SMB/7999/R

STRATEGIC BUSINESS PLAN (SBP)

IEC/COMMITTEE:	SECRETARIAT:	DATE:
69	**BE**	**2023-09**

Please ensure this form is annexed to the Report to the Standardization Management Board if it has been prepared during a meeting or sent to the IEC Secretariat promptly after its contents have been agreed by the committee.

A. STATE TITLE AND SCOPE OF COMMITTEE

TC69 “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.

B. MANAGEMENT STRUCTURE OF THE COMMITTEE

The current organization of TC 69 can be summarized as follows. Activities on vehicle performance, vehicle safety and hybrid vehicles have been transferred to ISO TC22 SC37.

WG7: Electric vehicle wireless power transfer (WPT) systems
Three projects in the IEC 61980 series have been developed. Edition 2 of the standard 61980-1 is published as is Edition 1 of the standards 61980-3 (initially published as TS), with 61980-2 now at FDIS stage.
WG7 also deals with new projects on WPT such as “Interoperability and safety of high power wireless power transfer (H-WPT) for electric vehicles”, Interoperability and safety of dynamic wireless power transfer (WPT) for electric vehicles” and” Communication requirements of dynamic wireless power transfer (D-WPT) for electric vehicles”

WG9: Electric vehicle charging roaming service
It develops IEC 63119 series on Information exchange for Electric Vehicle charging roaming service. Work on the second edition of 63119-1 (General) has started. The second part is published.

WG10: Light Electric Vehicles conductive power supply systems
This WG is disbanded after publication of 61851-3 series of documents

WG12: Electric Vehicles conductive power supply system
The scope is to maintain IEC 61851-1

WG13: Electric vehicle battery exchange infrastructure safety requirements
IEC 62840-1 on General and Guidance, first published as TS, is now at CD stage for IS; work on the second edition of 62840-2 has started. 62840-3 (which originated as 61851-3-3) was published as PAS

WG 14: EV supply equipment with automated connection of a vehicle coupler
This WG works on the 61851-26 and 61851-27 projects now at CD stage

WG18: EV supply equipment vocabulary
WG18 started work on a common vocabulary for TC69 which will eventually be passed to TC1 as a part of IEC60050 (Electropedia)

PT61851-23-1: Electric vehicle conductive charging system - Part 23-1: DC Charging with an automatic connection system
This project is now at CDV stage.

PT61851-23-3: DC electric vehicle supply equipment for Megawatt charging systems
This new project is at NP stage

PT62576-2 Electrical characteristics test methods of EDLC Module for Electric road vehicles
This project is at CD stage

PT63380: Local Charging station management systems
This project is at CD stage

MT5: Maintenance of IEC 61851-23 and IEC 61851-24
The parts IEC 61851-23 and IEC 61851-24 pertaining to d.c. charging are now maintained in MT5. Second edition is at CDV stage

MT19: EMC requirements for on and off board electric vehicle charging systems
The development of IEC 61851-21-2 has been completed and maintenance will start in order to publish Edition 2

MT62576: Electrically propelled vehicles, energy storage, electric double-layer capacitors and hybrid capacitors
IEC 62576 Edition 2 has been published.

JWG1: Vehicle to Grid Communication Interface (V2G CI)
Mode 5 cooperation with ISO TC 22 SC31 is used for development and maintenance of ISO 15118 series of standards on the so-called High-Level Communication between EV and EV Supply Equipment.

JWG11: Management of Electric Vehicles charging and discharging infrastructures.
This JWG is with IEC TC57. IEC 63110 series will comprise three different standards: Part 1 on basic definitions, use cases and architectures, Part 2 on technical protocol specifications and requirements, Part 3 on requirements for conformance tests. Part 1 is now in CDV stages, other parts NP.

JWG15: Distributed energy storage systems based on Electrically Chargeable Vehicles
This JWG is with TC57 and TC120. It works on the project IEC63382 “Storage Systems based on Electrically Chargeable Vehicles (ECV-DESS) now at CD stage for part 1

JWG69 Li and JWG69 PbNi are JWG led by IEC TC21 dealing with EV battery standards, focusing o battery cells and modules (the battery system in the vehicle being the province of ISO)

Chair Advisory Group CAG16 was founded in 2021 to support the working of TC69

Adhoc group aHG17 on Interoperability and safety issues of using charging adapters between different DC charging systems

C. BUSINESS ENVIRONMENT

TC 69 "Electric Road Vehicles and Industrial Trucks" was established in 1969 for preparing international standards for road vehicles, totally or partially electrically powered from self-contained power sources, including charging infrastructures for these vehicles, and for electric industrial trucks.

