



Feasibility analysis and development of on-road charging solutions for future electric vehicles

EVs: wireless charging feasibility

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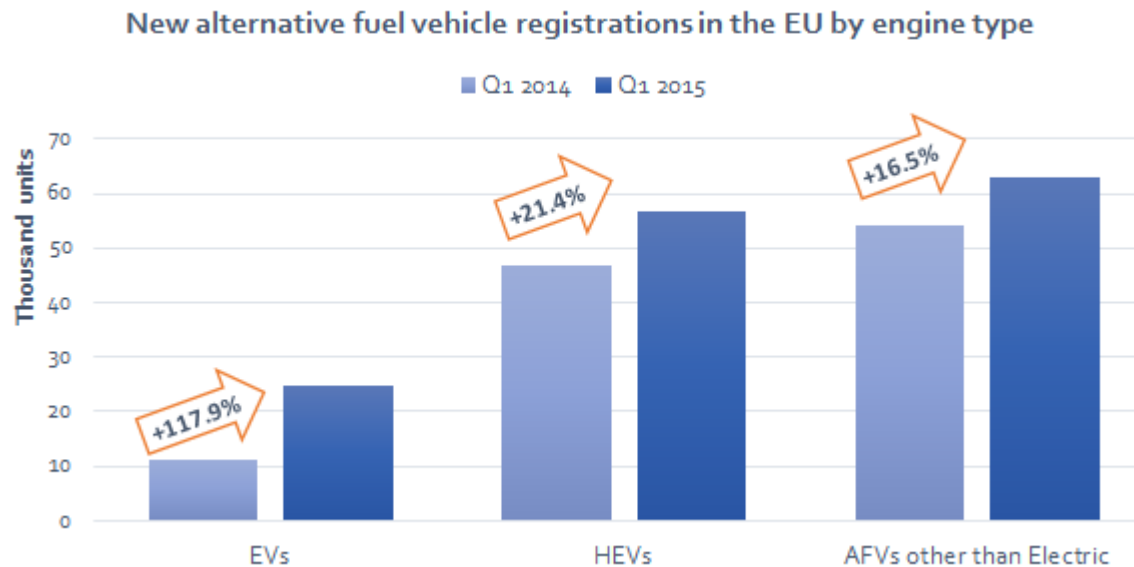
ITS World Congress 2015, Bordeaux



EVs: market

total motor vehicles registrations (EU27) in 2013: 13,6 m units

In the first quarter of 2015 total alternative fuel vehicle registrations in the EU significantly increased (+28.8 %)



[source ACEA]

EVs registrations from 11,304 units in Q1 2014 to 24,630 units in Q1 2015

EVs: mapping charging stations

http://openchargemap.org/app/?view=map-page

Open Charge Map - The globa... Map

Search

turin

The following 100 locations match your search

Collegno - IKEA Collegno

Viale Svevia 1/a
TO
10093
Italy

5.5 Miles

Public - Membership Required
Operational
Level 2 : Medium
(Over 2kW)

Rivoli - Mercatò Rivoli

Corso 4 Novembre
Rivoli
TO
10098
Italy

7.1 Miles

Public
Operational
Level 2 : Medium
(Over 2kW)

