spectrum use. It will also include using new or upgraded validated modeling to bolster stronger acceptance of the results of studies assessing the potential for coexistence.

- Pillar Three regarding unprecedented spectrum innovation, access and management through technology development provides the following strategic objectives.

1) Improve spectrum efficiency and bolster coexistence by facilitating investments in new and emerging technologies. This entails incorporating spectrum efficiency requirements early on by both Federal and non-Federal users, which depends both on receiver characteristics and transmitter operations. It also relies on using spectrum management technologies and techniques, including cloud-based spectrum management, AI/ML, advanced antenna technology, open and interoperable network architectures, cognitive transceiver technologies, advanced RF microelectronics, simultaneous transmit and receive, and edge intelligence. The NTIA and FCC will study commercial incentives and consider economic factors – including a "designed to share whenever feasible" mindset – and collaborate with each other to develop an enduring, scalable common platform for coexistence mechanisms and explore different approaches to spectrum sharing going forward.

2) Commit to improving collective understanding of the electromagnetic spectrum through coordinated, focused and sophisticated research and development. This National Spectrum Research and Development Plan will identify key innovation areas for spectrum R&D and will include a process to refine and enhance these areas on an ongoing basis. It will also consider recommendations developed through the collaborative framework and it will include assessments from stakeholders and the development of a national testbed for dynamic spectrum sharing – which will

encourage real-world measurements through field testing whenever possible and increase awareness and availability of outdoor wireless testbeds.

3) Pursue spectrum policies that maximize flexible use of spectrum, accommodate new and innovative technologies, and identify opportunities to expand spectrum access. This approach would include considering legislative changes to the Spectrum Relocation Fund to make payments for costs associated with general spectrum coexistence and compatibility R&D by Federal entities across all spectrum access models. It would also respond to changing conditions to accommodate new and innovative technologies and expand access to new users in underrepresented communities.

- Pillar Four regarding expanding spectrum expertise and elevating national awareness provides the following three objectives.

1) Attract, train and grow the current and next-generation spectrum workforce. This involves the development of a National Spectrum Workforce Plan to prioritize development of and enhancements to the spectrum ecosystem workforce (including the full range of operational, technical, and policy positions involved in spectrum-related activities). It will also involve the identification of needed education and training programs, and participation in conferences, trade shows and other opportunities for informal collaboration and cross-stakeholder network building, such as through participation in technical and professional organizations. There should also be partnerships with colleges and universities to develop programs to offer training in engineering skills to support analysis of spectrum issues, including a work-study program that could result in employment and leverage existing collaboration efforts. Similarly, there should be fellowship programs that place doctorate-level scientists in the U.S. Government and in organizations, as applicable, as well as engagement with trades schools to develop and implement certification programs for targeted, spectrum-related skills sets.

2) Improve policymakers' understanding of spectrum considerations. This objective recognizes that spectrum management is an interdisciplinary process and few if any policymakers have expertise in all the relevant fields. The goal is to improve policy decisions by enabling policymakers to understand the complex technologies and trade-offs involved when weighing current uses and impacts on incumbents against potential future applications. So, it encourages policymakers at all levels to increase their understanding, and it also encourages Federal organizations that rely on spectrum to perform their missions to ensure sufficient spectrum expertise on staff and to train them to communicate in plain language with decision-makers.

3) Improve the public's understanding of radio frequency spectrum and raise awareness of its role in everyday life. This objective also recognizes that spectrum is commonly misunderstood by everyday users, and it sets a goal to prioritize educating the public about spectrum and the role it plays, ideally to spark an interest among a broader community and attract multi-faceted problem-solvers to the field, as well as

encourage public input in determining priorities for competing interests in spectrum access.

UTC applauds this comprehensive and holistic approach within the NSS, and it provides the following recommendations to achieve the strategic objectives through the Implementation Plan, as described in more detail in the following comments. First, UTC agrees that there needs to be sufficient spectrum in the pipeline, and it needs to be made available for utilities and protected from harmful interference to meet the current and future requirements to support mission critical communications that advance national security and other overriding policies. Second, UTC also supports the development of long-term spectrum planning and guiding principles for the process by which spectrum is made available, including collaboration, transparency, evidence-based studies and input from all interested stakeholders, including and especially utilities and other critical infrastructure industries and the Department of Energy and other Federal agencies in order to provide their collective expertise and policy perspectives regarding the need for spectrum for the energy and water sectors. Third, UTC emphasizes utilities' needs for access to licensed exclusive use spectrum in order to ensure reliable mission critical communications, but it also supports additional research and development of technologies such as dynamic spectrum sharing, including approaches for real-world testing to ensure that incumbents are protected against harmful interference. Utilities are efficient users of spectrum, but they lack sufficient spectrum to meet their increasing communications needs, such that they need resources in the form of access to additional licensed spectrum that provides favorable coverage and greater capacity. Moreover, they have conducted numerous interference testing studies in real-world environments, which can further inform and support efforts under the NSS to promote unprecedented spectrum innovation, access and management through technology development. Fourth and finally, UTC supports increasing education and training for

