



## WIRELESS ENERGY – THE OTHER BIG NEWS IN ENERGY

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**You can't pick up the *Wall Street Journal* or *New York Times* these days without reading about alternative fuels and clean emissions technologies. Homeland security and concerns about global warming are driving significant investment in domestic energy production and clean energy production technologies. The focus on alternative energy sources is important, but it overshadows another important energy trend – the local, over-the-air distribution of energy or "wireless energy". Wireless energy may not be making the headlines in major publications, but over the next few years it is going to have a more tangible impact on our daily lives than any of the macro changes taking place in the area of energy sources or production technologies.**

**The promise of wireless energy has been around for some time. In 1899, Nikola Tesla demonstrated the wireless transmission of power. Wireless energy is already being used in applications ranging from water treatment to electric toothbrushes. So, if it has been around for some time, why hasn't wireless energy taken hold? Why should it gain traction now?**

### **The Time is Right**

Over the last few years we have seen the proliferation of portable electronic devices. It's hard to imagine a time when iPods weren't in every teenager's ears, BlackBerries weren't every business person's addiction, and cell phones weren't the "third screen" after TVs and PCs. In fact, all of these things are products of innovation in the past 5 years.

What all of these devices have in common is their mobility – and therefore their reliance on batteries. Never before has there been such a demand for power on-the-go. There are four converging reasons why there is sufficient momentum for wireless energy to emerge now:

- **Consumers own, and more importantly prefer to use, mobile electronic devices.** Cell phones, iPods, laptops, digital cameras, GPS systems and portable video game players are everywhere. Wireless Internet usage now accounts for one-third of all Internet usage in the US. With the development of a new wave of mobile electronic devices in healthcare and security, there is no end in sight to this proliferation.
- **Mobile devices are increasingly power-hungry.** Bright color displays, antenna reception, and fast processor chips all devour power. As a result, manufacturers have avoided traditional batteries, instead using custom batteries that need to be regularly recharged using their custom-corded chargers.

- **Consumers are frustrated with existing battery technology.** Whilst the iPod is famous for revolutionizing portable digital music, its one major backlash came when the custom-built battery failed just after the one-year warranty expired. This resulted in bad press and a class action law suit. At Sony's annual shareholders' meeting last year, Martha Stewart epitomized consumer frustration when she held up two nearly identical plugs for Sony devices and said, "Why can't this thing be this thing?"
- **Existing technology is maturing and new technology is emerging.** Companies like Fulton Innovation are applying technology originally developed for use in water treatment to power electronic devices without wires. Startups such as WildCharger, Splashpower and Powercast are developing their own wireless power products. Equally important, academics are getting into the act, as demonstrated by Marin Soljacic: a MIT physicist who, in November 2006, introduced a new approach to wireless energy called nonradiative resonant energy transfer. This approach enables safe and efficient energy transfer at distances of up to 12 feet.



CREDIT: Splashpower Ltd., developer of the SplashPad™ universal wireless charging pad

## Companies to Watch

### Technology: Inductive Coupling

#### **Fulton Innovation ([www.ecoupled.com](http://www.ecoupled.com))**

- Products: eCoupled™ technology
- History: Technology has been used in water treatment business of parent company (Altacor Inc.) for 6 years. Visteon cupholder charger that uses eCoupled™ technology is scheduled to be available in 2007
- Notable partners: Herman Miller, Mobility Electronics, Motorola, Visteon
- Headquarters: Ada, Michigan

#### **Splashpower Ltd. ([www.splashpower.com](http://www.splashpower.com))**

- Products: SplashPad™ universal wireless charging pad and SplashModule™ power receiver
- History: Founded in 2001, SplashPad™ and first Splashpower-enabled electronic devices expected in 2007
- Headquarters: Cambridge, UK

#### **WildCharge Inc. ([www.wildcharge.com](http://www.wildcharge.com))**

- Products: WildCharger™ and the WildCharger-Mini™ charging pads, WildCharger™ adapter
- History: Founded in 2005, products expected to be available in summer 2007
- Headquarters: Scottsdale, AZ

### Technology: Radio Frequency Power Harvesting

#### **Powercast LLC ([powercasteco.com](http://powercasteco.com))**

- Product: Wireless Power Platform™
- History: Founded in 2003, technology currently in use at the Pittsburgh Zoo. Philips Electronics will ship the first consumer products using the technology in 2007. Medical implants are also expected to employ the technology in 2007
- Notable Partners: Department of Defense, Philips Electronics, Pittsburgh Zoo
- Headquarters: Ligonier, PA

## What it Means for Investment

It will be some time before wireless energy is sufficiently mainstream for houses and factories to be built without electrical outlets. Yet the technology will likely have near-term impact in a number of areas:

- **Wireless Energy Circuitry Providers** – With the move underway towards powering mobile devices with wireless energy, competition to be the circuitry provider is building. Device manufacturers have decisions to make about which, if any, standards to adopt to charge and power their products. Fulton Innovation and Powercast LLC look to be off to a strong start, as both companies have big-name partners launching consumer devices employing their technology in 2007. The game is still early though, and new technologies are emerging.
- **Mobile device manufacturers** – As device manufacturers shift to wireless power, the form and function of batteries will change, and their footprints will likely shrink. This frees mobile device manufacturers from two key burdens of batteries: weight (currently the battery accounts for about one-third of a laptop's weight) and liability (just ask Sony that recently recalled 9.6 million laptop batteries because they posed a risk of fire). With the burden of batteries reduced, new opportunities for device innovation will emerge.
- **Energy Service Providers (ESPs)** – Internet Service Provision gave birth to new companies like AOL and enabled new revenue streams for established companies like Verizon and Comcast. As energy transfer over mid- and long-range distances is commercialized, "Energy Service Providers" may emerge. The winners here could be utilities if they can seize the opportunity and take advantage of the established billing and deployment relationships they have with homes and businesses. If utilities aren't able to move quickly, new companies will come forward to provide the service.
- **Healthcare** – Drug development has provided blockbuster profit for decades. However, with healthcare costs under intense scrutiny, drug delivery, diagnostics, and medical devices are increasingly the drivers of profit in the industry. Wireless energy makes new approaches for all of these areas possible, particularly medical devices that are implanted in the human body.

While today it is the macro-level energy issues that are grabbing the headlines, big opportunities still exist at the micro level. Our everyday lives will be transformed as wireless energy emerges to save us from the intense and common frustration of having our cell phone or laptop die at the most inconvenient moment.

If you are exploring investment or strategic opportunities in wireless energy, Grail Research can help you gather the market intelligence you need to make an informed investment decision.

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