

EVS28

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EV Integration in Smart Grids through Interoperability solutions

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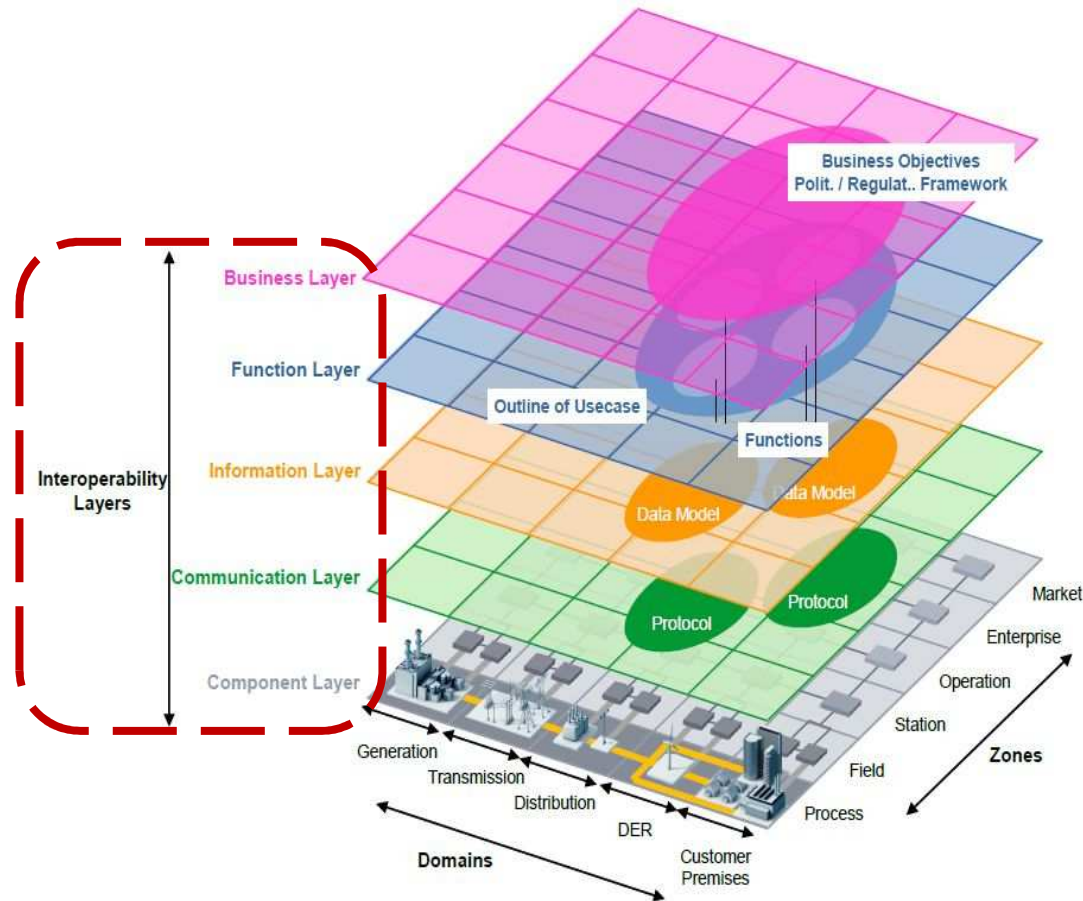
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Introduction (I)

- New **business models based on added value services** may play a facilitator role for EV deployment.
- **Interoperability** is key to achieve efficient and advanced solutions:
 - Integration of e-mobility within smart grid procedures.
 - Between different e-mobility deployments.
- **Existing and expected electromobility solutions** will be presented based on:
 - The work performed by the Smart Grid Coordination Group (SG-CG) in Europe.
 - The analysis of EV related demonstration projects.

Introduction (II)

- The results are presented with the Smart Grid Architecture Model (SGAM) in mind.



