ICS 43.120

# 中華民國國家標準

# C N S

# 道路車輛－道路對電網通訊介面－第 1 部：一般資訊及使用案例定義

# Road vehicles − Vehicle to grid communication interface − Part 1: General information and use-case definition

## CNS 15118-1:2022

中 華 民 國　　年　　月　　日制定公布
**Date of Promulgation:　-　-**

中 華 民 國　　年　　月　　日修訂公布
**Date of Amendment:　-　-**

目錄



(共 257 頁)

## 前言

本標準係依據 2019 年版 ISO 15118-1，不變更技術內容，制訂成為中華民國國家標準者。

本標準係依標準法之規定，經國家標準審查委員會審定，由主管機關公布之中華民國國家標準。

依標準法第 4 條之規定，國家標準採自願性方式實施。但經各該目的事業主管機關引用全部或部分內容為法規者，從其規定。

本標準並未建議所有安全事項，使用本標準前應適當建立相關維護安全及健康作業，並且遵循相關法規之規定。

本標準之部分內容，可能涉及專利權、商標權及著作權，主管機關及標準專責機關不負責任何或所有此類專利權、商標權及著作權之鑑別。

## 簡介

**Introduction**

迫於眉睫之能源危機及有必要減少溫室氣體排放，已導致車輛製造者做出極重大努力以降低其車輛的能源耗用。其正開發部分或完全由電能驅動之車輛。若電力係產生自可再生能源，則此等車輛將減少對石油之依賴，提高全球能源效率並減少道路運輸的二氧化碳排放總量。為對此種車輛之電池充電，要求特定的充電基礎設施。

The pending energy crisis and the necessity to reduce greenhouse gas emissions have led vehicle manufacturers to make a very significant effort to reduce the energy consumption of their vehicles. They are presently developing vehicles partly or completely propelled by electric energy. Those vehicles will reduce the dependency on oil, improve global energy efficiency and reduce the total CO2 emissions for road transportation if the electricity is produced from renewable sources. To charge the batteries of such vehicles, specific charging infrastructure is required.

充電基礎設施及車輛介面之尺度規格及電氣規格的大部分標準化工作已於相關之 ISO 或 IEC 群組中處理。然而，車輛、本地設施及電網間資訊傳送之互運性問題亦屬最重要者。

Much of the standardisation work on dimensional and electrical specifications of the charging infrastructure and the vehicle interface is already treated in the relevant ISO or IEC groups. However, the question of the interoperability of information transfer between the vehicle, the local installation and the grid is also of the upmost importance.

此種通訊有利於最佳化電能資源及電能生產系統，因車輛可於最經濟或最節能之時刻充電或放電。其亦要求開發高效便捷之付費系統，以覆蓋由此產生的小額支付(micro-payment)。必要之通訊通道可於未來對電網穩定有所貢獻，以及支援有效運作電動車輛所要求的額外資訊服務。

Such communication is beneficial for the optimisation of energy resources and energy production systems as vehicles can charge or discharge at the most economic or most energy-efficient instants. It is also required to develop efficient and convenient payment

systems in order to cover the resulting micro-payments. The necessary communication channel can serve in the future to contribute to the stabilisation of the electrical grid as well as to support additional information services required to operate electric vehicles efficiently.

本標準之要求事項(requirements)形成本系列標準中所有使用案例說明及相關文件之基本框架。本標準係電氣行動機制之所有行為者(actor)廣泛共識的結果，且為針對本系列標準實作者的指導綱要。

The requirements of this document form the basic framework for all use cases descriptions and related documents in the ISO 15118 series. This document is the result of a large consensus among all the actors of the electro mobility and is a guideline for implementers of the ISO 15118 series.

## 1. 適用範圍

## 1 Scope

本標準作為本系列標準其他各部之基礎，規定 EVCC 與 SECC 間的傳導性 HLC 及無線 HLC 之用語及定義、一般要求事項及使用案例。

This document, as a basis for the other parts of the ISO 15118 series, specifies terms and definitions, general requirements and use cases for conductive and wireless HLC between the EVCC and the SECC.

本標準適用於以手動或自動連接裝置，涉及傳導式電力傳送(power transfer)及無線電力傳送技術之 HLC。

This document is applicable to HLC involved in conductive and wireless power transfer technologies in the context of manual or automatic connection devices.

本標準亦適用於自 EV 供電設備(supply equipment)對 EV 電池充電，抑或自 EV 電池至 EV 供電設備，以便對家庭、負載或電網供電之電能傳送(energy transfer)。

This document is also applicable to energy transfer either from EV supply equipment to charge the EV battery or from EV battery to EV supply equipment in order to supply energy to home, to loads or to the grid.

本標準提供對影響識別、關聯、充電或放電控制及最佳化、付費、負載平衡、網路安全及隱私等層面之一般概述及共同瞭解。其為 SECC 以外之所有電氣行動機制行為者提供可互操作的 EV-EV 供電設備介面。

This document provides a general overview and a common understanding of aspects influencing identification, association, charge or discharge control and optimisation, payment, load levelling, cybersecurity and privacy. It offers an interoperable EV-EV supply equipment interface to all e-mobility actors beyond SECC.

