

Smart Charging of Electric Vehicles

E-mobility Coordination Group (EM-CG)

Kick-off meeting



Ad hoc group for Smart Charging under CEN/CENELEC M468 and M490

Short: **EM-AhG-SmartCharge**

Reference: caa@eurisco.dk
Current revision: 2012-03-23

Focus Group on European Electro-Mobility

Plenary Meeting, 8 September 2011
CEN-CENELEC Meeting Centre

6.3 Link to Smart Grids Co-ordination Group

The liaison *rapporteur*, Claus Andersen, presented the discussions so far held within the Smart Grids Co-ordination Group (**documents N138 & N139**). It was noted that the reference to a “first set of standards” for eMobility co-ordination referred to the establishment of a list (by May 2012) of the first set, rather than the end-result, although it was noted that before end-May many of the items would already be under development.

It was proposed there be an ad hoc Group on smart charging issues, based on the current report, and concerning how this issue should be handled in detail. The Focus Group participants could consider the ToR for this, and then (depending on the timeframe) the results fed into the new Co-ordination Group as well as into the Smart Grids Co-ordination Group.

Action 12/04: Chairman, Mr Andersen and CCMC to propose ToR for an *ad hoc* Group on smart charging issues and circulate them to the Focus Group participants list for comment and approval.

STANDARDISATION MANDATE TO CEN, CENELEC AND ETSI CONCERNING THE CHARGING OF ELECTRIC VEHICLES

1. PURPOSE-SCOPE

To develop or review existing standards in order to:

- Ensure interoperability and connectivity between the electricity supply point and the charger of electric vehicles, including the charger of their removable batteries, so that this charger can be connected and be interoperable in all EU States¹.
- Ensure interoperability and connectivity between the charger of electric vehicle- if the charger is not on board- and the electric vehicle and its removable battery, so that a charger can be connected, can be interoperable and re-charge all types of electric vehicles and their batteries.
- Appropriately consider any smart-charging issue with respect to the charging of electric vehicles.
- Appropriately consider safety risks and electromagnetic compatibility of the charger of electric vehicles in the field of Directive 2006/95/EC (LVD) and Directive 2004/108/EC (EMC)².

Terms of Reference

CEN/CENELEC M/468

Ad Hoc group

'Smart Charging of Electric Vehicles'

Background

The E-mobility Focus Group at CEN/CENELEC responding to the mandate M/468, has decided on the plenary meeting on the 8th of September 2011 – to start an Ad Hoc group regarding 'Smart Charge of Electric Vehicles'.

Title

Smart Charging of Electric Vehicles (EM-AhG-SmartCharge)

Status

The eM-AhG-SmartCharge will be an informal Ad Hoc group of CEN/CENELEC, open to the relevant technical stakeholders. It will report to CEN/CENELEC EM-CG (M/468) and SG-CG (M/490).

Scope

Smart charging issues with respect to charging of electric vehicles has not been thoroughly described in the M/468 focus group report, due to the fact that this is a new domain and a domain that is split between the standardization organizations for vehicles and power system.

Smart charging will be based on new business models and new power system infrastructures for demand response services, between E-mobility operators, power system operators and end users.

In order to make recommendations for harmonization of standards between the organizations involved, there needs to be a common framework for the role models, technical and safety requirements, reference architectures and use cases for smart charging of electric vehicles.

The scope of this EM-AhG-SmartCharge will be to prepare the following:

- Define and document a generic role models for different actors and their roles in the domains of E-mobility and power system (Smart Grid)
- Define and document a reference architectures for smart charging of electric vehicles, which will be aligned with the Smart Grid (M/490) reference architecture (correlation with other smart grid functionalities is required in order to maximize system-wide impact and benefits)
- Collect and adapt a set of typical, relevant reference use cases from E-mobility stakeholders to the sustainable processes defined by SG-CG, with focus on smart charging of electric vehicles

Tasks

The main tasks of the EM-AhG-SmartCharge will be to:

