

# Electric Vehicle / eMobility Projects & Requirements

In-Vehicle Data Access – W3C Automotive Web Platform – April 2016



## About me:

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### Private: Renewable energy producer and EV driver since 2014



## Agenda

1. The EU Green Vehicles Project „Green eMotion“ 2011 – 2015
2. Project IBM Research and Energy Producer EKZ, Switzerland for SmartCharging 2014
3. The EU Green Vehicles Project „NeMo“ 2016 - 2019
4. Requirements for EV In-Vehicle Data Access

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## The “Green eMotion” Project



**Demonstration Project is part of European Framework Program for “Green Cars” Initiative of EU Economic Recovery Plan.**

### Objectives of the project:

1. Acceleration of the market roll-out of electric vehicles in Europe
2. Meeting EU policy on energy of supply, energy efficiency and green house gas emission reduction
3. Viability of different types of electrical vehicles for immediate market introduction

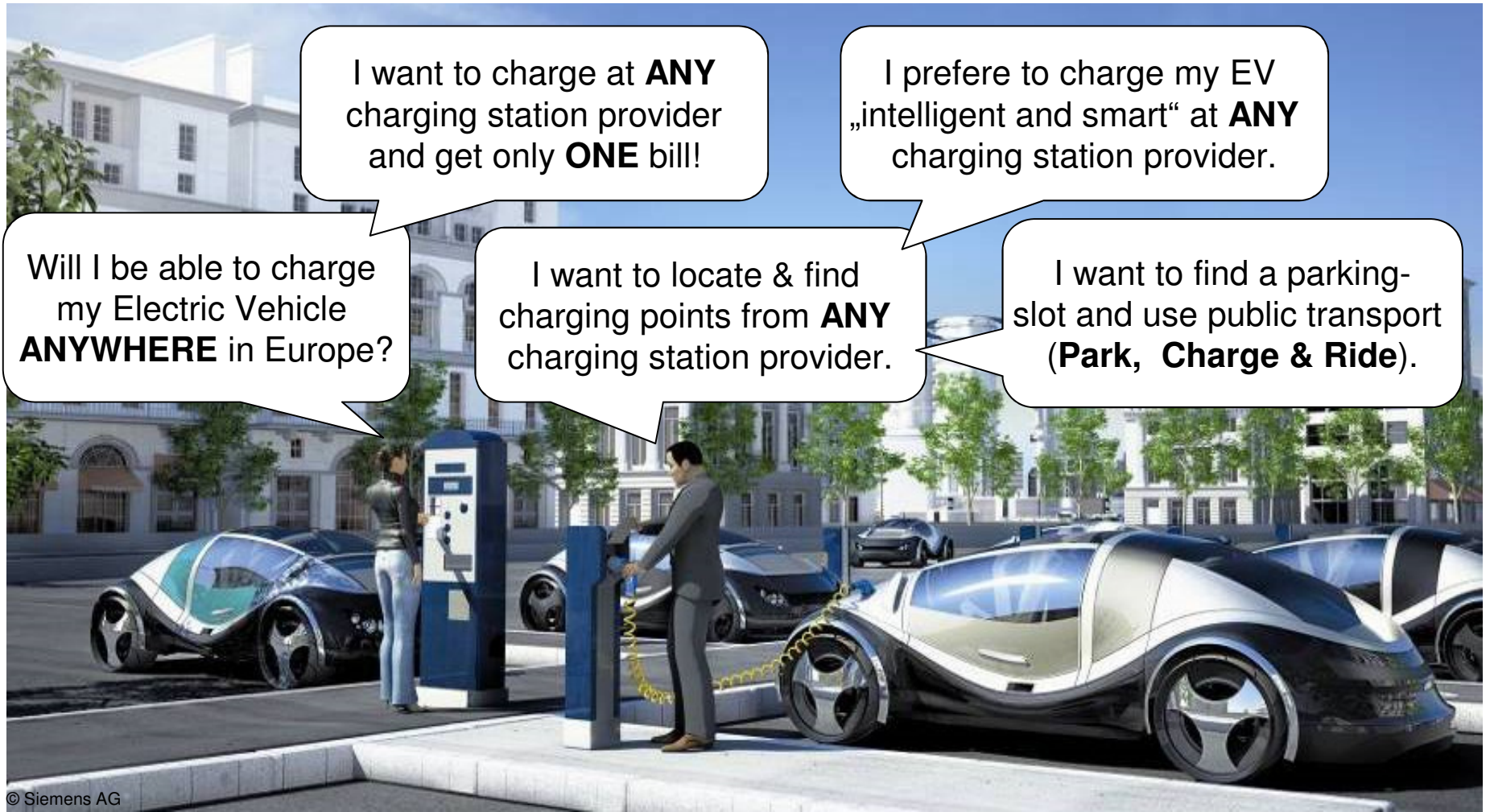
### Key Facts of the project:

- 43 partners have signed the consortia agreement
- Over all EU Funding: 24.226.954 Euro
- Project Start: March 2011
- Project End: February 2015