a skilled spectrum workforce and raising awareness about spectrum with policymakers, their staff and the public in general, and UTC is already working to promote education and training for utility telecommunications professionals, including by hosting conferences and other educational events as well as developing educational programs and exploring partnerships with other organizations and academic institutions to advance theses strategic objectives.

II. The Implementation Plan for the National Spectrum Strategy Should Ensure U.S. Leadership by Providing Spectrum Resources to Support Utility Operations and Applying Guiding Principles and Leading Program Management Practices to Make Available Additional Spectrum.

The overarching goal of Pillar One of the NSS is to ensure U.S. leadership in advanced and emerging technologies by establishing a "spectrum pipeline" to consider repurposing certain bands to satisfy non-Federal and Federal needs. This pillar focuses on immediate action to meet existing and reasonably anticipated near- and mid-term spectrum needs, and it identifies five spectrum bands for in-depth, near-term study to determine suitability for potential repurposing to address the nation's ever evolving needs. One of the key strategic objectives here is to ensure spectrum resources are available to support private sector innovation now and into the future. In that regard, the NSS identified five spectrum bands for potential expanded governmental and non-governmental use for an array of advanced, next-generation applications and services.

Among these bands is the 7125-8400 MHz band, which is currently used for a variety of mission-critical Federal operations (including Fixed, Fixed Satellite, Mobile, Mobile Satellite, Space Research, Earth Exploration Satellite and Meteorological Satellite services) that the NSS states "will make it challenging to repurpose portions of the band while protecting incumbent users from harmful interference."[7] Moreover, the NSS recognizes that the "United States must

[7] NSS at 6.

now invest time and resources into studying spectrum bands that are more encumbered and complex than in the past."[8] The hard reality is that some of these bands that are subject to study may not be repurposed for non-federal use as a practical matter because they are too heavily encumbered and/or certain types of non-Federal uses are not compatible with Federal incumbent operations.

A. The 7125-8400 MHz band should be shared with utilities to ensure U.S. leadership in advanced and emerging technologies in the energy and water sectors and to promote national security, economic growth and social welfare.

UTC believes that the NSS should ensure U.S. leadership in advanced and emerging technologies in the energy and water sectors by sharing the 7125-8400 MHz band with utility microwave communications systems. Utility microwave communications systems are compatible with Federal incumbent operations because they use the same microwave communications technologies as one another. These systems can be coordinated to avoid causing harmful interference to each other, using well-understood, prior coordination processes that have been used for decades and have been proven effective at preventing interference from occurring. Utilities could share this spectrum immediately and put this spectrum to more effective use without disrupting incumbent Federal operations. Moreover, utilities are compatible users of the spectrum because they have similar missions and use their systems in similar ways as Federal government agencies. They operate these private internal mission-critical communications systems to support essential public services, just like federal government agencies. Sharing spectrum with utilities also opens up the potential for synergies whereby utilities and Federal government operations could deploy shared networks that would be capable of interoperability, which would facilitate coordination during emergency response.

[8] NSS at 7.

While sharing this spectrum band with utilities is technically feasible and compatible with Federal government operations, it will be comparatively much more "challenging" to repurpose this band for commercial wireless broadband services.[9] Whether the band is repurposed for licensed or unlicensed wireless broadband, incumbent Federal government operations will be either actually relocated or effectively displaced by harmful interference. UTC can speak from experience in this assessment, because our utility members are being displaced out of the 6 GHz band due to harmful interference from a variety of unlicensed operations that have been authorized to "share" the spectrum band.[10] The same thing will happen to Federal incumbents if the 7125-8400 MHz band is opened up to unlicensed wireless broadband operations. Numerous real-world studies conducted by utilities in the 6 GHz band have proven that unlicensed wireless broadband operations are certain to cause widespread and significant interference to utility licensed microwave systems.[11] The findings from these real-world studies

[9] NSS at 6 (stating that it will be challenging to repurpose portions of the 7125-8400 MHz band while protecting incumbent users from harmful interference, because there are "a variety of mission-critical Federal operations in this band (including Fixed, Fixed Satellite, Mobile, Mobile Satellite, Space Research, Earth Exploration Satellite, and Meteorological Satellite services)").