- Organize a smaller group of experts from both E-mobility and power system, maybe with a larger follow group.
- Prepare a detailed Scope-of-Work which defines the sub-tasks. The responsible persons and a time table with the expected milestones for the deliverables
- Align the deliverable with the other activities from EM-CG and SG-CG
- Make a plan of F2F and Web conference meetings for the first half period
- Prepare a draft role model document to be circulated in the EM-CG and SG-CG
- Prepare a reference architecture document to be circulated in the EM-CG and SG-CG
- Call for use cases from the E-mobility and relevant power system stakeholders
- Adapt the uses cases to a harmonized set of uses cases to be send to the SG-CG subgroup for sustainable processes
- Make a final report with the findings and recommendations regarding smart charging of electric vehicles, to be circulated in the EM-CG and SG-CG

Timescale

The EM-AhG-SmartCharge will be released of its task before 31st of December 2012, unless the EM-CG and SG-CG decide that prolongation of the activities is needed.

Participation

A chairperson nominated by CEN/CENELEC

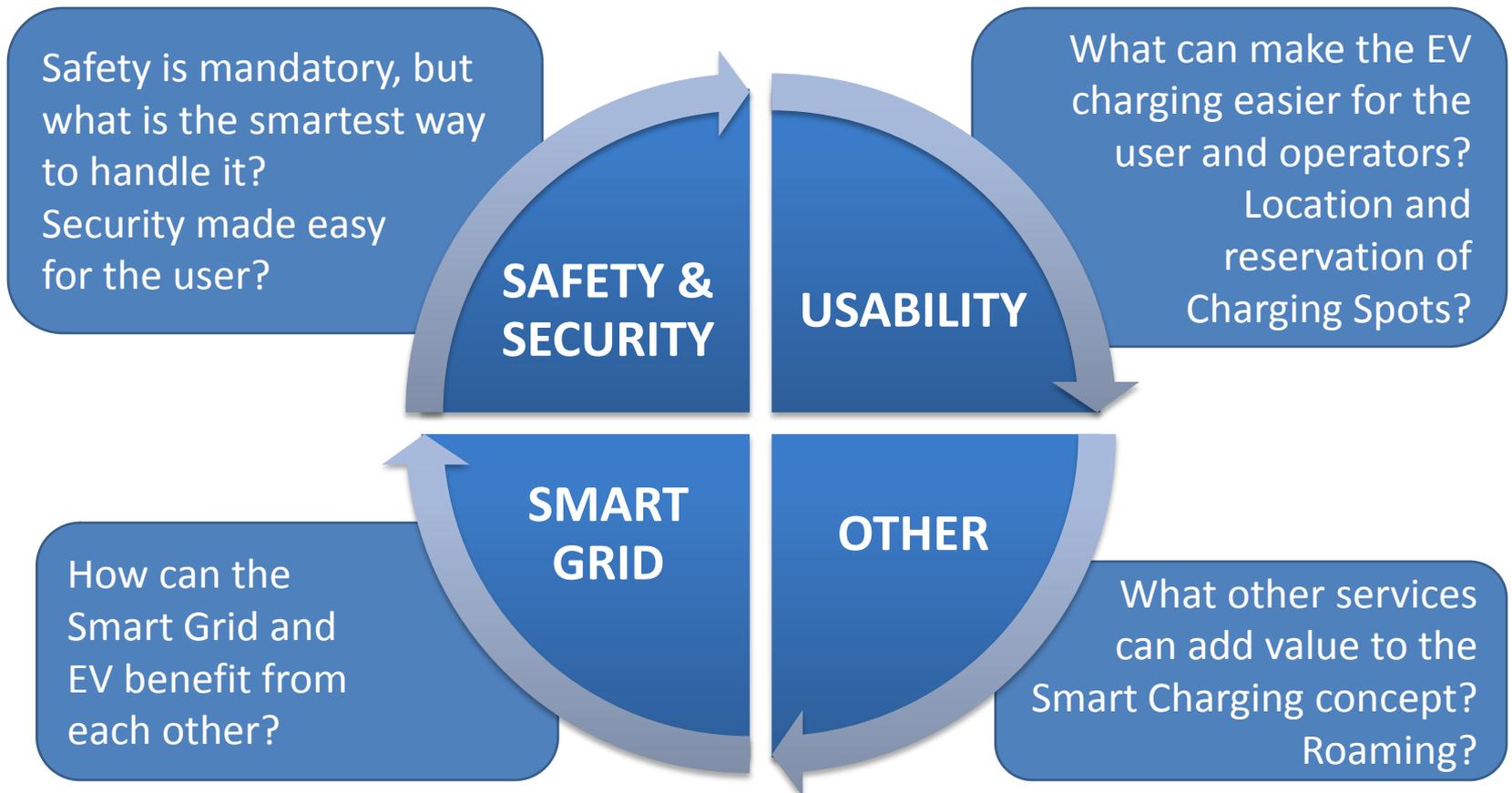
Technical experts from EM-CG and SG-CG or other stakeholders with experience and knowhow from smart charging issues

