

The need for EV standardisation

EDISON WP5



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energi til gode oplevelser



EDISON

Introduction and experience with international standardisation work

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Active member of the following standardisation groups:

- IEC TC57 WG17 (Distributed Energy Resources)
- IEC TC57 WG15 (Security)
- IEC TC69 WG4 (EV Power supplies and chargers)
- IEC/ISO JWG V2G Communication Interface
- S-557 (TC57 Danish mirror committee)
- S-454 (EV Danish mirror committee)
- Project team leader for CEN/CENELEC EV Focus Group for 'EV Communication'



Agenda

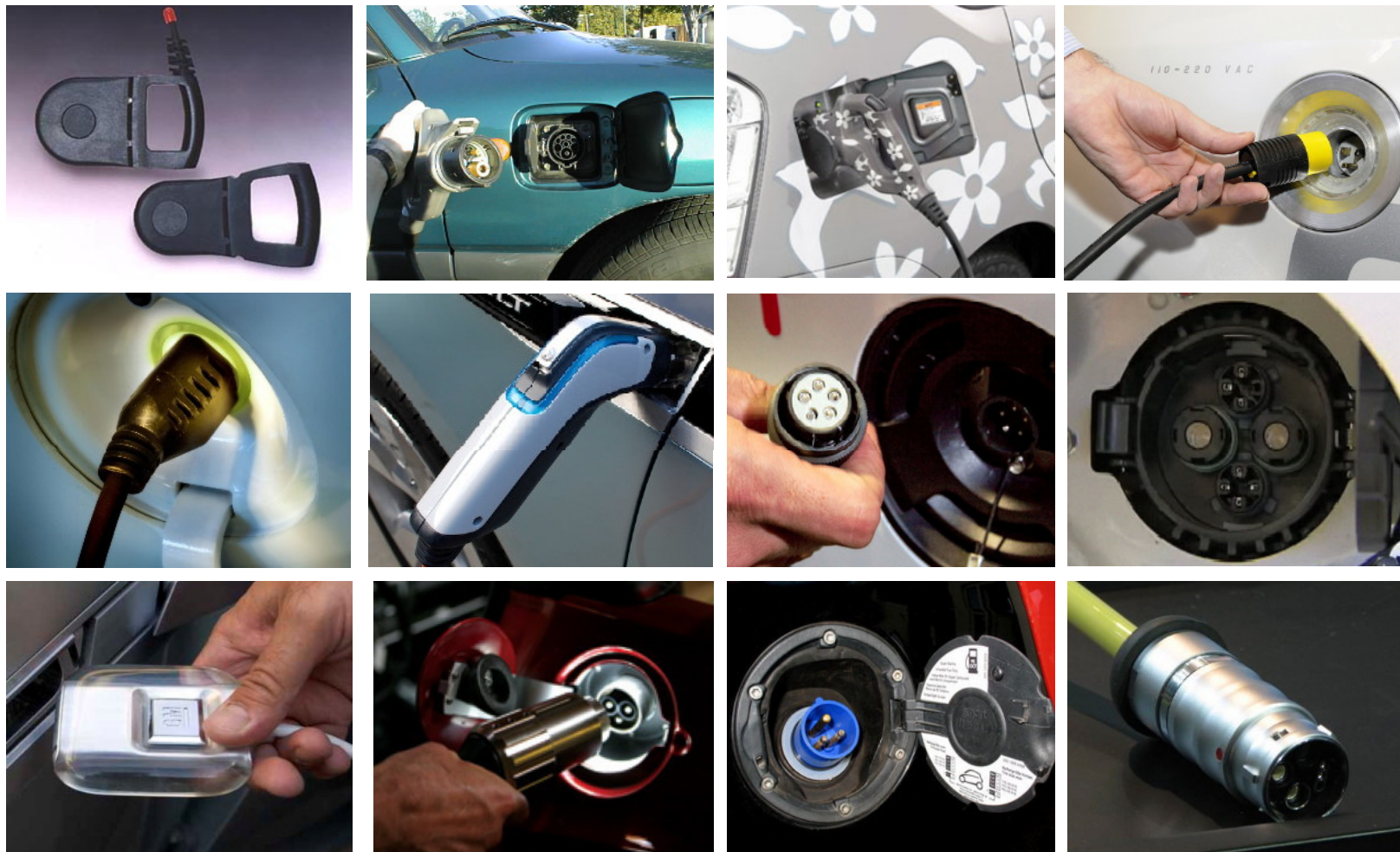
- Why international standardisation?
- Standards and EU directives
- What is IEC and how is it organised?

Example of a standardisation process for EV communication

- General purpose of the JWG V2G CI standardisation work
- Status of work for the WD15118-1 document
- Overview of the WD15118 project team work
- Proposal from DK regarding actors and use cases
- Time table for future work



Why international standardisation?



Source: <http://www.casteyanqui.com/ev/plugs.html>



What is a standard?

A standard (French: Norme, German: Norm) is a technical document designed to be used as a rule, guideline or definition. It is a consensus-built, repeatable way of doing something.

Standards are created by bringing together all interested parties such as manufacturers, consumers and regulators of a particular material, product, process or service. All parties benefit from standardization through increased product safety and quality as well as lower transaction costs and prices.



European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Keywords: EU standards, defacto, global/international markets, important for EV infrastructure and SmartGrid

