17th – 18th May 2022 Valencia (Spain)

Electromobility Technology Workshop:

Driving a Greener Value Chain

by i-HeCoBatt

The regulatory and standardization scenario towards a circular market for EV components

UNE Normalización Española

TITLE: Project Manager, Road, Rail, Air & Maritime Transport

SPEAKER: Javier López

i-HeCoBatt

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824300

hosted by LOMARTOV [Applied Innovation Engineering]

UNE-The Spanish Association for standardization

UNE
NormalizaciónEspañola

- Non profit, private and independent organization
- Spanish official National Standardization Body since 1986
- National, European & International Standardization
  - 32000 standards in catalogue
  - 15000 experts involved
- Integration of standardization in R&I
  - >60 projects
- International Cooperation projects

Standards vs Regulations

Voluntary

Technical document designed to be used as a **rule, guideline** or **definition**

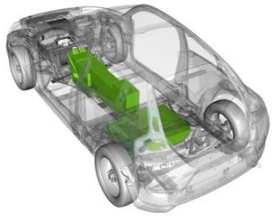
It is estabished by **consensus** between all interested parties

Standard

It is based on consolidated results of **science, technology** and **experience**

It is approved by a **recognized bo**dy

UNE
NormalizaciónEspañola



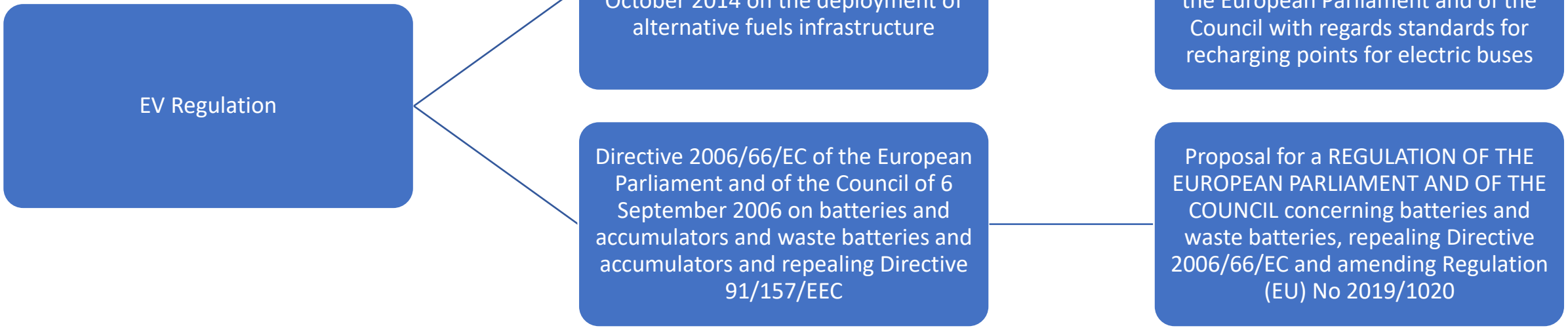
Mandatoy

European Commission

Policies and Regulations

Standardization request (Sreq)

EV Regulation



Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure

This Directive establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union in order to minimise dependence on oil and to mitigate the environmental impact of transport. This Directive sets out minimum requirements for the building-up of alternative fuels infrastructure, including recharging points for electric vehicles and refuelling points for natural gas (LNG and CNG) and hydrogen, to be implemented by means of Member States' national policy frameworks, as well as common technical specifications for such recharging and refuelling points, and user information requirements.

CEN and CENELEC have developed the new **Guide 38** to facilitate the integration of alternative fuels at existing fuelling stations and to give guidance to design, authorise and operate new multifuel stations in support of the Directive 2014/94/EU on the deployment of alternative fuels infrastructure and of the future Regulation replacing the directive. This CEN and CENELEC Guide also considers other legislations impacting multifuel stations (ATEX, PED, MID).

Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC

This Directive establishes:
(1) rules regarding the placing on the market of batteries and accumulators and, in particular, a prohibition on the placing on the market of batteries and accumulators containing hazardous substances; and
(2) specific rules for the collection, treatment, recycling and disposal of waste batteries and accumulators to supplement relevant Community legislation on waste and to promote a high level of collection and recycling of waste batteries and accumulators.

