Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band	)	GN Docket No. 12-354
	)	
	)	

REPLY COMMENTS OF SIEMENS INDUSTRY INC

Siemens Industry Inc. is one of the world's leading suppliers of innovative, environmentally friendly products and solutions for industry customers. With our globally unmatched offering of automation and communication technology, industrial control and drive technology, as well as industrial software, we equip enterprises with what they need over their entire value chain – from product design and development to production, sales and service. The backbone of Siemens Industry's integrated portfolio of automation systems is our extensive offering for industrial communication in every environment, from the factory floor to the harshest outdoor conditions.

Siemens Industry Inc hereby submits its comments in response to the *Further Notice of Proposed Rulemaking and Order* (the "*FNPRM*") in the above-captioned proceeding of the Federal Communications Commission ("Commission"). For the reasons detailed below, Siemens urges the Commission not to include the 3650-3700 MHz band in the untested Citizens Broadband Radio

Service ("CBRS") regulatory regime so as to avoid disrupting the many incumbents in the 3650-3700 MHz band and, most importantly, to facilitate the on-going implementation of Smart Grid networks in this band.

INTRODUCTION

1. On December 12, 2012 the Commission issued a Notice of Proposed Rulemaking ("NPRM"), under GT Docket 12-354, proposing the creation of a new CBRS sharing the 3550-3650 MHz band with incumbent users. In the NPRM, the Commission also sought comment on a supplemental proposal to include the adjacent 3650-3700 MHz band in the proposed regulatory regime to create 150 MHz of contiguous spectrum for CBRS. The NPRM reported that there were 2,117 licensees with more than 25,000 registered sites throughout the United States as of October 2012 in the 3650-3700 MHz band. It refers to the assumption in the 3650-3700 MHz rulemaking "that Commercial Mobile Radio Services licensees would operate high-powered WiMAX devices". On April 23, 2014 the Commission issued a Further Notice of Proposed Rulemaking ("FNPRM"), under GT Docket 12-354 seeking further comments regarding the terms for the inclusion of the 3650-3700 MHz band within the CBRS regulatory regime. Our response to the FNPRM is centered on the Commission's proposal to include the 3650-3700 MHz band.

2. Siemens supports the Commission's goals to improve the overall efficiency of usage within the spectrum band 3550-3650 MHz by means of the two proposed techniques: *small cells and spectrum sharing* managed by the Spectrum Access System ("SAS") as suggested in the report issued in July 2012 by the President's Council of Advisors on Science and Technology ("PCAST"). With the FNPRM however, the Commission is proposing several significant changes to the regulatory framework for CBRS, changes that have led us to change our position with respect to the inclusion of

the 3650-3700 MHz band in the CBRS. Our position and the factors that have influenced our decision are described in the following paragraphs.

SIEMENS STRONGLY OPPOSES THE INCLUSION OF THE 3650-3700 MHz BAND WITHIN THE NEWLY-PROPOSED 3550-3650 MHz CBRS REGULATORY REGIME

3. **Proposed rules and concepts are untested:** Siemens applauds the Commission's willingness to consider new concepts to improve spectrum utilization. However, recognizing that these concepts are untested in practice and, as such, are highly likely to warrant modification as experience is gained, Siemens has concerns with the extension of these untested rules and concepts to the 3650-3700 MHz band. Commissioner Rosenworcel described the "*sandbox*" concept for testing and trying out new ideas before applying the ideas on a larger scale[1]. The underutilized and largely unusable 3550-3650 MHz band under traditional licensing schemes is an excellent candidate to serve as a '*sandbox*' in which to test and validate the novel concepts suggested in the PCAST report; on the other hand, the 3650-3700 MHz band, with a large number of incumbents is not a viable candidate for 'testing new ideas'. The PCAST report[2] also expresses the need to "*experiment*" with new and novel concepts and discusses the concept of '*test-beds*' and a '*test city*' to evaluate new concepts before deploying them on a larger scale. Even in the 3550-3650 MHz band an argument can be made for a more prudent approach and testing the small cell, SAS concepts on a limited geographic scale before expanding the