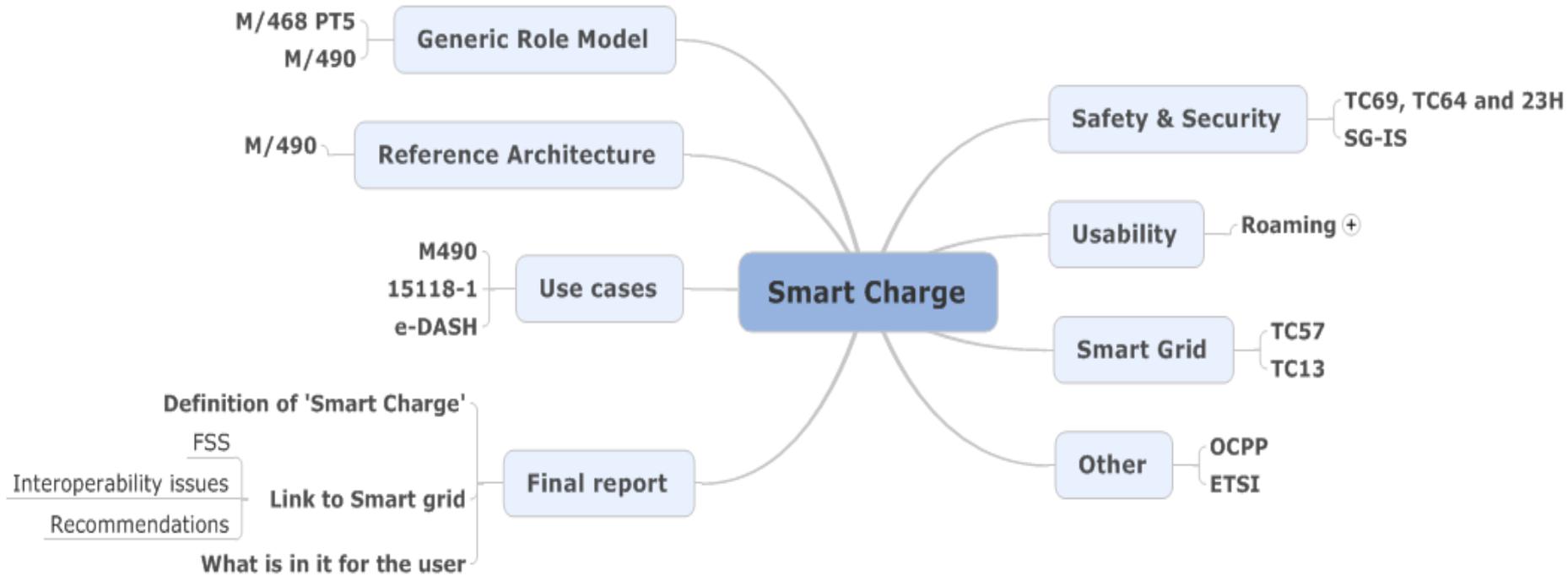
Working methods

As far as possible, the EM-AhG-SmartCharge and any subordinate groups will work on specific topics electronically, through e-mail, telephone conference and web conference. However, some physical meetings may be required, and the full Group should meet at least 3 times during the whole working period.