本系列標準未規定電池與其他內部設備間之車輛內部通訊(某些與電能傳送相關的專屬訊息元件(element)除外)。

The ISO 15118 series does not specify the vehicle internal communication between battery and other internal equipment (beside some dedicated message elements related to the energy transfer).

備考 1. 電動道路車輛區分為 M 類別(用於載客)及 N 類別(用於載貨)車輛(比較 ECE/TR ANS/WP.29/78 ev.2)。此並未妨礙其他類別車輛亦採用本系列標準。

NOTE 1 Electric road vehicles specifically are vehicles in categories M (used for carriage of passengers) and N (used for carriage of goods) (compare ECE/TR ANS/WP.29/78 ev.2). This does not prevent vehicles in other categories from adopting the ISO 15118 series as well.

備考 2. 本標準注定面對本系列標準第 2 部及第 20 部之訊息集。本標準中無任何特定使用案例並非意味著其將不與所要求之訊息一起實施。

NOTE 2 This document is destined to orientate the message set of ISO 15118-2 and

ISO 15118-20. The absence of any particular use case in this document does not imply that it will not be put into practice, with the required messages.

備考 3. 本系列標準第2部及第20部係設計為與所使用資料傳送介質無關之工作。然而，本系列標準係為適合本系列對應文件中規定之資料鏈路層所制定。

NOTE 3 This document, ISO 15118-2 and ISO 15118-20 are designed to work independent of data transfer medium used. However, the ISO 15118 series is made for fitting the specified data link layers in the corresponding documents in this series.

## 2. 引用標準

## 2. Normative references

下列標準因本標準所引用，成為本標準之一部分。有加註年分者，適用該年分之版次，不適用於其後之修訂版(包括補充增修)。無加註年分者，適用該最新版(包括補充增修)。

~~The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.~~

ISO/TR 8713 Electrically propelled road vehicles − Vocabulary

ISO 15118-2 Road vehicles − Vehicle to grid communication interface − Part 2: Network and application protocol requirements

ISO 15118-3 Road vehicles − Vehicle to grid communication interface − Part 3: Physical and data link layer requirements

ISO 15118-8 Road vehicles − Vehicle to grid communication interface − Part 8: Physical layer and data link layer requirements for wireless communication

ISO 15118-20 Road vehicles − Vehicle to grid communication interface − Part 20: 2nd generation network and application protocol requirements

EN 50549-1 Requirements for generating plants to be connected in parallel with distribution networks − Part 1: Connection to a LV distribution network − Generating plants up to and including Type B

IEC 61851-1 Electric vehicle conductive charging system − Part 1: General requirements

IEC 61980-2 Electric vehicle wireless power transfer (WPT) systems − Part 2 specific requirements for communication between electric road vehicle (EV) and infrastructure with respect to wireless power transfer (WPT) systems

## 3. 用語及定義

## 3. Terms and definitions

ISO/TR 8713 之用語及定義與下列用語及定義適用於本標準。

For the purposes of this document, the terms and definitions given in ISO/TR 8713

and the following apply.

ISO 及 IEC 於下列位址維護用於標準化的用語資料庫：

— ISO 線上瀏覽平台：https://www.iso.org/obp

— IEC 電子百科：http://www.electropedia.org/

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

**3.1 一般用語**

**3.1 General terms**

**3.1.1 行為者(actor)**

特性化由使用者所扮演之角色或與主題互動的任何其他系統之個體。

**3.1.1 actor**

entity which characterizes a role played by a user or any other system that interacts with the subject

**3.1.2 輔助服務(ancillary service)**

由系統營運者及/或電力系統使用者所提供之電力系統運行的必要服務。

[來源：IEC IEV Electropedia 之 617-3-9，移除備考。]

**3.1.2 ancillary services**

services necessary for the operation of an electric power system provided by the system operator and/or by power system users

[SOURCE: IEC IEV Electropedia, 617-3-9, modified − The Note has been removed.]

**3.1.3 關聯(association)**

於控制充電基礎設施[例：WPT 之線圈(3.1.76)]的 SECC (3.1.68)與 EVCC (3.1.31)間建立無線通訊之程序。

**3.1.3 association**

procedure to establish the wireless communication between the SECC (3.1.68) controlling the charging infrastructure [e.g. coils for WPT (3.1.76)] and the EVCC (3.1.31)

**3.1.4 鑑別(authentication)**

EVCC (3.1.31)與 SECC (3.1.68)間，或 USER 與 EV (3.1.30)供電設備或 SA 間之程序，以證明所提供的資訊[參照識別(3.1.49)]係正確、有效，抑或其屬於 EVCC、USER 或 SECC。

**3.1.4 authentication**

procedure between the EVCC (3.1.31) and the SECC (3.1.68) or between the USER and the EV (3.1.30) supply equipment or the SA, to prove that the provided information [see identification (3.1.49)] is either correct, valid, or it belongs to the EVCC, the USER or the SECC