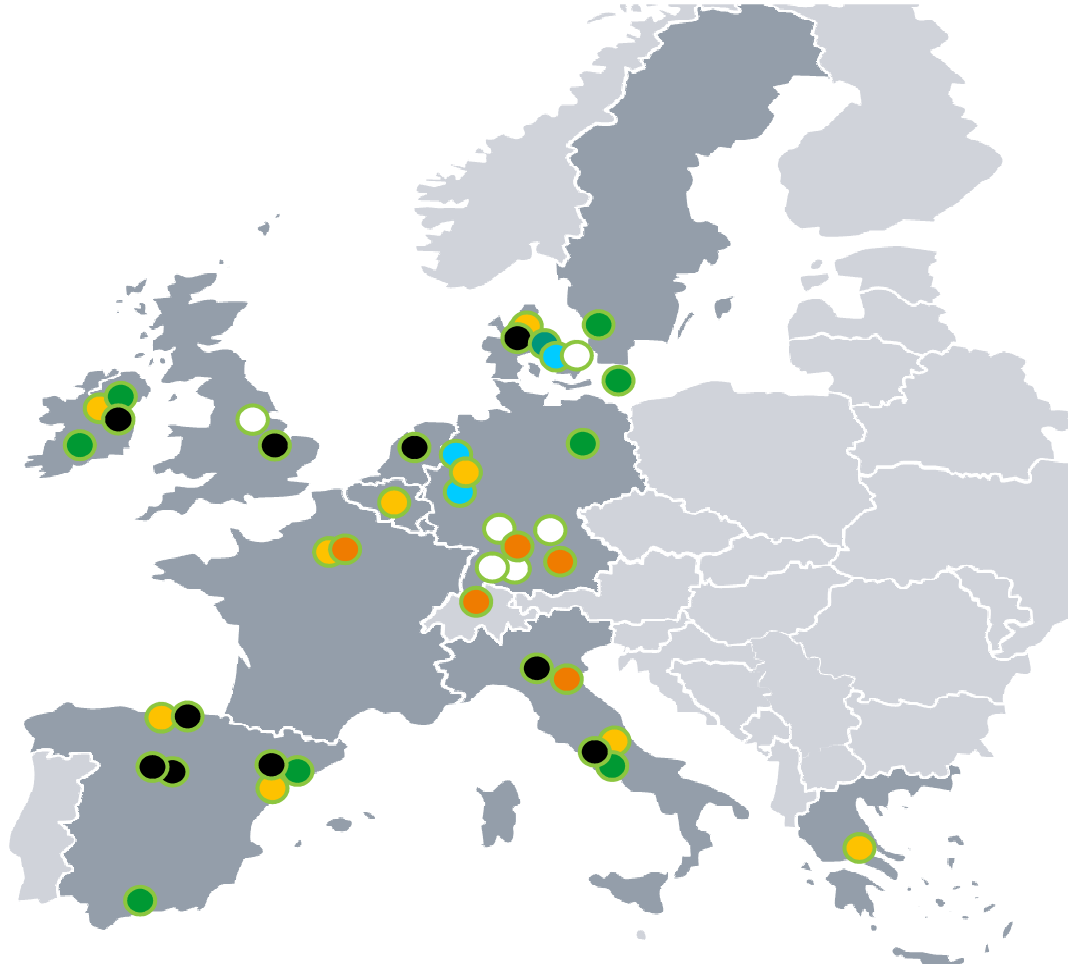




# What are the end-user's requirements about electromobility services?



# The Green eMotion Project Consortium



- Industries:**  
Alstom, Better Place, Bosch, IBM, SAP, Siemens
- Utilities:**  
Danish Energy Association, EDF, Endesa, Enel, ESB, Eurelectric, Iberdrola, RWE, PPC
- Electric Vehicle Manufacturers:**  
BMW, Daimler, Micro-Vett, Nissan, Renault
- Municipalities:**  
Barcelona, Berlin, Bornholm, Copenhagen, Cork, Dublin, Malaga, Malmö, Rome
- Research Institutions and Universities:**  
Cartif, Cidaut, CTL, DTU, ECN, Imperial, IREC, RSE, TCD, Tecnalia
- EV Technology Institutions:**  
DTI, FKA, TÜV Nord

**+ External Stakeholders** to facilitate the access to information not held by the consortium, to disseminate Green eMotion knowledge and encourage its application outside the consortium

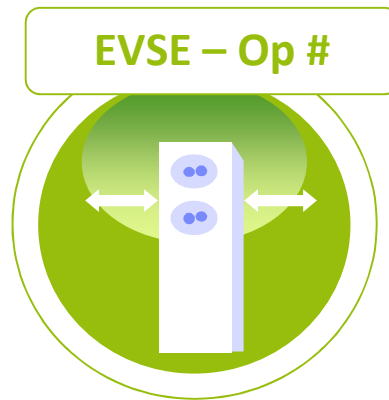
# Who are the stakeholders around electromobility?