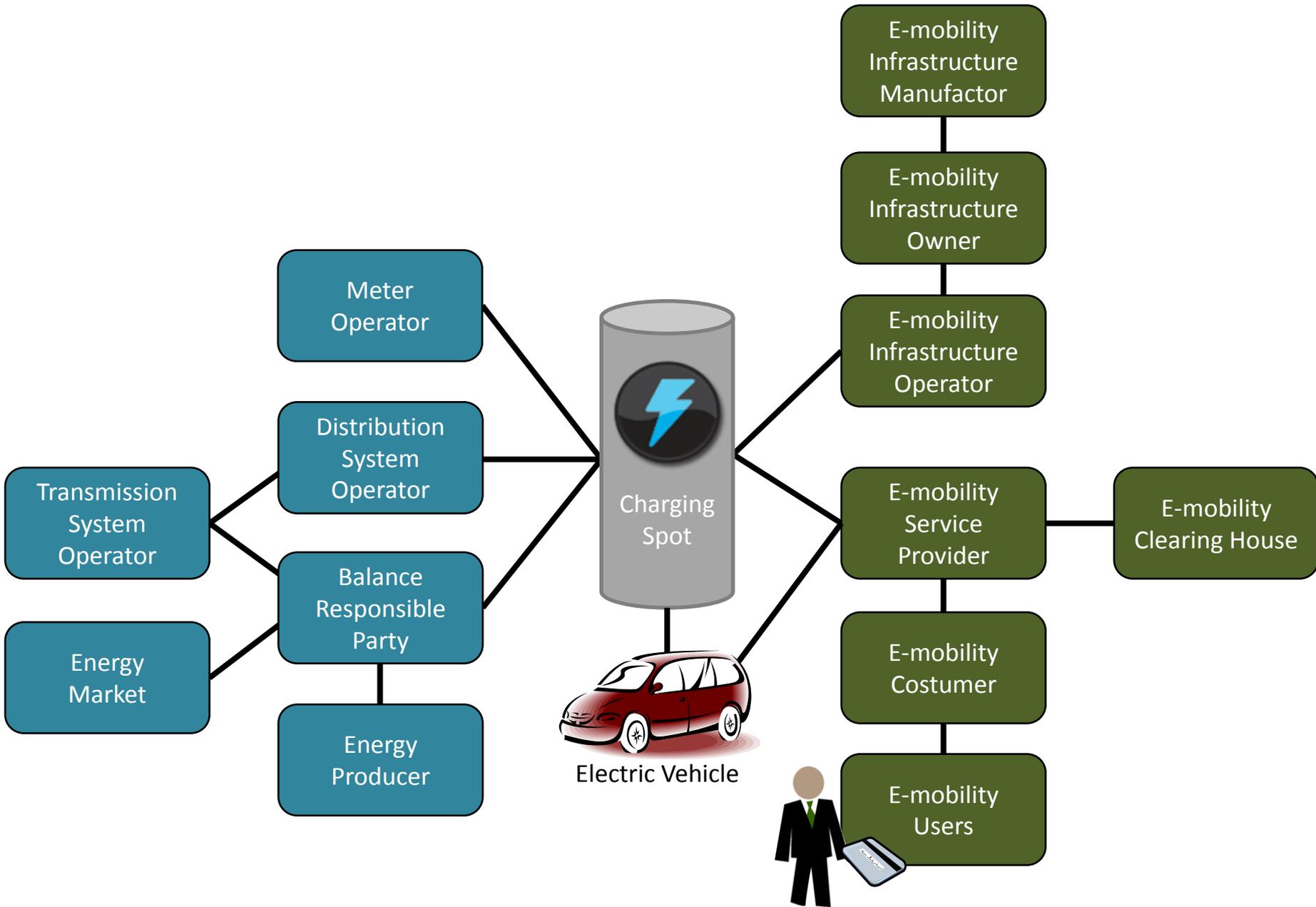
Definition of Smart Charging for Electric Vehicles

Smart charging is the ability for an electric vehicle to communicate information and services between electro-mobility and Smart grid stakeholders, in order to supply and maintain a safe, reliable and user friendly charging infrastructure.





