Wireless charging technology for ev

Wireless charging technology for ev

As we progress with electric vehicle technology, charging convenience is of top importance among prospective buyers. While it hasn"t quite matched the ease of taking a few minutes at the pump to fill up, DC fast charging has gotten us pretty close. Then, it certainly helps that at-home Level 2 charging is becoming more commonplace, too.

But convenience is more than just speed. Having the ability to go about one"s day with as little interaction with a cable as possible is important to those in the market for the kilowatt-powered life, at least according to Boston-based wireless charging company, WiTricity. This operation"s been in the game since 2007, though primarily focused on automotive applications since 2010. That"s well before many consumers ever considered EVs to be a viable form of everyday transportation.

I recently had the opportunity to chat with WiTricity and other industry members about how this technology works, as well as get a solid idea of how exactly it could benefit consumers. According to some experts, we may be on the verge of mass adoption.

WiTricity"s current product is what it calls its fourth-generation system, and outlines convenience, enhanced vehicle-to-grid (V2G) functionality and autonomy as its three main focuses, and in that order of importance. But before diving into what each of those mean, let"s discuss how it works.

First and foremost, the system is simple and is classified as magnetic resonance: There"s a wall box that can connect to any type of power input, whether it"s commercial, three-phase, single-phase, etc. That connects to a pad--the charger--which is weatherproof and built to the Society of Automotive Engineers" (SAE) J2954 Standard. This covers wireless power transfer (WPT) for passenger vehicles (including pickup trucks), and light commercial.

The SAE pointed out to me in an email that a lot has gone into creating this standard. In fact, 394 members comprise its Wireless Power Transfer Task Force, which is responsible for not only J2954, but also J2954/2, the heavy duty WPT standard up to 500 kW. Besides the SAE, stakeholders include nearly every major automaker, the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO), large-scale suppliers like Denso and wireless charging startups like InductEV, WAVE, WiPowerOne, ZEV Station, Electreon, Magment and WiTricity.

"Let"s say you"ve got 240-volt wiring in your home at 60 hertz AC," Alex Gruzen, former CEO of WiTricity explained to me when I first learned of this technology a few months back. "That connects to our wall box, which takes it and turns it into DC, and then it turns it back into AC again, but at 85 kilohertz."

Regardless of air gap (eight inches is considered standard), from coil to coil is 98-99%. If there"s a larger air

gap, such as on a higher-sitting SUV, truck, or commercial vehicle, all it takes is a larger receiver with more surface area to capture the same amount of energy. Not only that, but overall efficiency from the grid to the vehicle is around 90 percent; this is because the air gap effectively acts as a transformer, therefore skipping a conventional form of isolation that plugging in requires to avoid damage on either end.

With that in mind, there are many areas across the wide spectrum of mobility, outside of passenger vehicles, where wireless charging adoption makes a lot of sense. Ready your Caddyshack references: Golf carts are the perfect candidate for wirelessly juicing up.

WiTricity find this to be a great place to grow. "We have the full product ready for those automakers, what do we do with it in the time between now and mass market launches?" a representative told me. It certainly makes sense: mass-adoption of EVs in this sphere is already well underway and easy to integrate.

Scaling up from golf carts, wireless charging benefits a wide range of consumers, including persons with disabilities in passenger vehicles, as it completely cuts out the activity of handling cumbersome cables.

"I drive it, I park it, I drive it, I park it--it"s like having a car with infinite range," a WiTricity representative told me. "You just never have to think about charging." This sentiment isn"t quite a full-on reality at the moment, at least outside of an owner"s residence. However, if adoption increases at a mass scale, going about one"s daily errands could net an increase in charge with no thought at all.