FABRIC

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

IEVC

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FABRIC: Feasibility analysis and development of on-road charging solutions for future EVs

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ΕΠΙΣΕΥ
ICCS

Roadblocks for large scale electromobility adoption

EVs as percentage of the whole fleet:

- France 0.83%
- US 0.62% (96000 sold in 2013)
- Japan 0.59%
- Germany 0.25% (7400 sold in 2013)

Current penetration of EVs very small.

Reasons:

- Weight and size of batteries.
- Cost of battery manufacturing.
- EV price premium over conventional vehicles.
- Small or non-existent charging infrastructure network.
- Long duration of charging.
- Plugging the EV in is not a user friendly experience.

Solutions:

- ITS
- Novel charging technologies

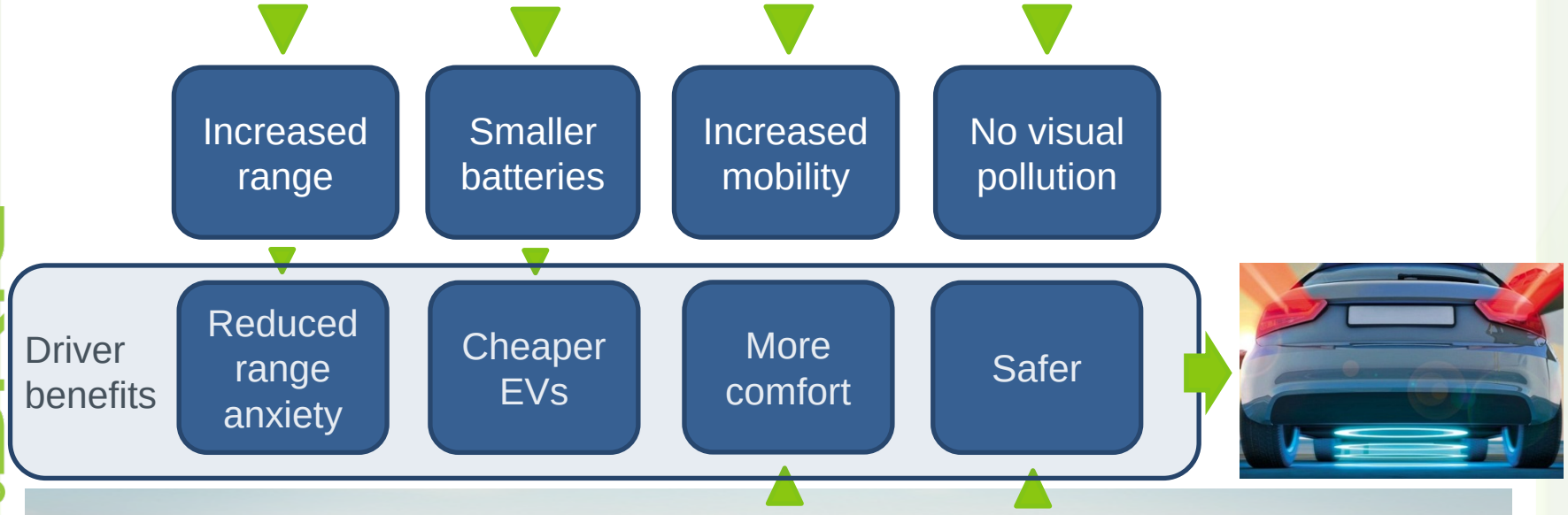
FABRIC aim

- Facilitate the use of smaller and cheaper batteries
- Increase EV range.
- Reduce EV immobilization (unavailability) due to charging.