[10] *See generally* Unlicensed Use of the 6 GHz Band, ET Docket No. 18-295, *available at* https://www.fcc.gov/ecfs/search/docket-detail/18-295.

[11] *See e.g.* Letter from Larry Butts, Manager, Telecom Engineering, Southern Company Services, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission in ET Docket No. 18-295 and GN Docket No. 17-183 (filed June 23, 2021); and see Attachment A: Test Report on the Effects of 6 GHz Unlicensed RLAN Units on Fortson to Columbus Microwave Link June 21, 2021. *See also* Letter from Greg Kunkle, counsel for FirstEnergy Corp. to Marlene H. Dortch, Secretary, Federal Communications Commission in ET Docket No. 18-295 (filed May 9, 2023); *and see Attachment*, "FirstEnergy 6 GHz Additive Interference Study – Phase 2" (May 2023); EPRI Report #3002027536 (May 2023). *See also* Letter from Greg Kunkle, counsel for FirstEnergy Corp. to Marlene H. Dortch, Secretary, Federal Communications Commission in ET Docket No. 18-295 (filed Oct. 12, 2022); *and see* Attachment, "FirstEnergy 6 GHz Additive Interference Study" (October 2022); EPRI Report #3002025484 (Oct. 2022). *See also* Letter from Michael Bennet, counsel for the Evergy Companies to Marlene H. Dortch, Secretary, Federal Communications Commission in ET Docket No. 18-295 (filed Dec. 8, 2022); *and see* Attachment, "Wi-Fi 6E and 6 GHz Microwave Testing", Burns & McDonnell, September 24, 2022.

have also been confirmed using modeling that predicts the impact of interference to utility microwave links in the near and long-term.[12]

B. Utilities need access to the 7125-8400 MHz band to avoid interference to their incumbent licensed microwave systems in the 6 GHz band.

Utilities are transitioning their 6 GHz microwave communications systems to other spectrum bands to avoid the potential for harmful interference from unlicensed wireless broadband operations. Unfortunately, the cost of doing so is significant, and other spectrum bands do not offer the same propagation characteristics, which can also compound the cost and the difficulty of transitioning out of the 6 GHz band. Worse, some utilities simply do not have the option to transition to another spectrum band and/or they must resort to using other technologies to replace their 6 GHz systems, if possible. As a practical matter, opening up the 6 GHz band to unlicensed wireless broadband operations poses an imminent threat to utility reliability, safety and security, and there is no confidence that enforcement mechanisms will be able to mitigate the threat to mission critical communications in a timely and effective manner. Fixing interference after the fact will be far too late to sufficiently protect mission critical communications and prevent potentially catastrophic consequences, and it poses an undue burden on the utilities to investigate and remediate the source of interference, as well. It should also be recognized that the interference from these wireless broadband operations also threatens critical public safety communications and other incumbent operations in the band.

Utilities and other critical infrastructure industries need access to the 7125-8400 MHz band to migrate their incumbent licensed microwave systems in the 6 GHz band to avoid interference from unlicensed wireless broadband operations. Studies have been conducted and

[12] Letter from Nick Petrakis, Director, Infrastructure & Cloud Service Strategic Infrastructure Programs, Pacific Gas & Electric Company to Marlene H. Dortch, Secretary, Federal Communications Commission in ET Docket No. 18-295 (filed Apr. 25, 2023).

have concluded that the 7125-8400 MHz band would be able to effectively and efficiently support incumbents to transition from the 6 GHz band.[13] The band has sufficient capacity in terms of bandwidth for utilities and other critical infrastructure industries to support their current and future requirements. Moreover, the incumbent microwave systems in the 6 GHz band could readily transition to the 7125-8400 MHz and effectively coordinate with incumbent Federal government operations without disrupting their communications. Finally, the 7125-8400 MHz band would enable utility incumbents in the 6 GHz band to transition relatively easily and with a minimum of additional new tower construction.

C. Sharing the 7125-8400 MHz band with utilities is necessary to ensure national security as well as public safety, economic growth, and health and social welfare.

