

ICT requirements for on-road wireless EV charging

DEVELOPMENTS
AREA

Needs and solutions for different on-road charging modes with respect to Information and Communication Technologies (ICT)

Introduction

On road charging services require information from independent infrastructure systems and data aggregation functionalities to enable a high quality of service for electric vehicle (EV) users.

The overall system proposed in FABRIC includes sub systems integrated in the EV, at the roadside, in the charging infrastructure and at the backend to provide services before a trip, on route to the charging zone, while charging, and afterwards (for billing, etc.).

Objectives

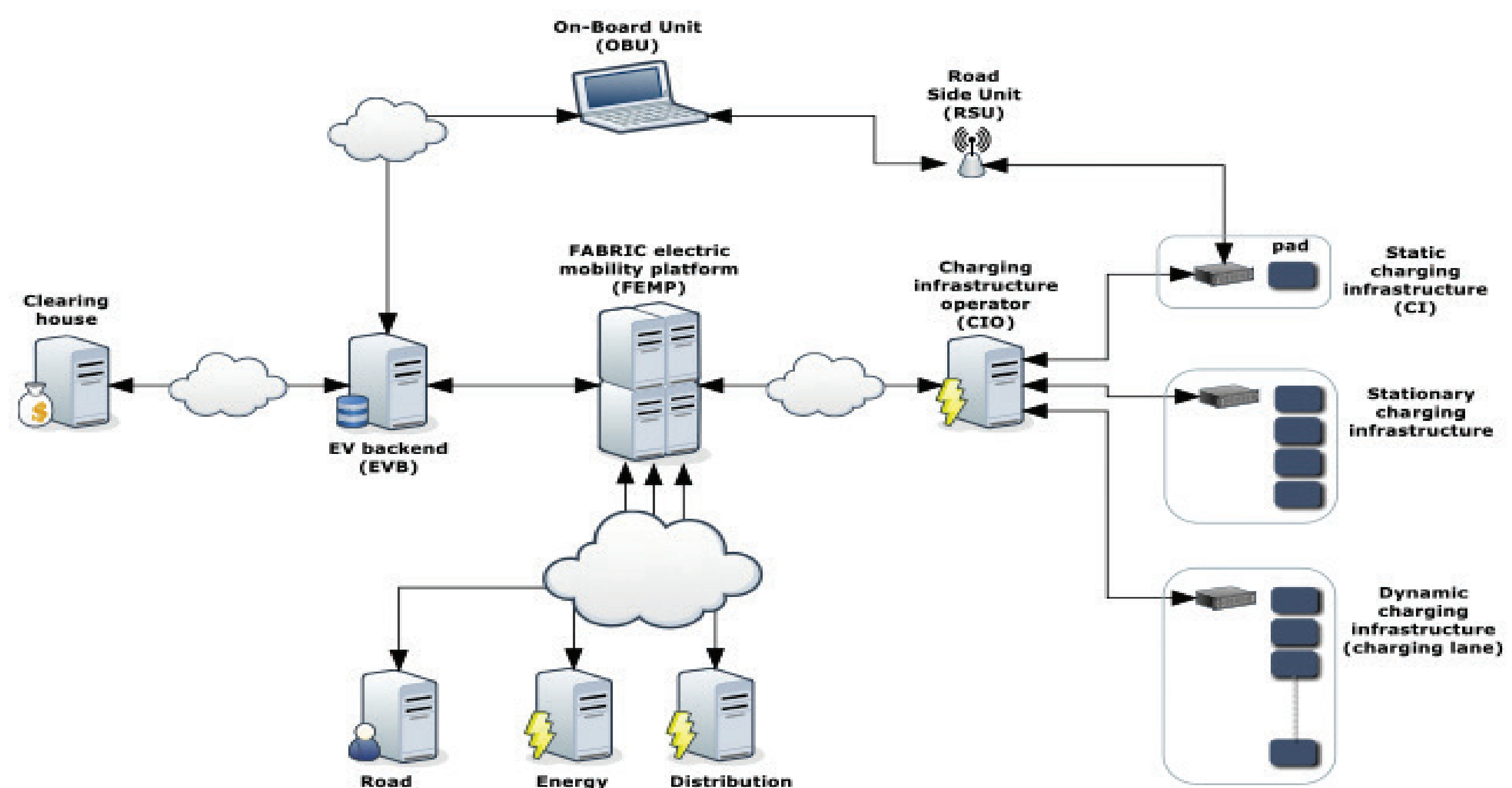
- Assess the ICT needs of an on-road charging system.
- Benchmark potentially suitable existing ICT solutions and conduct a gap analysis.
- Develop a functional ICT architecture for on-road charging:
 - Note that not all elements of this architecture are included in the demonstrations, for example authorisation and billing are not part of the FABRIC demonstrations.
- Build and test prototypes for three types of ICT solution:
 - Lane-keeping application;
 - Human-Machine Interface (HMI) for the driver;
 - Load balancing application for off-board charge planning.

