



# Accelerating EV Market Adoption with Wireless Charging

ALEX GRUZEN, CEO, WiTricity



# Magnetic Resonance

THE ONLY TECHNOLOGY THAT MEETS AUTOMAKER REQUIREMENTS FOR WIRELESS CHARGING

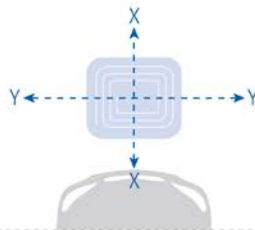
## Power Transfer as Efficient as Conventional Plug-in

(90-93% grid to battery)



## Park-and-Charge X-Y Flexibility

Misalignment allowance:  $\pm 10$  cm side to side,  
 $\pm 7.5$  cm front to back



## Charges as Fast as Conventional Plug-in

3.6  $\rightarrow$  7.7  $\rightarrow$  11  $\rightarrow$  22 kW  $\rightarrow$



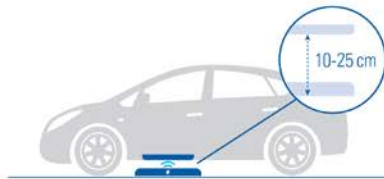
## Powers Through Materials (In-ground placement)

Asphalt, cement, snow, ice, etc.  
Static or dynamic



## Spans Sports cars, Sedans and SUVs with Single Design and No Moving Parts

10-25 cm vehicle ground clearance (Z1, Z2 & Z3)



## Bi-Directional Power Transfer

Use large battery on EV to:

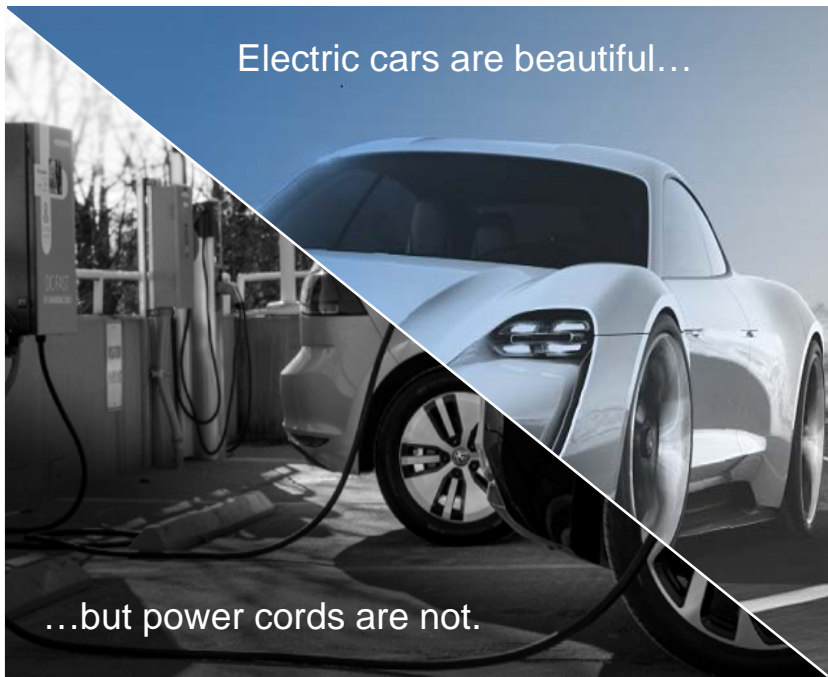
- Stabilize grid
- Power home





# Wireless Charging for Electric Vehicles

VIRTUALLY EVERY AUTOMAKER HAS WIRELESS CHARGING PROGRAMS HEADING INTO PRODUCTION



## Goals:

- Expand adoption of EVs by taking “plugging-in” out of the equation
- Global Interoperable Standard





# Electric Vehicle Market Overview

IMPROVING THE USER EXPERIENCE WILL BE CRITICAL TO ACCELERATING ELECTRIC VEHICLE ADOPTION

## Countries mandating zero emissions vehicles (banning gas powered cars)

- Netherlands 2025, Norway 2025, India 2030, Scotland 2032, France 2040, Britain 2040 (Germany and China setting dates)

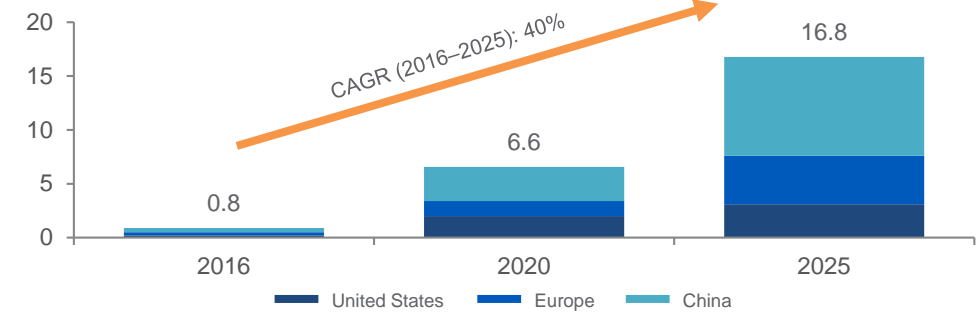
## Automakers have defined wireless charging as a top priority for next generation EV design

