

# Sempra Renewables 3550-3650 GHz MHz Experiment Proposal

## 1 Introduction

Sempra Renewables (NYSE:SRE) is a leading developer of clean energy solutions in markets throughout the U.S. Together with its partners, Sempra Renewables owns and operates nearly 2,400 megawatts of renewable generating capacity fueled by the sun and wind, enough to power approximately 600,000 homes and businesses. Its more than \$3 billion investment in clean energy has created about 4,000 jobs, while providing an economic boost to communities and landowners in 11 states. With proven capabilities in the development, design, construction, and operation of large-scale renewable energy projects, Sempra Renewables has the experience needed to develop customized energy solutions for today and tomorrow. Core to its mission, Sempra Renewables collaborates closely with customers, partners, and the communities in which it operates to safely and responsibly deliver clean energy solutions. For more information please visit our website: <http://www.semprarenewables.com/>

## 2 Experiment Description

Sempra is working with partner companies NOKIA and Advantech to evaluate and trial a LTE system operating in the frequency range of 3550-3650 MHz to establish suitability for supporting critical wind energy operations and innovation.

This trial will consist of up to 5 fixed site base stations and will be located inside the geographic region described in Section 2. **Note: this trial area is outside the exclusion zone defined by NTIA (TR-15-517r1).** Up to 15 mobile devices will operate in the areas of the fixed base stations. All base station equipment is prototype hardware, controlled and owned by NOKIA and will be removed after the conclusion of the trial.

The intent is to operate the LTE uplink/downlink 24 hours per day 7 days per week.

At the present, Sempra together with the named partners, have been doing extensive research and testing on the LTE technology applied to a small subset of our wind turbine farm, in the same geographical area of this request, operating under the granted STA with file numbers 1136-EX-ST-2017 and 0349-EX-ST-2018 .

This STA extension is critical to the continued exploration of use of wireless technologies for effective monitoring and management of our wind turbines technologies in all weather and operating conditions. This study will provide valuable understanding of how wind turbine farms can most cost effectively be deployed, operated and managed to provide reliable and sustainable wind energy using new high capacity wireless networks. In extension of the study, additional coverage and performance measurement will be conducted.

## 3 Transmitter Information

Up to 5 20 MHz LTE RF channels per base station will be operated within the requested frequency range at any one time.

The maximum EIRP for mobile and fixed sites is listed in Table 1. The fixed sites support MIMO and the defined power is the maximum radiated power for an individual antenna. A directional antenna may be used but it's listed as OMNI to not restrict orientation.

Table 2 defines the deployment radiuses where all fixed cell sites will be located within during the testing.

**Table 1 Transmitter Information**

Type	Transmit Frequency (MHz)	Conducted TX Power (dBm)	Maximum Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	ERP (dBm)	ERP (W)	Maximum Transmission Bandwidth (MHz)	Emissions Designator
Fixed	3550-3650	40	18	58	631	55.85	385	20	20M0W7W
Mobile	3550-3650	23	0	23	0.2	20.15	0.12	20	20M0W7W

**Table 2 Fixed Site Location Radius and Mobile Operational Radius**

Location Description	Location #	Operational Center Point		Fixed Site Location and Mobile Operational Radius	
		Lat	Long	Miles	km
Garfield, Nebraska Met3 tower	1	41°32'49.25"N	99°34'11.97"W	2.5	4
Garfield, Nebraska Main station	2	41°29'52.14"N	99°35'15.37"W	2.5	4
Garfield, Nebraska Wind turbine C-32	3	41°30'16.654"N	99°33'10.469"W	2.5	4

#### 4 Interference Coordination

Immediate requests for Sempra Renewables to stop transmission should be emailed to [RemoteOperationsCenter@sempraglobal.com](mailto:RemoteOperationsCenter@sempraglobal.com). Alternatively, a shutdown requested can be submitted through Leonardo Prospero who can be contacted at 619-696-4873 or [lprosperi@sempraglobal.com](mailto:lprosperi@sempraglobal.com)