**Customer /  
End-User**



## Who are the stakeholders around electromobility?



**Electric Vehicle**

**Supply**

**Equipment**

**Operator (EVSE-  
Op)**



**DSO/ TSO Retailer  
/ Utility**

## Who are the stakeholders around electromobility?

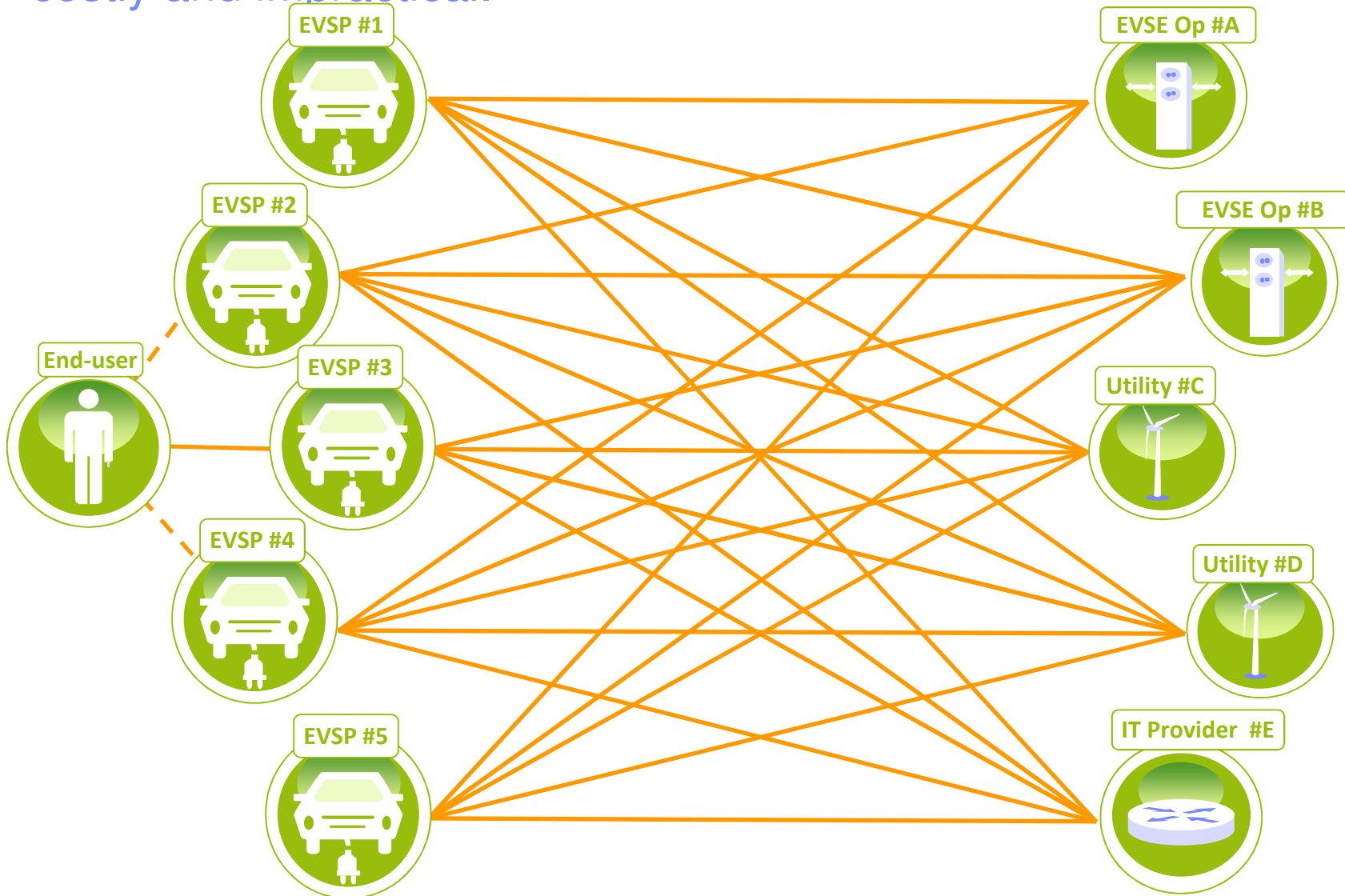


**Electric Vehicle  
Service Provider  
(EVSP)**

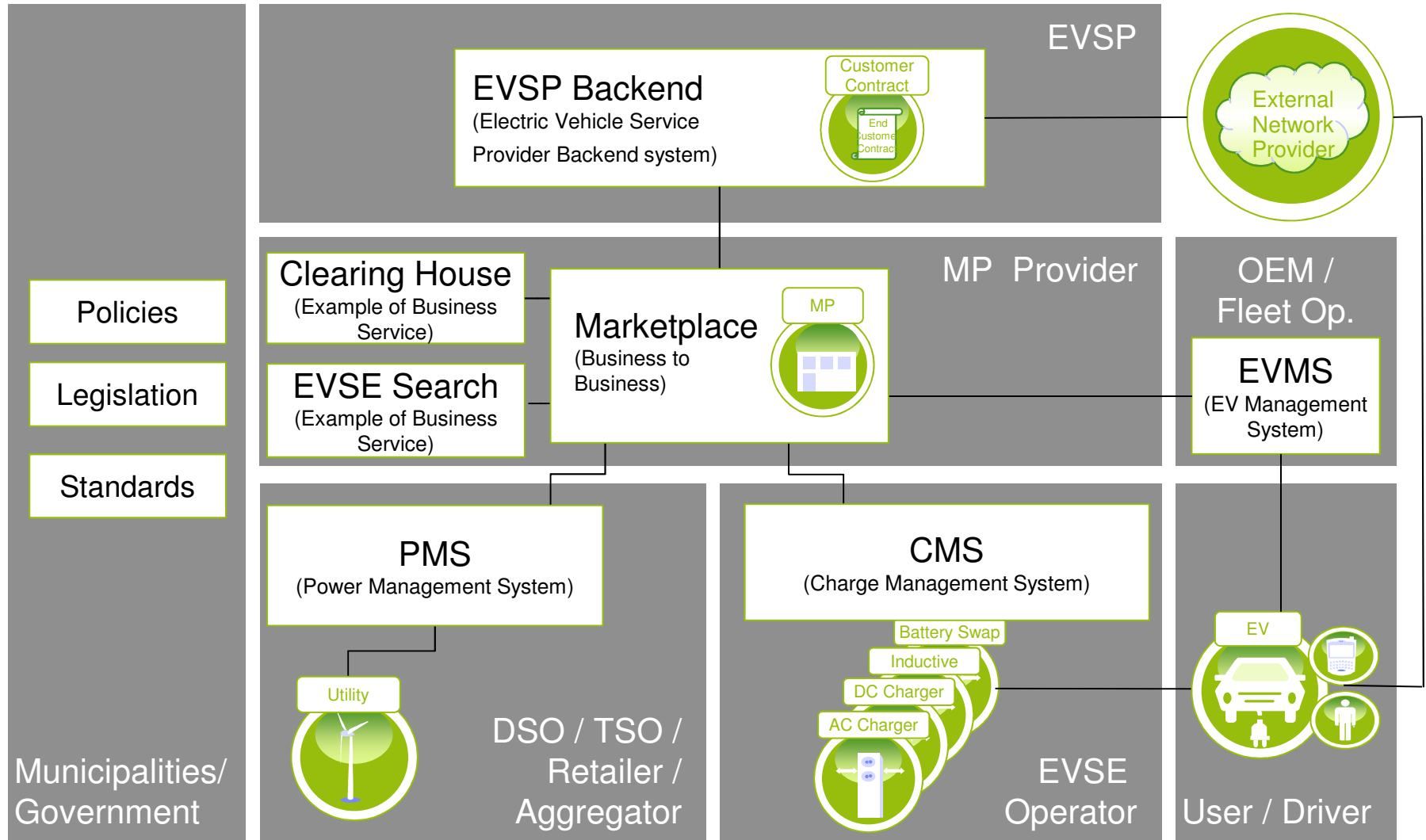


**IT Service  
Provider**

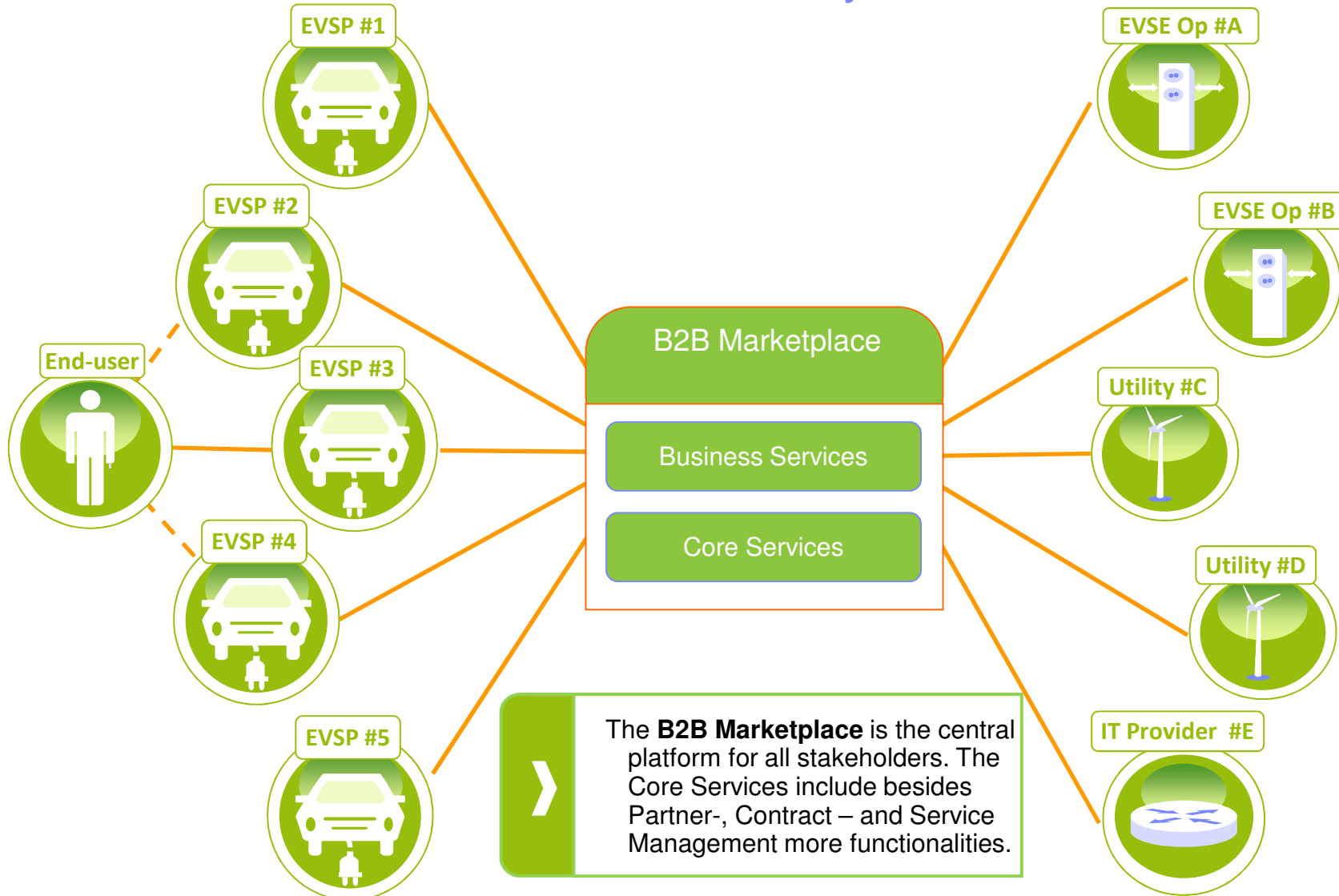
Operating EVs with many stakeholders is becoming very complex, costly and impractical.



# Green eMotion Building Blocks



# Mass market adoption of EVs is enabled by a B2B Marketplace that will interconnect all stakeholders ICT systems.



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# Motivation for EV Smart Charging



It would it be nice to get my charge-plan loaded **automatically** into my EV based on local PV generation and smartgrid information to charge it in **eco – mode**



Volker Fricke | AKTIVE FAHRGESTELLNUMMER VF1AGVYA049056149 | BENUTZ... FAHRZEUGEINSTELLUNGEN | X ABMELDEN

**RENAULT MY Z.E. ONLINE**

STARTSEITE | BATTERIEAUFLADUNG | KLIMAANLAGE | LADESTATIONEN | LADEHINWEISE

Batteriestatus | Batterie laden | **Aufladung planen** | Ladeprotokoll

Fahrzeuginterner Kalender | **Kalenderänderung**

**Kalenderänderung**

|            | 00.00                             | 04.00 | 08.00 | 12.00 | 16.00 | 20.00 | 24.00 |
|------------|-----------------------------------|-------|-------|-------|-------|-------|-------|
| Montag     | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Dienstag   | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Mittwoch   | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Donnerstag | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Freitag    | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Samstag    | [Bar chart showing charging plan] |       |       |       |       |       |       |
| Sonntag    | [Bar chart showing charging plan] |       |       |       |       |       |       |