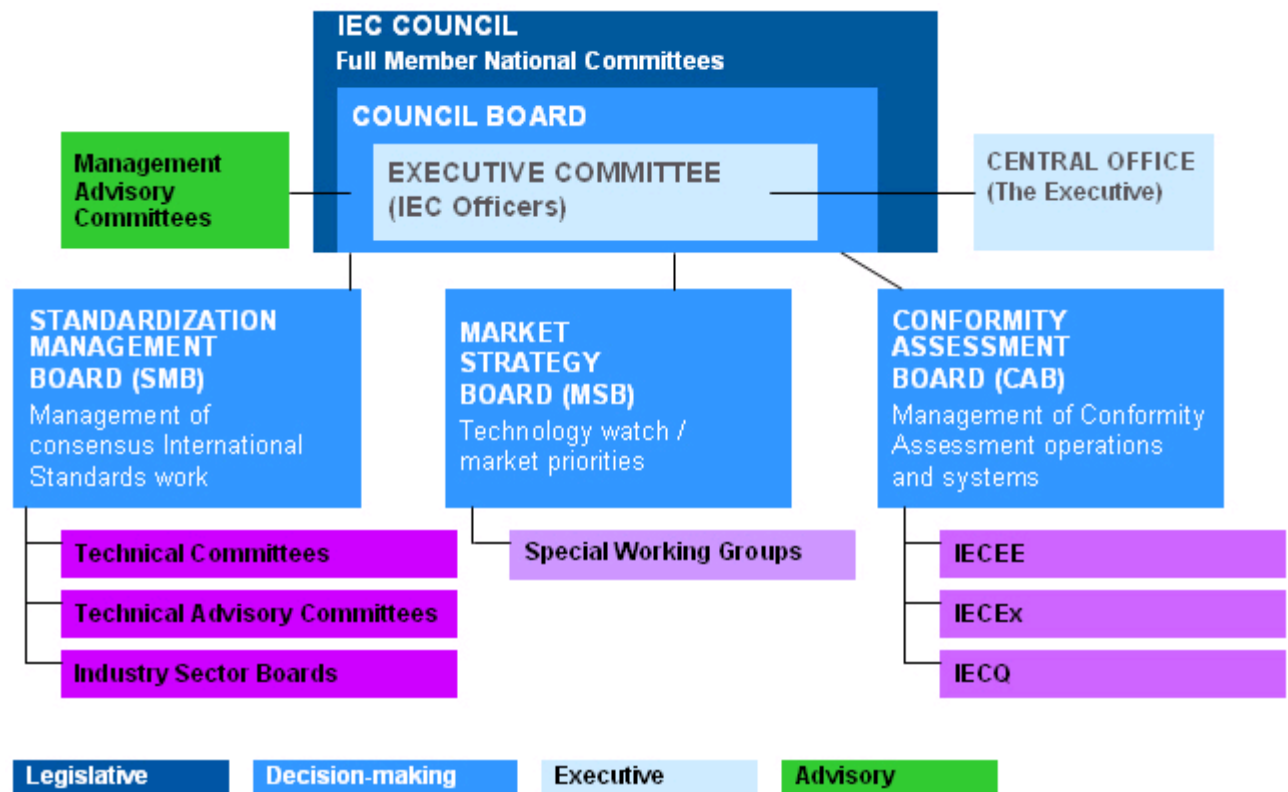


Introduction to IEC

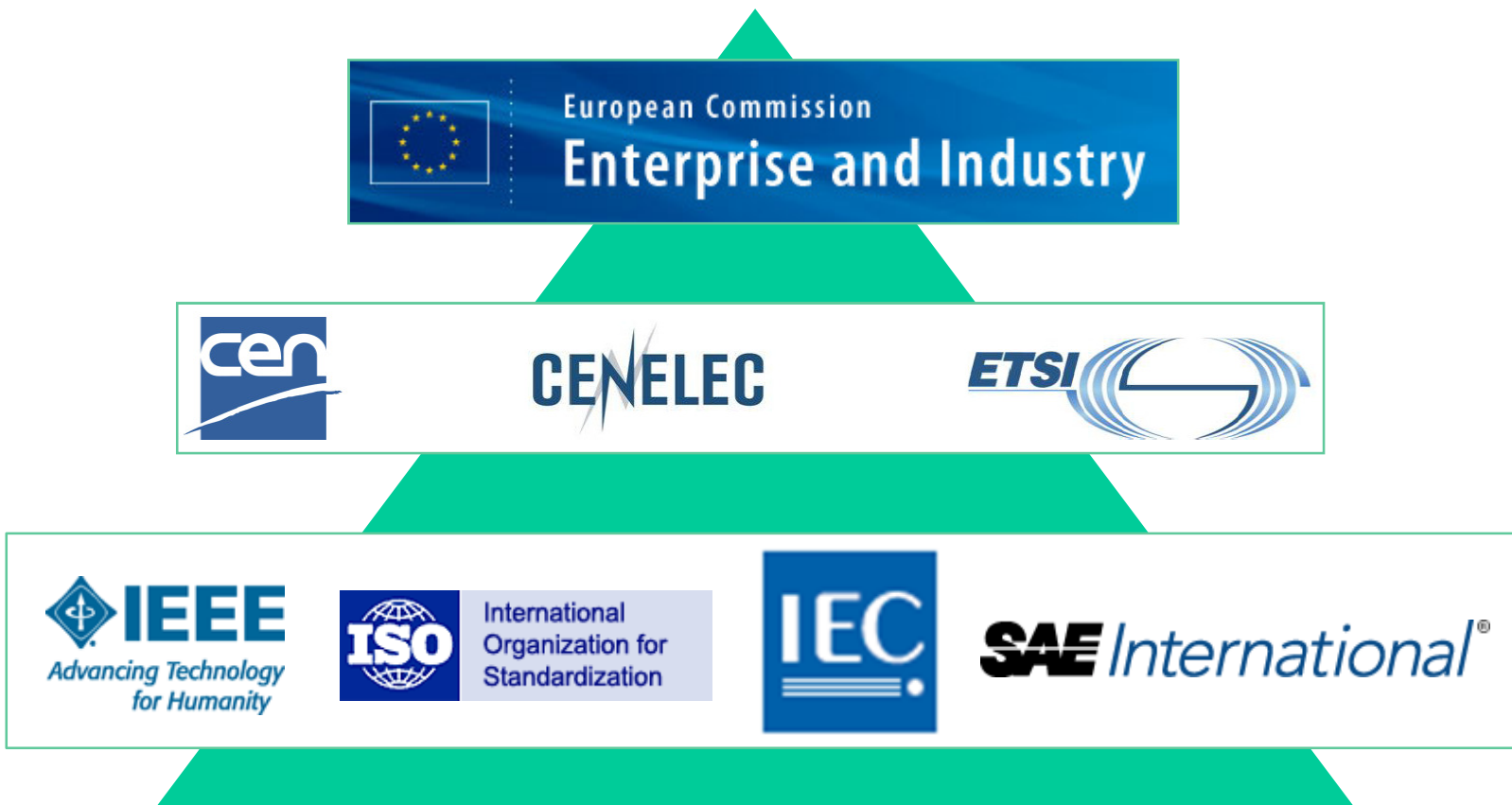


The IEC (International Electrotechnical Commission) is the world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies

179 Technical Committees and sub-committees.
700 Project teams and working groups
F.eks. TC69 WG4 (Power supplies and chargers)



From EU mandate to international standards and directives



Keywords: standards/directives/regulations, approved by parliament and council



EU mandate regarding EV standards



Brussels, 29 June 2010 - Green standardization is again in the spotlight with a new mandate given by the European Commission and EFTA, the European Free Trade Association, to the European Standards Organisations, CEN, the European Committee for Standardization, CENELEC, the European Committee for Electrotechnical Standardization, and ETSI, the European Telecommunications Standards Institute, regarding the charging of electric cars, scooters and bicycles.

Mr Antonio Tajani, European Commission Vice-President responsible for Industry and Entrepreneurship, officially handed over today the mandate (M/468) to Mr David Dossett, CENELEC President, Mr. John Phillips, ETSI General Assembly Chairman, Mrs Elena Santiago Cid, CEN-CENELEC Director General and Ms. Margot Dor, Director of Partnerships and EU Affairs of the ETSI Secretariat, at the European Commission premises.



CEN and CENELEC should make a response to the mandate (M/468)

CEN and CENELEC have created a Joint Focus Group that will prepare an initial response to the mandate, by urgently assessing European needs and seeking to ensure that international standards meet these. The Focus Group hopes to complete its report by 31 March 2011.