CASTAGNOLE PIEMONTE - Bed & Breakfast EDERA

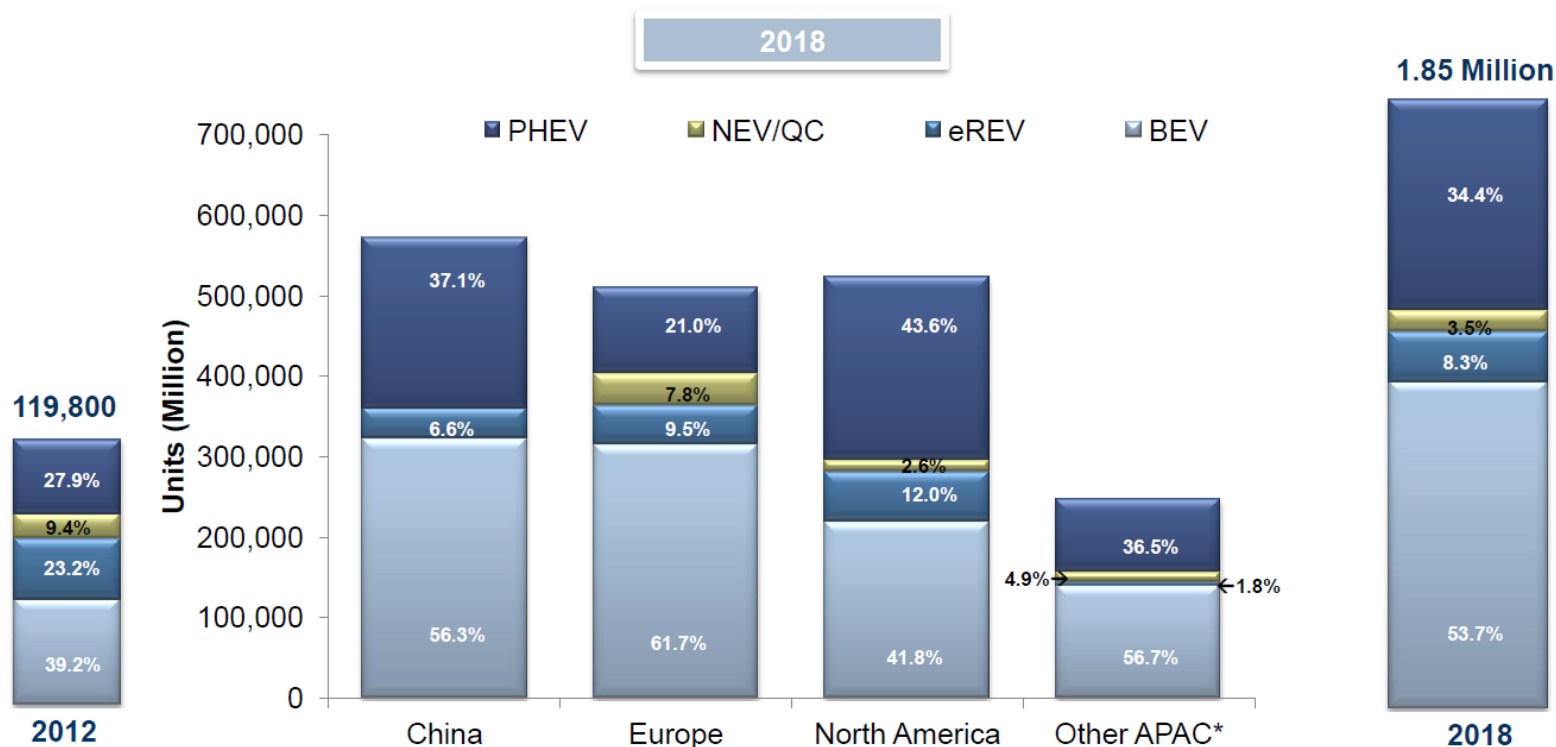
Via Garibaldi, 27
CASTAGNOLE PIEMONTE
TO
Italy

13.1 Miles

Private - For Staff and Visitors
Operational
Level 2 : Medium
(Over 2kW)

EVs: market estimates

EV Market: Sales Estimates, Global, 2012–2018



PHEV – Plug-in Hybrid Electric Vehicles
 NEV – Neighborhood Electric Vehicles
 QC – Quadracycles

eREV – Extended Range Electric Vehicles
 BEV – Battery Electric Vehicles

*Other APAC – Australia, Japan, India and South Korea
 The base year is 2012. Source: Frost & Sullivan

