

A decorative graphic in the top left corner consisting of four overlapping curved lines in green, orange, magenta, and blue, mirroring the colors in the Sanef logo.

Electric driving & Wireless charging on highways

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Agenda

- Electric mobility : background
- What role for the highway operators?
- Different ways to charge a vehicle
- Sanef's actions
- FABRIC project



Electric mobility : background

- Environmental and public health issue
 - Reduction of CO2 emissions :
 - Transport= 25% of mondial CO2 emissions (18% for road transport)
 - Carbon footprint of electric vehicle (<130g/km) is better than traditional vehicle (average 160 g/km)
 - Public health :
 - Air quality : no emission of hydrocarbons, NOx, CO, fine particles
 - Low noise
- But a slow and long-lasting deployment
 - Price of the vehicle
 - Autonomy of vehicle (around 150 km vs 700 km for traditional vehicle)



What role for the highway operators ?

- Electric vehicle / highway : 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 highway operators : enhance the development of the electric vehicles by supporting the implementation of charging systems



Different ways to charge a vehicle on highways

Static charge

Conductive



Wireless



Operational

Slow or fast charge

Test

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

R&D

European project
« Fast in charge »

Dynamic charge

Conductive



Wireless



Test

Developed by
Siemens and Scania
in Sweden

R&D

in South Korea and
Germany

European R&D
project FABRIC

State of the art

Obstacle

Standard in progress :
3 plugs, 4 modes of
charge

Heavy visual impact



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)
 - Service areas : short stop => fast charge point (20 min)
- Dynamic charge : involvement in R&D project FABRIC as road infrastructure expert





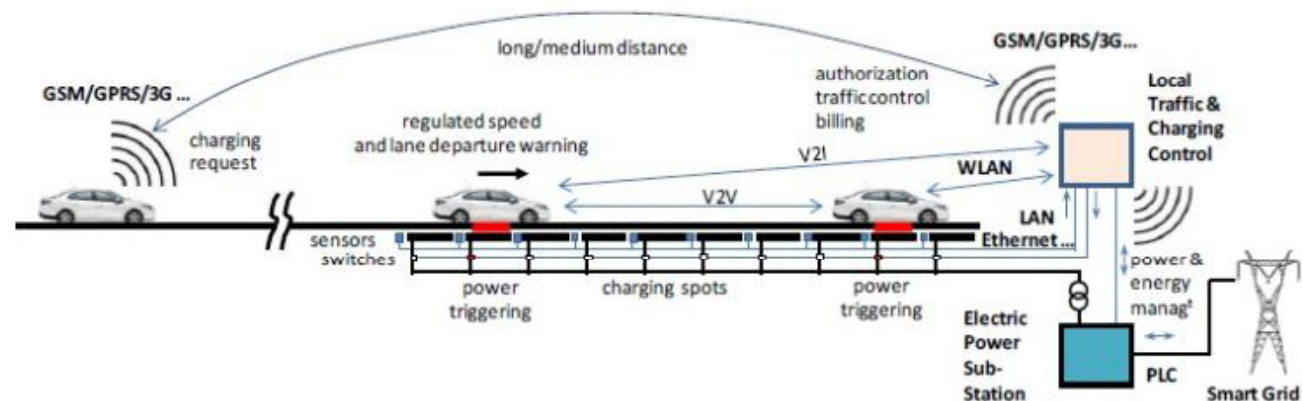
Service areas programme

- Since 2013, all call for service areas concessions renewals require the implementation of 4 static charging points.
- Sanef is associated in a French deployment programme of 200 fast charging points.
- Sanef will fund part of the investment costs for service areas on its network (~30 sites). The first implementation are planned for the beginning of 2015.
- Operation of charging points will be outsourced.

