Interoperability of E-Mobility Services - Requirements from an OEM Point of View

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Session 2F2 - ICT and promotion
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Interoperability of E-Mobility Services: Challenges for EVs & Comparison with fossil fuel infrastructure

Gasoline: EN228
Diesel: EN 590

Vehicle interface | Access & payment | Value add services | Network coverage

>130,000 stations (EU wide)

(Navigation Services; Low relevance with respect to refueling)

Gasoline: EN228
Diesel: EN 590

Navigation Services
Reservation
Eco-Routing...

< 10,000 charging points

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Green eMotion Work structure.
All WPs deliver contributions towards task of „Interoperability“

Administrative WP – Dissemination (WP10), Project Management (WP11)

Ongoing demonstration projects

EU-wide inventory

WP1: Synchronisation of demonstration regions

WP2: Urban electro-mobility concepts

G4V, MERGE, EDISON

Technical WP

WP3: Electromobility services / ICT solutions

WP4: Grid EV-olution

WP5: Recharging infrastructure

WP6: EV technology validation

EU-wide demonstration

WP7: Harmonisation of technology & standards

WP9: Technical, environmental, economic and social evaluation

Demonstration

Green eMotion framework demonstration

Subject: Integrated European demonstration on electro-mobility – Vehicles, infrastructure, grid, IT applications, user acceptance

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Overall OEM Requirement: convenient customer experience

Sub-Requirements to different Green eMotion Workpackages.

Vehicle interface
- Standardized connection EV/ EVSE (plug & communication) → WP5,7
- Variety of power levels to support different use cases in the most customer attractive way → WP5
- Holistic architecture, interfaces to OEM/ EVSP Backend → WP3,7

Access & payment
- E-roaming functionality (end user can charge everywhere with one contract) → WP3,8
- Viable business model (Attractive, transparent pricing & invoicing) → WP3,9
- Easy access & handling → WP3

Value add services
- Navigation to Charging Spots → WP3
- Dynamic Info/ Reservation of Charging Spots → WP3,8
- Enhanced Charging acc. to user preference → WP3,4,5 (e.g. green or economic charging → grid stabilization is not an USP!)

Network coverage
- Technical interoperability (e.g. Multi-Standard) → WP5
- Sufficient public network – where needed → WP10
- Integration in mobility/ intermodal solutions → WP1,2
The architecture for solving the interoperability challenge: Green eMotion Building Blocks

- **EVSP Backend** (Electric Vehicle Service Provider Backend system)
- **Clearing House Service**
- **Marketplace** (Business to Business)
- **PMS** (Power Management System)
- **CMS** (Charge Management System)
- **Customer Contract**
- **External Network Provider**
- **Municipalities, Government**
- **Utility**
- **DSO / TSO / Retailer / Aggregator**
- **IT Provider**
- **Municipalities, Government Policies, Legislation, Standards**
- **EVSE Search** (Example of Business Service)
- **EVSE Operator**
- **EV**
- **User**

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Marketplace for electromobility:
OEMs are already offering services beyond the vehicle!

**BMW**
- ChargeNow – Public Charging Offer
- EV Leasing & Fleetmanagement
- EV Carsharing

**Daimler**
- EV Leasing & Fleetmanagement
- EV Carsharing

**Renault**
- EV Leasing & Fleetmanagement
- Battery Leasing

**Nissan**
- EV Leasing & Fleetmanagement
- Battery Leasing

While in theory one single European Market Place would be the most efficient solution, actual development highlights the need for interconnected market places!
Marketplace for electromobility: The need for interconnected market places

“Competition on Market Place Level“

EVSP 1  EVSP 2  EVSP n

Market Place 1
= Service Broker
= Clearinghouse

Market Place n

Service Prov. 1  Service Prov. 2  Service Prov. m

→ OEM Requirement: facilitate process of interconnection of market places asap!
Electric Vehicle Service Provider (EVSP): EVSP holds customer relation, must manage trade-off between positive business case versus attractive retail pricing.

The EV driver has to pay for the services of all stakeholders inside the business model!

A REEV/ PHEV Driver has following fueling options*:
- Charge @ home: ~15-25 ct/ kWh (EU-range) → 1,80 – 3,00 €/ 100 km
- Refuel with gasoline: ~1,50 €/ Liter → 7,50 €/ 100km

Conclusions:
- Reasonable amortisation for infrastructure use & eRoaming is possible
- “fossile cost per mile” as ceiling (REEV)

* assumed consumptions: 12 kWh/ 100km, 5 liter gasoline/ 100 km

→ OEM Requirement: optimize business models, minimize end customer cost for usage of public charging infrastructure in addition to energy cost.
The Green eMotion automotive group proposes already a range of Electric vehicles and the portfolio is further growing....

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<th>2013</th>
<th>2014</th>
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<td>Nissan LEAF</td>
<td>Renault Kangoo Z.E. / Kangoo Maxi Z.E</td>
<td>Renault Twizy</td>
<td>Renault ZOE Preview</td>
<td>Nissan eNV200</td>
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<td>Mercedes B-Class ED</td>
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<td>Smart ED</td>
<td>BMW i3</td>
<td>BMW i8</td>
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The other E-Mobility stakeholder have to follow now!
Thank you for your attention.

Contact: www.greenemotion-project.eu