EVs: drawbacks

LIMITED

vehicles' driving range

LONG

recharging times

WEIGHT & SIZE

batteries

COST

battery manufacturing

PRICES

EVs versus other vehicles

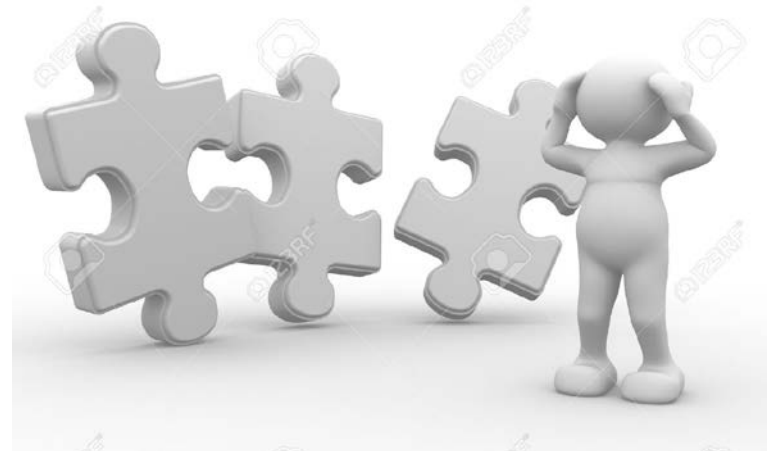
POOR

charging infrastructure network

UNFRIENDLY

user experience in plugging EVs

...



EVs: options to overcome drawbacks?

Quick-fast charge infrastructure

high power recharging units to recharge up to 80% of the battery state of charge in few minutes



Battery swap

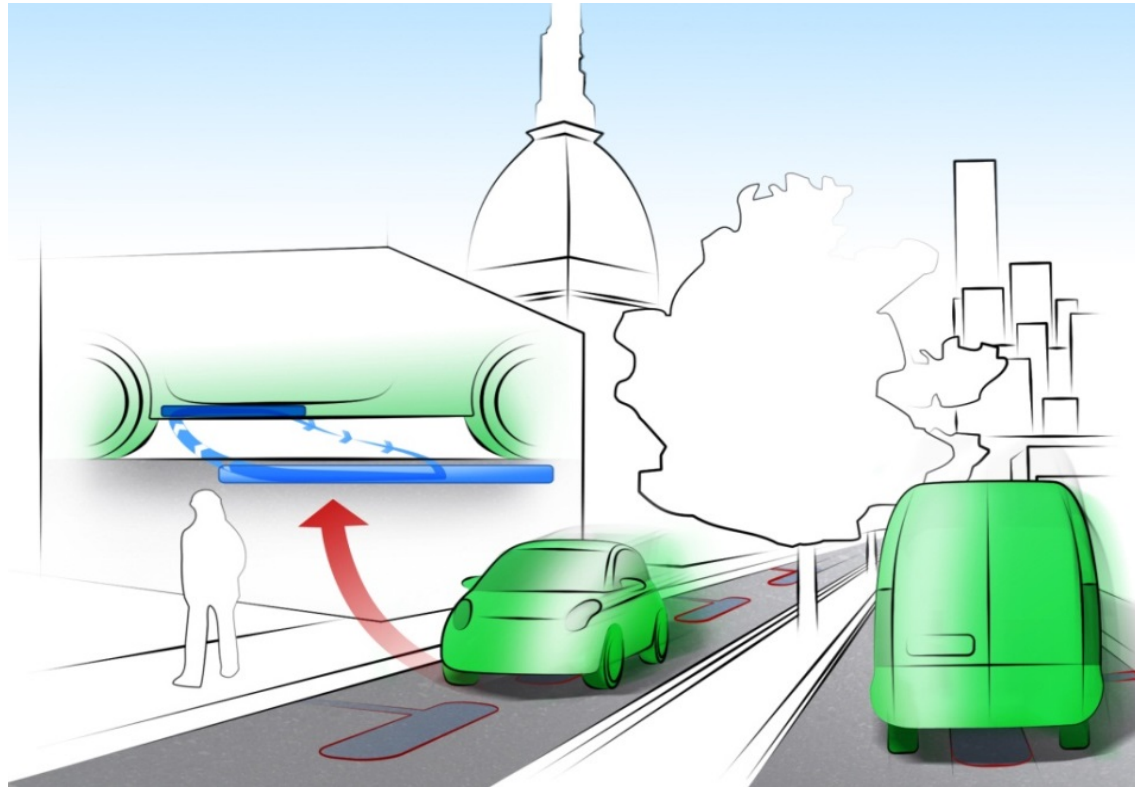
robotized systems for complete battery substitution in few minutes