Smart Grid Reference Architecture, CEN-CENELEC-ETSI SG-CG, November 2012

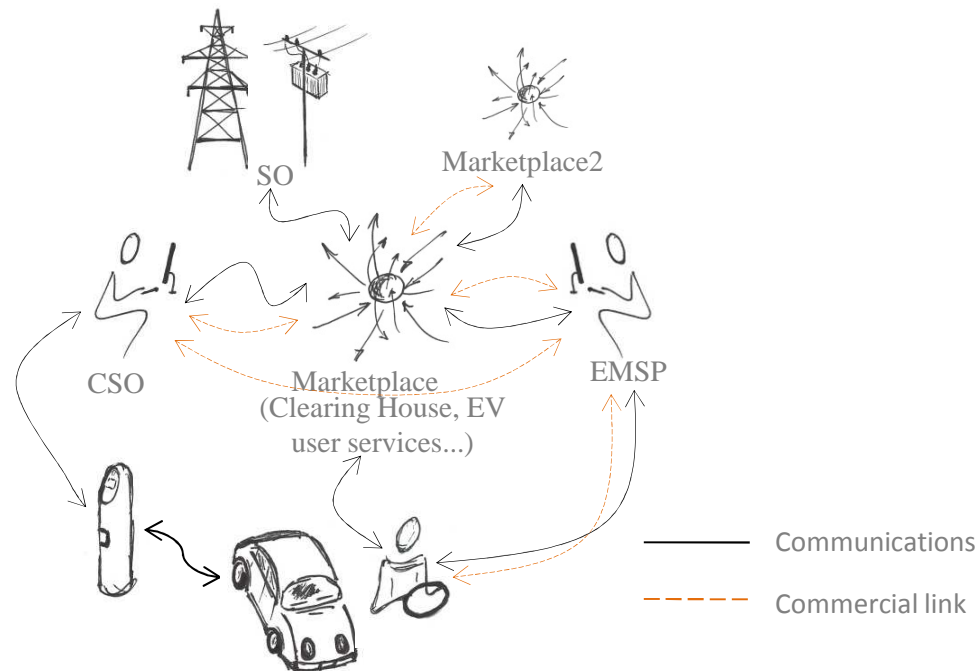
Regulation



- Direct influence on **regulated business** but it also builds a framework for **private business** development.
- It should **promote business models** and permit their profitability under global sustainability concepts.
- Structural **differences exist** between countries, resulting in diverse market conditions characterized by:
 - Actors and roles.
 - Electricity system codes, operation procedures, etc.
 - Energy market requirements and products...
- This poses a **risk for interoperability**.

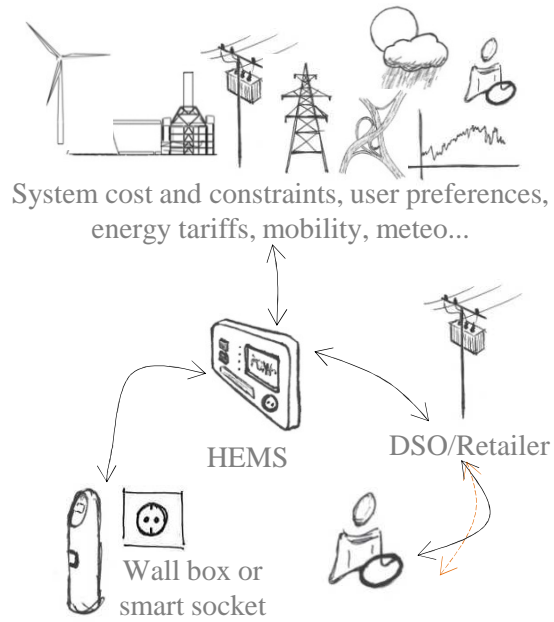
Business (I)

- They rely on product/**service sale** establishing relationships between stakeholders and leading to different **market models** options.
- **Public charging**



Business (II)

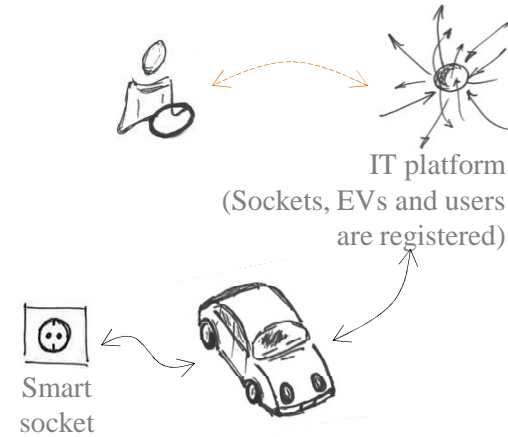
- **Private charging**



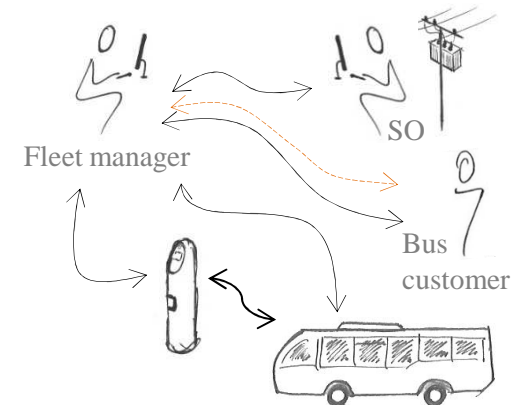
— Communications
 - - - Commercial link

- **Other**

- **Mobile metering**



- **Fleet management**





Services/Functions (I)

- They are the basis of **business models**.
- They can be described through **use cases**.
- They require the detailed description of the **interaction between components**.

- Many services have been tested technically in demo projects but their **feasibility needs to be validated** in real markets and regulatory frameworks.