It seeks to improve the environmental performance of batteries and accumulators and of the activities of all economic operators involved in the life cycle of batteries and accumulators, e.g. producers, distributors and end-users and, in particular, those operators directly involved in the treatment and recycling of waste batteries and accumulators.

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020

This Regulation establishes requirements on sustainability, safety, labelling and information to allow the placing on the market or putting into service of batteries, as well as requirements for the collection, treatment and recycling of waste batteries.

This Regulation shall apply to all batteries, namely portable batteries, automotive batteries, electric vehicle batteries and industrial batteries, regardless of their shape, volume, weight, design, material composition, use or purpose. It shall also apply to batteries incorporated in or added to other products.

This Regulation shall not apply to batteries in:
(a)equipment connected with the protection of Member States' essential security interests, arms, munitions and war material, with the exclusion of products that are not intended for specifically military purposes; and
(b)equipment designed to be sent into space.

Sreq ➔ M/579

COMMISSION IMPLEMENTING DECISION of 7.12.2021 on a standardization request to the European standardization organizations as regards performance, safety and sustainability requirements for batteries

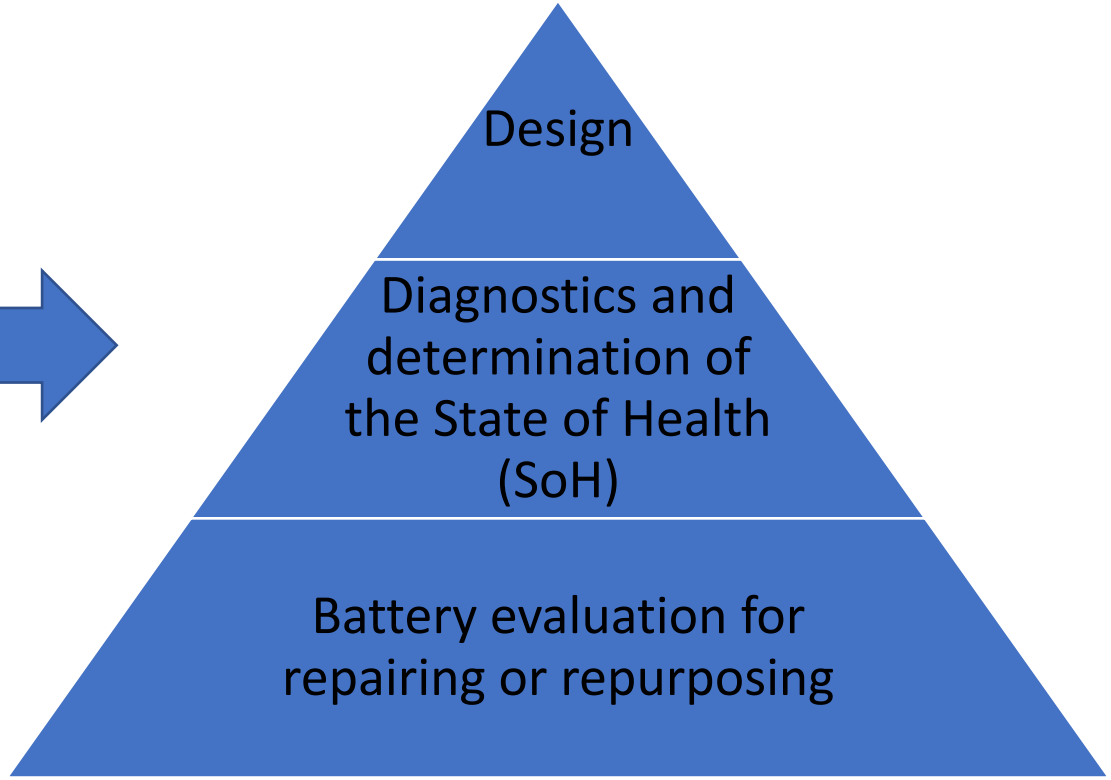
	Reference information	Deadline for the adoption
1.	European standard(s) on performance and durability aspects of portable rechargeable and non-rechargeable batteries	07 December 2025
2.	European standard(s) on performance and durability aspects of rechargeable batteries with internal energy storage	07 December 2025
3.	European standard(s) on the re-use and repurposing of rechargeable batteries with internal energy storage	07 December 2025
4.	European standard(s) on safety aspects of stationary battery energy storage systems with internal energy storage	07 December 2025