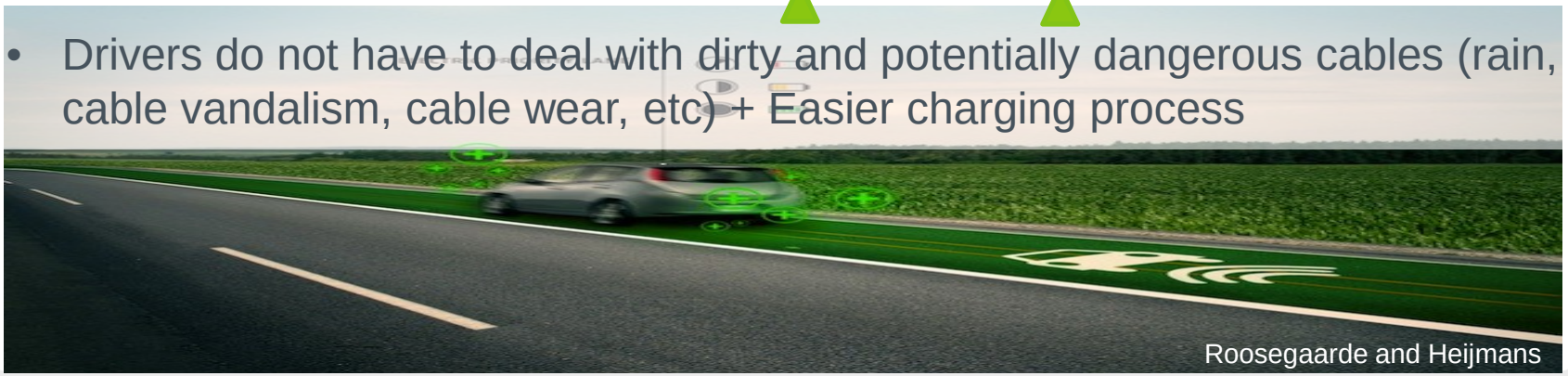
- Towards large-scale electromobility deployment.

HOW? FABRIC objectives: prototypes

- Allows EV charging while travelling (dynamic) or during short stops ideal for urban environment (stationary)

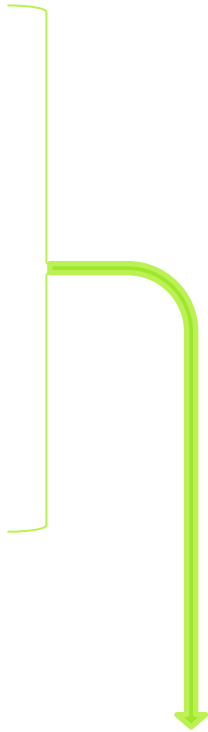


- Drivers do not have to deal with dirty and potentially dangerous cables (rain, cable vandalism, cable wear, etc) + Easier charging process



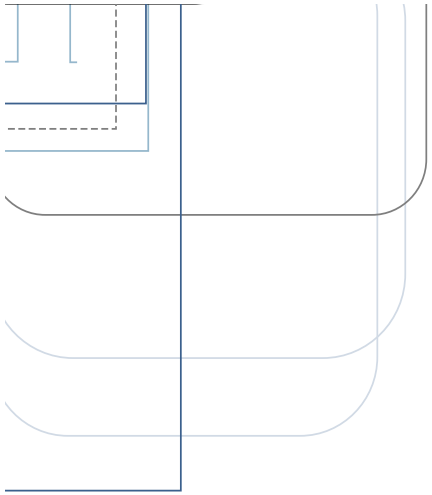
HOW? FABRIC objectives: feasibility studies

- Socio-economic impact
- Performance evaluation
- Business models
- Grid impact
- Road impact



