

1 **Wireless Power May Cut the Cord for Plug-In Devices, Including Cars**

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3 A mobile phone that **charges** in your pocket, a flat-screen TV that needs no **power** cord, a car **fueled** by a **cordless** panel in the floor:
4 In a building just outside Boston, these and other applications of wireless electricity signal a future with fewer snaking cables.

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6 WiTricity, a company spun off from research at the Massachusetts Institute of Technology (MIT), **aims** to redefine how people use
7 energy, making it possible to power **devices** without ever **plugging** them into an outlet. In WiTricity's lab, various devices run on
8 power transmitted from electric **coils** through the air. "It is not hard to imagine that in a few years, you go to a coffee shop, sign into a
9 power zone, and charge your phone or laptop," said Richard Martin. "We **predict** this technology **taking off in a similar fashion** to
10 how Wi-Fi got its start a decade or so ago." Martin says the industrial potential for wireless power is huge, **especially concerning**
11 electric **vehicles** and wireless sensors, where harsh environments make it difficult to run wiring. **In addition**, he says wire-free
12 electricity **transmission** is often a more **convenient**, greener alternative to conventional plug-in charging. "Part of this is that there is
13 an obviously big space in the market waiting to be filled," Martin said. WiTricity CEO Eric Giler imagines a future where power
14 devices are **embedded** in the walls and floors of homes, making for a truly wire-free household. He says with a big enough power
15 supply and small wireless repeaters, one could even power a grocery store or office building.

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17 Conventional charging devices use electromagnetic induction to transmit power. Through electromagnetic induction, an electric
18 **current** is sent through a **magnetic field** generated by a power **conductor** to a smaller magnetic field generated by a **receiving** device.
19 "Think of your electric toothbrush," Giler says. "It works very **efficiently**, but the problem is that it can only transmit power wirelessly
20 a few inches." WiTricity devices share energy through magnetic fields as well. However, **unlike** those **generated** by your toothbrush
21 or iPod cable, their devices produce magnetic fields through a process called resonant magnetic coupling, which allows power to be
22 transmitted several meters in **distance**. Resonant coupling can be illustrated by many everyday examples. A child pumps her legs at
23 the resonant frequency of a swing to fly through the air, or an opera singer shatters a wine glass by singing a single note at a frequency
24 that **matches** the acoustic resonance of the glass. WiTricity founder Marin Soljačić **wondered** whether electricity could be passed
25 from a wall outlet to an electronic device in a similar manner after he was awoken late one night in by the beeping of his wife's dying
26 cellphone. He experimented with two electromagnetic resonators vibrating at a specific **frequency** and found they **shared** power
27 through their magnetic fields at distances far greater than their conventional, magnetic induction **counterparts**.

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29 Giler says materials such as wood, brick, and concrete are essentially **transparent** to magnetic fields, enabling two WiTricity devices
30 to transfer power through them in **amounts** ranging from a few milliwatts to several kilowatts. As the number of household electronic
31 devices proliferates, so do **concerns** about electromagnetic radiation **exposure** from these devices and the possible health effects.
32 Giler, however, says their technology is safe. While the human body **responds** strongly to electric fields, (the same response that
33 makes it possible to cook the meat of a chicken or steak in a microwave), Giler says humans do not absorb power from the low-level,
34 magnetic field generated by a WiTricity device. "If you are OK living on Earth, then you should be OK with what we are doing here,"
35 he says. "Our technology generates less radiation than the Earth's magnetic field and it is one hundred times safer than a cell phone."

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37 He says WiTricity is developing wirelessly powered devices **ranging** from an iPhone to **implanted** medical devices and military
38 robots. Both Giler and Martin agree that the electric-vehicle industry will be the first market sector **to benefit from** wireless power
39 transmission. "The electric-car industry has **figured out** that people aren't going to use electric vehicles if they have to constantly plug
40 them in," Giler says. "We are trying to make charging your car as **convenient** as fueling it at the pump." In the bumper of an electric
41 BMW, WiTricity has placed a wireless coil that receives power from a resonator embedded in the floor beneath the car. The system
42 can transmit up to 3,300 watts per hour and takes four to six hours to fully charge the vehicle.

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44 **Adapted from [National Geographic News](#)**