**3.1.5 授權(authorization)**

查驗是否允許 EV(3.1.30)充電(3.1.12)或放電(3.1.22)之程序。

**3.1.5 authorization**

procedure to verify if an EV (3.1.30) is allowed to charge (3.1.12) or discharge (3.1.22)

**3.1.6 自動連接裝置(automatic connection device, ACD)**

支援 EV(3.1.30)與 EV 供電設備(3.1.33 及 3.1.34)間傳導性電能傳送之自動連接及解連過程的組件。

**3.1.6 automatic connection device, ACD**

components supporting the automatic connection and disconnection process for conductive energy transfer between an EV (3.1.30) and the EV supply equipment (3.1.33 and 3.1.34)

**3.1.7 基本信令(basic signalling)**

依引導功能(3.1.55)之實體信令。

備考：此定義係由 IEC 61851-1:2017 之附錄 A 所提供。

**3.1.7 basic signalling**

physical signalling according to the pilot function (3.1.55)

Note 1 to entry: This definition is provided by IEC 61851-1:2017, Annex A.

**3.1.8 電池管理系統(battery management system, BMS)**

控制或管理電池系統之電氣功能及熱功能的電子裝置，且其於電池系統與其他車輛控制器間提供通訊。

**3.1.8 battery management system, BMS**

**electronic device that controls or manages the electric and thermal functions of** the battery system and that provides communication between the battery system and other vehicle controllers

**3.1.9 雙向電力轉換器(bidirectional power converter, BPC)**

供給 BPT (3.1.10)功能之穩壓電源裝置。

**3.1.9 bidirectional power converter, BPC**

stabilized power supply device which delivers BPT (3.1.10) functions

**3.1.10 雙向電力傳送(bidirectional power transfer, BPT)**

正向或反向電力傳送序列之組合。

**3.1.10 bidirectional power transfer, BPT**

combination of forward or reverse power transfer sequences

**3.1.11 憑證(certificate)**

使用數位簽章將公鑰與身分繫結之電子文件。

備考： 本系列標準描述涵蓋不同目的之數種憑證，例：契約憑證，包括 EMAID 及 OEM (3.1.52)供應憑證。

**3.1.11 certificate**

electronic document which uses a digital signature to bind a public key with an identity

Note 1 to entry: The ISO 15118 series describes several certificates covering different purposes, e.g. the contract certificate including the EMAID and OEM (3.1.52) provisioning certificates.

**3.1.12 充電(charge)**

將電能儲存於車輛電池中。

**3.1.12 charge**

store electrical energy in the vehicle battery

備考 1. 於第 1 版 ISO 15118-1 中，〝charge〞或〝charging〞被廣泛用作通用語。於本標準中，為更準確地以 1 個詞涵蓋正向(3.4.1)及反向電力傳送(3.4.2)，用語〝充電(charge)〞及其傾斜已於適當時由〝電能傳送〞所取代。當於語句中使用電能傳送時，此意指電流之 2 個方向係屬可能。

Note 1 to entry: In the first edition of this document, the words “charge” or “charging” were used intensively as a generic term. In this edition, in order to be more precise and to cover with one word forward (3.4.1) and Reverse Power Transfer (3.4.2) the terms “charge” and its declinations have been replaced by “energy transfer” when appropriate. When energy transfer is used in a sentence, this means that both directions of power flow are possible.

備考 2. 用語〝充電(charge)〞(及相關動詞)於本標準中具與 EV(3.1.30)電池中所儲存電能相關之精確定義，其不同於傳送至 EV 的總電能。

Note 2 to entry: The term “charge” (and the associated verb) has in this text a precise definition in relation to the amount of energy stored in the EV (3.1.30) battery which can be different than the total energy transferred to the EV.

備考 3. 於某些語句中，仍使用〝充電(charging)〞一詞。例：仍使用〝充電場所(charging site)〞一詞。

Note 3 to entry: In some sentences, the word “charging” is still used. For example, the words “charging site” are still used.

**3.1.13 充電器(charger)**

履行為電池充電所必要功能之電力轉換器。

**3.1.13 charger**

power converter that performs the necessary functions for charging a battery

**3.1.14 充電站營運者(charging station operator, CSO)**

**EV 供電設備營運者(EV supply equipment operator)**

負責充電基礎設施(包括充電場所)之安裝及運作，以及電力管理，以提供所要求的電能傳送服務之次要行為者(3.1.64)。

備考： 本系列標準中亦使用語 CPO (充電點營運者)。出於商標原因，不建議

使用此用語。

**3.1.14 charging station operator, CSO; EV supply equipment operator**

secondary actor (3.1.64) responsible for the installation and operation of a charging infrastructure (including charging sites) and the management of electricity to provide the requested energy transfer services

Note 1 to entry: The term CPO (Charge Point Operator) is also used in the ISO 15118 series. This term is not recommended for trademark reasons.