Wireless charging

electric supply systems applied in specific areas to transfer electric energy to EVs

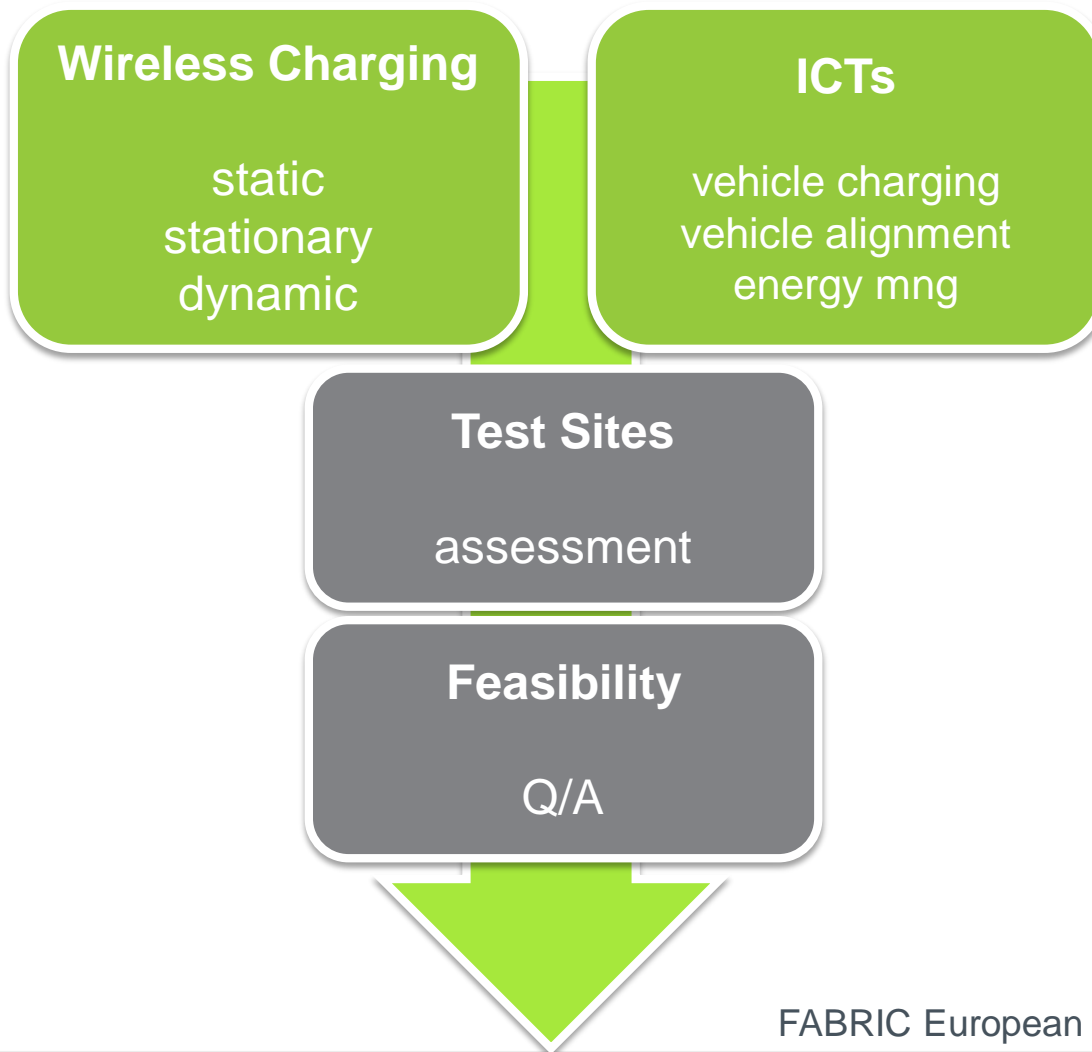
Feasibility of EVs wireless charging solutions