### Key Requests:

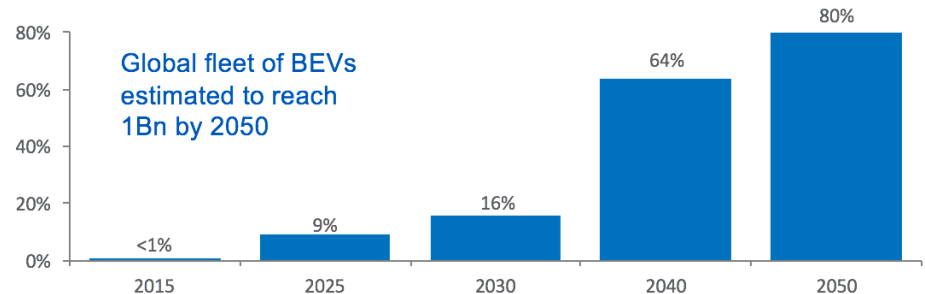
- No plugs, no mess
- Identical charge times as conventional wired chargers
- Operate in extreme weather
- Reliable
- Standardized / Interoperable

## Global BEV and PHEV Sales Forecast (1)

Units in millions



## Global BEVs as a Percent of Total New Car Sales (2)



Sources:

(1) McKinsey and Company Market Analysis, May 2017

(2) Morgan Stanley Research, Electric Vehicles On the Charge, August 2017



# Sizable Infrastructure Opportunity

WIRELESS CHARGING CAN ADDRESS VIRTUALLY THE ENTIRE MARKET FOR EV CHARGING

PRIVATE

**935** Level 1 & 2 Home/Garage  
Chargers per 1000 EVs

- **80%+ of EV charging will take place at home**  
*(cars spend avg. 15.5 hours parked at home per day)*



PUBLIC

Public charger infrastructure to be installed is **10x today's fuel pumps** and **almost all Level 2**



Forecasted Public Charger Demand\*

**96%**  
Level 2 charging dominates deployment



**4%**  
DC Fast Charging (DCFC) serves as highway "range extender"

**TAM is 975 Charging Systems per 1000 EV**  
**99% of these could be 11kW wireless charging systems**

Level 1 Charging – 120 volt  
Level 2 Charging – 240 volt



# Driving the Global Standard

WITRICITY'S PATENTED TECHNOLOGY IS FOUNDATIONAL TO AUTOMOTIVE WIRELESS POWER TRANSFER



CHINA



GLOBAL



GERMANY



*102 patents and  
patent applications  
declared **essential**  
to the SAE J2954  
standard*

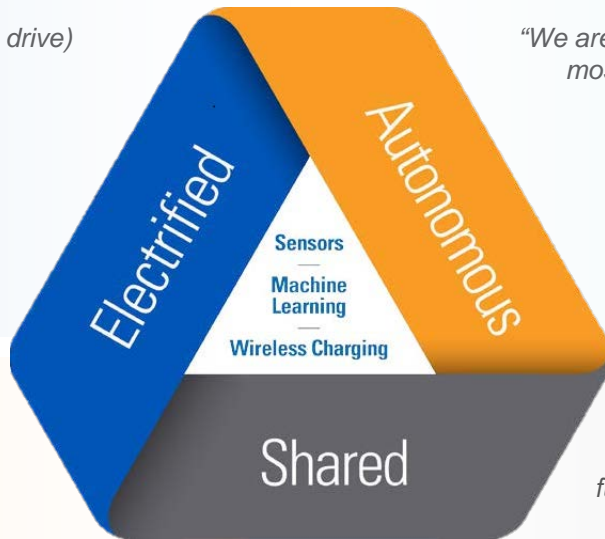


# Key Trends for Future of Mobility

THE THREE MEGATRENDS OF THE AUTO INDUSTRY ALL LEAD TO WITRICITY WIRELESS CHARGING

*“The BEV debate will be driven by (and in turn drive) ongoing developments in shared mobility and autonomous driving, the other two megatrends in the mobility space.”*

**Morgan Stanley Research**



*“We are on the cusp of one of the fastest, deepest and most consequential disruptions of transportation in history. By 2030, 95% of U.S. passenger miles travelled will be served by on-demand autonomous electric vehicles owned by fleets, not individuals, in a new business model we call ‘Transport-as-a-Service’.”*

**RethinkX**

*“If you have autonomous vehicles you have to be looking at wireless charging.”*

**Tony Posawatz**  
Vehicle Line Director for Chevrolet Volt

*“We believe that our increasingly connected, intelligent, autonomous and non-polluting cars will help change the face of mobility in the future. We see a future where robo-vehicles will become a big part of the overall mobility ecosystem.”*

**Ogi Redzic**  
SVP, Connected Vehicles & Mobility Services,  
Renault-Nissan-Mitsubishi Alliance



Wireless charging is an essential enabler for Mobility-as-a-Service



Thank you