**3.1.15 通訊會談(communication session)**

EVCC (3.1.31)與 SECC (3.1.68)互動地交換數位資訊，以管理 EV (3.1.30)電池充電或放電之時間序列。

備考： 通訊會談能暫停並稍後再續數次。通訊會談封裝 0 或多個電能傳送期間(3.1.37)。

**3.1.15 communication session**

sequence of time where the EVCC (3.1.31) and the SECC (3.1.68) interactively exchange digital information in order to manage charging or discharging the EV (3.1.30) battery

Note 1 to entry: A communication session can be paused and resumed later several times. The communication session encapsulates zero or more energy transfer periods (3.1.37).

**3.1.16 接觸器(contactor)**

用以切換電力電路之電氣控制開關。

備考 1. 不同於斷路器，接觸器並非用以中斷短路電流。

備考 2. 就通訊而言，接觸器發生為電力供應之觸發(3.1.70)出現。

**3.1.16 contactor**

electrically controlled switch used for switching a power circuit

Note 1 to entry: Unlike a circuit breaker, a contactor is not intended to interrupt a short circuit current.

Note 2 to entr y: As far as communication is concerned, the contactor occurs as a trigger (3.1.70) for the power supply.

**3.1.17 信符(credential)**

證明允許 EV (3.1.30)充電(3.1.12)或放電(3.1.22)之文件。

**3.1.17 credential**

document attesting the permission of the EV (3.1.30) to be charged (3.1.12) or to discharge (3.1.22)

**3.1.18 需量及預期狀況(demand and prognosis)**

涵蓋適用於實際電能傳送過程之電網及本地設施狀況的彙集之功能。

例： 銷售費率表(3.1.63)包含價格、$CO_2$ 含量及可再生能源百分比資訊與時間之關係，依電網、電能生產、電能需量(energy demand)及用戶契約(customer contract)資訊，以及選項契約式電流限制。電網排程(3.1.46)包含特定 EV

(3.1.30)供電設備之電流限制及時間限制，具體取決於本地設施及本地電力需量情況。

**3.1.18 demand and prognosis**

function that covers the collection of grid and local installation conditions which applies to the actual energy transfer process

EXAMPLE The sales tariff table (3.1.63) containing a price, CO2 content and percentage of renewable energy information vs. time based on grid, energy production, energy demand and customer contract information, along with an optional contract-based current limitation. The grid schedule (3.1.46) containing a current vs. time limitation at the specific EV (3.1.30) supply equipment due to local installation and local electricity demand situation.

**3.1.19 需量結算所(demand clearing house, DCH)**

電網協商之個體，其提供關於電網負載的資訊。

備考 1. 需量結算所於 2 個結算合作夥伴間進行斡旋：SECC (3.1.68)及連接至此 SECC 之電網部分。此功能很可能由系統營運者所提供。

備考 2. 需量結算所與表計營運者(3.1.51)可相互交換資訊，亦可與其他行為者(3.1.1)交換資訊。

**3.1.19 demand clearing house, DCH**

entity for grid negotiation that provides information on the load of the grid

Note 1 to entry: The demand clearing house mediates between two clearing partners: an SECC (3.1.68) and the part of the power grid connected to this SECC. Most likely this function will be served by a system operator.

Note 2 to entry: Demand clearing house and meter operator (3.1.51) may exchange information with each other as well as with other actors (3.1.1).

例：DCH 通常完成下列任務：

- 自電網之所有部分收集所有必要資訊，例：本地變壓器、配電網、變電所、輸電網、輸電變電所、發電廠(包括可再生能源)的目前或預測負載，以及由 EVCC (3.1.31)所提交之預測電能傳送排程(3.1.39)。
- 將所收集之電網資訊整合進〝電網剖繪〞中，並將其提供予 SECC/EVCC。
- 依所收集之電網剖繪，向提出請求的 SECC 提供已連接 EV (3.1.30)之電能傳送排程建議。
- 反之，若 EV 之電能傳送排程已變更，則 SECC 將通知需量結算所。
- 若電網剖繪有所變更，則通知 SECC 更新電能傳送排程之必要性。

EXAMPLE A DCH typically fulfils the following tasks:

- Collect all necessary information from all parts of the power grid, e.g. current or forecasted load oflocal transformers, distribution grid, power substation, transmission grid, transmission substation, power plants (including renewable

energies) and predicted energy transfer schedules (3.1.39) submitted by EVCCs (3.1.31).

— Consolidate the collected grid information to a “grid profile” and offer it to SECCs/EVCCs.

— Provide energy transfer schedule proposal for the connected EV (3.1.30) to the requesting SECC based on the collected grid profile.

— Inform the SECC as to the necessity for an updated energy transfer schedule if the grid profile has changed.

— On the contrary, the SECC will inform the demand clearing house if the EV's energy transfer schedule has changed.