M/579

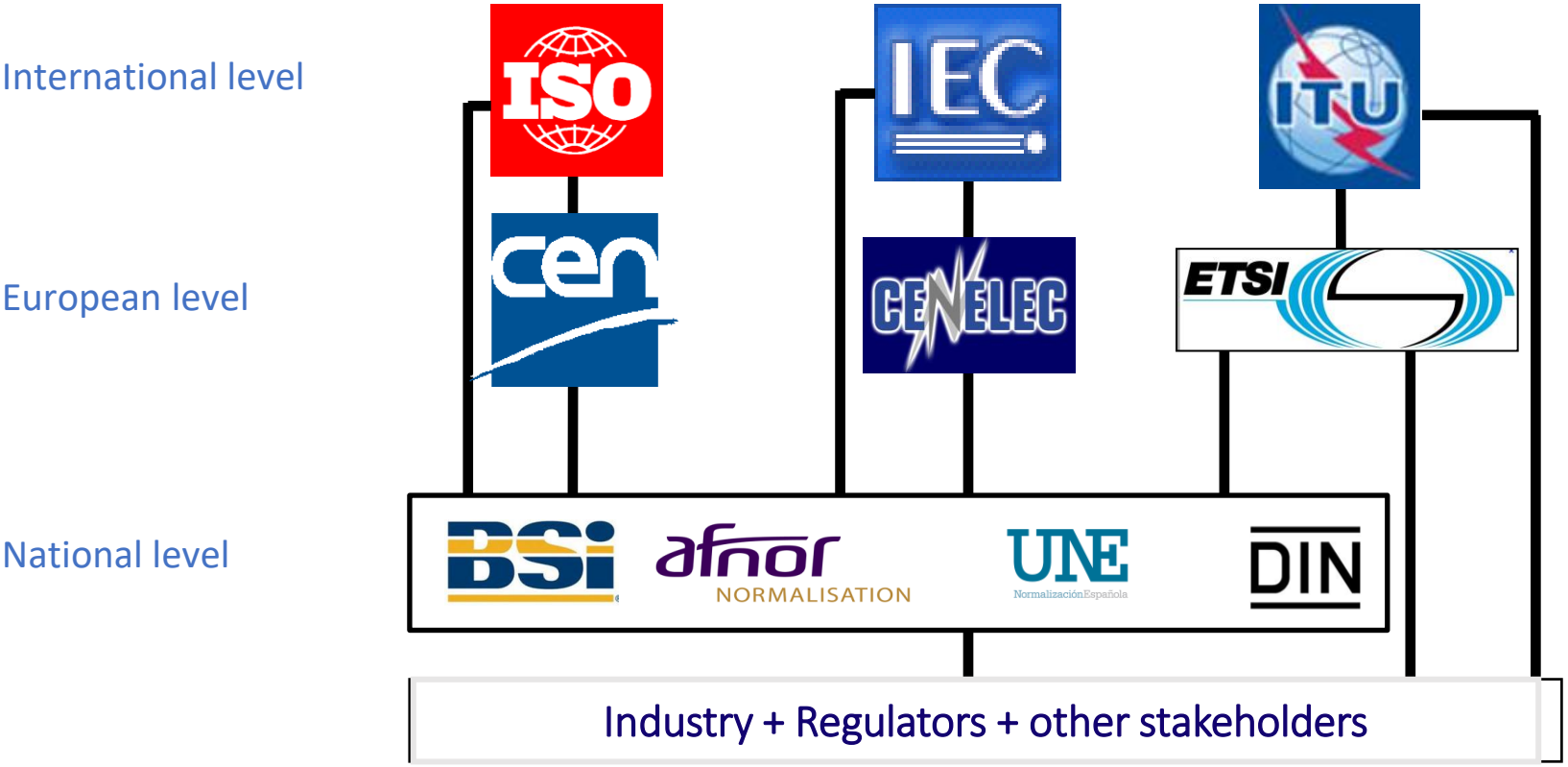
COMMISSION IMPLEMENTING DECISION of 7.12.2021 on a standardization request to the European standardization organizations as regards performance, safety and sustainability requirements for batteries