FABRIC European project



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Feasibility of EVs wireless charging solutions

Static charging

Typically the vehicle is parked (garage, parking slot, bus terminal...) , for a long duration of time.

Stationary charging

The vehicle is en-route and stops for a short period of time (car waiting at the traffic light, bus at a stop, etc).

Dynamic charging

The vehicle may travel at constant or variable speed typically in a devoted special lane that hosts the charging infrastructure.

Read more → <http://www.fabric-project.eu/>

FABRIC European project



Feasibility of EVs wireless charging



SAFETY

- Interference with living being?
- Interference with objects?
- RF regulatory framework?

AVAILABILITY

- In all weather conditions?
- Network availability?
- Misalignment?

VEHICLE

- Interference with vehicle systems?
- Efficient power transfer?
- Effective packaging for different vehicle models?

...

FABRIC European project



FABRIC Italian & French Test Sites

TECNOSITAF S.p.A.



INSTITUT
VeDeCoM



FABRIC European project



FABRIC project team

Vehicle Manufacturers



VOLVO



SCANIA

Energy Operators



Road Managers

TECNOSITAF S.p.A.



Technology Suppliers



saet group

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TNO



POLITECNICO DI TORINO



SMEs



enide

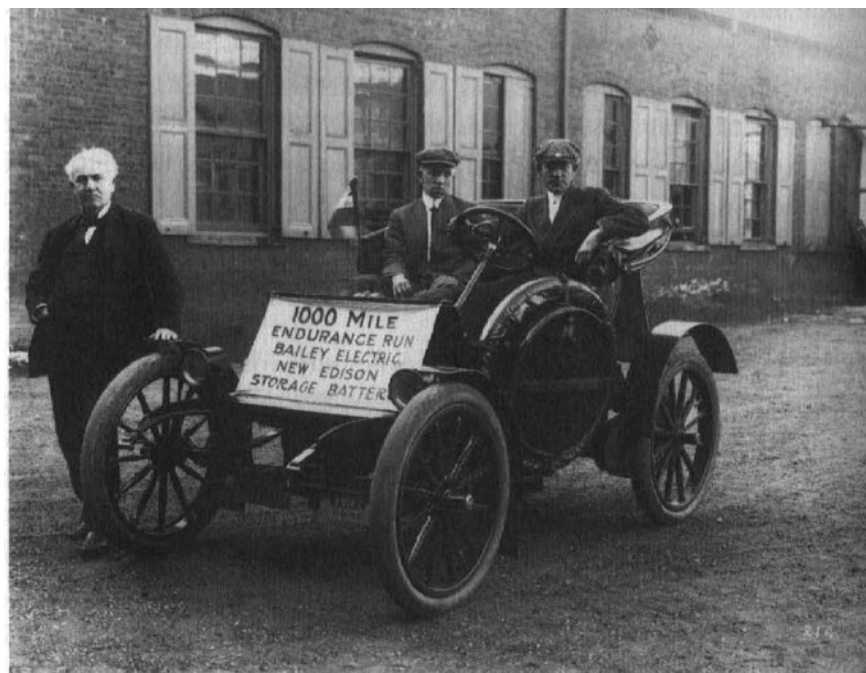


Association



after more than 100 years of history on Evs ...

1889: Thomas Edison built an EV
using nickel-alkaline batteries



... FABRIC is pointing to a new EVs' generation



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for future electric vehicles

Thank you!



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Vehicle Research & Innovation

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