Sharing this band with utilities would ensure U.S. leadership in the energy and water sectors and would promote national security, as well as public safety, economic growth and health and social welfare. The National Spectrum Strategy acknowledges that "some Government missions depend on nongovernmental, federally supported organizations, activities, and facilities, which also require access to spectrum."[14] As noted above, utilities and federal government agencies have similar missions, and as a practical matter, utilities support Federal government operations in many ways. For example, nearly all military bases depend on commercial power from utilities, and the same is true for other Federal government agencies as

[13] *See* Letter from Scott Bergman, Senior Vice President, Regulatory Affairs, CTIA to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295 (filed Feb. 24, 2020) *and see* Attachment "Analysis for 6 GHz Relocation (6525 – 7125 MHz) by Comsearch (Feb. 11, 2020), *available at* https://www.fcc.gov/ecfs/document/10224810516518/1. *See also* Chriss Hammerschmidt, Broadband Spectrum Survey in the San Diego, California Area, NTIA Report No. TR-14-498, at 103-05, 120 (Mar. 2014), https://www.its.bldrdoc.gov/publications/2741.aspx; Chriss Hammerschmidt , Heather E. Ottke & J. Randy Hoffman, Broadband Spectrum Survey in the Denver and Boulder, Colorado, Metropolitan Areas, TR-13-496, at 115-117, 129 (Mar. 2014), *available at* https://its.bldrdoc.gov/-publications/2735/aspx.

[14] NSS at 3.

well.[15] Moreover, utilities are a significant part of several of the sixteen critical infrastructure sectors, "whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof."[16] Utilities also enable the effective functioning of many if not all of the other critical infrastructure sectors, as well. For all these reasons, utilities are critically important to this country, and providing them access to adequate spectrum resources is necessary to ensure their critical communications which in turn support their essential energy and water services.

Utilities own, maintain and operate their own private internal communications networks to ensure the safe, secure and effective operation of their critical infrastructure systems and the underlying essential energy and water services they provide to the public at large. The National Spectrum Strategy recognizes that government agencies cannot rely on commercial communications networks, because it may be infeasible or would be materially detrimental to national interests to do so. In those cases, the NSS "will ensure that sufficient spectrum resources are available to agencies and their supporting entities to conduct their missions and to protect their operations from experiencing harmful interference."[17] Utilities follow the same approach, which is why they rely on their own private internal wireless communications networks. Like Federal government agencies, utilities also need sufficient spectrum resources to conduct their

[15] *See* "Regulatory Considerations for Utility Investments in Defense Energy Resilience," National Association of Regulatory Utility Commissioners (Oct. 2021), *available at* *https://pubs.naruc.org/pub/9931AF59-1866-DAAC-99FB-17BF932AECF5* ("Today, more than 98% of military installations depend on the civilian power grid, and DoD also relies heavily on interdependent civilian utilities for communications, natural gas, and water.")

[16] See CISA at https://www.cisa.gov/topics/critical-infrastructure-security-and-resilience/critical-infrastructure-sectors (listing the Energy Sector, the Nuclear Reactors, Materials and Waste Sector, the Dams Sector, and the Water and Wastewater Sector among those within the Critical Infrastructure Sectors that include utilities).

[17] NSS at 3-4.

missions and to protect their operations from harmful interference. Moreover, they cannot rely on commercial communications services, particularly for mission critical communication and especially during emergencies and in remote areas when and where they may be unavailable. Finally, and importantly, they must be protected against harmful interference, recognizing that their mission-critical communications need 99.999% reliability. Therefore, they need access to spectrum that is free from interference and congestion, and the NSS should ensure that utilities are protected from harmful interference so that their mission-critical communications continue to meet their demanding requirements for reliability.[18]

D. Utilities face increasing demands for communications to support overarching national policies and protect their critical infrastructure.

The unfortunate reality is that utilities lack sufficient spectrum resources to meet their increasing communications needs, and their wireless communications operations are not protected from harmful interference. Utilities lack sufficient spectrum because most of their existing spectrum is composed of narrowband land mobile radio allocations that do not provide sufficient capacity to support the bandwidth required for additional utility applications for grid modernization. In addition, they need additional spectrum to monitor and control an increasing number of distributed energy resources (such as solar, wind and hydro) and demands (such as electric vehicles) to balance power on the grid in real-time. At the same time that utilities face increasing demands for spectrum, their existing spectrum is being reallocated for commercial communications services and is subject to increasing congestion from other private wireless licensees and unlicensed wireless operators who share the same spectrum with utilities or operate

[18] *See* Douglas McGinnis, "*Spectrum and Utility Communications Networks: How Interference Threatens Reliability,"* Utilities Technology Council, *available at* https://utc.org/wp-content/uploads/2019/02/Spectrum-and-Utility-Communications-Networks-2.pdf.

in adjacent bands. The threat of harmful interference in the 6 GHz band is the clearest example, but there are plenty of other problems with the existing spectrum utilities use.