	Reference information	Deadline for the adoption
1.	European standard(s) on performance and durability aspects of portable rechargeable and non-rechargeable batteries	07 December 2025
2.	European standard(s) on performance and durability aspects of rechargeable batteries with internal energy storage	07 December 2025
3.	European standard(s) on the re-use and repurposing of rechargeable batteries with internal energy storage	07
4.	European standard(s) on safety aspects of stationary battery energy storage systems with internal energy storage	07 December 2025

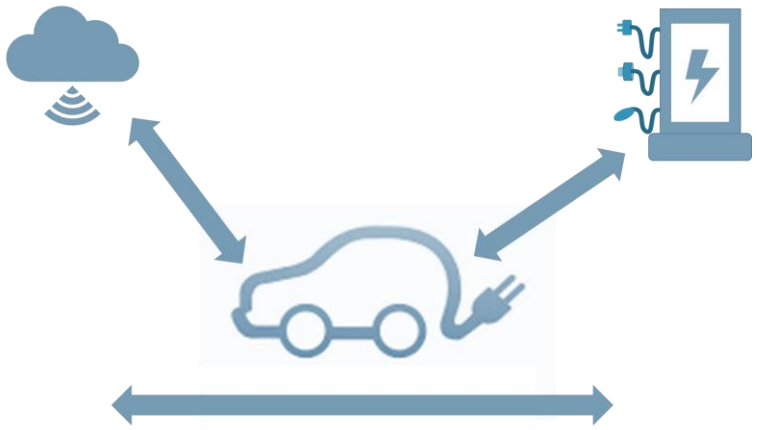
Requirements



Standards


International level
European level
National level
ISO
IEC
ITU
CEN
CENELEC
ETSI
BSI
afnor NORMALISATION
UNE Normalización Española
DIN
Industry + Regulators + other stakeholders

EV Standards



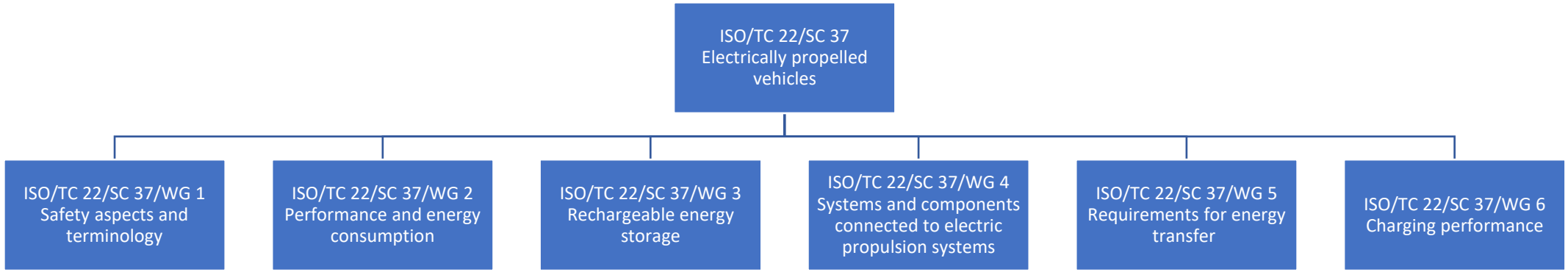
- ISO/TC 22/SC 37 Electrically propelled vehicles
- ISO/TC 22/SC 38 Motorcycles and mopeds
- IEC/TC 21 Secondary cells and batteries
- IEC/TC 69 Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks
- IEC/SC 23H Plugs, Socket-outlets and Couplers for industrial and similar applications, and for Electric Vehicles

ISO/TC 22/SC 37 Electrically propelled vehicles

SCOPE

Specific aspects of electrically propelled road vehicles, electric propulsion systems, related components and their vehicle integration.