TC69 was formed at a time when advancements in technology made electric automobiles a practical alternative to traditional ICE vehicles that were under regulatory pressure with respect to environmental and petroleum supply concerns. Initial work was conducted by five working groups in the areas of vehicle performance measurement, motors and motor controllers, on-board electrical energy storage, power supply and chargers (infrastructure), and hybrids. Several standards and technical reports were issued during the 1980s.

During the 1990s, automotive industry involvement in TC 69 has contributed to the development of charging system architecture standards consistent with their needs and national demonstration programmes in anticipation of commercialization. This activity has resulted in cooperative standards development with other IEC TC/SCs and some ISO TCs. Informal coordination has also been established with SAE, CENELEC, CEN and JEVA.

New developments for the 21st century, with the advent of electric and fuel cell vehicles, create new opportunities for the continuation of the work of TC 69, maintaining its published standards and preparing new documents in the areas where such is deemed useful. Standards and technical specifications are prepared on power transfer systems (conductive (AC or DC), or wireless) for charging or discharging

(reverse power flow) of any types of electric vehicles. Communication standards for smart charging between the EV and the EV supply equipment as well as with the smart grid are developed too.

In urban traffic, due to their beneficial effect on environment, electrically propelled vehicles are an important factor for improvement of traffic and more particularly for a healthier living environment. Electrically propelled vehicles (this term encompasses battery-electric, hybrid and fuel cell vehicles) are a key element of the future personal and fleet transportation product offerings of vehicle manufacturers. Growing concern for the environment and for the security of energy supply will necessitate further development of electrically propelled vehicles, with new markets emerging in industrializing countries where energy supply issues are a strong incentive for this technology. With electric vehicle recharging infrastructures becoming widespread in private and public electrical installations, they become the subject of regulatory measures for which compliance to international standards is a key issue.

D. MARKET DEMAND

The direct customers of the TC 69 standardization work are the automotive, electrical equipment and electric utility industries. The automotive industry and component suppliers utilize TC 69 standards for vehicle hardware and system architecture for future models. The electrical equipment and utility industry utilize TC 69 standards for developing EV charging equipment and planning growth. Furthermore, the availability of TC 69 standards facilitates regulatory processes by governments and local authorities.

E. SUSTAINABLE DEVELOPMENT GOALS

Indicate the Sustainable Development Goals (SDGs) that are addressed by work within the committee. Indicate each SDG Indicator affected (reference spreadsheet available at https://www.iec.ch/SDG/, and provide specific information about how the committee is addressing the SDG. Consider both direct and indirect impacts of the work of the committee.

- ☐ **GOAL 1:** No Poverty
- ☐ **GOAL 2:** Zero Hunger
- ☐ **GOAL 3:** Good Health and Well-being
- ☐ **GOAL 4:** Quality Education
- ☐ **GOAL 5:** Gender Equality
- ☐ **GOAL 6:** Clean Water and Sanitation
- ☒ **GOAL 7:** Affordable and Clean Energy
- ☒ **GOAL 8:** Decent Work & Economic Growth
- ☐ **GOAL 9:** Industry, Innovation & Infrastructure
- ☐ **GOAL 10:** Reduced Inequality
- ☒ **GOAL 11:** Sustainable Cities and Communities
- ☐ **GOAL 12:** Responsible Consumption & Production
- ☒ **GOAL 13:** Climate Action
- ☐ **GOAL 14:** Life Below Water
- ☐ **GOAL 15:** Life on Land
- ☐ **GOAL 16:** Peace, Justice Strong Institutions
- ☐ **GOAL 17:** Partnerships to achieve the Goals

F. TRENDS IN TECHNOLOGY AND IN THE MARKET

During the past decade auto manufacturers and national EV demonstration programmes have proven the feasibility of electric road vehicle technology. Limited progress in battery performance and limited commercial availability of advanced batteries initially had biased the offer in battery-electric vehicles towards smaller vehicles in specific applications like urban environments, where range and speed are consistent with technological capability. Recent interests and progress in battery technology together with the emergence of plug-in vehicles however have led to a new interest in the grid-recharged electric vehicle and its infrastructure.

The electric drive train technology with its on-board components is also used in vehicles which are now penetrating the market, as well as in fuel cell vehicles which are being developed for the future. Grid connecting infrastructures are also applicable to plug-in vehicles which offer interesting opportunities and which are presenting themselves as a key step towards electrification of transport.