In short, utilities are having to do more with less, and that is simply unsustainable and a threat to our national security as well as to public safety and health and welfare generally. There are increasing threats to utilities' cyber and physical security, and these threats are increasing in sophistication from a growing variety of vectors. Accordingly, utilities need more communications capacity and coverage to ensure encryption and two-way multi-factor security authentication and to provide video surveillance to protect critical assets such as substations against attacks. There are also increasing communications demands to support grid modernization, including new applications that use predictive analytics to continuously monitor power quality to improve operational efficiency, reliability and safety using more granular measurements deeper into the grid than ever before.[19]

E. The NSS can fill existing technology and educational gaps to help utilities meet policy requirements and achieve overarching national policy objectives by following certain guiding principles to study sharing additional spectrum bands.

Policymakers are well-aware of these additional demands and new applications, and many times they are requiring utilities to implement them as part of the drive towards cleaner energy and water services as well as critical infrastructure protection. Yet, there is a gap that currently exists between these policies and the lack of sufficient spectrum necessary to support these policy initiatives. Pillar One of the NSS can fill the technology gap by providing utilities with the spectrum they need, and Pillar Four of the NSS can fill the policy gap by educating

[19] *See* William Monzon, Wei Du and Gregg Edeson, "Predictive analytics: How utilities are moving from reactive to proactive" Power Grid International (Nov. 9, 2022), *available at* https://www.power-grid.com/td/predictive-analytics-how-utilities-are-moving-from-reactive-to-proactive/.

policymakers about the need for spectrum to support clean energy, critical infrastructure protection and other overriding national policy objectives.

The 7125-8400 MHz band is the near-term need that immediately aligns with the bands identified for study under Pillar One, but utilities also need access to other spectrum bands to meet their increasing communications needs in the near-term as well, including the 400 MHz band as UTC explained in its initial comments in response to the NSS.[20] As part of Pillar One, the NSS identifies certain guiding principles and leading program management practices to identify additional bands for study.[21] One such principle is that relevant and timely information from all stakeholders – with appropriate safeguards for the collection of confidential information and sensitive data – is often necessary to sustain decision-making processes in support of the spectrum pipeline.[22] In this context the NSS calls for greater transparency into supporting studies for repurposing spectrum bands, which studies "should be peer-reviewed, and the underlying findings should be published to the greatest degree possible."[23] Another principle is that once a spectrum band is identified to be repurposed, NTIA and the FCC should follow best practices as they plan for the transition of the band, coordinate between incumbents and new entrants, and execute the planned transition.[24] In this context, the NSS states that these best practices will involve tracking progress, identifying risks, and addressing issues early to minimize any

[20] Comments of the Utilities Technology Council in response to the NTIA Request for Comment, Docket No. NTIA– 2023–0003 at 13 (filed Apr. 17, 2023), *available at* https://www.ntia.gov/sites/default/files/publications/utilities_technology_council_utc.pdf. Specifically, the 400 MHz band refers to federal spectrum in the 380-399.9 MHz and 406-420 MHz bands.

[21] NSS at 7.

[22] *Id.*

[23] *Id.*

[24] *Id.* at 8.

disruption to implementation. Finally, similar principles will apply to monitoring the ongoing sufficiency of the spectrum pipeline, which will be conducted on an interim basis until the long-term spectrum planning process outlined in Pillar Two is established and implemented. In this context, the NSS states that "if this joint assessment [between the NTIA and FCC] shows that additional spectrum bands need to be studied for potential repurposing, then NTIA will collaborate with the FCC and coordinate with the Federal agencies to develop a transparent and data-driven process to identify and assess potential impacts to incumbent spectrum users."[25]

UTC supports these guiding principles, and it urges the NTIA and FCC to identify other spectrum bands for potential sharing with utilities in the near, and mid- to long term. UTC agrees with the need for transparency in the process and basing spectrum decisions on studies that disclose the underlying data and are ideally peer-reviewed to the maximum extent. To be sure, UTC and other organizations representing incumbents in the 6 GHz band objected to the way that the FCC relied on simulations that supported unlicensed use of the 6 GHz band, despite the absence of any underlying data to support the conclusions reached in those studies. Accordingly, UTC supports this guiding principle, and it urges the NSS to require the disclosure of the underlying data and the algorithms that are used for models that are submitted in support of repurposing spectrum. Similarly, UTC agrees with the principle of collaboration and transparency in the process once a spectrum band has been identified for further study for access by non-Federal operations. With regard to access to spectrum for utilities, UTC recommends collaborating with the Department of Energy, which is the Sector Risk Management Agency for the Energy Sector, particularly regarding the spectrum to support electric utilities. Finally, UTC supports the principle for NTIA and the FCC to monitor the ongoing sufficiency of the spectrum