[1] REMARKS OF COMMISSIONER JESSICA ROSENWORCEL FEDERAL COMMUNICATIONS COMMISSION, IEEE GLOBECOM 2013, ATLANTA, GEORGIA, DECEMBER 11, 2013

("…..I think we need to build more sandboxes in Washington—and at the FCC. Because back at home, our big policy initiatives follow the traditional approach to innovation. We toil in isolation, generate ideas from deep within large federal buildings, and refine them with some outside input, a series of summits, panels, and the occasional Blue Ribbon commission. Then, without the benefit of having tested our thoughts in the real world, we unveil a finished product, cross our fingers, hold our breath, and hope everything turns out for the best…..")

http://www.fcc.gov/document/remarks-commission-jessica-rosenworcel-ieee-globecom-2013

[2] http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf.

concepts nation-wide. As pointed out in the WiMAX Forum response to the NPRM, the regulatory regime for the 3650-3700 MHz band is not perfect; nevertheless, the band appears to be working quite well with numerous incumbents including more than 100 licenses issued to utilities. Further, it is not clear that the proposed rules as they are currently evolving for CBRS will resolve issues in the 3650-3700 MHz band and, in fact, insofar as utilities are concerned, may further exacerbate the challenges they face with Smart Grid network deployments. Evidence to this effect, are the number of utilities that have put on hold the acquisition of new licenses in the 3650-3700 MHz band pending conclusion of these proceedings; if these organizations expected the rules to be favorable they certainly would have proceeded with their licensing and deployment plans. Without a suitable regulatory regime for the 3650-3700 MHz band, we believe the public benefits of a US-wide Smart Grid network will never be fully realized or at best, will be very slow to materialize. We strongly urge the Commission to take this into consideration in this proceeding. It is in the public's interest to support spectrum policy to facilitate the deployment of Smart Grid networks and the 3650-3700 MHz band is one of the few spectrum alternatives available.

4. **Costs for incumbents in 3650-3700 MHz band:** Incumbents in the 3650-3700 MHz band would be required to incur the significant cost of replacing fully functional equipment designed for higher power operation with new equipment that is SAS-compliant and suited to small cell deployments. Incumbents would also experience service and operational disruptions resulting from the changeover. With the requirement for smaller cells, incumbents would also be required to bear the cost of additional cells and licenses to cover the same geographical area they have with their current license(s) and higher transmit power. In addition to wireless equipment, the costs to these incumbents would include; installation costs, expenses for obtaining additional right-of-ways or roof-rights, towers and other infrastructure, leasing arrangements, etc. Excluding the 3650-3700 MHz band from

the CBRS proceedings ensures that all incumbents in this band, including utility smart grid networks, will be protected and not subjected to excess costs, service interruptions, or necessary equipment modifications to conform to the CBRS regulatory regime after the proposed 5 year grace period.

5. **Five-Year 'grandfather' period:** Even though recently issued licenses in the 3650-3700 MHz band would have up to 10 years before expiration; incumbents in the band would have to comply with the CBRS regulatory regime in only 5 years. In most cases equipment will have to be taken out of service before its end of useful life. In many cases, 5 years may not be long enough for incumbents to complete the necessary planning for a radically different cell layout and accrue the financial means to cover the investment costs (see 4 above) to comply with the CBRS regulatory framework and acquire the necessary licenses.

6. **Competitive bidding for PALs puts utilities at a disadvantage:** For a secure and reliable Smart Grid network with capacity available during mission-critical periods such as disaster recovery, utilities require a priority access license ("PAL"). The Commission chose not to embrace suggestions to allocate a portion of the CBRS band for critical facilities leaving a market-driven bidding process as the only means to gain a PAL. Utilities will be greatly disadvantaged with a market-driven bidding process, especially in areas with higher population densities where multiple and well-financed bidders can be expected. Utilities do not have the ability to translate the acquisition of spectrum directly to increased revenues as do WISPs and Mobile Operators. Additionally, utilities are often encumbered by local Public Utility Commissions (PUCs) for investment and rate increase approvals.