Organisation of project teams within the Joint Focus Group:

- PT1 - Terminology : Mr Stolz
- PT2 - Connectors : Dr Thies
- PT3 - Batteries : Ms Patir
- PT4 - Communication : Mr Andersen
- PT5 - Charging : Mr Dupuy
- PT6 - Regulations & Standards : Mr Moretti

Keywords: fast track process, link to SmartGrid FG

Danish national committee S-454

To join a national standardisation committee is the first step. The real work is done in the working groups (WG) and then reported to the national committees for the voting process.

The screenshot shows the Dansk Standard website. The header includes the DS logo and navigation links: Aktuelt, Områder, Ydelser, Om Dansk Standard, and a search box. The breadcrumb trail reads: Du er her: Dansk Standard » Ydelser » Standardisering » Alle udvalg » S-454. The main content area is titled 'S-454 Standardiseringsudvalget for elkøretøjer' with a sub-section 'Arbejdsområde'. It contains text about the committee's role in standardizing electric vehicles and a table of international relations. The right sidebar includes options to become a member, the next meeting (1. oktober 2009), and membership information.

DS
DANSK STANDARD

| Aktuelt | Områder | Ydelser | Om Dansk Standard | Søg

Du er her: Dansk Standard » Ydelser » Standardisering » Alle udvalg » S-454

Print Send Mail

Ydelser

- Standardisering
 - Få indfyldelse på standardisering
 - Hvad er standardisering?
 - Fagområder
- Alle udvalg
 - Ordlister
 - Produkter og priser
 - Startpakke til vækst
- Standarder og håndbøger
- Kurser og konferencer
- Rådgivning
- Certificering
- WTO Informationscenter

S-454 Standardiseringsudvalget for elkøretøjer

Arbejdsområde

Som bilist tager vi det for givet at kunne tanke op, når behovet opstår. – eller at kunne købe en ny pære til forlygten på den første tankstation, vi møder. Udvalget for elbiler vil være garanten for, at de danske interesser inden for standardisering af elbiler føres videre til de internationale og europæiske organisationer.

Udvalget skal fungere som fagligt netværk for elbil-interessenterne i det danske samfund samt arbejde med udarbejdelse og kommentering af internationale standarder.

Standardiseringsarbejdet kan omfatte alle dele af elbilen og infrastrukturen omkring denne. I praksis vil udvalget udvælge nogle emner af særlig interesse for deltagerne og koncentrere arbejdsindsatsen der.

Arbejdsindsatsen vil være 3-4 møder om året. Når der er dokumenter, der berører udvalget, udsendes disse elektronisk til medlemmerne en gang om ugen. Du har også mulighed for at deltage i det internationale arbejde, hvor der kan være møde 2-3 gange årligt.

Internationale relationer

IEC	TC 21	Secondary cells and batteries
IEC	TC 69	Electric road vehicles and electric industrial trucks
IEC	TC 21/SC 21A	Secondary cells and batteries containing alkaline or other non-acid electrolytes
ISO	TC 22	Road vehicle
ISO	TC 22/SC 21	Electrically propelled road vehicles
ISO	TC 22/SC 22	Motorcycles

Bliv medlem af udvalget
Send os en e-mail og bliv kontaktet

Næste møde
1. oktober 2009
kl. 10-15 hos
Better Place, København

Kun for medlemmer
Se S-454 dokumenter i DSLivlink

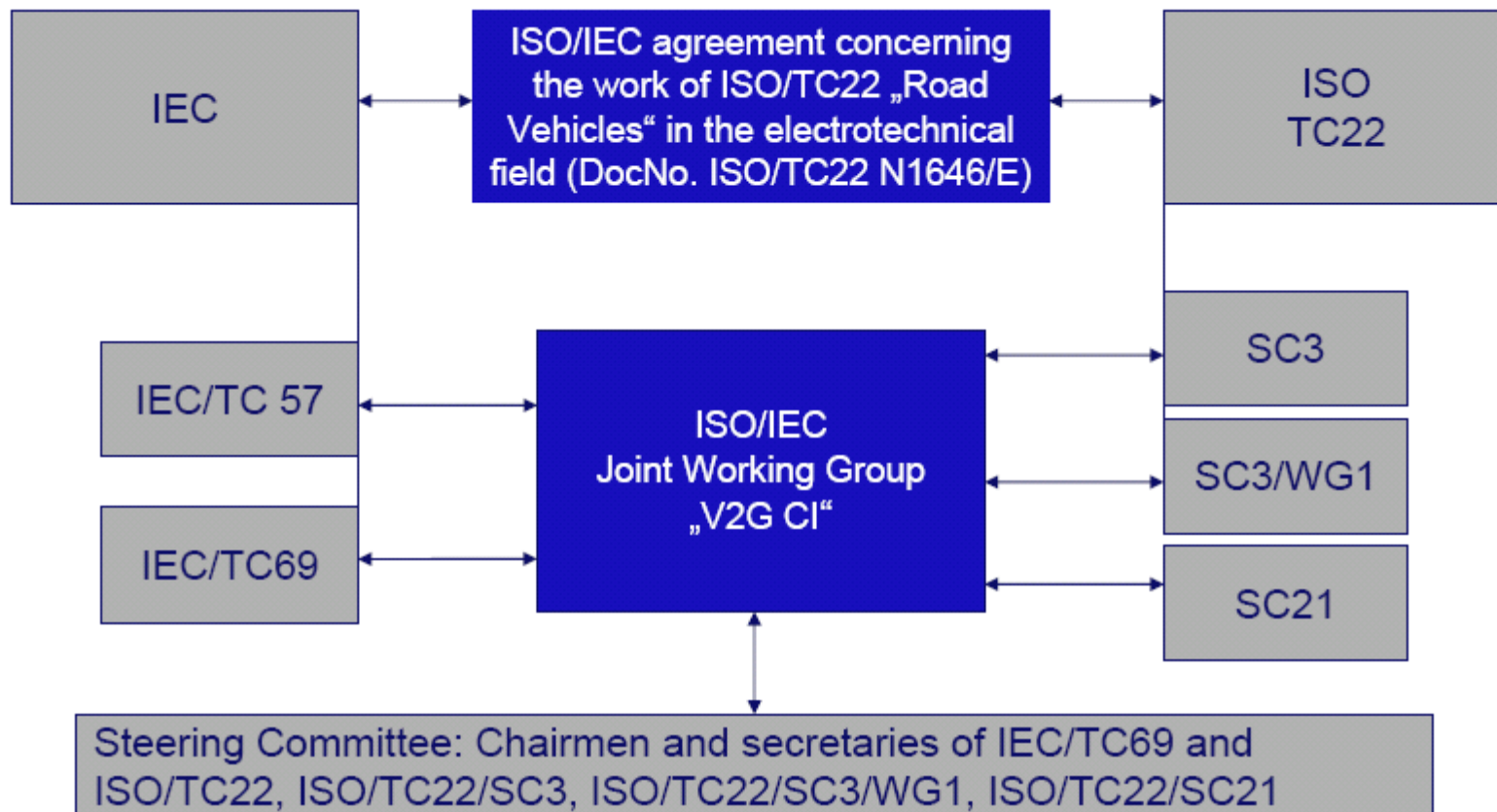
Pris for deltagelse 2008
2009: Kr. 18.000 (eks. tilægsgydelser) Serviceniveau: Udvidet
Betingelser for deltagelse