**3.1.20 分散式能源(distributed energy resources, DER)**

1 或多種電能服務資源之分散式集合，包括發電機、儲能及可控制負載，其能用以供給輔助服務(3.1.2)。

**3.1.20 distributed energy resources, DER**

distributed set of one or more energy service resources, including generators, energy storage and controllable load, that can be used to deliver ancillary services (3.1.2)

**3.1.21 離場時間(departure time)**

使用者擬拔出車輛插座及/或離開充電場所之時間點。

**3.1.21 departure time**

point in time when the user intends to unplug the car and/or leave the charging site

**3.1.22 放電(discharge)**

釋放車輛電池之電荷。

**3.1.22 discharge**

release the electric charge of the vehicle battery

**3.1.23 發現(discovery)**

EV (3.1.30)於其無線通訊範圍內獲得可用 SECC (3.1.68)表列之階段。

**3.1.23 discovery**

phase in which an EV (3.1.30) obtains a list of available SECCs (3.1.68) in its wireless communication range

**3.1.24 配電系統營運者(distribution system operator, DSO)**

負責配電網電壓穩定之個體。

備考 1. 配電係將電力實體供給至供給點之最後階段，例：終端使用者、EV 供電設備(3.1.33 及 3.1.34)或停車營運者。

備考 2. 配電系統網路自輸電網輸送電力並將其供給予耗用者。通常，該網路將包括中壓電力線、變電所，以及具相關設備之低壓配電線路網路。

**3.1.24 distribution system operator, DSO**

entity responsible for the voltage stability in the distribution grid

Note 1 to entry: Electricity distribution is the final stage in the physical delivery of electricity to the delivery point, e.g. end user, EV supply equipment (3.1.33 and 3.1.34) or parking operator.

Note 2 to entry: A distribution system network carries electricity from the transmission grid and delivers it to consumers. Typically, the network would include medium-voltage power lines, electrical substations and low- voltage distribution wiring networks with associated equipment.

**3.1.25 電氣行動機制需要(e-mobility need)**

由 EV (3.1.30)使用者就離場時間(3.1.21)、最小(3.5.1)及最大電能請求(3.5.2)，以及標的電能請求所表示之行動性需要。

**3.1.25 e-mobility needs**

mobility needs expressed by the EV (3.1.30) user in terms of departure time (3.1.21), minimum (3.5.1) and maximum energy request (3.5.2) and target energy request

**3.1.26 電氣行動機制營運者結算所(e-mobility operator clearing house, EMOCH)**

於 2 個結算夥伴間斡旋之個體，以提供關於不同 EMSP 契約的漫遊驗證服務(3.1.27)。

**3.1.26 e-mobility operator clearing house, EMOCH**

entity mediating between two clearing partners to provide validation services for roaming regarding contracts of different EMSPs (3.1.27)

備考 1. EMOCH 斡旋之目的為：

- 收集所有必要之契約資訊，如 EMAID、EMSP、對 EMSP 的通訊路徑、漫遊費用、契約之生效及結束日期等。
- 向 SECC (3.1.68)提供 EMSP 將付費予給定 EMAID [有效契約授權(3.1.5)]之確認。
- 於各電能傳送期間(3.1.37)後傳送 SDR (3.1.66)以連接經識別契約之 EMSP 及 EP (3.1.29)。

Note 1 to entry: EMOCH mediates for the purpose of:

- collecting all necessary contract information like the EMAID, the EMSP, the communication path to the EMSP, roaming fees, begin and end dates of the contract, etc.;
- providing the SECC (3.1.68) with confirmation that an EMSP will pay for a given EMAID [authorization (3.1.5) of valid contract]; and
- transferring an SDR (3.1.66) after each energy transfer period (3.1.37) to connect the EMSP and the EP (3.1.29) of the identified contract.

備考 2. EMOCH、EMSP 與表計營運者(3.1.51)可相互交換資訊，亦可與其他行為者(3.1.1)交換資訊。

Note 2 to entry: The EMOCH, EMSP and meter operator (3.1.51) may exchange

information with each other as well as other actors (3.1.1).

**3.1.27 電氣行動機制服務提供者(e-mobility service provider, EMSP)**

與用戶簽訂相關於 EV (3.1.30)運營之所有服務契約的個體。

備考 1.通常，EMSP 將包括其他某些行為者(3.1.1)，如現場操作者(spot operator)或 EP (3.1.29)，且具與配電系統營運者(3.1.24)及表計營運者(3.1.51)之關係。OEM (3.1.52)或公用事業亦可滿足此種角色。

備考 2. EMSP 驗證源自其用戶之 EMAID，其係接收自 EMOCH (3.1.26)，抑或與用戶相關之其他 EMSP 或現場操作者。

備考 3. EMSP 向其用戶發布 EMAID。

**3.1.27 e-mobility service provider, EMSP**

entity with which the customer has a contract for all services related to the EV (3.1.30) operation

Note 1 to entry: Typically, the EMSP will include some of the other actors (3.1.1), like the spot operator or EP (3.1.29), and has a close relationship with the distribution system operator (3.1.24) and meter operator (3.1.51). An OEM (3.1.52) or utility could also fulfil such a role.

Note 2 to entry: The EMSP validates EMAIDs from his customers, which were received either from the EMOCH (3.1.26), other EMSPs or spot operators the customer is in relation with.

Note 3 to entry: The EMSP issues EMAIDs to his customers.