STRUCTURE



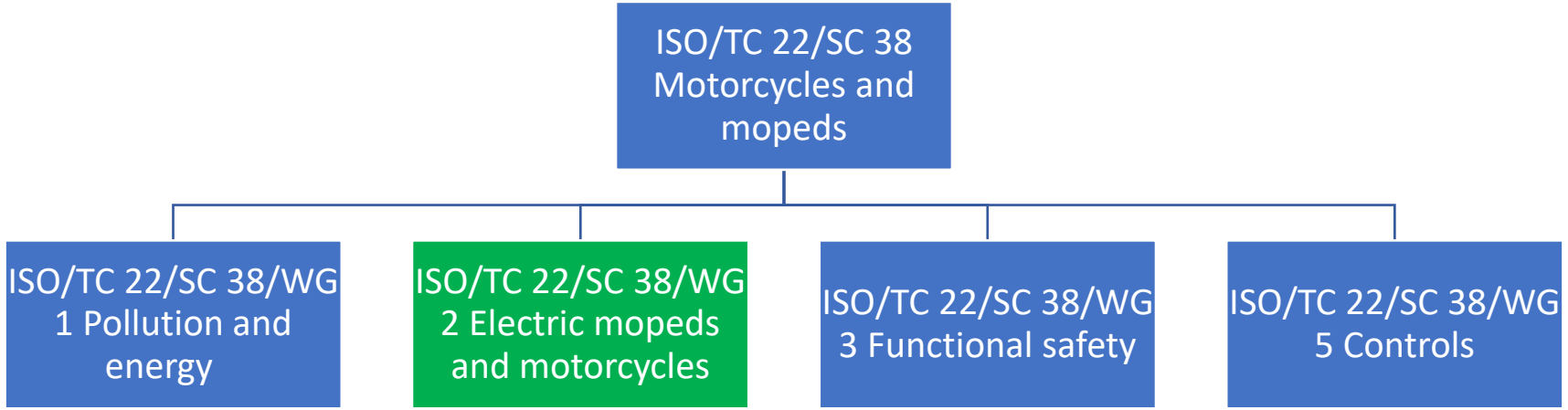
https://www.iso.org/committee/5391154.html

ISO/TC 22/SC 38 Motorcycles and mopeds

SCOPE

Standardization of motorcycles, mopeds and their components, concerning compatibility, interchangeability, safety, terminology and test procedures (including the characteristics of instrumentation), in order to evaluate their performances.
Motorcycles and mopeds are to be intended as defined in the relevant definition of ISO 3833.

STRUCTURE



https://www.iso.org/committee/5384008.html

IEC/TC 21 Secondary cells and batteries

SCOPE

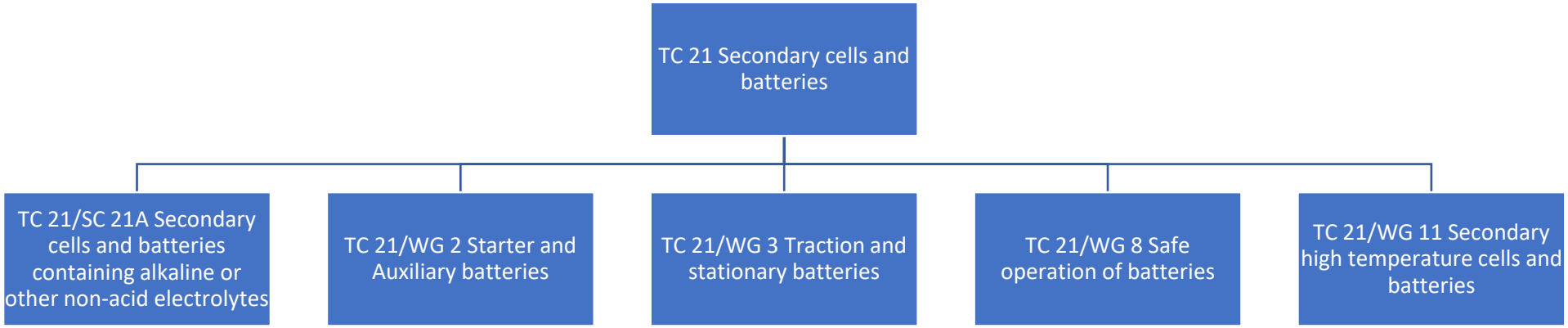
To provide standards for all secondary cells and batteries related to product (dimension and performance), safety (including marking and labelling), testing, and safe application (installation, maintenance, operation) irrespective of type or application or configuration (hybrid, stand alone, module). Main applications are:

- automotive (car, motorcycle, truck) for starting, lighting, ignition, start/stop
- industrial (telecom, UPS, reliable power supply and traction)
- electrical vehicles (full electrical vehicle, hybrid car, bicycle)
- portable (computer, tool, lamp)
- onboard batteries (aircraft, railway, ship, motor-home)
- energy storage (renewable, on- grid and off-grid).

All electrochemical systems are considered such as Lead acid, Nickel based (NiMH, NiCd) and Lithium based. New battery technologies and chemistries such as flow batteries and High temperature batteries (e.g. sodium sulfur, sodium nickel chloride) are included. The work is shared between TC 21 and SC 21A according to technologies and applications. For standardization of applications and system integration, TC 21 is cooperating with the responsible Committees, TC 9, TC 34, TC 69, TC 82, TC 105, TC 116, TC 120 and ISO TC22/SC21.

IEC/TC 21 Secondary cells and batteries

STRUCTURE



https://www.iec.ch/dyn/www/f?p=103:29:503604946107211::::FSP_ORG_ID,FSP_LANG_ID:1290,25#1

IEC/TC 69 Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks

SCOPE

To prepare publications on electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks (hereafter EV) drawing current from a rechargeable energy storage system (RESS). Possibilities to transfer power/energy include conductive power/energy transfer, wireless power/energy transfer and battery swap.

The different publications can cover, but are not limited to:

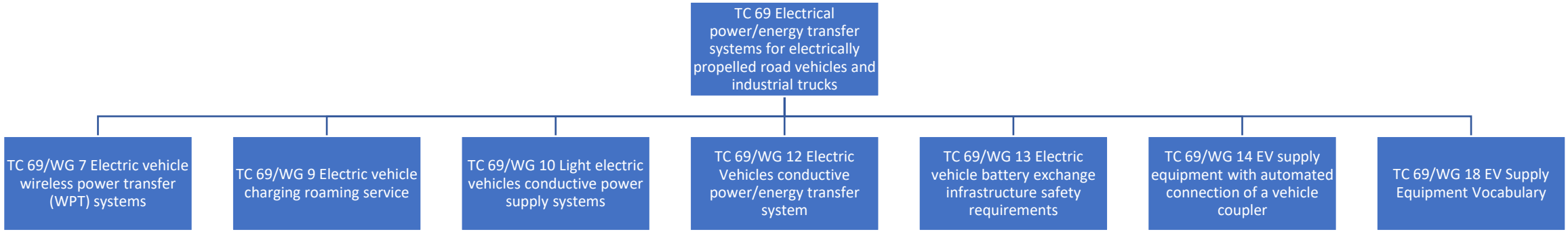
- general requirements (e.g. safety, EMC, construction, testing);
- functional requirements (e.g. charging modes);
- communication between the EV and the EV supply equipment;
- electrical power/energy transfer between EV and supply network (G2V and V2G);
- management of the corresponding infrastructures in view of offering the associated value added services.

EV include but are not limited to passenger cars and buses, two and three-wheel and light four-wheel vehicles, trucks and goods vehicles, trailers and special and industrial trucks.

Trains, trams and trolleybuses are out of scope of TC69.