Draft for E-mobility generic role model



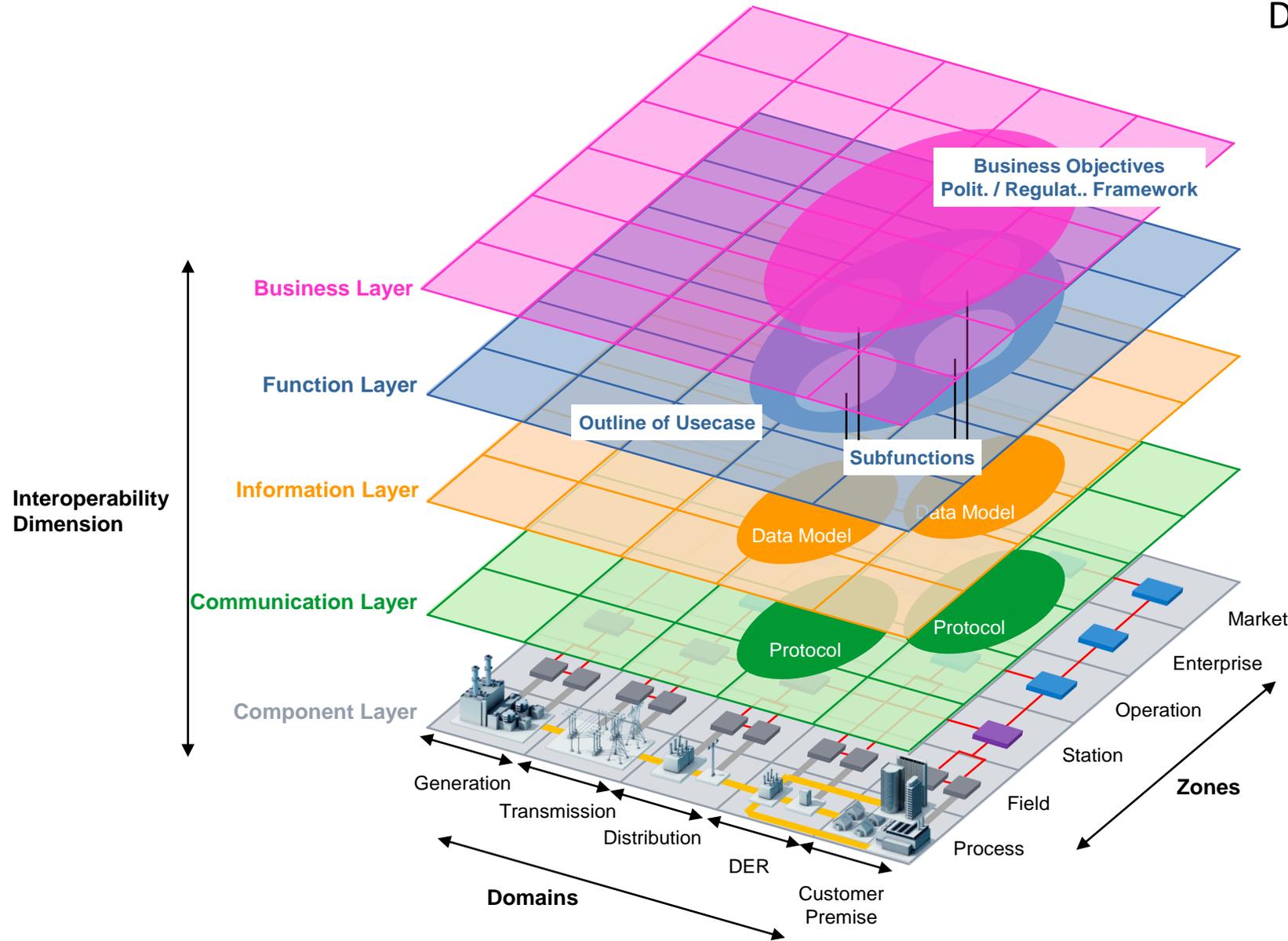
Matrix for E-mobility use cases

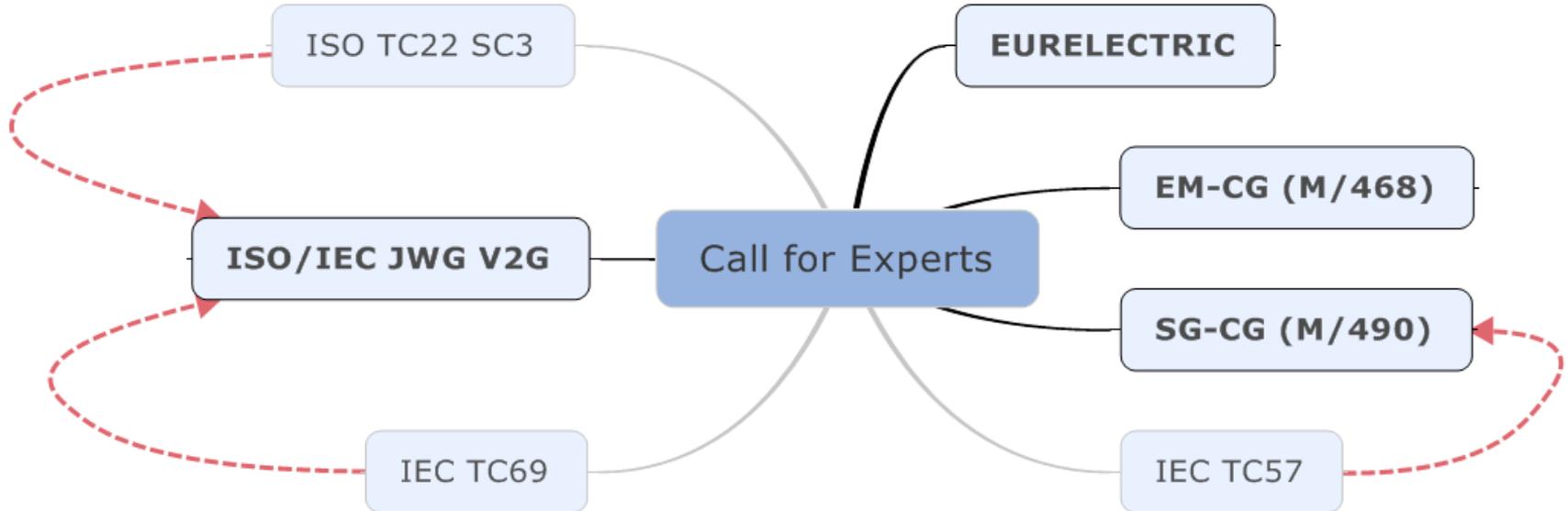
EXAMPLE

Charging scenarios	Private domestic socket (mode 1 and 2)	Private dedicated E-mobility socket (mode 3)	Semi-public AC (mode 3)	Public AC charging (mode 3)	Public DC charging (mode 4)
<u>Pre-charging:</u> - Localisation of charging spot (reservation) -Identification -Demand negotiation - Status info to the user	A1	A2	A3	A4	A5
<u>Charging/Discharging:</u> Lock of cord-set - Safety check -Meter readout start -Charging/discharging process -Meter readout end (CDR) - Status info to the user	B1	B2	B3	B4	B5
<u>Post-charging:</u> -Identification -Unlock of cord-set - Status info to the user	C1	C2	C3	C4	C5

Reference Architecture model based on SG-CG work

DRAFT





- Short process
- Technical experts - from different domains
- Active people – not observers (small group) → EM-CG (large group)

Organization of work – next step

- First step : Approval of ToR for EM-AhG-SmartCharge (is approved by SG-CG steering group)
- Next steps (see table)

ID	Activity	Deadline
	Organize a smaller group of experts from both E-mobility and power system, maybe with a larger follow group.	Ultimo April 2012
	Prepare a detailed Scope-of-Work which defines the sub-tasks. The responsible persons and a time table with the expected milestones for the deliverables	
	Align the deliverable with the other activities from EM-CG and SG-CG	
	Make a plan of F2F and Web conference meetings for the first half period	
	Prepare a draft role model document to be circulated in the EM-CG and SG-CG	
	Prepare a reference architecture document to be circulated in the EM-CG and SG-CG	
	Call for use cases from the E-mobility and relevant power system stakeholders	
	Adapt the uses cases to a harmonized set of uses cases to be send to the SG-CG subgroup for sustainable processes	
	Make a final report with the findings and recommendations regarding smart charging of electric vehicles, to be circulated in the EM-CG and SG-CG	