**3.1.28 電能表計(electric energy meter, EEM)**

藉由整合功率與時間量測電能之設備。

備考 1. 設備遵循 IEC 62052-11 及 IEC 62053-21、IEC 62053-52。

備考 2. 某些使用案例(3.1.71)需要藉由電能表計量測電能總和，並通過 SECC (3.1.68)傳送予 EVCC(3.1.31)，而其他情境則無需分離之電能表計。EV (3.1.30)可獲取此資訊，並依 OEM (3.1.52)之意圖使用之。

**3.1.28 electric energy meter, EEM**

equipment for measuring electrical energy by integrating power with respect to time

Note 1 to entry: The equipment complies with IEC 62052-11 and IEC 62053-21, IEC 62053-52.

Note 2 to entry: Some use cases (3.1.71) need the amount of electric energy measured by the electric energy meter and communicated through the SECC (3.1.68) to the EVCC (3.1.31), while other scenarios do not need a separate electric energy meter. The EV (3.1.30) may get this information and use it according to the OEM's (3.1.52) intentions.

**3.1.29 電力提供者(electricity provider, EP)**

其活動係批發購買電力且隨後通過契約直接轉售予客戶端之個體。

備考 1. 提供者亦可供給與電能相關之服務。

備考 2. 提供者能通過調整電價(使用時間、臨界峰值價格…)產生彈性，此等彈性能對電能市場及/或網路運營具價值。

**3.1.29 electricity provider, EP**

entity whose activity is the wholesale purchase of electricity and the subsequent direct resale to a client through a contract

Note 1 to entry: The provider may also deliver energy related services.

Note 2 to entry: Provider can generate flexibilities through modulation of electricity prices (Time-of-Use, Critical Peak Prices...), flexibilities which can have value on energy markets and/or for network operations.

**3.1.30 電動車輛(electric vehicle, EV)**

包括插接式油電混合道路車輛(PHEV)之所有道路車輛，其驅動源自車載可充電儲能系統(RESS)的全部或部分電能。

[來源：IEC 61851-1:2017 之 3.1.32]

**3.1.30 electric vehicle, EV**

all road vehicles, including plug-in hybrid road vehicles (PHEV), that derive all or part of their energy from on-board rechargeable energy storage systems (RESS)

[SOURCE: IEC 61851-1:2017, 3.1.32]

**3.1.31 電動車輛通訊控制器(electric vehicle communication controller, EVCC)**

車輛內之嵌入式系統，其實作車輛與 SECC (3.1.68)間之通訊，以支援特定功能。

備考： 此種特定功能可為，例：控制車輛與 ECC 間之輸入及輸出通道、加密或資料傳送。

**3.1.31 electric vehicle communication controller, EVCC**

embedded system, within the vehicle, that implements the communication between the vehicle and the SECC (3.1.68) in order to support specific functions

Note 1 to entry: Such specific functions could be e.g. controlling input and output channels, encryption or data transfer between the vehicle and the SECC.

**3.1.32 電動車輛電力系統(electric vehicle power system)**

**EV 電力系統(EV power system)**

提供雙向供電之專屬功能的設備或設備組合：

－ 自電氣裝置或供電網路對 EV (3.1.30)充電。

－ 自 EV 中之 DER (3.1.20)向供電網路或電網放電。

備考：前者功能等同於 IEC 61851-1 所提供之 EV 供電設備(3.1.33 及 3.1.34)。

**3.1.32 electric vehicle power system**

**EV power system**

equipment or combination of equipment providing dedicated functions to supply electric power in both directions:

－ from an electrical installation or supply network to an EV (3.1.30) for the purpose of charging; and

— from a DER (3.1.20) in the EV to supply network or the grid for the purpose of discharging

Note 1 to entry: The former function is equal to the EV supply equipment (3.1.33 and 3.1.34), provided by IEC 61851-1.

**3.1.33 電動車輛供電設備(electric vehicle supply equipment)**

**EV 供電設備(EV supply equipment)**

<傳導式電能傳送>導體，包括相線、中性線及保護接地線、EV (3.1.30)耦合器、附接插頭，以及所有其他附錄、裝置、電源插座(3.1.58)或特地安裝之器材，目的為自房屋布線向 EV 交付電能，且必要時允許其彼此間通訊。

備考： 本標準將保留任何電能傳送過程之〝EV 供電設備〞一詞，但定義將取決於所使用的技術。

**3.1.33 electric vehicle supply equipment**

**EV supply equipment**

<conductive power transfer> conductors, including the phase(s), neutral and protective earth conductors, the EV (3.1.30) couplers, attached plugs, and all other accessories, devices, power outlets (3.1.58) or apparatuses installed specifically for the purpose of delivering energy from the premises wiring to the EV and allowing communication between them as necessary

Note 1 to entry: This document will keep the wording “EV supply equipment” for any energy transfer process but the definition will depend on the technology used.