Indfyldelse på



IEC/ISO JWG V2G CI

Standardisation between IEC (power system) and ISO (automotive industry)

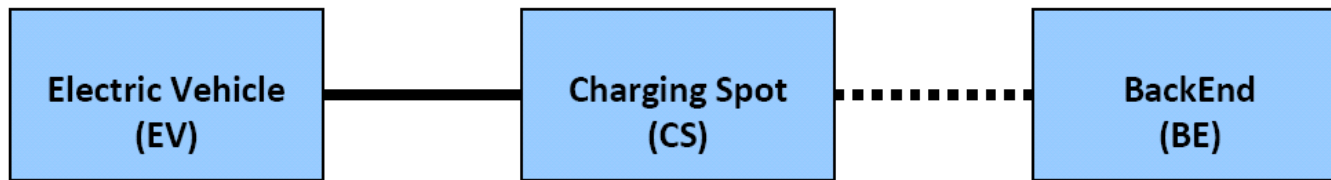


What is Denmark interested in?

Denmark does not have an automotive industry, but Denmark has a power system with a lot of renewable energy, that we would like to support.

We can influence the standardisation work, by putting a lot of work into the WG and hereby make focus on the areas that are important for DK, which is basically 'controllable load'

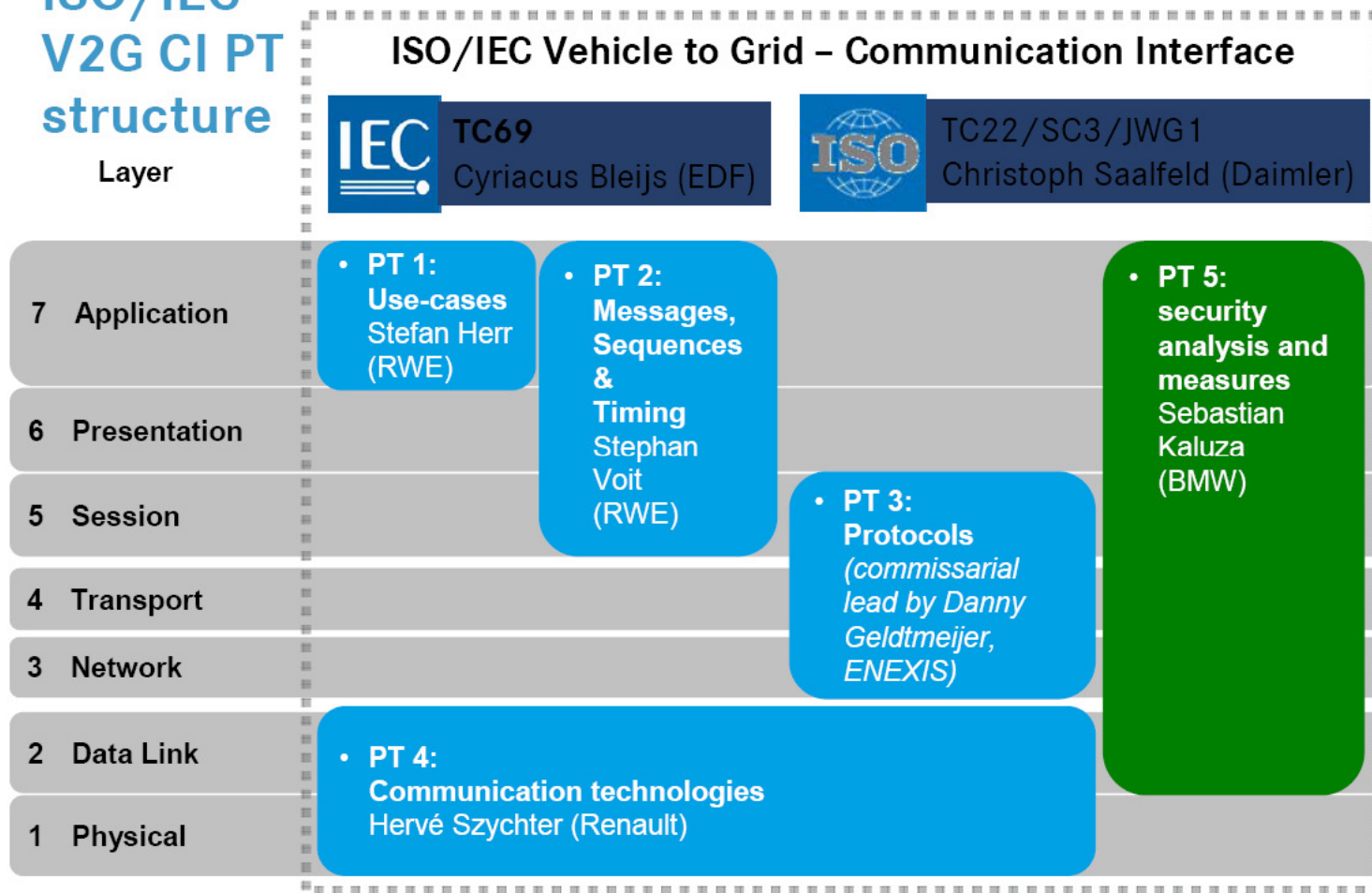
A standardised plug is not enough for Denmark, we need communication between the EV, user and the power system.



