E-Mobility Services

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**H2020 TRANSPORT**

**CEF TRANSPORT**

**Technology readiness levels (TRL)**

- **TRL 1-2** Principles and formulation
- **TRL 3-4** Proof of concept and validation
- **TRL 5-6** Validation in real environment
- **TRL 7-8** Prototype demonstration and completion
- **TRL 9** Proven and operational

**Building blocks**

- **H2020: SPICY** Battery technologies, charging cycle, discharge rate, materials and integration
- **FP7: ELVA** Electric architecture of the vehicle
- **H2020: ESPRIT** New stackable urban electric vehicles

**Deployment**

- **CEF: 2014-EU-TM-0196-S** Deployment of 241 standard fast chargers in Germany and 37 in Belgium
- **CEF: 2015-EU-TM-0367-S** Deployment of a pilot of 25 Ultra-Chargers on the TEN-T corridors connecting the Netherlands, Belgium, Germany and Austria

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Policy & Legislation

Applicable Legislation

- Alternative Fuels Infrastructure Directive
- Intelligent Transport Systems Directive
- Currently under revision:
  - Clean Vehicles Directive
  - Regulation on CO2 Emissions

To assist with the implementation of the Alternative Fuels Infrastructure Directive

Creation of the Sustainable Transport Forum

- Assist the Commission [...] fostering the deployment of alternative fuels infrastructure
- Provide a platform for structured dialogue [...] between Union Member States and relevant public and private stakeholders

Sub-Groups

- Advanced Biofuels
- Implementation
- E-Mobility Services (SGEMS)
- Clean Buses
- Alternative Fuels in cities
E-Mobility Services

Interoperability: leading to Seamless Charging across Europe

Avoiding:
- Stranded Investments
- Multiple Charging Cards/Apps
- Islands of connectivity

SGEMS recommendations on:
- Payments (Ad-hoc & subscription based)
- EU-wide Identification of e-Mobility actors
- Interoperability/Standards/Data Formats
- Charging Point Infrastructure
E-Mobility Services

Consumer Information

Avoiding:
- Bill Shock
- Especially when 'roaming'

SGEMS recommendations on:
- Pricing Information (Phase II SGEMS)
Smart Charging Infrastructure

Avoiding:
- Stranded Investments
- Electric Grid instability

SGEMS recommendations on:
- Vehicle / Grid interaction (Phase II SGEMS)
- Interoperability/Standards/Data Formats (Phase II)
- Charging Point information
  - Location information
  - Availability
  - Reservation
  - ...
Paying for EV Charging: 2 options:
- Ad-hoc payment
- Subscription (contract) based

**Issues** with ad-hoc charging (legally required)
- Different approaches used across the EU – NOT consumer friendly

**Recommendations for customer-friendly ad-hoc payment options**
- Charging Point needs to be digitally (i.e. remotely & in real-time) connected
  - This allows a variety of payment options via a users’ smartphone without imposing pin-terminals for credit card readers
  - Provides for value added services (e.g. reservation)
- Provide means to use Smartphone for payment (e.g. via QR code)
- Encourage use of Open/Standardised communication protocol (e.g. OCPP) to ensure Charging point infrastructure is transferable to other operator
- When using public funding – stimulate authorities to foresee an Interconnection obligation in their tenders. Example of FR & DE

For more detailed information: see Deliverable D.1.1.
Issues with subscription based charging

- Consumer having a contract with a specific provider
  - Cannot necessarily use the charging points of a different provider
  - Does not necessarily have an idea about the price he will be charged
- Not all providers are (yet) inter-connected
  - e-Roaming providers offer a possible solution

Recommendations for subscription based payment options

- Identification of e-mobility actors (see also Deliverable D.3.1)
- Harmonization of protocols & data formats used between actors
  - Harmonized data structures: eMi3 format (next step: Datex-II)
  - E-roaming: standardisation development ongoing at Int'l level (2018)

For more detailed information: see Deliverable D.1.1.
Recommendations

Identification of e-Mobility actors
Ensuring a unique registration process

Issues:

- To ensure interoperability: Need to uniquely identify e-Mobility actors
- e-Mobility actors: Charge-point (EVSE) & Charge-point pool
  Account of the e-Mobility user (via EVSP)
- Need for an organisation to issue those unique identifiers
  Current state: only 4 countries have such an ID-issuing organisation

Recommendation:

- Publish/Promote one unique ID registration process – based on international standards and described in SGEMS deliverable D.3.1.
- Set up ID-issuing mechanism at EU Level (public-private initiative). This will ensure consistency with country-level ID-issuing organisations & can fill-in for those countries that have not yet set up such an ID-organisation
- Ensure backwards compatibility with ID’s that have already been issued

For more detailed information: see Deliverable D.3.1.
Interoperability
Minimum Set of Harmonized Protocols (1/2)

Aim: Ensure interoperability through (a minimum) set of standards and protocols

Overview of protocols available (and under development) – see Deliverable D.2.1

- Some (but not all) protocols have already been agreed upon & are in use
- Many more will need to be developed/adopted as the sector progresses

For more detailed information: see Deliverable D.2.1.
Today the SGEMS recommends to follow these Protocols / Standards:

- **Digitally connecting of charging points to back-office IT Systems**
  - minimum requirement = Ensure that the charging point is digitally connected
  - Use of Open Charge Point Protocol (OCPP).

- **Identification & authentication of EV Users**
  - Recommended to install readers that are able to support both MiFare Classic & Mifare Desfire.
  - Use of QR-code / NFC to enable ad-hoc charging + recommend to allow at least the use of Credit Cards / PayPal via smartphone Apps
  - ISO 15118: Plug-and-Charge

- **Charging Point information (see next slide)**
  - Ensure that data is available on the charging point: location, operational status,…
  - Data should be in a standard format

- **Harmonised E-Roaming protocol being developed via (EC TC69 / WG9)**

- **Interface to Energy networks & markets**
  - Metering interface to electricity grid
  - (in future vehicle-grid integration)

- **Pricing information to EV user**

For more detailed information: see Deliverable D.2.1.
Questions?

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