There is a strong demand for the development of standardized infrastructures for this application. Additionally, TC 69 standardization work and general EV technology is applicable to electric industrial trucks and electrically propelled buses.

Electrically propelled vehicle technology, which encompasses battery -electric, hybrid and fuel cell vehicles, has the potential for improving environmental conditions particularly in congested urban areas through allowing the deployment of zero-emission vehicles, and for enhancing energy security, through diversification of primary energy sources, improved energy efficiency and more effective environmental control techniques

G. Systems approach aspects (See Directives Part 1 Annex SP)

The growing interest for electric vehicles has been reflected in the participation to TC 69, with new countries opting for P-member status and the number of active experts growing considerably. The ongoing liaison cooperation with ISO TC 22 SC31 and SC37 is essential for the realization of efficient vehicle-related standards and needs to continue. The same applies for the collaboration within IEC with TC 21, SC 23H, SC 23E, TC 57, TC 61, TC 64, TC 120 and SC 121B on relevant matters. Furthermore, some work is coordinated with IEC TC 77, CISPR/B, CISPR/D, ITU-R and ACEC where appropriate in order to ensure compliance with EMC standards. In view of the development of the complete set of standards for the management of electric vehicles charging and discharging infrastructures on one hand and the impact of electrical energy storage systems on the charging infrastructures on the other hand, the effectiveness of liaisons with TC 57 and TC 120 is very important. In this regard JWG have been established with TC 57 and TC 120. All the liaison modes between IEC TC 69 with ISO TC 22 and its relevant SCs have been defined project by project. Furthermore, a coordination between the main technical committees involved in electro-mobility (including TC 64, TC 21, SC 23E, SC 23H, SC 121B, ISO TC 22 SC31 and SC37) has been sought. A corresponding Joint Working Group was established.

H. Conformity Assessment

N/A

I. 3-5 Year Projected Strategic Objectives, Actions, Target Dates

Strategic Objectives 3-5 years	Actions to support the strategic objectives	Target Date(s) to complete the actions
Conductive (AC, DC, MCS, personal safety methods) Including 61851 series	Publish and maintain the family of standards for conductive charging.	2025 Beyond 2025, further work foreseen
Wireless (WPT, HWPT, DWPT) Including 61980 series	Publish and maintain the family of standards for wireless charging, resolving issues with other concerned bodies like CISPR, avoiding standstill.	2025 for current version further work going on (HD, dynamic,...)
Battery exchange	WG13	Remains for discussion, 2025?
Communication issues: all projects involving communication (63110 series, 63119 series, 63380, 15118 series, 63382,...)	Optimize coordination of communication between concerned WGs (e.g. JWG11, WG9, JWG1, JWG15, PT63380, MT5...): to enhance interactions between standards, using a global ecosystem vision, to ensure compatibility through a bottom-up approach considering a wide perspective of users and stakeholders Considering new issues raised by V2G operation, such as the behaviour of the system in the case of network problems, DSO interactions, cybersecurity issues, island operation and local DC grids.	2025f Long time evolution is not stabilized.
Common vocabulary	Provide IEV chapter on EV to TC1	2024

Energy storage (Batteries and capacitors)	Maintain battery standards with TC21	2024
Automated connection (DC, AC)	Publish 61851-26 and -27 as TS for now, with a possible split-off of communication issues	2024
EMC (on/off-board)	Synchronize documents (61851-21-1 and -21-2) with relevant UNECE regulations (R10) Consider the specific EMC issues for “megawatt” charging	2024 for -21-1 2025 for -21-2
LEV - WG10	-3 series published soon as TS, work start on IS	2025 for IS
JWG26 (led by TC85)		
Connector Adaptors (DC & AC) AhG17	Identify the need for adaptors with other concerned committees (23H) Common understanding and requirements needed	2025
Smart metering	Develop common standards with TC13 through AhG	2024
Conductive Dynamic charging (Electric road systems)?	Define interaction with TC9 and other relevant TC including division of labour	At appropriate point of time
Open topics (safety) coordination with other TCs	Identify, describe and handle problems and optimize coordination on safety through the JAG (TC64, SC23E, TC69, ISO/SC37, SC23H?)	Start 2022 – continuing…
Interaction with society (electrical system and transportation systems)	Interact with SyC SE and future SyC sustainable transportation, considering cybersecurity and privacy aspects – public key infrastructure (cf. IEC62351-9) Follow up SyC?	2024