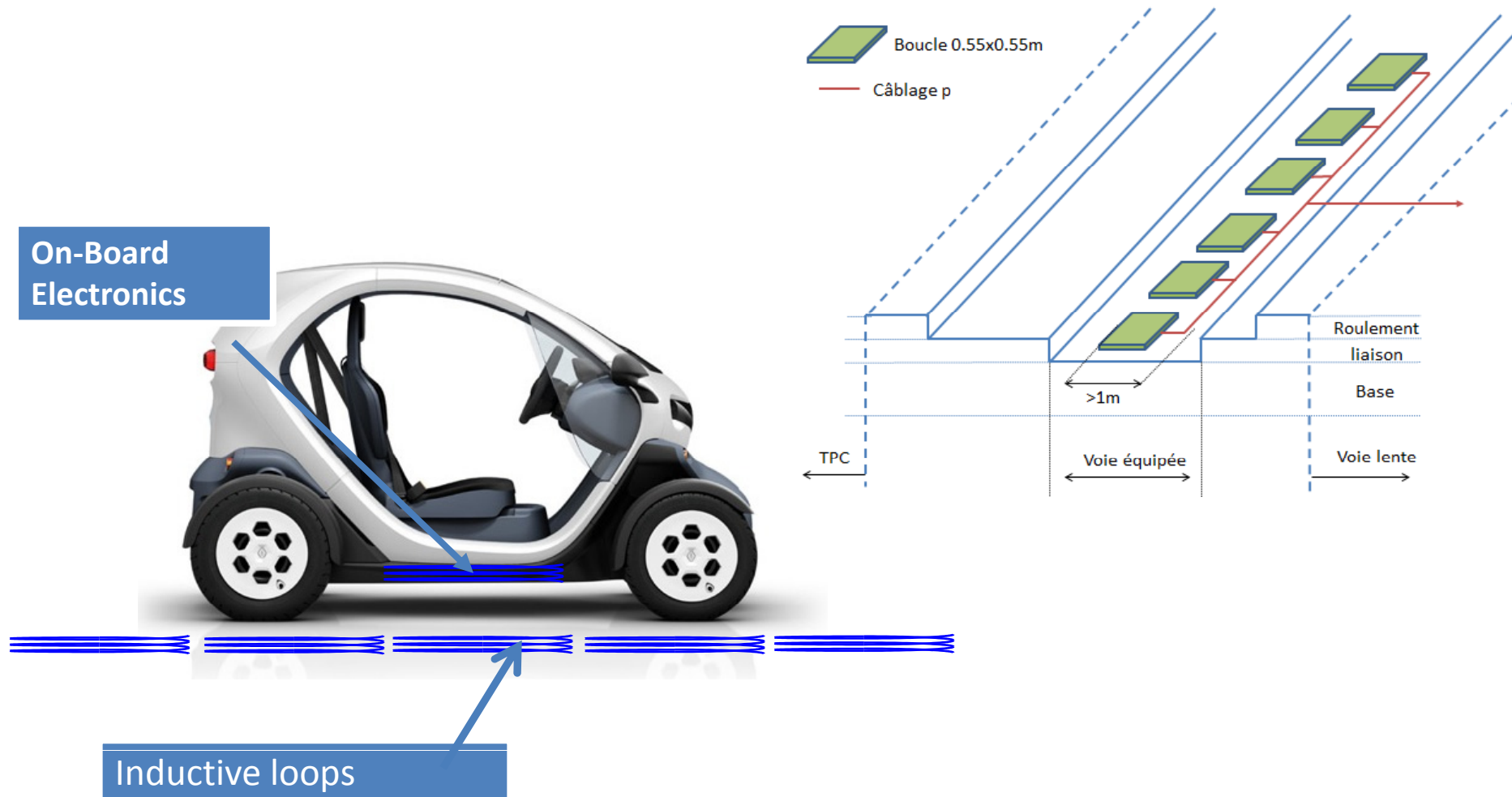


FABRIC project : outline

- 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)



Inductive charging : principles of functioning



FABRIC project : issues for highway 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 (130 km/h, mix of light and heavy vehicles)
- Organisation of the operation of the system (share of responsibilities between highway operator, charging infrastructure operator, grid operator, electric vehicle backend operator)
- Economical feasibility !
- ...

Implantation dans la chaussée