Services/Functions (II)

- Some examples:

Service	Options
EV charging	<ul style="list-style-type: none">• Public, private...• Access and payment: open access, pre-paid, subscription....
Marketplace (B2B platform)	<ul style="list-style-type: none">• Data routing.• Authorization request.• Customer services offer.• Connection to external ICT platforms.
Roaming/Clearing house	<ul style="list-style-type: none">• Data and/or economic clearance.• Open access payment.
Load management	<ul style="list-style-type: none">• EVSE control, EV control, open loop• Capacity availability information and reserve• Renewable energy integration• Vehicle to everything (V2X)• EV user requirement consideration.

Components

- The term includes **devices, applications, persons and organizations**.
- **Communication and information** protocols are used for data exchange in order to carry out the functionalities required to fulfill services.

Component type	Component example
Device	<ul style="list-style-type: none">• EVSE, EV, backend and frontend systems, Home energy management system (HEMS), meter, metering head-end system...
Application	<ul style="list-style-type: none">• DMS, SCADA, GIS, data bases, trading applications, Demand response management system, customer access & information system...
Actor/role	<ul style="list-style-type: none">• EV user, Charge Station Operator (CSO), e-mobility service provider (EMSP), System operator (SO), Energy retailer, market place operator...

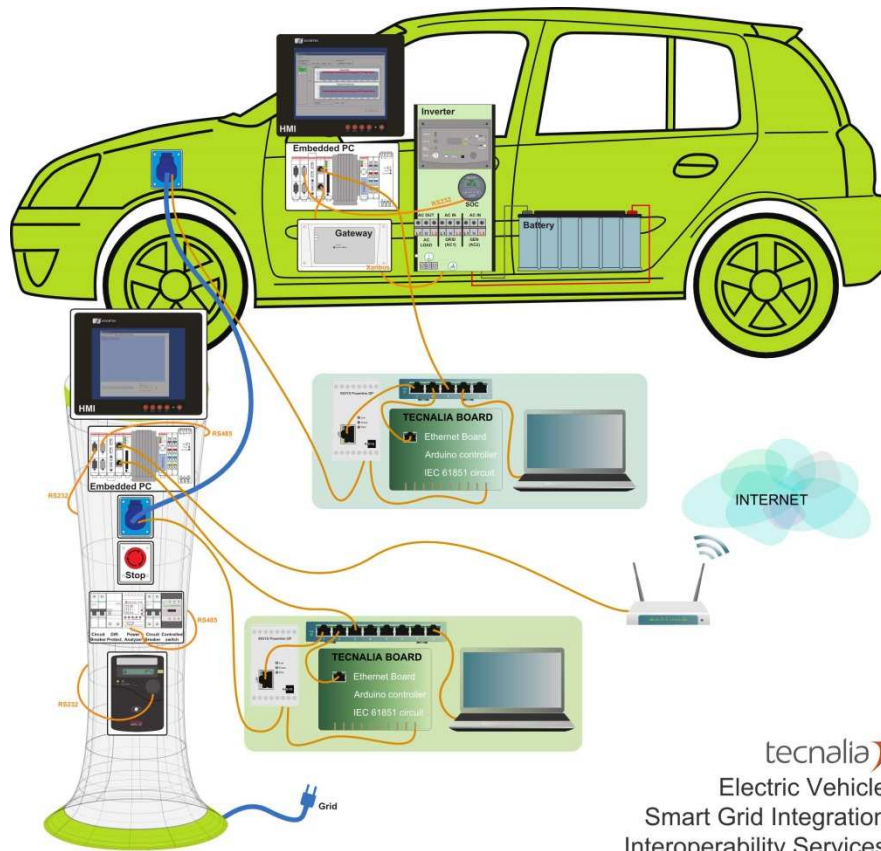
Interoperability assessment (I)

- EU Member States must guarantee by 2020 that most critical aspects relating to charging infrastructures have been tested.
- There is a **need for precise and clear procedures and facilities to achieve conformity and interoperability assessment of electromobility systems.**
- **COTEVOS EU** project addresses key issues as:
 - Assessment of e-mobility interoperability.
 - Design of procedures and tests.
 - Coherence with developments by the SG-CG at EU level.
 - Cross-national collaboration.



Interoperability assessment (II)

- Partners with laboratories are adapting their **infrastructures** to permit interoperability testing.





Conclusions (I)

- **Interoperability is necessary** to foster the widespread adoption of EVs under sustainability and efficiency premises.
- A big **harmonization work is being carried out** internationally and many ICT solutions exist for service development in the frame of smart grids.
- However, at least, a minimum level of **agreement must be achieved** to allow the deployment of the most basic e-mobility services.
- **Interoperability assessment** is basic, involving all layers and domains.

Conclusions (II)

- **Regulatory evolution** is necessary to permit:
 - An increased availability of services.
 - An increased profitability of business models.
 - Higher levels of market participation and competence.
- Due to the existing uncertainty, it is difficult to make an **economic assessment of added value services.**

TECNALIA deals with this in other EU research projects such as **Green eMotion** and **PlanGridEV**.



<http://www.greenemotion-project.eu>



<http://www.plangridev.eu/>



Farewell



Thank you for your attention

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