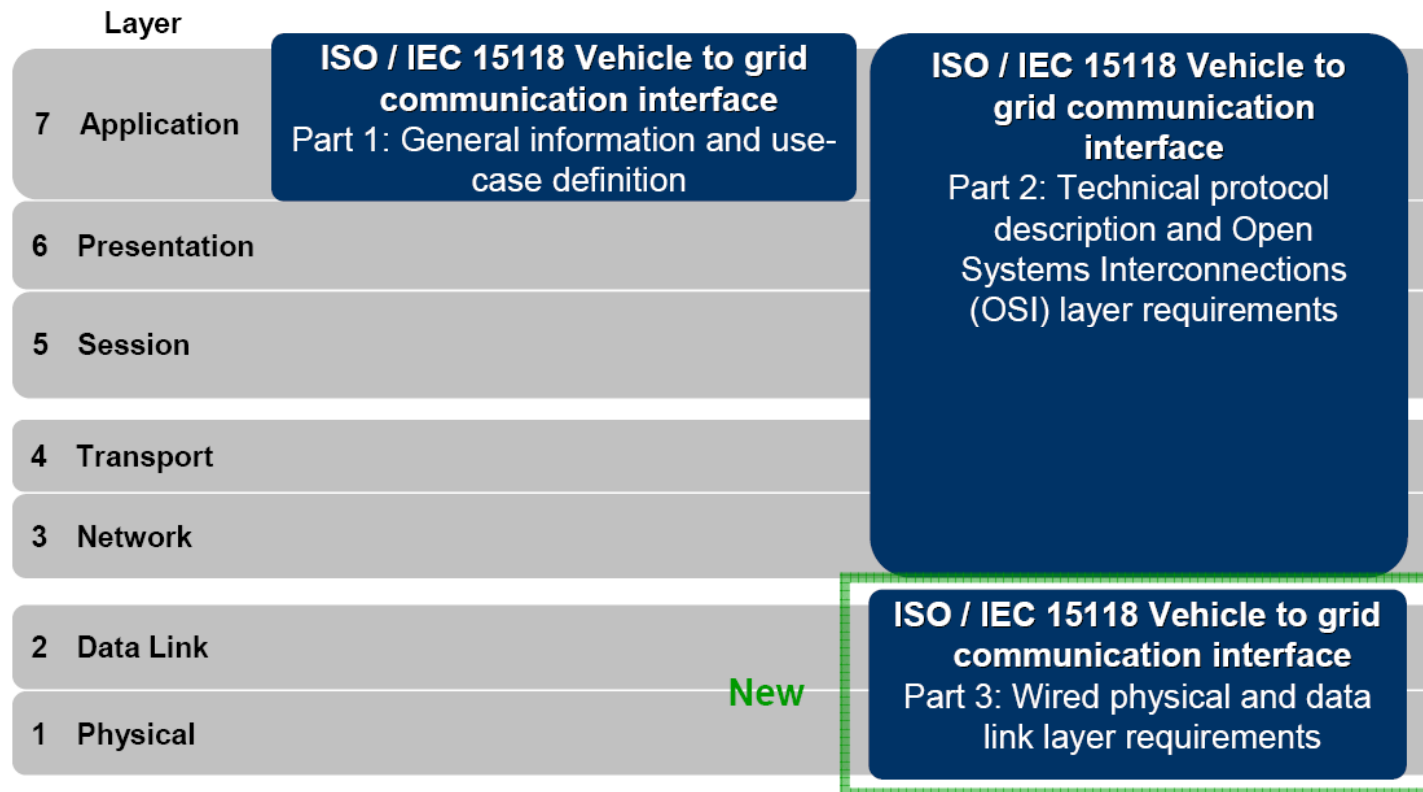
————— To be standardized
..... Definition of messages for use case

Organisation of project teams (PT)

ISO/IEC V2G CI PT structure



ISO/IEC Road vehicles – Communication protocol between electric vehicle & grid - Document structure



Contents	Page
Foreword.....	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms.....	4
5 Requirements	4
5.1 General considerations	4
5.2 Basic requirements	5
5.3 OEM specific requirements	6
5.4 Utility specific requirements	6
6 Actors.....	7
6.1 Actors and roles (primary)	7
6.2 Actors and roles (secondary)	10
7 Use Cases	11
7.1 Matrix of use cases	12
7.2 Plug-in [A]	13
7.3 Communication link setup [B]	15
7.4 ID and Payment [C].....	16
7.5 Setup charging process [D].....	20
7.6 Charging loop [E]	23
7.7 Ending charging process [F].....	26
Bibliography.....	27
Annex A – IEC61851 and ISO15118 interface flow diagram.....	28
Annex B – Security.....	29

Functional grouping of the use cases

EXAMPLE

A	Plug-in process
B	Communication setup
C	Identification and authentication
D	Payment
E	Charging
F	Added value services
G	Plug-out process

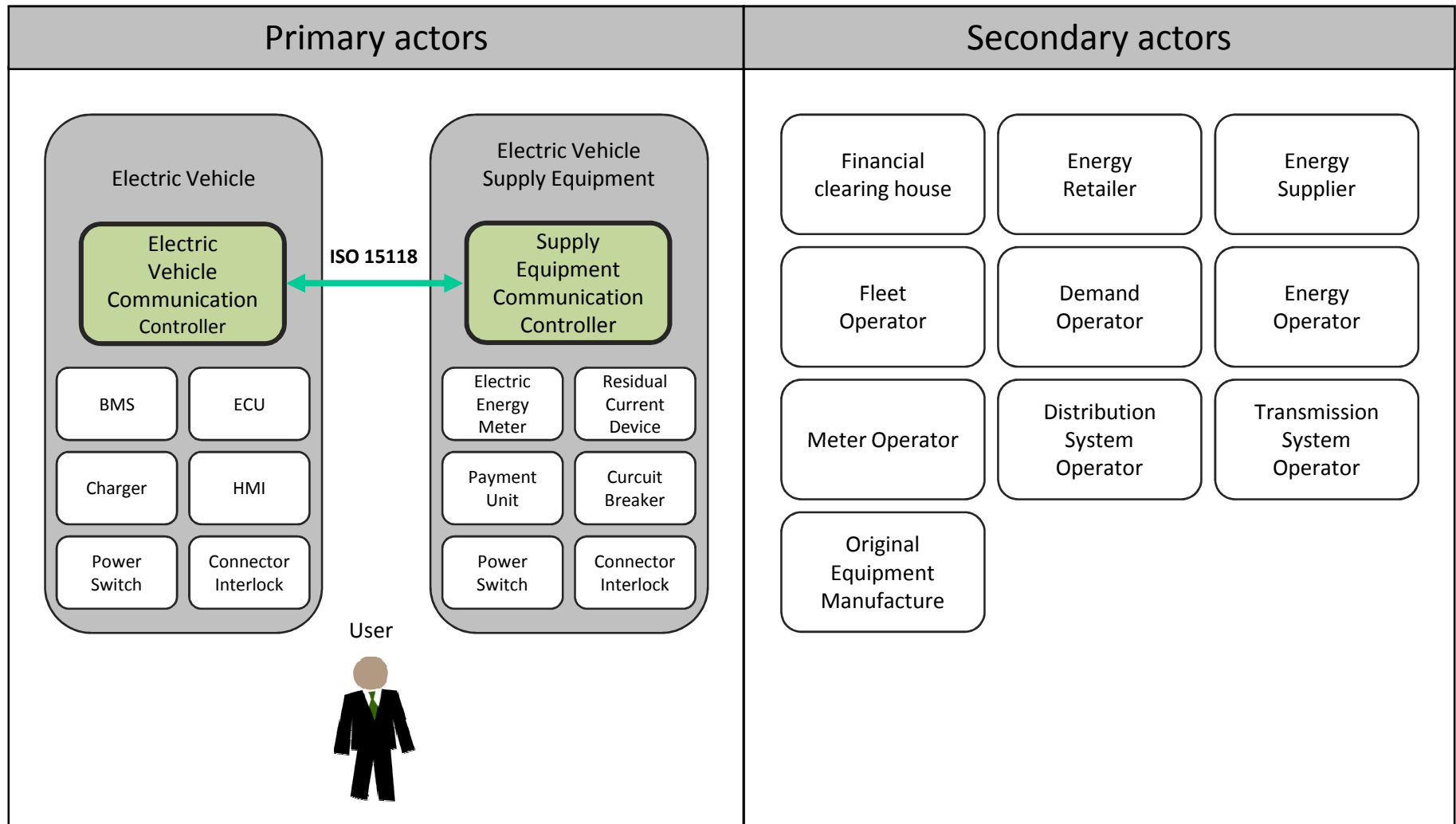
Matrix of the use cases

EXAMPLE

No.	Use case names
A1	Plugin process according to IEC 61851
A2	Plugin process with high level communication (ISO 15118)
B1	IP binding
C1	Identification from the EV
C2	Identification from the EVSE
C3	Identification with validation from secondary actor
D1	Anonymous payment from the EVSE
D2	Non anonymous payment from the EVSE
D3	Non anonymous payment from the EV
D4	Non anonymous payment with secondary actor account
E1	Charging with load levelling according to IEC 61851
E2	Charging with load levelling based high level communication (ISO 15118)
E3	Charging with schedule to secondary actor
E4	Charging loop with metering
E5	Charging loop renegotiation
E6	Charging loop with status information
F1	Value added services
G1	Plug-out process