ICT solutions

FABRIC is aimed at dynamic charging at normal traffic speeds. However two “degraded” modes also exist: static charging and stationary charging (see above right) where the same technology can be applied. The six classes of ICT functions identified for these charging modes are:

- User accounts, booking and billing;
- Dynamic routing for Electric Vehicles;
- Vehicle identification, charging zone access/ authorisation and management/enforcement;
- Wireless Power Transfer;
- Driving assistance while charging (for dynamic charging mode only);
- Distribution Supply Operator (DSO) and grid management.

These elements are provided by the different actors and modules shown in the architecture diagram (right).



FABRIC ICT high level physical architecture

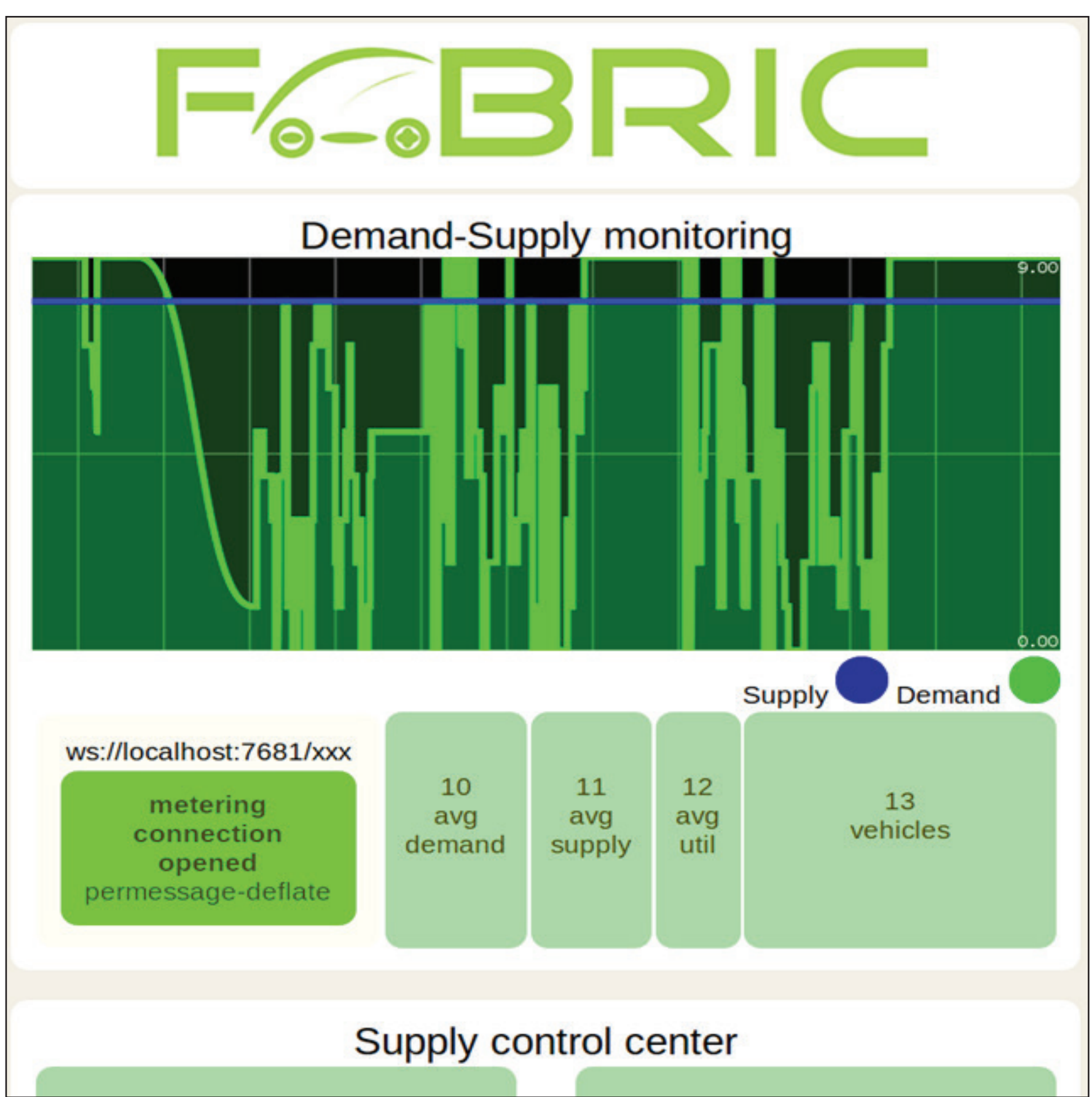
Examples of ICT modules developed



Lane-keeping application under test in rainy conditions on the Italian test track (Susa). See “GAAS” poster for further details



Lane-keeping application driver HMI on the French test track (Versailles-Satory)



Load balancing web user interface (Demand Supply Monitoring Part). See “Grid Load Balancing” poster for further details

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Contact

Andrew Winder, ERTICO-ITS Europe, Belgium
Email: a.winder@mail.ertico.com

Coordinator

Angelos Amditis, ICCS, Greece
Email: a.amditis@iccs.gr

Consortium

Project facts

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