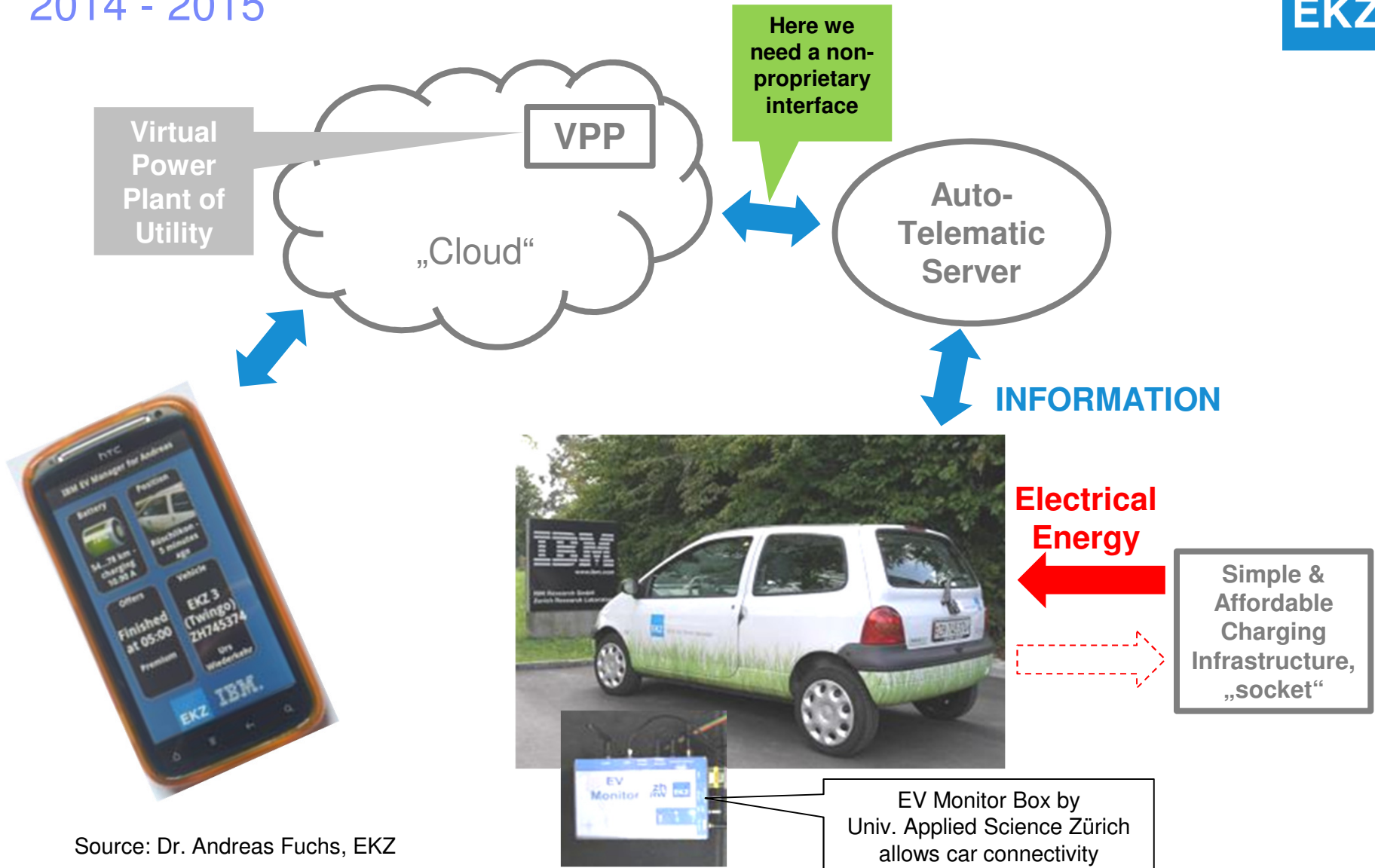
STATUS: ENTWURF (1/3)  
 Letzte Aktualisierung: ---  
 Letzte ECO<sup>2</sup>-Optimierung: ---  
 Optimieren Sie ECO<sup>2</sup> viermal im Jahr.

RENAULT eco<sup>2</sup>  
 ECO<sup>2</sup> optimieren >

> Bearbeiten / Ändern > An das Fahrzeug senden und aktivieren



# Pilot architecture for ubiquitous smart-charging of EVs – 2014 - 2015



Source: Dr. Andreas Fuchs, EKZ

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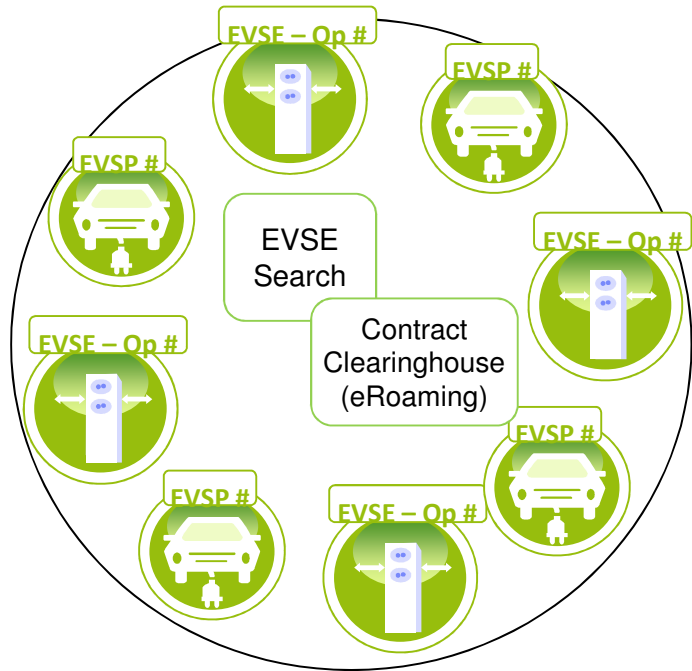
## European Union Call for Green Vehicle GV8 extends IBM contribution from EU Project „Green eMotion“ towards transport and smart grid integration and services.