IEC/TC 69 Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks

STRUCTURE



https://www.iec.ch/dyn/www/f?p=103:7:503604946107211::::FSP_ORG_ID,FSP_LANG_ID:1255,25

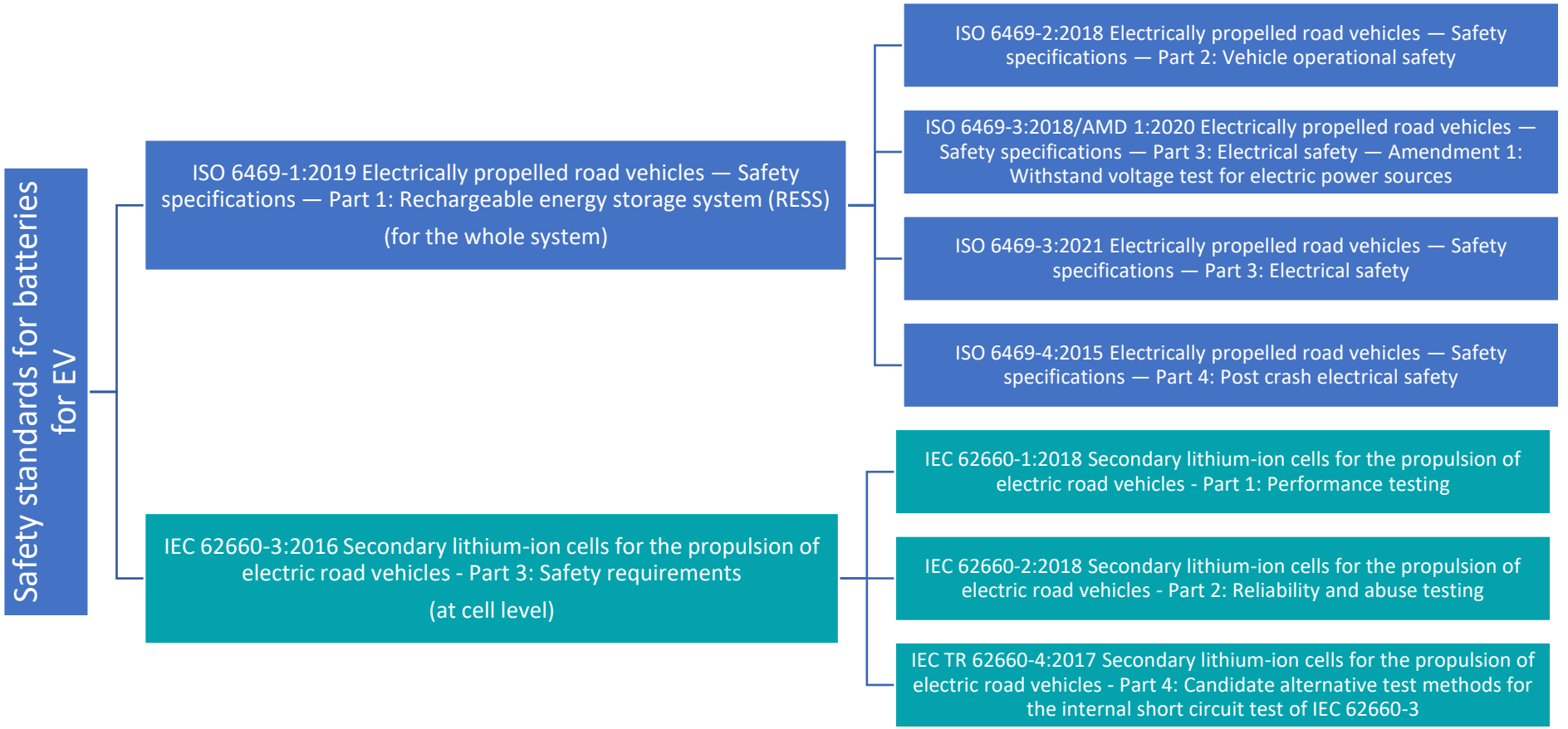
IEC/SC 23H Plugs, Socket-outlets and Couplers for industrial and similar applications, and for Electric Vehicles

SCOPE

To prepare standards for industrial plugs, socket-outlets and couplers suitable for use in industrial, commercial, private or public locations, either indoors or outdoors. To prepare standards for other accessories, such as industrial cable reels among others, intended for use with industrial plugs, socket-outlets and couplers. To prepare standards for connection products intended for the connection of electric vehicles to the supply network and/or to dedicated supply equipment. The rated voltages of products covered by these standards lie within IEC 60038.

https://www.iec.ch/dyn/www/f?p=103:7:503604946107211::::FSP_ORG_ID,FSP_LANG_ID:1426,25

Safety standards for batteries for EV



Safety standards for batteries for EV

ISO 6469-1:2019 Electrically propelled road vehicles — Safety specifications — Part 1: Rechargeable energy storage system (RESS)

This document specifies safety requirements for rechargeable energy storage systems (RESS) of electrically propelled road vehicles for the protection of persons.

