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# How 5G and Wireless Power Enable Smaller Sensors and Increased Device Functionality

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**By Florian Bohn, CEO and Co-Founder, GuRu Wireless**

There's a convergence happening-a cascading domino effect involving Tesla's new power storage and distribution technology and separately, the advent of two technologies: the 5G wireless network and wireless power. These innovations in tandem have far-reaching benefits for engineers and product managers-especially those developing Internet of Things (IoT) products-for both businesses and consumers.

Tesla is making huge leaps in making clean energy more accessible. The electric car manufacturer has developed a means for storing and managing electricity for both residential and industrial use by large utility companies. The company also built software that incorporates machine learning to control energy assets. Right now, their software is being used to manage the huge Hornsdale power reserve, which sits next to a wind farm in South Australia. In the U.S., Tesla is slowly deploying its energy storage products in Vermont.

How do Tesla's first steps into the public utilities market relate to IoT products? All of this clean energy can be sent to devices that need it by employing another separate, recent innovation-wireless power, delivered over the air and at a distance. Wireless power using millimeter-wave (mmWave) radio frequencies (similar to the radio frequencies used by 5G), can travel over the air on small and grand scales. This means IoT devices could receive an almost constant wire-free recharge. If power is consistently available over the air, batteries inside IoT tech can shrink or even be eliminated entirely, allowing for smaller sized sensors and reducing battery waste.

Another important puzzle piece enabling the decreased size of sensors is edge computing. Edge computing allows part of a sensor's processing capacity to come from nearby data centers. 5G networks-at speeds of up to 10 times faster than 4G - enable edge computing on a large scale, and in turn enable smaller sensors. Smaller sensors enable more streamlined and sleeker IoT products, and thus allow engineers and product managers to create more complex functionalities. Consumers always demand more features, and product managers and designers need more compact sensors to provide them. Product designers lean on the engineers to help them put it all together to complete the cycle.

Smaller batteries mean devices are lighter and have room for other components. Think of an early model mobile phone from the '90s compared to a later-model flip phone from the early 2000s. A person who carried a device with "everything but the kitchen sink" functionality in their bag would have to make room for something that resembled a two-pound brick. In fact, most of the volume and weight of any device comes from its battery. Now, devices are lighter and easier to carry with us on-the-go.

Both 5G and wireless power have yet to manifest their full potential, but one thing is for certain - the future is bright when it comes to what our IoT devices will be capable of doing thanks to smaller sensors and batteries. The benefits will be reaped by both consumers and industries, by allowing us to live more productive, connected lives and leverage technology to make our businesses gain a competitive edge.

##

**About the Author**

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*As a co-founder at GuRu, Florian brings years of technology experience. At Axiom Microdevices, he helped define and implement high-frequency RF integrated circuits which have shipped more than 400 million units. At Agilent Laboratories (formerly HP Labs) he worked on clock and data recovery circuits as well as novel test and measurement systems. As a Caltech Lead Scientific Researcher, Florian guided engineering and operational aspects of implementing the microwave system at Caltech's Space Solar Power Initiative.*

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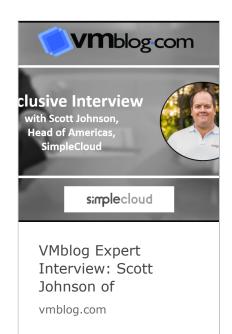To post a comment, you must be a registered user. Registration is free and easy! Sign up now!

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