Actors for the use cases

EXAMPLE



Definition of the roles for the actors

EXAMPLE

Engine Control Unit	ECU	All information regarding the EV which is not related to the battery or charger will come from the ECU. (in the use cases the ECU could be a trigger for the mechanical interlock)
Electric Vehicle Charger	EVC	All information regarding the charging process which is not related to the BMS or ECU will come from the EVC. (in the use cases the EVC could be a trigger for start/stop of the charging process)
Human Machine Interface	HMI	All information the a user will input or which the will be displayed, will be from a HMI (inside the EV, at the EVSE or a mobile phone) (in the use cases the HMI could be a trigger for the payment or activations of a charging process)
Electric Vehicle Supply Equipment	EVSE	EVSE defines all equipment inside the supply equipment incl. RCD, MCB, contactor, connector and more. Regarding communication, the EVSE is the gateway to both the EVCC and the secondary actors.
Supply Equipment Communication Controller	SECC	The SECC is the actor that defines the communication to the EVCC and to the secondary actors. Regarding information exchange with the secondary actors, the SECC will act as a data gateway.
Electric Energy Meter	EEM	The electric energy meter is located in the EVSE. This standard will only define the information exchange between the EVSE and the EEM. (in the use cases the EEM could be a trigger for a specific amount of energy supplied)
Payment Unit	PU	The payment unit is the device that accepts cash, credit card or any other payment methods. (in the use cases the PU could be a trigger for payment accepted)
Power Switch	PS	The power switch is the electrical or mechanical device that will make the physical connection for the energy flow. (in the use cases the PS could be a trigger for actual start/stop of charging)
Connector Interlock	CI	The connector has to be mechanical locked in order to prevent hot unplug or theft protection of the charging cord. (in the use cases the CI could be a trigger for ending of the charging process)

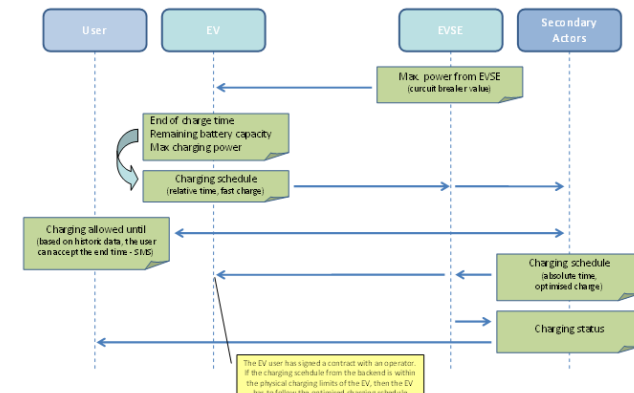
Defintion of the actors and there roles are a very important part of the use case description

Example of a use case description

EXAMPLE

7.5.2 Optimized charging with schedule to operator outside EVSE

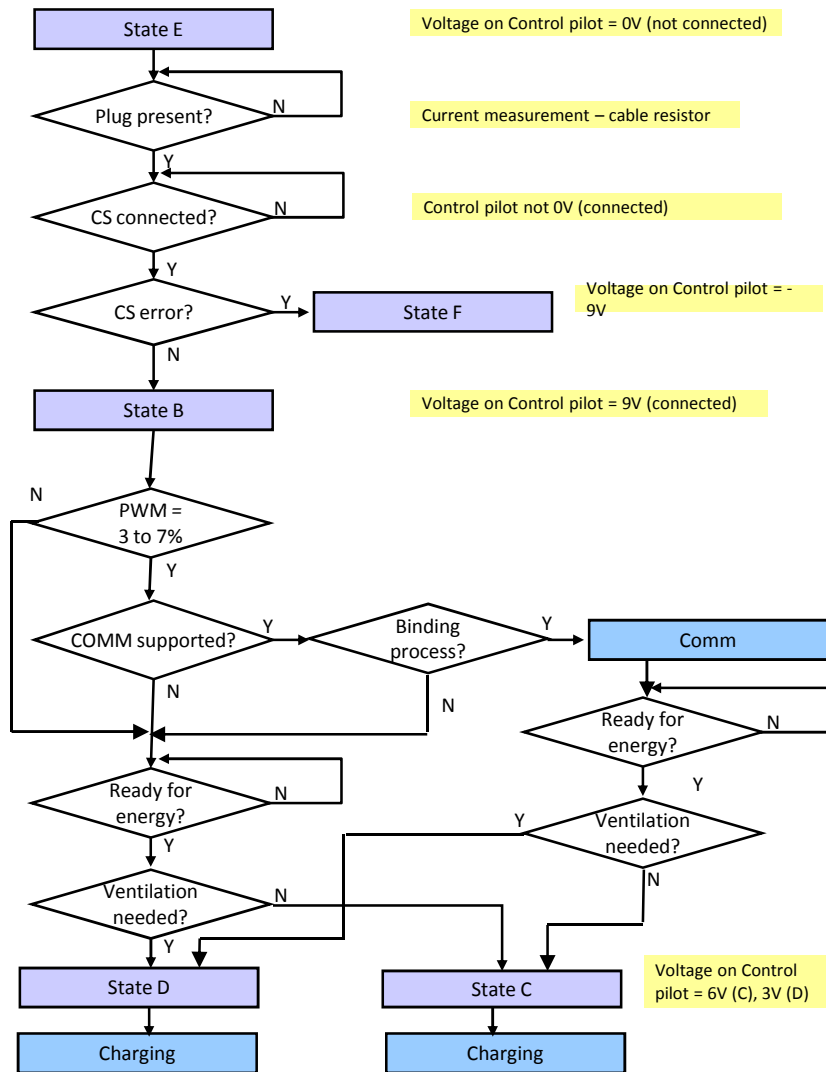
1	Use case name	Optimized charging with schedule to operator outside EVSE										
2	Use case ID	D2										
3	Description	This use case covers the charging process with simple load leveling at the EVSE. Simple load leveling can be in a parking house, where not all power outlets can deliver full power and therefore need to dynamically adjust the max. power that the EV can draw.										
4	Use case goal	Dynamically adjustment of the max. power to be drawn by the EV										
5	Primary actors	EV, EVCC, SECC										
6	Secondary actors	DSO, FO										
7	Pre-conditions	<u>The following pre-conditions must be applied:</u> <ul style="list-style-type: none"> EV is connected to the EVSE Payment or no-payment has been done 										
8	Post-conditions	<u>Success end conditions:</u> <ul style="list-style-type: none"> The EVSE will deliver power within the max. physical limits The EVSE will deliver power according to the request from the secondary actors The EVSE will deliver power until the EV is fully charged The EVSE will deliver power until the USER disconnect <u>Failure end conditions:</u> <ul style="list-style-type: none"> The EVSE will not deliver power, due to circuit breaker failure 										
9	Trigger	Payment or no-payment has been accepted										
10	Scenario description (see illustration below)	<ul style="list-style-type: none"> EV will ask for the max. power limits from the EVSE EVSE will reply EV will send information about: End of charge time, energy required and max. EV charging power EVSE will reply with a charging schedule based on information about: USER, grid and market requirements, from the secondary actors EV will start charging according to the schedule, if it is within the capabilities of the EV loop charging will begin and EV will every X sec. ask for any change in the charging setup (e.g. new charging schedule) EVSE will reply 										
11	Special requirements	The USER will input the requirements for 'when the EV should be charged to a given state' to the secondary actors, for this to be included in the schedule. The optimization algorithms that the secondary actors use for making the schedule, is not part of this standard.										
12	Issues											
13	Information	<table border="1"> <thead> <tr> <th>From EVCC to SECC</th> <th>From SECC to EVCC</th> </tr> </thead> <tbody> <tr> <td>EV End of charge time</td> <td>Max. Current/phases</td> </tr> <tr> <td>Remaining battery capacity</td> <td>EVSE charging schedule</td> </tr> <tr> <td>Max. charging power</td> <td>Metering readout (I)</td> </tr> <tr> <td>EV charging schedule</td> <td></td> </tr> </tbody> </table>	From EVCC to SECC	From SECC to EVCC	EV End of charge time	Max. Current/phases	Remaining battery capacity	EVSE charging schedule	Max. charging power	Metering readout (I)	EV charging schedule	
From EVCC to SECC	From SECC to EVCC											
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EV charging schedule												