- 1) Mechanical requirements
- 2) Climatic requirements
- 3) Simulated vehicle accident requirements
  - Thermal shock cycling
  - Vehicle crash
  - Immersion into water
  - Exposure to fire
- 4) Electrical requirements
  - Isolation resistance
  - Clearance and creepage distance
  - Short-circuit protection
- 5) Functional requirements
  - General
  - Overcharge protection
  - Overdischarge protection
  - Protection against internal overheating
- 6) Requirements for the emission of hazardous gases and other hazardous substances

Safety standards for batteries for EV

IEC 62660-3:2016 Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 3: Safety requirements

This document specifies test procedures and acceptance criteria for safety performance of secondary lithium-ion cells and cell blocks used for propulsion of electric vehicles (EV) including battery electric vehicles (BEV) and hybrid electric vehicles (HEV). This document determines the basic safety performance of cells used in a battery pack and system under intended use and reasonably foreseeable misuse or incident, during the normal operation of the EV. The safety requirements of the cell in this document are based on the premise that the cells are properly used in a battery pack and system within the limits for voltage, current and temperature as specified by the cell manufacturer (cell operating region).

1) Mechanical tests			2) Thermal test		3) Electrical tests			
Vibration	Mechanical shock	Crush	High temperature endurance	Temperature cycling	External short circuit	Overcharge	Forced discharge	Internal short circuit test

Performance standards for batteries for EV

Performance standards for batteries for EV

ISO 12405-4:2018 Electrically propelled road vehicles —Test specification for lithium-ion traction battery packs and systems — Part 4: Performance testing	This document specifies test procedures for the basic characteristics of performance, reliability and electrical functionality for the battery packs and systems for either high-power or high-energy application. Unless otherwise stated, the test applies to both applications.
IEC 62660-1:2018 Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 1: Performance testing	This document specifies performance and life testing of secondary lithium-ion cells used for propulsion of electric vehicles including battery electric vehicles (BEV) and hybrid electric vehicles (HEV). This document specifies the test procedures to obtain the essential characteristics of lithium-ion cells for vehicle propulsion applications regarding capacity, power density, energy density, storage life and cycle life. This document provides the standard test procedures and conditions for testing basic performance characteristics of lithium-ion cells for vehicle propulsion applications, which are indispensable for securing a basic level of performance and obtaining essential data on cells for various designs of battery systems and battery packs.
IEC 62660-2:2018 Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing	This document specifies test procedures to observe the reliability and abuse behaviour of secondary lithium-ion cells and cell blocks used for propulsion of electric vehicles including battery electric vehicles (BEV) and hybrid electric vehicles (HEV). This document specifies the standard test procedures and conditions for basic characteristics of lithium-ion cells for use in propulsion of battery and hybrid electric vehicles.

Standards for reuse of secondary batteries

Under development

Standards for reuse of secondary batteries

- IEC 63330 ED1 Requirements for reuse of secondary batteries
- IEC 63338 ED1 General guidance for reuse of secondary cells and batteries

Conclusions

Usually, standards are required by the market

Sometimes, standards are also required by regulation

- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning batteries and waste batteries foresees four new European Standards (EN)
- Mandate on a standardization request to the European standardization organizations as regards performance, safety and sustainability requirements for batteries

Two standards under development for reuse of secondary batteries

- IEC 63330 ED1 Requirements for reuse of secondary batteries
- IEC 63338 ED1 General guidance for reuse of secondary cells and batteries

Javier LÓPEZ RODRÍGUEZ
Project Manager, Road, Rail,
Air & Maritime Transport
jlopezr@une.org