



ELECTRIC MOBILITY ON MOTORWAYS

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Electric mobility : background

- Environmental and public health issue mainly due to reduction of CO2 emissions :
 - Transport= 25% of global CO2 emissions (18% for road transport)
 - Carbon footprint of electric vehicle (<130g/km) is better than traditional vehicle (average 160 g/km)
- But a slow and long-lasting deployment
 - Price of the vehicle
 - Autonomy of vehicle (around 150 km vs 700 km for traditional vehicle) and time required for charging (5 minutes for fuel vs between 20 minutes and 8 hours for electric charge)

What role for the motorway operators ?

- Electric vehicle / motorway : a difficult association considering the autonomy of the vehicles
- Motorways are designed for fuel engine vehicles : service stations are built in coherence with their long range autonomy
- A key role for the motorway operators : enhance the development of the electric vehicles by supporting the implementation of charging systems

Different ways to charge a vehicle on motorways

Static charge

Dynamic charge

Conductive

Wireless

Conductive

Wireless



Operational

Slow or fast charge

Test

2 bus in South Korea
Promising results :
> 95% efficiency

R&D

European project
« Fast in charge »

Test

Developed by
Siemens and Scania
in Sweden

R&D

in South Korea and
Germany

European R&D
project FABRIC

Standard in progress :
3 plugs,
4 modes of charge

Heavy visual impact

State of the art

Obstacle

Sanef's actions

- Static charge : contribution to the expansion of the electric charge points' network

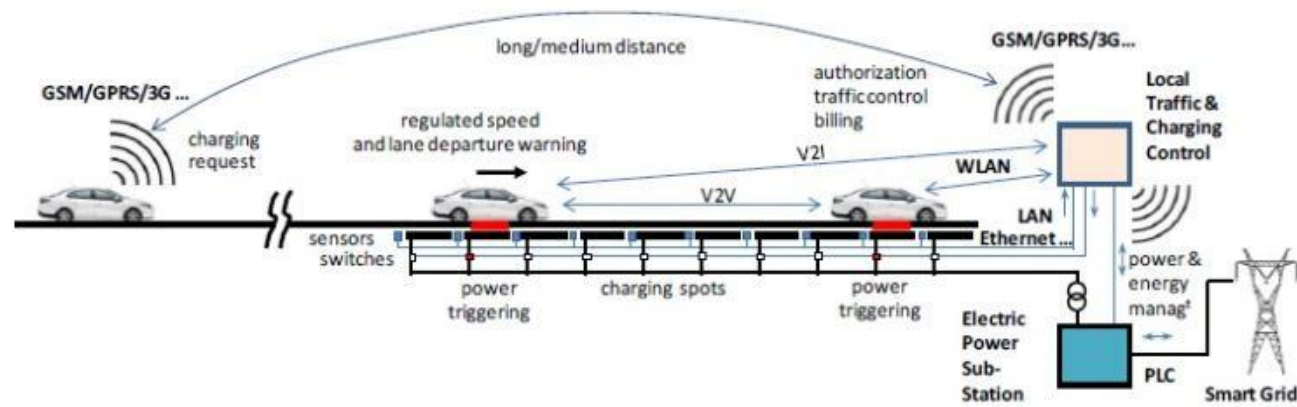
The nature of the charge points (normal / fast) is selected according to the nature of the stops



- Carpool parks : long stop => normal (=long) charge point (8h)
 - Rest areas : short stop => fast charge point (20 min)
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- Dynamic charge : involvement in R&D project FABRIC as road infrastructure expert

FABRIC project : outline

- EU project, started since 1/01/2014, for 4 years. 23 partners involved. Budget : 9M€ (with EU support). Coordination : ICCS (Greek Academic Research body)
- Objective : Feasibility analysis and development of on-road charging solution for future electric vehicles
- 2 test sites will be implemented :
 - In France at Versailles-Satory, operated by VeDeCom (French Institute of Excellence on Zero Carbon energy)
 - In Italy at Torino, operated by CRF (Fiat)



FABRIC project : issues for motorway operators

- Impact of inductive systems on the infrastructure (cracking, road surface quality, ...)
- Ability of the system to cope with roadwork conditions (temperature of mixture, pressure of compactor...)
- Ability of the system to cope with « normal » traffic conditions (130km/h, mix of light and heavy vehicles...)
- Organisation of the operation of the system (share of responsibilities between motorway operator, charging infrastructure operator, grid operator, electric vehicle backend operator)
- Economical faisability
- ...