

The current status of standardisation in the field of e-mobility in IEC and CENELEC

(as at 13 March 2024)

Current status of standardisation on V2G EV and associated V2G EV supply equipment for category EV2:

The relevant groups and standards for reverse power transfer in alternating current (AC) and direct current (DC) are as follows:

a.) V2G AC

- IEC TC 69 WG12: Responsible for the IEC 61851-1 standard, which is the relevant product standard for V2G AC EV supply equipment. Requirements for grid integration, among other things, are currently being integrated into CD2 of the 4th edition, which is to be made available to the national committees for comment in 05/2024. According to the current project plan, the final standard is planned for 2026.

- ISO TC 22 SC37 WG5: Responsible for the ISO 5474-2 standard, which is the relevant product standard for the V2G AC electric vehicle. Requirements for grid integration are to be incorporated into ED2 of the standard, work on which is due to begin shortly. As an alternative to ED2, an extension of ED1 is also being considered, which would focus exclusively on the topic of V2G. This would prevent a comprehensive revision from delaying the topic of AC V2G.

In IEC TC 69 WG12, the evaluation of the requirements arising from the EN 50549-1/-2 standards was completed on 1 March 2024. This means that the international working group reached a consensus on the technical division of functions between the V2G AC EV and associated V2G AC EV supply equipment. The aim was to present this view to ISO TC 22 SC37 WG5 on 13 March 2024.

To summarise, the IEC TC 69 WG12 consider it to be technically feasible:

1.) implement the functions described as "protective functions" in the EN 50549 series certified in the V2G EV supply equipment.

- The international working group refers to this as level 2 functions (see below)

2.) to realise the functions described in the EN 50549 series as "functions to prevent the triggering of interface protection" in the V2G EV in a certified manner, whereby the V2G EV supply equipment must also make a certain certified contribution to this.

- According to the IEC, these are the functions required in RfG 2.0, for which it is hoped that Europe-wide standardisation will be achieved.

- The international working group refers to this as level 1 functions (see below)

Important: International standardisation assumes that it is not required to proof vehicle certification before each reverse power transfer. If this verification will be required an enormous amount of additional work is needed meaning a significant delay of bidirectional charging. From the grid operator's point of view, however, it is important to realise that a technical check of the V2G electric vehicle's capabilities is carried out by the V2G EV supply equipment before each reverse power transfer. A V2G electric vehicle is therefore only

allowed to be connected to the grid by the stationary part (V2G EV supply equipment) if it confirms all the values required at the local point of connection (POC).

b.) V2G DC-BPT

- IEC TC 69 MT5: Responsible for the IEC 61851-23 standard, which is the relevant product standard for V2G DC-EV supply equipment. Requirements for grid integration, among other things, are to be addressed in ED3, the development of which began in the USA at the beginning of March 2024.

- ISO TC 22 SC37 WG5: Responsible for the ISO 5474-3 standard, which is the relevant product standard for the V2G DC electric vehicle. Reverse power supply in DC will be dealt with after reverse power transfer in AC, but this decision depends to some extent on whether ISO decides in favour of a complete revision of ISO 5474-1/-2/-3 or only a partial revision.

c.) Communication between V2G AC/DC EV and V2G AC/DC EV supply equipment

- TC22 SC31 JWG1: Responsible for the ISO 15118-20 standard, which describes the interface between the V2G electric vehicle and the associated V2G EV supply equipment and is relevant for AC and DC reverse power transfer. The current published version of ED1 only permits DC reverse power transfer. The necessary extension for AC reverse power transfer should be finalised in 05/2024 (possibly 06/2024).

Coordination of the standardisation work between IEC and CENELEC is now being sought.

Source: Dennis Haub, Head of Standardisation and Regulatory Affairs | Standardisation mobility

CENELEC

In CENELEC TC8X WG03, a new work item was adopted in November 2023 which deals with the grid-serving "self-regulation" of loads. This project is currently in the development phase, a "call for experts" is in preparation.

However, as the work is to be based on an existing IEC project in the microgrid area, it can be assumed that a first CD will be available relatively quickly, possibly before the end of this year.

However, it has so far been assumed within CENELEC that the specific question of which property is implemented in the vehicle and which in the charging infrastructure is not considered, but that the requirements are formulated analogously to EN 50549-1 in relation to the grid connection point and are not defined by which subcomponent these are provided.

However, this issue is to be discussed in TC8X WG03. Coordination of the IEC and CENELEC standardisation work in this regard is now being sought.

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