- Integration of the overall cycle of EV energy management into a comprehensive EV battery and ICT-based re-charging system management, providing ergonomic and seamless user support. Such integration should build upon existing technology standards and may address:
  - Digital support for EVs such as common information model, market place interaction and service provision based on wireless / power line communication interfaces, roaming management, energy consumption and supply as well as cost.
  - Interoperability of EVs with the communication infrastructure and electricity grid regarding locally deployed smart-grid and smart-metering systems while investigating arising operational issues.

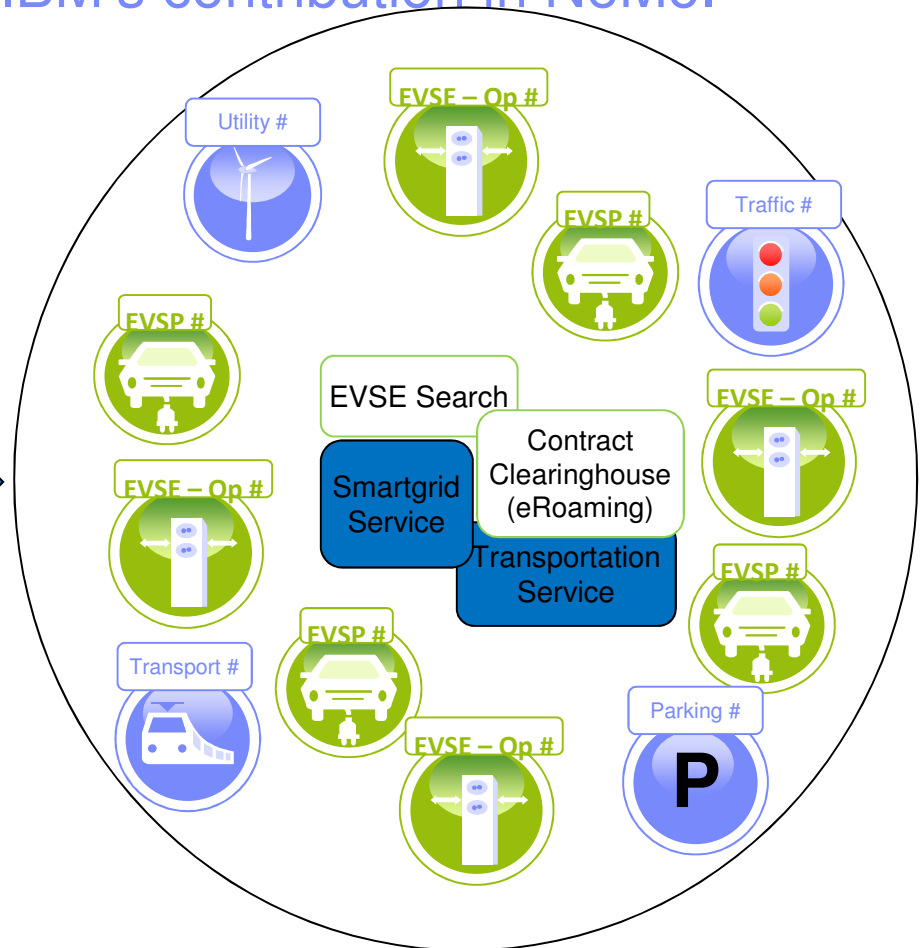
<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2608-gv-8-2015.html>

IBM has demonstrated „Open Marketplace“ ICT solution which allows new innovative business services to be provided by 3rd Party Developer. This will be the base of IBM’s contribution in NeMo.