7. **Geographic area for PALs :** It is proposed that PALs be authorized at the census tract level and to permit geographic aggregation across license areas . We feel that this approach may impose unnecessary constraints for utility Smart Grid networks. For a Smart Grid network, a utility will require a licensed coverage area consistent with the utility's service area. US census tracts range from

1,200 to 8,000 inhabitants with an average of 4,000. A utility providing electrical power to only 1 million housing units would be required to acquire licenses for almost 1,000 census tracts. Further, for a WAN, in a propagation-friendly environment, base station coverage areas may very well extend over several census tracts while still being within the utility service area. It would be necessary in those cases to be assured that the same channel be assigned for surrounding census tracts. An additional shortcoming arises from the fact that boundaries for census tracts are subject to change every 10 years in accordance with demographic shifts to keep each census tract within the desired 1,200 to 8,000 inhabitant range. Census tracts with increasing populations are subject to being split while tracts with decreasing populations can be combined with adjacent tracts.

8. **One-Year license term is too short:** The licenses terms proposed for the CBRS of 1 year with up to 5 consecutive licenses available at a time is inconsistent with time-scales under which utilities and many other organizations operate. A license term of at least 10 years is more acceptable and the 3650-3700 MHz band currently meets this requirement. A license term of only 1 year creates a significant amount of added paperwork and operating costs for the licensees; especially for entities that must manage a large number of licenses spanning hundreds or thousands of census tracts as described in the preceding paragraph.

9. **Few alternative spectrum options are available for Smart Grid:** Very limited spectrum opportunities considered suitable for Smart Grid network deployments have materialized in any other frequency bands. Although, the 3650-3700 MHz band is not perfect it has proven to be a viable solution for many Smart Grid network deployments under the prevailing licensing rules as evidenced by the licenses currently issued to utilities, which number over one hundred.

10. **Rules for small cells are incompatible with Smart Grid:** Compliance with the CBRS EIRP limitations and antenna gains to support '*small cell*' deployments will not, in most cases, be

consistent with the most cost-effective Smart Grid WAN (city-wide) deployment for a typical medium to large size US city[3].

11. **'Contained Access' defined as indoor only is not compatible with Smart Grid and other public safety or 'critical facility' requirements:** "Contained Access" in the CBRS regime should not be defined to be ONLY indoors, but expanded to include 'outdoor areas' surrounding critical infrastructure. Example: An outdoor area extending 300 feet (or some other value) from a nuclear power plant (or other critical infrastructure) should be considered a 'Contained Access' area. This would support the use of a wireless video surveillance system to support continuous monitoring in areas surrounding the facility. There are many critical infrastructures that do not have the 'benefit' of a walled enclosure to 'contain' signals. Examples include: solar farms, wind-generating equipment, sub-stations, electrical power plants, refineries, and so on. Wireless video surveillance is a cost-effective solution for mitigating threats to these critically important facilities and for providing responders with timely on-site images in disaster recovery situations.

SUMMARY

12. Wireless networks offer the best and most cost-effective alternative for the deployment of a Smart Grid network and wireless solutions currently exist in the 3650-3700 MHz band with features specifically adapted for Smart Grid deployments[4]. The effectiveness of this band for a Smart Grid network under current prevailing rules is clear as more than 100 licenses have been issued to electric, gas, water, and oil utility companies and other organizations are waiting on the sidelines pending this proceeding. Subjecting the 3650-3700 MHz band to the untested rules being proposed for the 3550-3650 MHz CBRS will be detrimental to the utilities industry as they move forward in their attempts to meet the mandates of Title XIII of the Energy Independence and Security Act of 2007 (EISA). The long term public benefit for Smart Grid networks include:

    a. Improved energy efficiency and management of renewable energy resources

    b. Greater grid reliability with reduced outages and faster recovery in the event of an outage

    c. Better protection against random acts of vandalism and terrorist threats

    d. More efficient use of existing utility infrastructure

    e. Lower energy costs for residential and business customers

CONCLUSION

Siemens strongly urges the Commission to consider these comments and exclude the 3650-3700 MHz band from the CBRS regulatory regime. By taking this action the Commission will not disrupt the many incumbents in the 3650-3700 MHz band and, most importantly, will help facilitate the on-going implementation of Smart Grid networks in this band.

Respectfully submitted,

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