[25] *Id.*

pipeline and to develop a transparent and data-driven process to identify and assess potential impacts to incumbent spectrum users in spectrum bands that are identified for study for repurposing for non-Federal operations. In that regard, UTC recommends prioritizing access to spectrum for utilities because of the urgent need to meet their increasing communications needs and the importance of the essential services that utilities provide. Moreover, it recommends protecting utility investments in bands where they currently operate and have relocated by refraining from repurposing these bands to incompatible operations that are certain to cause interference to utility licensed systems, as is currently the case with the 6 GHz band. The NSS must avoid making these kinds of mistakes again in other bands used by utilities and other critical infrastructure industries for mission critical communications.

III. The Strategic Planning Process Should be Developed Through a Collaborative Framework Using an Evidence-Based Methodology with Supporting Future Spectrum Requirements.

Pillar Two outlines the collaborative framework for long-term planning to identify additional spectrum bands for study in the future. It recognizes the increasing complexity involved in identifying other spectrum bands that are capable of being repurposed while ensuring that incumbents are protected from harmful interference. Accordingly, its three strategic objectives structure this process so that it is 1) ongoing, collaborative, and transparent; 2) supported by technical and economic analyses that are data-driven, science-based and peer-reviewed; and 3) capturing essential data and information on spectrum use now and into the future. Key to this process is the development of the advisory structures and interagency coordination mechanisms bringing all the stakeholders together for advanced planning, so they can generate recommendations earlier, based on the combined knowledge and perspectives of

both the Federal Government and the private sector.[26] "[A]s the demands for spectrum access continue to increase, the Nation must implement a long-term planning process in which stakeholders come together openly, consistently and transparently … to address users' current and future spectrum requirements."[27]

A. The collaborative framework should identify additional spectrum, including the 400 MHz band, for use by utilities.

It is critical that additional spectrum bands are identified to be made available for use by utilities. To be sure, there is an immediate need for utilities to share the 7125-8400 MHz band, as described above, but there is also a growing need in the near future if not already for utilities to access additional spectrum for their field area networks (FANs). The FANs are where utilities really need additional spectrum to be able to support grid modernization, which requires two-way, real-time connectivity all across their generation, transmission, and distribution infrastructure, as well as to be able to meet emerging demands from distributed energy resources, electric vehicles and both physical and cybersecurity threats. The spectrum bands for the FAN will need to support higher speeds and greater capacity while also providing wide-area coverage. Ideally, the spectrum should also support the use of standardized equipment by utilities, as well.

UTC has identified the 400 MHz band as one such band for the utility FAN, and it recommends that it be studied for sharing with utilities as part of the NSS in the very near future.[28] This spectrum band meets utilities' requirements for additional capacity and coverage,

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[26] NSS at 10.

[27] NSS at 9.

[28] Comments of the Utilities Technology Council in response to the NTIA Request for Comment, Docket No. NTIA– 2023–0003 at 13 (filed Apr. 17, 2023), *available at* https://www.ntia.gov/sites/default/files/publications/utilities_technology_council_utc.pdf.

and it supports the use of standardized equipment for private LTE (PLTE) with the potential to support 5G in the future. Utilities in Europe and other parts of the world are currently operating PLTE systems in various configurations using this spectrum band, and leveraging this ecosystem would enable utilities here in the U.S. to operate PLTE systems cost-effectively. UTC looks forward to working with NTIA, FCC and the energy and water sector designated agencies to analyze the 400 MHz band as well as other additional spectrum bands for potential sharing with utilities.

B. The collaborative framework should be open, transparent and evidence-based and leverage advisory structures and interagency coordination including all energy and water sector agencies as well as related organizations.