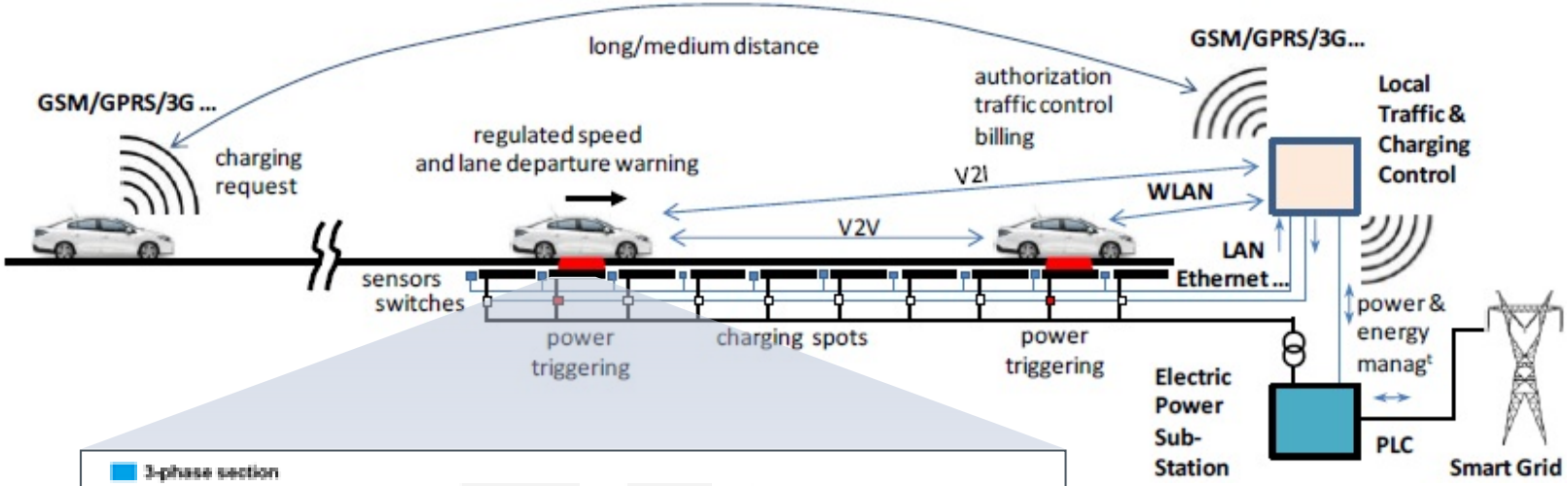
Guidelines for authorities and a priori assessment of necessary investments for large scale deployment.

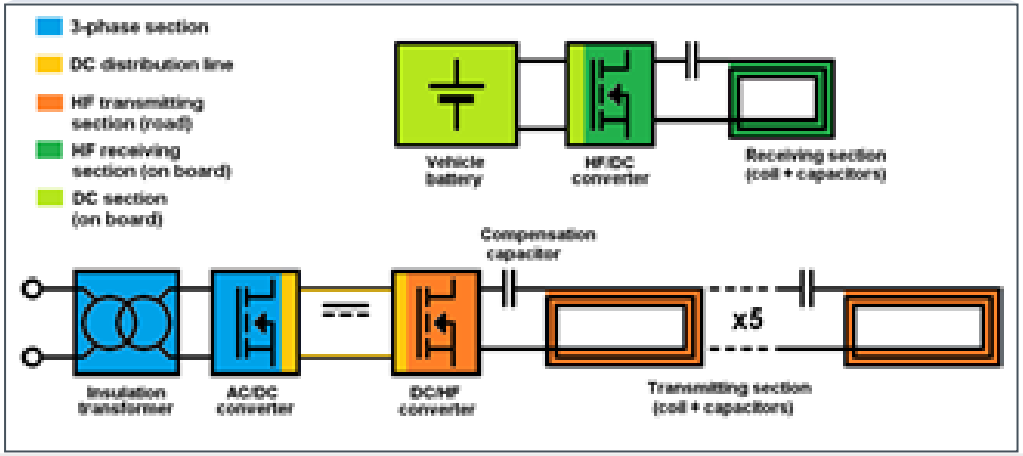
FABRIC ICT architecture



FABRIC prototypes – POLITO, IT (I)

Development of dynamic charging prototype no1 – Italy (POLITO, CRF)
- 200m test track, 20kW, ~150kHz