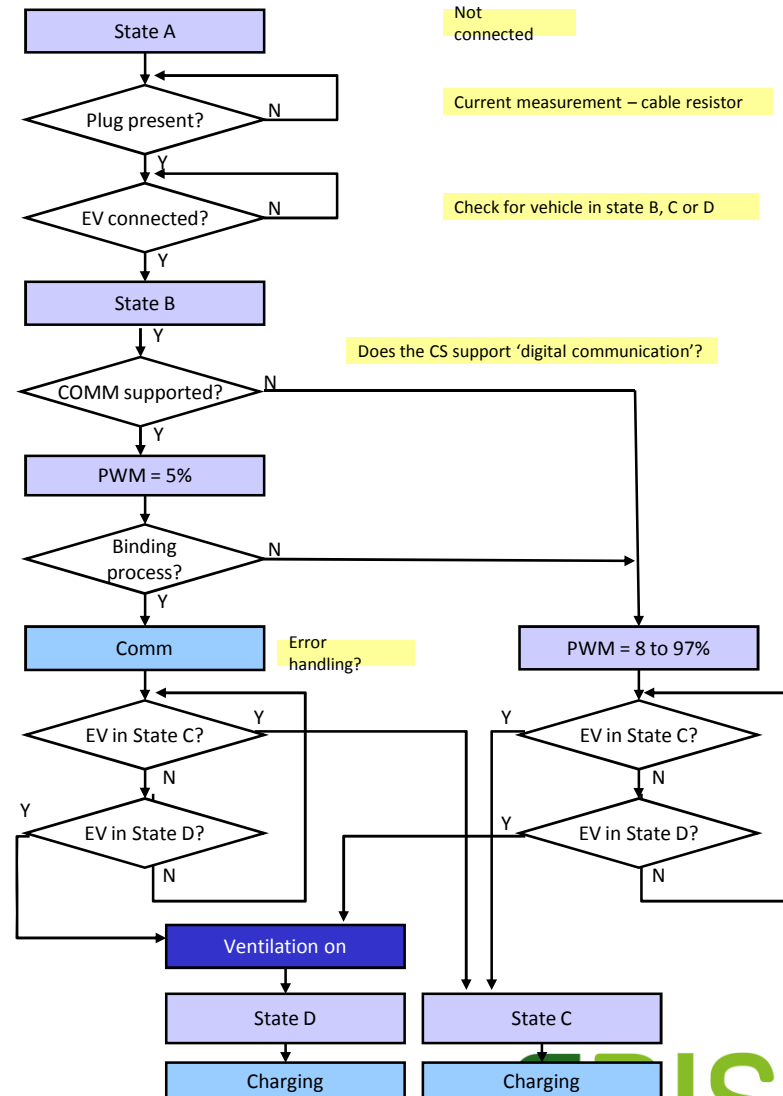
ANNEX A

EXAMPLE

Electrical vehicle





Charging Spot



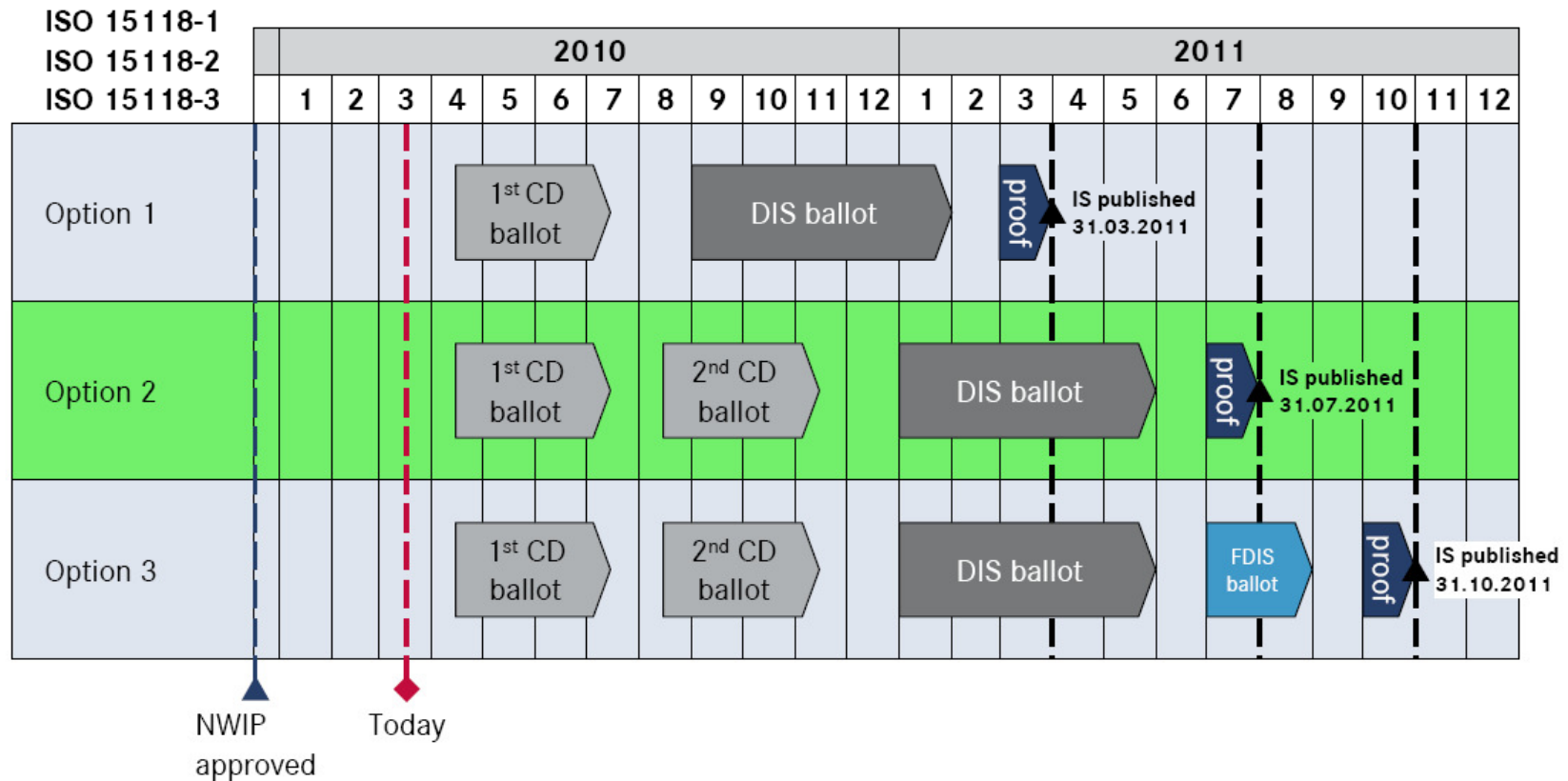
Commenting on the document

EXAMPLE

					electricity supplier	"Provider ID"	
171		DAI GE	7.4.4	Description	Is credit card a valid payment method for this use case?	Remove: <ul style="list-style-type: none"> Credit card (VISA, American Express, Master Card ...) 	
172		FR- Ren	7.5 before chapter		ge Addition of new simple use case and new chapter	 C:\Dokumente und Einstellungen\y88163	
173		FR- Ren	7.5		ge Change use case name	replace 7.5 Setup charging process [D] by 7.6 High level communication setup charging process [F]	
174		DE RWE E	7.5		GE Overview of is missing, not 100% equivalent to the former documentation	 I:\ RWE-CONSULTING\	