UTC supports the development of the collaborative framework for an ongoing, evidence-based and open and transparent process to identify additional spectrum to ensure U.S. leadership going forward. Spectrum policy should not be driven solely to serve the needs of commercial communications service providers. Moreover, the value of spectrum should not be determined simply by auction revenues; and other factors, including the public interest in the use of the spectrum, must also be considered. Similarly, there may be costs associated with repurposing spectrum, and the NSS needs to protect the investments that have been made by incumbents in existing spectrum bands and avoid disruption of these operations to the extent possible while allowing them to recover their costs caused by repurposing a spectrum band. These costs and benefits should be carefully balanced as part of the collaborative framework.

UTC agrees with the NSS that the evidence to support studies of spectrum bands should be transparent such that the underlying data and methodology of the results of the findings of the study should be disclosed to the extent possible without compromising national security. Similarly, UTC supports the NSS in its objective to capture essential data and information on spectrum use to accurately inform spectrum policy decision-making, such that this data and

information should also be disclosed to the extent possible without compromising national security. Finally, and importantly, UTC agrees with the NSS that it should not let the desire for more perfect information take precedence over the critical national interest in maintaining U.S. spectrum leadership internationally by making additional spectrum available.[29] Utilities have immediate needs for spectrum which must be addressed as quickly as possible. [30]

UTC underscores the need for advisory structures and interagency coordination that includes all the stakeholders in the process. Specifically, there is an important role for interagency coordination with the Department of Energy (DOE), as the sector specific agency for the energy sector, and the Federal Energy Regulatory Commission (FERC), as it pertains to its oversight of the North American Electric Reliability Corporation (NERC) and its Critical Infrastructure Protection (CIP) requirements.[31] Similarly, UTC supports including Idaho National Laboratory (INL), which has the resources for and the experience of conducting studies involving spectrum and energy infrastructure. Finally, UTC supports including the Electric Power Research Institute (EPRI) and similar industry groups to provide their expertise and unique perspectives regarding utilities and communications technologies.[32] Including DOE, FERC, NERC and INL, as well as EPRI and similar industry groups in the process will also provide different perspectives that will help to inform the NSS and assist in the spectrum decision making process by considering how spectrum access can support national clean energy

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[29] NSS at 12.

[30] *See* "Utility radiocommunications operating in the land-mobile service," International Telecommunications Union, Report M.2533-0 (09/2023), *available at* https://www.itu.int/pub/R-REP-M.2533-2023.

[31] *See* NERC Reliability Standards, *available at* https://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx.

[32] *See* https://www.epri.com/

and critical infrastructure protection policies. In this way, the NSS will truly "[e]stablish a new framework for collaboration [that] will facilitate robust and regular dialogue and interchanges of data, building trust and transparency among all stakeholders."[33]

IV. UTC Supports New Technologies, Sophisticated Research and Development and Policies that Flexible Use of Spectrum.

Pillar Three challenges the spectrum research community to enhance coordination of U.S. research and development endeavors and address areas where innovation is critical, including improving spectrum coexistence. Key to success here is advancing the state of technology for spectrum access, with an emphasis on dynamic forms of spectrum sharing for all users. Accordingly, the strategic objectives set out to facilitate investments in new and emerging technologies, develop a National Spectrum Research and Development (R&D) Plan; and pursue spectrum policies that maximize flexible use of spectrum, accommodate new and innovative technologies, and identify opportunities to expand spectrum access.

UTC reiterates and underscores its preference for access to licensed spectrum by utilities, and it continues to support additional development of spectrum sharing technologies as a way for utilities to access additional spectrum.[34] UTC was an early advocate for spectrum sharing as part of the National Broadband Plan, which was cited by the President's Council of Advisors on Science & Technology in its Report to the President on Realizing the Potential Full Potential of Government-Held Spectrum to Spur the Economy which supported spectrum sharing.[35]

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[33] NSS at 9.

[34] *See e.g.* UTC Policy Resolution Supporting Department of Defense Spectrum Sharing, *available at* Resolution-Supporting-Department-of-Defense-Spectrum-Sharing_PGE.pdf (utc.org). *See also* Comments of the Utilities Technology Council and the Edison Electric Institute to the Department of Defense Request for Information on Dynamic Spectrum Sharing (filed October 19, 2020), *available at* https://utc.org/wp-content/uploads/2020/10/UTC-EEI-Comments_DOD_RFI.pdf.

[35] President's Council of Advisors on Science & Technology, Report to the President on Realizing the Potential Full Potential of Government-Held Spectrum to Spur the Economy, (July 2012) PCAST Report at 45, n. 83, *available at*

Moreover, utilities are using spectrum sharing technologies and they are efficient users of spectrum generally. Utilities were some of the highest winning bidders in the CBRS auction, and they are using spectrum access systems to coordinate their operations in the 3.5 GHz band. Moreover, utilities use digital systems and trunking to make more efficient use of the spectrum for their land mobile and microwave communications networks. They also use spread spectrum unlicensed wireless networks, which increases the capacity and makes more efficient use of spectrum as well.