**3.1.34 電動車輛供電設備(electric vehicle supply equipment)**

**EV 供電設備(EV supply equipment)**

<無線電力傳送>通過主要裝置及次要裝置向 EV(3.1.30)提供電力之非車載電子裝置，包括所有外殼及蓋子。

[來源：IEC 61980-1:2015 之 3.3]

**3.1.34 electric vehicle supply equipment**

**EV supply equipment**

<wireless power transfer> off-board electronics that supply the electric power through the primary and secondary device to the EV (3.1.30) including all housings and covers

[SOURCE: IEC 61980-1:2015, 3.3]

**3.1.35 電子控制單元(electronic control unit, ECU)**

提供關於車輛資訊之單元。

**3.1.35 electronic control unit, ECU**

unit providing information regarding the vehicle

**3.1.36 電能管理系統(energy management system, EMS)**

控制 DER (3.1.20)、房屋器材與電網間電力傳送之系統。

備考：EMS 類似於 HEMS 或 PNEMS (3.1.57)。

**3.1.36 energy management system, EMS**

system that controls the electric power transfer among the DER (3.1.20), premises appliances and the grid

Note 1 to entry: The EMS is similar to the HEMS or PNEMS (3.1.57).

**3.1.37 電能傳送期間(energy transfer period)**

電能傳送開始與電能傳送結束間之時間序列。

例 1. 對電池進行 1 或多次充電或放電，進行預調節或後調節。

例 2. 可通過諸如電纜連接或通過 WPT (3.1.76)達成電能傳送。

例 3. 可通過諸如解連電纜或離開停車位達成電能傳送之結束。

**3.1.37 energy transfer period**

sequence of time between the beginning of energy transfer and the end of the energy transfer

EXAMPLE 1 One or many periods of charging or discharging the battery, doing pre-conditioning or post-conditioning.

EXAMPLE 2 Energy transfer can be achieved, for example, through a cable connection or though WPT (3.1.76).

EXAMPLE 3 End of energy transfer can be achieved, for example, with the disconnection of the cable or with leaving the parking place.

**3.1.38 電能傳送情境(energy transfer scenario)**

使用案例(3.1.71)元件之組合，以滿足特定電能傳送使用案例。

**3.1.38 energy transfer scenario**

combination of use case (3.1.71) elements to fulfil a specific energy transfer use case

**3.1.39 電能傳送排程(energy transfer schedule)**

包含於電能傳送期間(3.1.37)針對電池充電或放電之功率限制(power limit)的方案。

備考： EV (3.1.30)應盡可能接近所協商之限制，以允許 EMS (3.1.36)或 DSO (3.1.24)之電力平衡。

例： 排程係依標的設定(3.1.69)、銷售費率表(3.1.63)及電網排程(3.1.46)資訊所計算，但顧及對應之電流限制，亦即使用最低電流值。

**3.1.39 energy transfer schedule**

scheme which contains the power limits for charging or discharging the battery during an energy transfer period (3.1.37)

Note 1 to entry: The EV (3.1.30) should apply the negotiated limits as close as possible, to allow power balancing for the EMS (3.1.36) or the DSO (3.1.24).

EXAMPLE The schedule is calculated based on the target setting (3.1.69), sales tariff table (3.1.63) and grid schedule (3.1.46) information, respecting the corresponding current limitations, i.e. using the lowest current value.

**3.1.40 電能傳送方法(energy transfer method)**

於 EV 供電設備(3.1.33 及 3.1.34)及 EV 兩者支援多種電能傳送方法及不同插頭

與插座之情況下，允許 EV (3.1.30)選擇其所欲電能傳送方法的元件。

備考：參照 IEC 62196。

**3.1.40 energy transfer method**

element which allows the EV (3.1.30) to select its desired energy transfer methods in case both the EV supply equipment (3.1.33 and 3.1.34) and the EV support multiple energy transfer methods and different plugs and sockets

Note 1 to entry: See IEC 62196.

**3.1.41 EV 供電設備 ID (EV supply equipment ID, EVSEID)**

EV 供電設備(3.1.33 及 3.1.34)之唯一識別(3.1.49)。

**3.1.41 EV supply equipment ID, EVSEID**

unique identification (3.1.49) of the EV supply equipment (3.1.33 and 3.1.34)

**3.1.42 外部識別方式(external identification means, EIM)**

經授權耦合之 EV (3.1.30)由 EV 供電設備(3.1.33 及 3.1.34)提供服務之外部方式。

例：NFC、RFID、SMS 信用卡/轉帳卡、智慧型手機或 web 應用、電話呼叫。

備考：EIM 亦支援〝免費充電〞(公平模式)每次賦予正授權(3.1.5)。

**3.1.42 external identification means, EIM**

external means that authorized the coupled EV (3.1.30) to be served by services from the EV supply equipment (3.1.33 and 3.1.34)

EXAMPLE NFC, RFID, SMS credit/debit card, smartphone or web application, phone call.

Note 1 to entry: EIM also support "charging for free" (fair mode) to be given a positive authorization (3.1.5) every time.