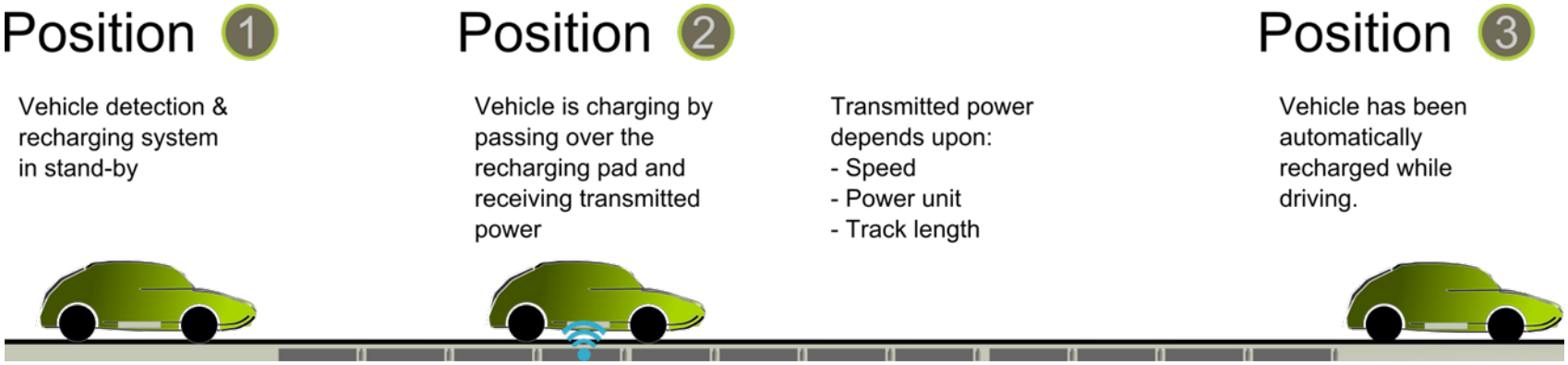




FABRIC prototypes – SAET, IT (II)

Development of dynamic charging prototype no2 – Italy (SAET)

- *50m, 10-150kHz load-resonant power frequency*



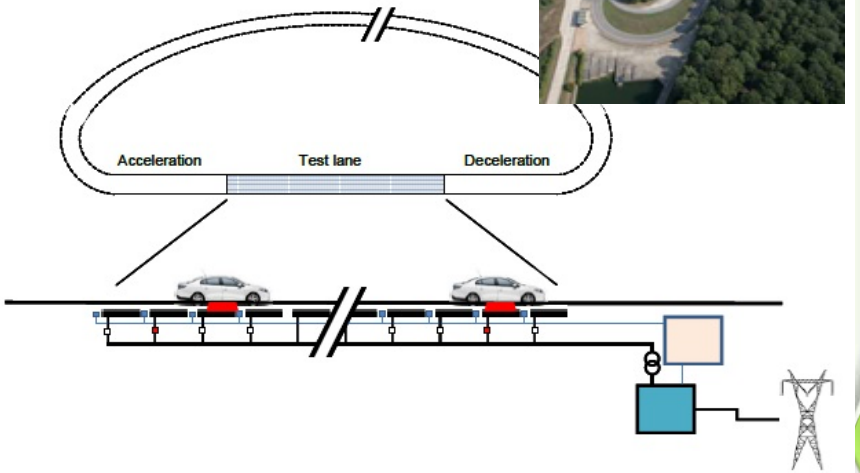
Source: SAET

FABRIC prototypes – VEDECOM, FR (III)

3. Development of dynamic charging prototype no3 – France (QUALCOMM, VEDE [IFSTTAR RENAULT PSA PEUGEOT CITROËN IFP Energies nouvelles ParisTech INTEMPORA])

- *100m test track, QUALCOMM charging pads in series, 85kHz, >20kW*

Qualcomm halo™
Wireless Electric Vehicle Charging



Dynamic charging challenges (I) - Road

Road adaptation – electrification

- Initial investment
- Maintenance costs
- Lifecycle assessment
- Traffic impact assessment

Dynamic charging challenges (II) - Grid

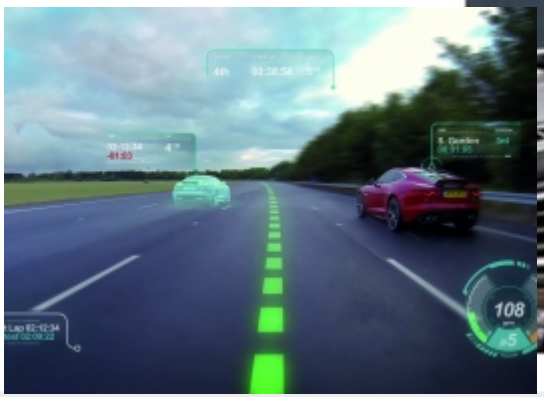
- **Increased demand**
  - RES penetration increase necessary
  - Investments on new base units
  - Incentives to charge during off-peak hours
    - Need for robust communication network with the end users

- **High frequency demand fluctuations**
  - Need for energy storage systems
    - Size, cost and feasibility assessment