UTC looks forward to working with the NSS to promote the development of spectrum sharing technologies. While UTC and utilities continue to support the development of spectrum sharing technologies, more work is needed to improve the capabilities of these systems. For instance, utilities have reported varying performances by different CBRS spectrum access systems. Similarly, performance testing of 6 GHz AFC systems has also yielded varying results as reported in several challenges on the record in the FCC's docketed proceeding. Thus, any sharing methodology should be verified with comprehensive field testing and approved by established standards development organizations such as IEEE. In this regard, UTC supports Pillar Three of the NSS and its strategic objectives, consisting of facilitating investments in spectrum sharing generally and DSS specifically; developing a National Spectrum Sharing R&D Plan; and establishing policies to promote flexible use of spectrum using innovative technologies and identifying opportunities to expand spectrum access. Importantly,

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https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf. (recommending beginning a pilot program involving spectrum sharing supported by early release of funds from various sources, with three key elements: immediate sharing by new low-power devices in two existing Federal spectrum bands, formation of a Spectrum Sharing Partnership Steering Committee (SSP) of industry executives to advise on a policy framework to maximize commercial success; and creation of an urban Test City and a Mobile Test Service that can support rapid learning in spectrum management technology and practice.)

V. UTC Supports Education and Training to Promote a Skilled Spectrum Workforce and Increasing Awareness with Policymakers and the Public About the Complexities and Importance of Spectrum.

Pillar Four of the NSS promotes workforce development, educating policymakers and raising awareness with the public about spectrum, and it includes strategic objectives to provide training for workers, encourage policymakers to better understand spectrum issues, and increase public awareness about the importance of spectrum generally.

UTC strongly supports these strategic objectives as part of the Implementation Plan. Already, UTC is working with its members and partnering with other organizations and academic institutions to promote workforce development specifically in the area of communications technology. UTC recognizes that there is a shortage of skilled technicians to perform the work that needs to be done to deploy, maintain and operate communications infrastructure. The utility industry is particularly affected by aging workforce issues, which is another reason UTC has been and continues to be focusing on attracting young professionals to pursue career opportunities in the field of utility telecommunications. UTC looks forward to working with the NSS to promote workforce development to train technicians in the field of radiofrequency spectrum.

UTC is also promoting education of policymakers about spectrum through advocacy, conferences and other events, and information about spectrum-related developments affecting utilities. UTC started in 1948 as one of a number of FCC-certified frequency coordinators, and it continues to provide frequency coordination for land mobile and microwave systems today. Moreover, UTC advocates with the FCC and other Federal agencies, Congress, and state and local government agencies and organizations about spectrum issues affecting utilities. UTC also holds conferences and other events in various locations around the country, and these

conferences feature comprehensive educational programs that address spectrum issues as well as other topics affecting utility radiocommunications. Finally, UTC publishes and provides information about news related to radio-frequency spectrum, and it also provides that information to the public to increase awareness about the importance of utility wireless communications systems. UTC looks forward to working with the NSS to educate policymakers and the public about spectrum issues to inform their decision making and increase awareness about radiofrequency spectrum.[36]

VI. CONCLUSION

UTC supports NSS and it looks forward to working with the NTIA and FCC on the Implementation Plan. In conclusion, UTC supports utility access to the 7125-8400 MHz band to provide utilities with the spectrum they need for the safe, secure and reliable delivery of essential energy and water services to the Nation. UTC also supports the development of the collaborative framework for identifying additional spectrum bands to study repurposing them for use by utilities, and it specifically recommends studying allowing utilities to share Federal spectrum in the 400 MHz bands and adopting a process with guiding principles to promote transparency, openness and collaboration that includes utilities and the Federal agencies, such as DOE and FERC as well as related organizations such as NERC and INL. UTC also supports R&D for spectrum sharing technologies, and promoting policies for flexible use of spectrum generally, so that utilities can access additional spectrum that is critically needed for the U.S. to ensure its leadership in support of the energy and water sectors. Finally, UTC supports working with the NSS Implementation Plan to promote workforce development as well as educate policymakers and increase awareness among the general public about spectrum issues.

[36] For more information about UTC educational and training events, *visit* https://utc.org/events-and-education/.

Respectfully,

UTILITIES TECHNOLOGY COUNCIL

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