**B2B Marketplace from EU Project  
Green eMotion  
(Open Marketplace)**

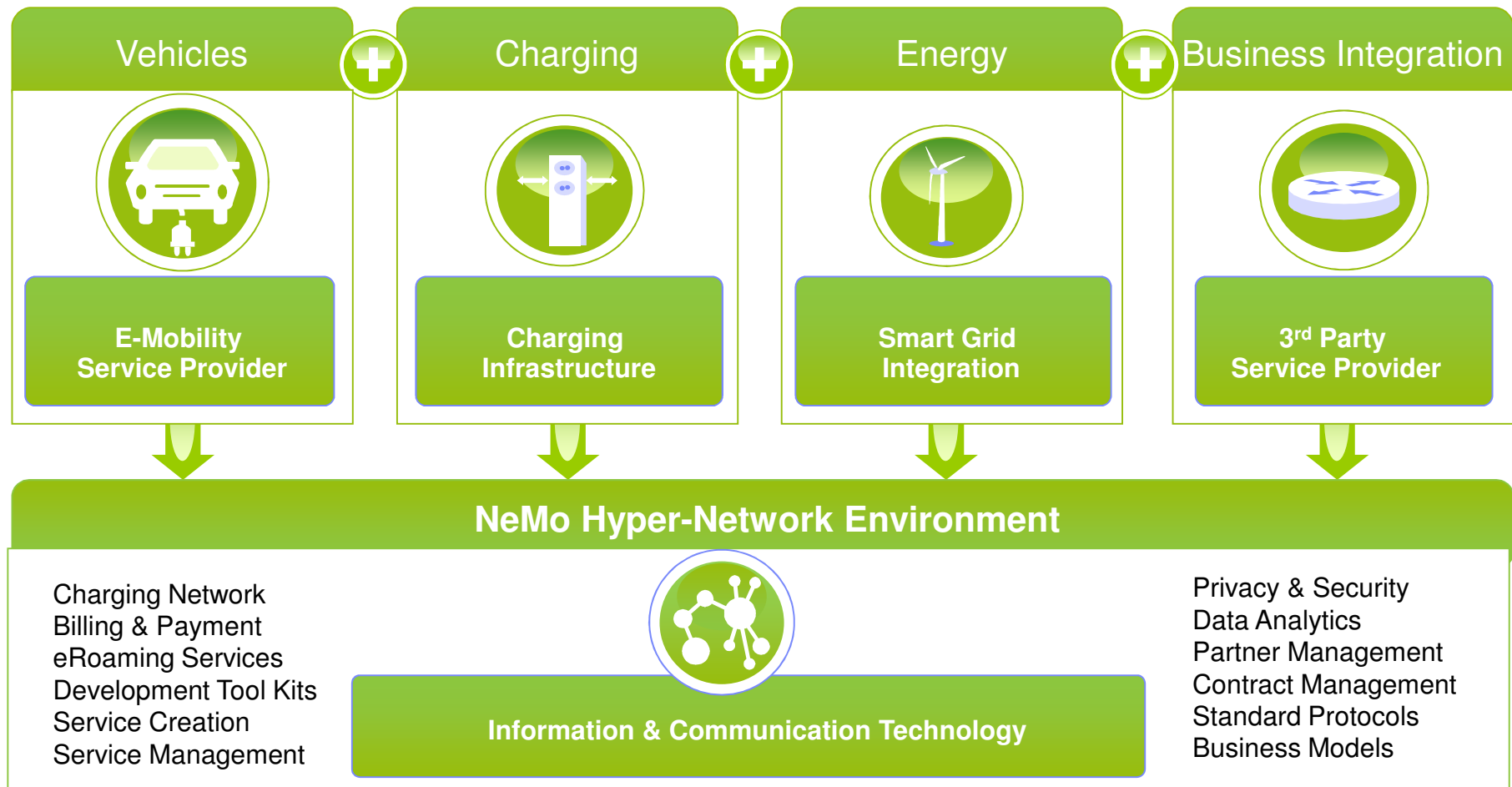


Extended to NeMo



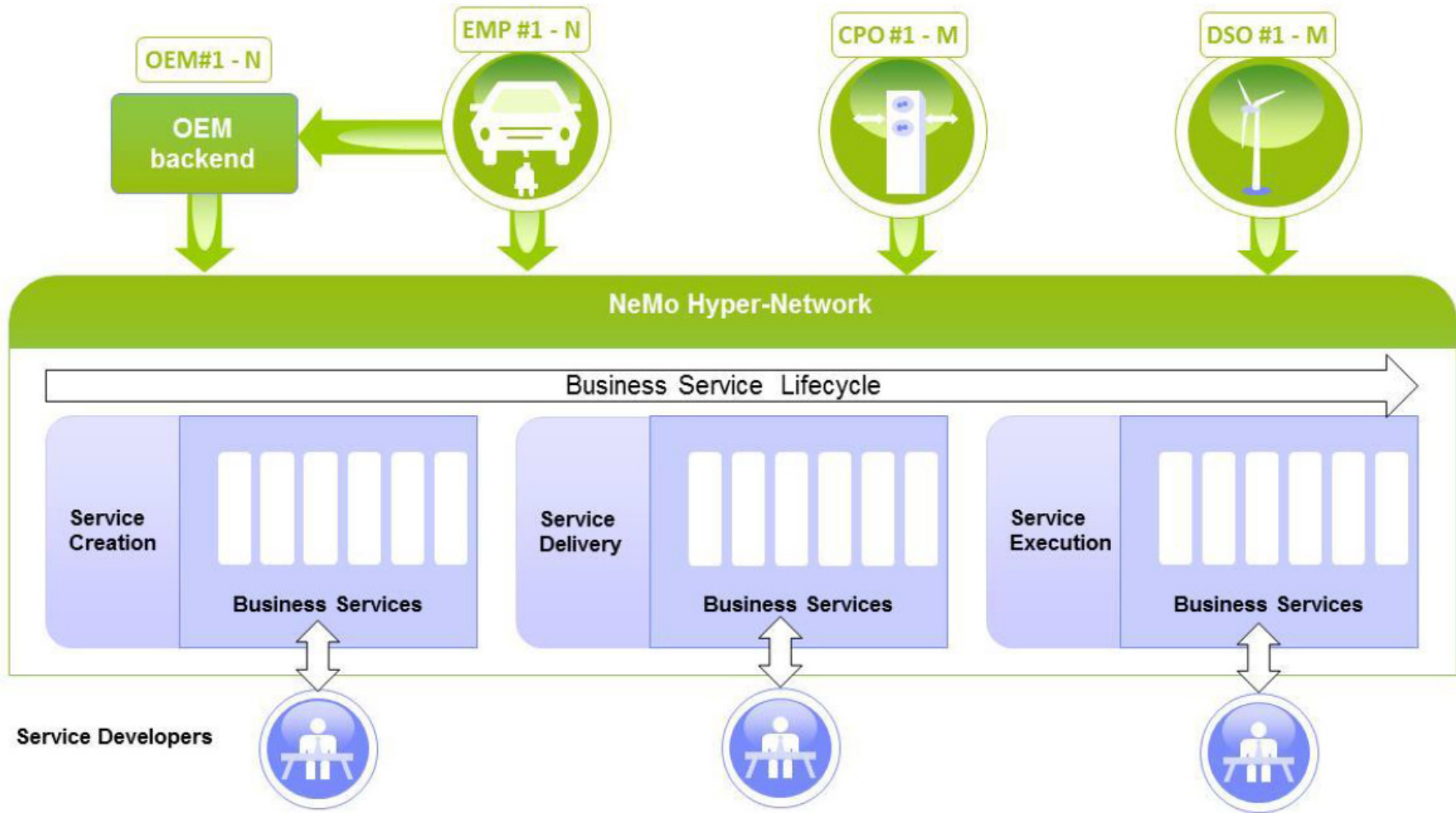
NeMo ICT services will allow EV integration services into smart grid and transportation ecosystem.

Information and Communication Technology (ICT) plays an important role in realizing successful electromobility scenarios. NeMo Hyper-Network environment enables seamless integration of data and services.