175		FR- Ren	7.5 after chapter		ge Addition of new chapter "High level communication data exchange during charge except metering data [G]" as proposed before with using existing use cases and addition of new ones.	Addition of new use cases -- Charging loop without metering - Charging loop with interrupt from EV Replace old use cases with new modifications 7.6.2 Charging loop with interrupt from EVSE 7.6.3 Charging loop with charging details	

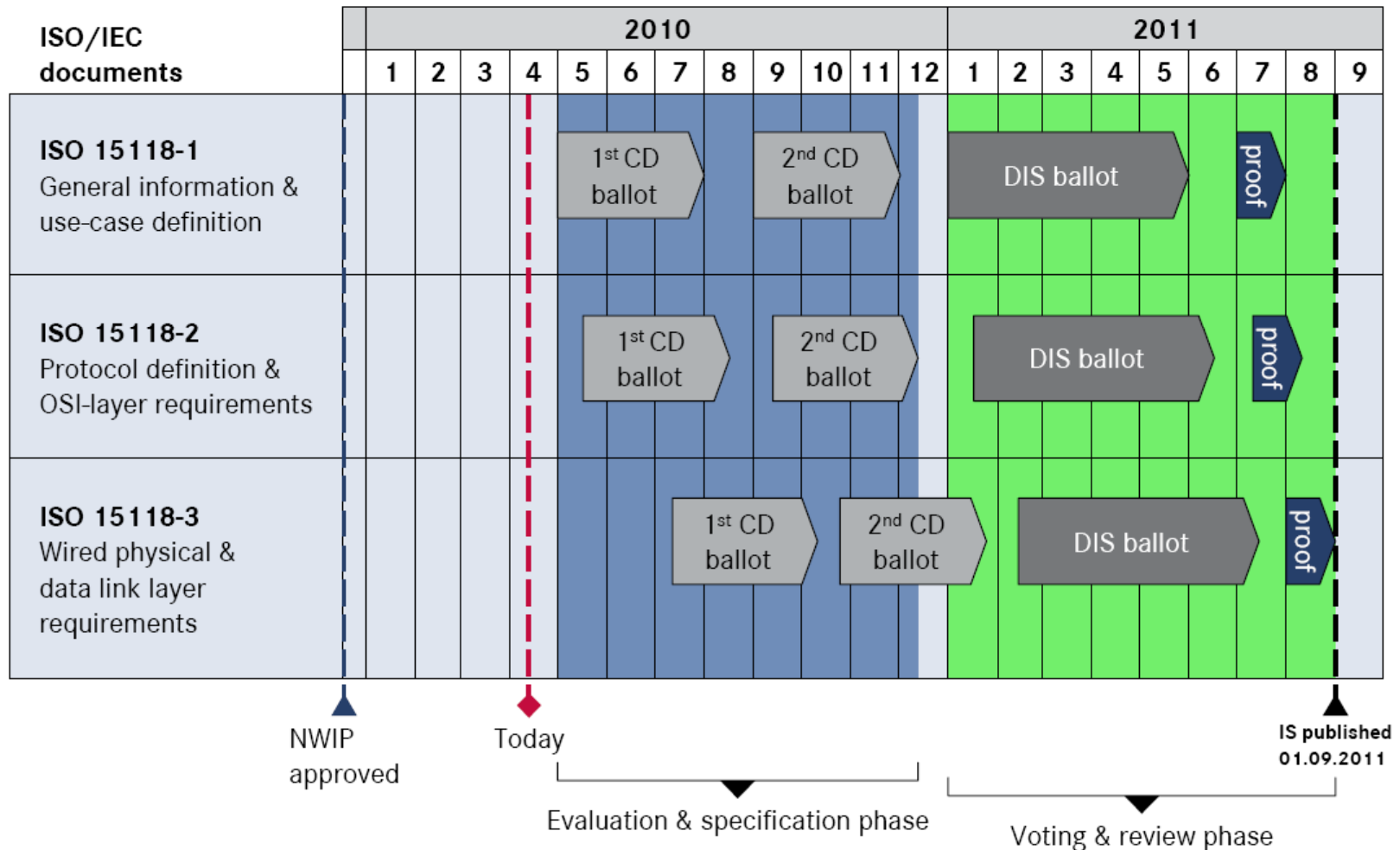
Time table

ISO/IEC 15118 voting options (option 2 most likely)



Time table

ISO/IEC 15118 document set creation plan



The need for EV standardisation

Questions?



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