- **Smart grid necessary**
  - Potential new security vulnerabilities

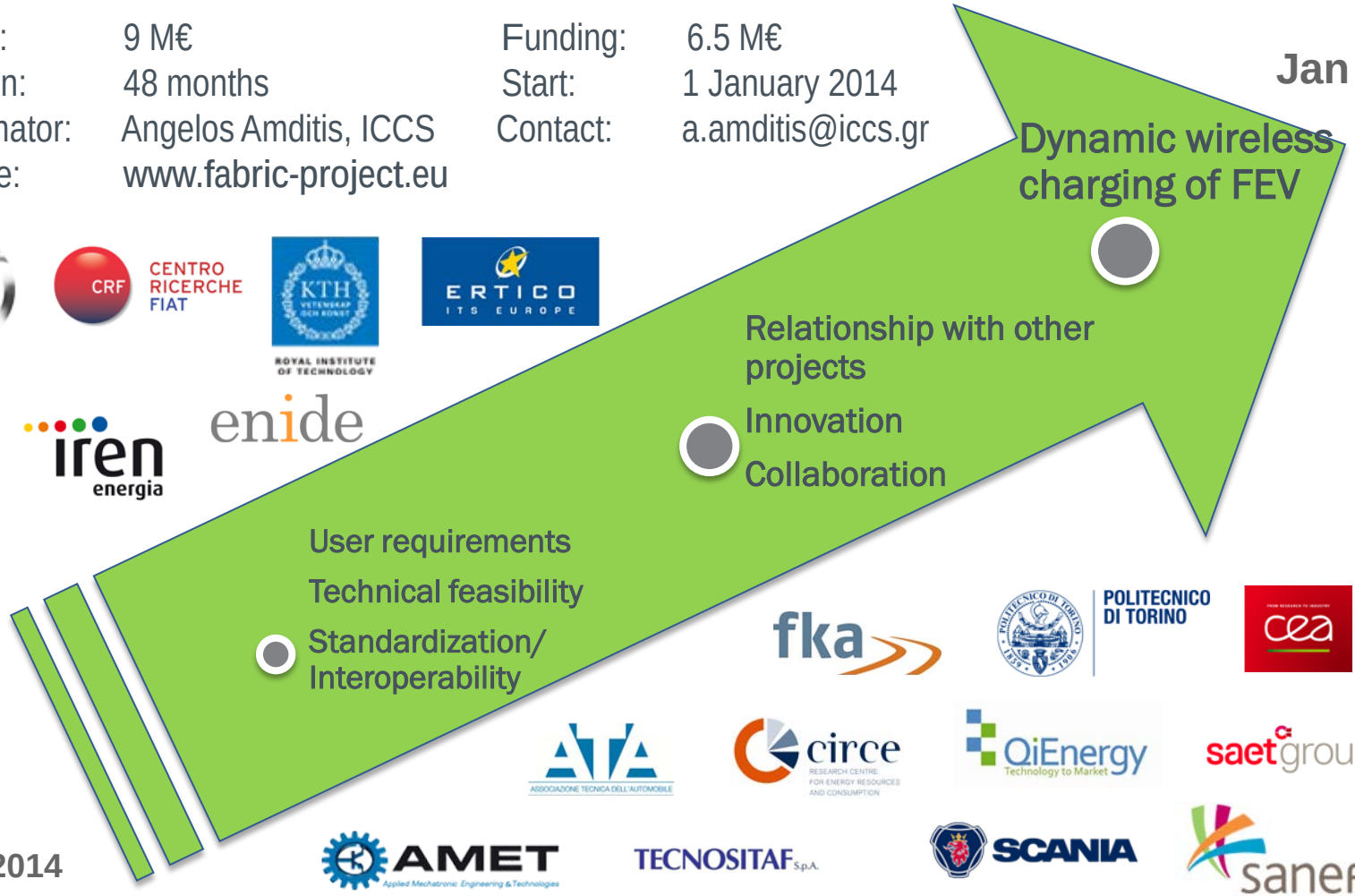
Dynamic charging challenges (III) - ICT

- Need for fast (real time) V2I communications
- Real time load balancing and charging management
- Unobtrusive, non-distracting user interfaces



FABRIC Integrated Project

Budget:	9 M€	Funding:	6.5 M€
Duration:	48 months	Start:	1 January 2014
Coordinator:	Angelos Amditis, ICCS	Contact:	a.amditis@iccs.gr
Website:	www.fabric-project.eu		



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Thank you!

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