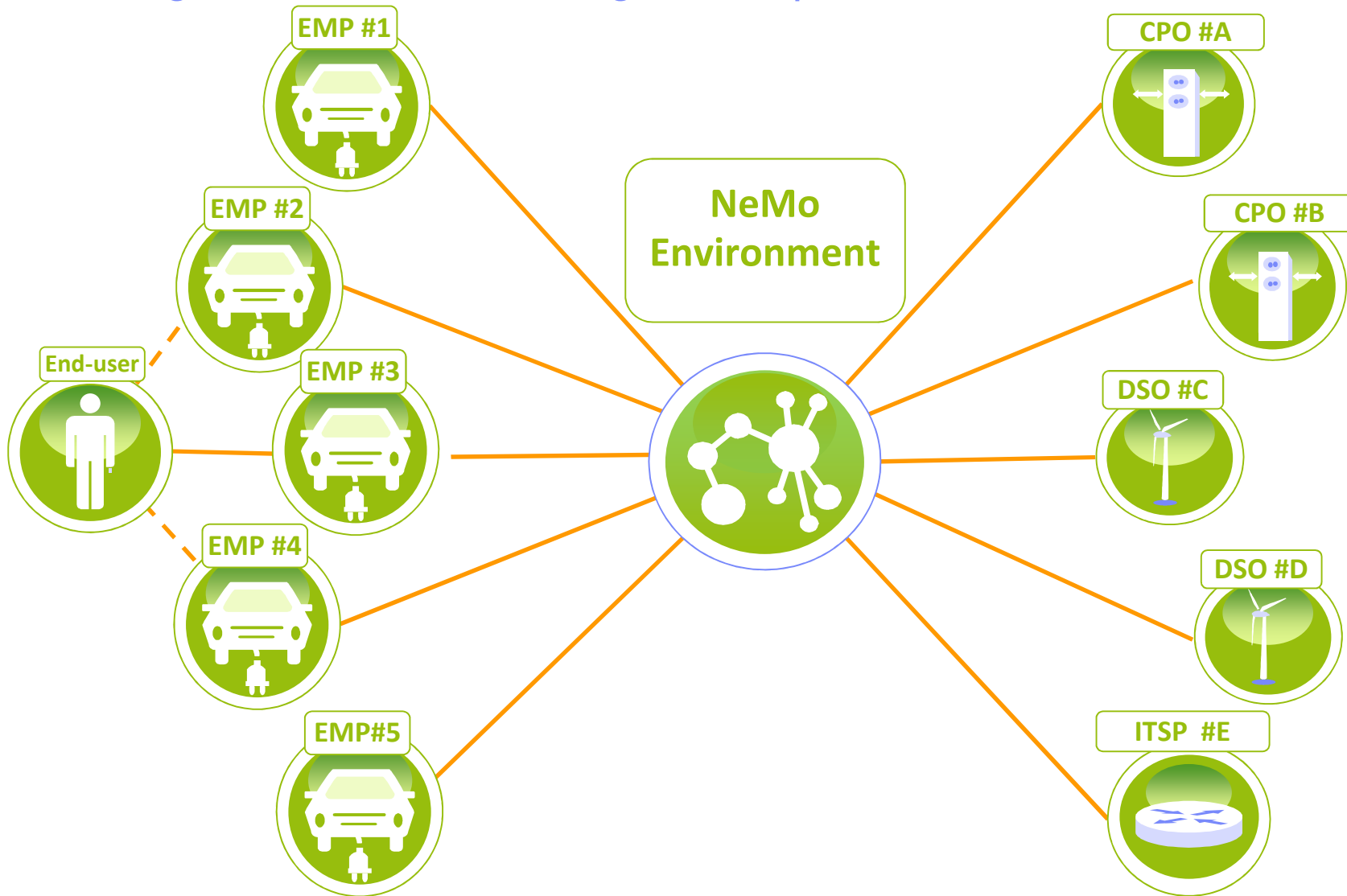




# Source: NeMo Proposal, chapter 1, figure 2: How actors will interact with the NeMo Hyper-Network



NeMo environment interconnect all stakeholders ICT systems allowing end-users to leverage interoperable ICT services.



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## Initial Draft of EV Data Requirements for In-Vehicle Data Access

Draft by Robert Sharpe & Volker Fricke

C-ITS EU Platform Workgroup 6 In-Vehicle-Data Needs:  
Extract from report January 2016

| Group                            | Field   |
|----------------------------------|---|
| New fuelOptions                  | capacity<br>level (as percent)<br>FuelTemperature   |
| New refuellingPort interface     | type<br>maxRate<br>maxLevel   |
| Refuelling system                | RefuellingStatus<br>selectedPortName<br>status<br>SupplyRate<br>MaxSupplyRate<br>availablePorts ??? |
| Refuelling timers                | startTime;<br>finishTime;<br>weekDay;<br>targetFuelLevel;   |
| Refuelling plan                  |   |
| Climate control timers           | TBD   |
| Traction battery State of health | TBD   |
| Available Range                  | TBD   |

| 6.Electric vehicles only  |                  |    |
|---|------------------|----|
| <b>EV charging plug (plugged /not plugged)</b>  | ✓                |    |
| <b>Actual energy consumption</b>  | ✓                |    |
| Vehicle battery state-of-charge (SOC in%) [Read]                                      | ✓                | no |
| Remaining vehicle range/distance (Range in km) [Read]                                 | ✓                | no |
| Electric Vehicle Contract ID (EVCOID) [Read]  | partly available | no |
| Electric Vehicle Charge Plan (Charge EV starting from date/time to date/time) [Write] | partly available | no |
| Battery charging driving plan   | partly available | no |
| EV specific IDs for mobility service provider (EVCOID)                                | partly available | no |
| Age battery (dd/mm/yyyy)  | ✓                | no |
| Status battery (ok/nok)   | ✓                | no |

**THANK YOU.**

