Be in Charge.

Mobility Innovations Summit

Preparing the Energy Grid for the Rise in EVs with Wireless Charging Technology
“Our goal is to make the charging experience transparent, with or without a driver.”

— Dr. Morris Kesler, Chief Technology Officer
WiTricity’s **Magnetic Resonance Technology**

- **Power Transfer as Efficient as Conventional Plug-in**
  (90-93% grid to battery)

- **Park-and-Charge X-Y Flexibility**

- **Charges as Fast as Conventional Plug-in**
  3.6 → 7.7 → 11 → 22 kW→

- **Powers Through Materials**
  (In-ground placement)
  Asphalt, cement, snow, ice, etc.

- **Spans all Vehicle Heights with Single Design and No Moving Parts**
  (Static or dynamic)
  10-25 cm

- **Bi-Directional Power Transfer**
  Use large battery on EV to:
  - Stabilize grid
  - Power home
Who wants a charging cable?
Try to build an Altima EV with equivalent range to ICE Altima.

- Target $\rightarrow$ 512 miles range (16 gallons x 32 mpg)
- 1.6 minutes @ gas pump (10 gpm)
- EV @ 3.6 miles/kw-hr $\rightarrow$ 142 kw-hr battery pack
- 142 kw-hr/1.6 minutes $\rightarrow$ **5.3 megawatt charge rate required!**
What does 5 MW look like?
EV Charging Reality Check.

Compare charging to filling a gas tank

• Typical EV Charge rates:
  • Home chargers: 3.3 kw-7 kw (~2.4 fl oz of gas/min)
  • DC “fast chargers”: 60 kw – 120 kw (~1 quart/minute)
  • Next Gen “fast chargers”: 350 kw (~1 gallon/minute)

• Gas pump @ 10 gallons/min → 5.3 megawatts

GULP GULP vs. (sip sip)
EV Charging
Reality Check.

• EV’s require a complete re-thinking of “refueling behavior”

• Charge when the vehicle is NOT driving around: at home overnight, at work during the day…

• “Sorta-Fast” DC charging is needed for long range travel, ….but will never be the primary charging method
Forecasted Public Charger Demand

- The National Renewable Energy Laboratory, **DCFC will only be needed 4% of the time**, when EVs are used for longer trips that extend beyond their battery capacity.

- For the vast majority of EV use — **the other 96% of the time, charging happens at home and work with level 2 charging**.

*Level 2 Charging – 240 volt, 11 kW*
Charger demand by 2030:

- **40 million chargers**, private and public
- **$50 billion** of cumulative capital
Wireless charging is a catalyst for electric mobility.

**Premium Experience**
- 2018
- Home
- Work

**Broad Availability**
- 2021
- Parking garages
- Multi-tenant
- Fleets

**Essential**
- 2025
- Urban
- Autonomous parking
- Car sharing
- Robo Taxi
- V2G
At home.
EV Car sharing.
EV Taxi Queuing.
AV Power snacking.
Automakers are aligned with our vision.
More than 2/3 of consumers in Germany planning to buy a car are more willing to purchase an EV if they could charge it wirelessly.

SOURCE: J.D. Power Mobility Disruptor Study
V2G Anytime.
V2G = Virtual Power Plant.
V2G needs Vehicle Availability.

V2G needs Full Batteries.

Who wants to plug-in if the battery is full?
WiTricity Bi-Directional Prototype with Honda R&D

SAE Compatible

Wall Box
Power Electronics & UI

SAE Compatible
Vehicle Assembly (VA)

SAE Compatible
Ground Assembly (GA)
“Simpler always wins. Once a technology goes wireless, it stays that way — you’ll never want to plug in again.”

— Alex Gruzen, Chief Executive Officer
The future is wireless.

Join us.

www.witricity.com