**3.1.43 快速回應服務(fast responding service)**

調適電能次要行為者(3.1.64)即時約束之服務，導致資料交換僅限於電能層級邊界。

備考：電能次要行為者之即時約束大約為幾秒。

**3.1.43 fast responding services**

services adapted to energy secondary actors' (3.1.64) real-time constraints leading to data exchanges limited to energy level boundaries

Note 1 to entry: Energy secondary actors' real-time constraints are in the order of a few seconds.

**3.1.44 車隊營運者(fleet operator, FO)**

運作多部 EV (3.1.30)且其能與 EMSP (3.1.27)簽訂契約之個人或法人個體。

**3.1.44 fleet operator, FO**

person or legal entity operating several EVs (3.1.30) and who can have the contracts with the EMSP (3.1.27)

**3.1.45 彈性營運者(flexibility operator)**

針對其用戶聚合彈性之一方。

**3.1.45 flexibility operator**

party which aggregates flexibilities for its customers

**3.1.46 電網排程(grid schedule)**

依本地電網情況於特定時間設定功率位準之功能。

備考：計算電網排程之參數諸如本地電網需量及供應情況，實際及預測。

**3.1.46 grid schedule**

function which sets the power level at a specific time based on the local grid situation

Note 1 to entry: Parameters to calculate the grid schedule are e.g. local grid demand and supply situation, actual and forecast.

**3.1.47 高層通訊(high level communication, HLC)**

使用實體層及資料鏈路層協定及訊息之雙向數位通訊。

備考 1. 依本系列標準中所規定。

備考 2. 本系列標準中之 HLC 遵循 SAE J1772、SAE 2836、SAE 2847 及 SAE 2931 中的用語〝digital communication〞。

**3.1.47 high level communication, HLC**

bidirectional digital communication using protocol and messages and physical and data link layers

Note 1 to entry: As specified in the ISO 15118 series.

Note 2 to entry: HLC in the ISO 15118 series is compliant with the term digital communication in SAE J1772, SAE 2836, SAE 2847 and SAE 2931.

**3.1.48 人機界面(human machine interface, HMI)**

允許車輛使用者(3.1.75)接收與電能傳送過程相關之資訊，並向電能傳送系統提供輸入的介面。

備考 1. 來自使用者(輸入)或顯示予使用者(輸出)之所有資訊都將通過 HMI 履行之。

備考 2. HMI 能實作為 EV (3.1.30)、EV 供電設備(3.1.33 及 3.1.34)、手機等之功能。

3.1.48 human machine interface, HMI

interface allowing the vehicle user (3.1.75) to receive information relative to the energy transfer process and provide input to the energy transfer system

Note 1 to entry: All information from a user (input) or displayed to a user (output) will be performed through an HMI.

Note 2 to entry: The HMI could be implemented as a function of the EV (3.1.30), EV supply equipment (3.1.33 and 3.1.34), mobile phone, etc.

**3.1.49 識別(identification)**

EVCC (3.1.31)或 USER 針對授權(3.1.5)目的，提供其識別資訊之程序，主要提供其付費能力。

例： 契約憑證(3.1.11)、信用卡號等及/或 SECC (3.1.68)向 EVCC 提供 EV 供電

設備 ID (3.1.41)之程序。

備考： 為簡單起見，於本系列標準中，用語〝識別〞亦包括對所提供之識別資訊的鑑別(3.1.4)，亦即此資訊係屬正確，或其屬於 EVCC、USER 或美 SECC。

**3.1.49 identification**

procedure for the EVCC (3.1.31) or USER to provide its identifying information for the purpose of authorization (3.1.5), mostly to provide its capability for payments

EXAMPLE Contract certificate (3.1.11), credit card number, etc. and/or procedure for the SECC (3.1.68) to provide the EV supply equipment ID (3.1.41) to the EVCC.

Note 1 to entry: For simplicity reasons, within the ISO 15118 series, the term “identification” includes also the authentication (3.1.4) of the provided identifying information, i.e. this information is correct, or it belongs to the EVCC, the USER or the SECC.

**3.1.50 位準選擇器(level selector)**

自需量及預期狀況(3.1.18)功能所發出之資料中選擇最小值之功能，然後將結果提供予排程功能。

備考：此功能可能實作於 EV (3.1.30)或 EV 供電設備(3.1.33 及 3.1.34)中。

**3.1.50 level selector**

function to select the lowest value among the data issued from the demand and prognosis (3.1.18) function, and then to feed the result to scheduling function

Note 1 to entry: This function may be implemented in the EV (3.1.30) or the EV supply equipment (3.1.33 and 3.1.34).

**3.1.51 表計營運者(meter operator, MO)**

對 EEM (3.1.28)之安裝及維護負法律責任之機構。

**3.1.51 meter operator, MO**

body having the legal responsibility for the installation and maintenance of the EEM (3.1.28)

**3.1.52 原始設備製造者(original equipment manufacturer, OEM)**

生產由公司購買並以該採購公司之品牌名稱零售的產品或組件之生產者。

備考 1. OEM 係指最初製造該產品之公司。

備考 2. 當提及車輛零件時，OEM 指定由原始零件製造者所製造之替換零件。

**3.1.52 original equipment manufacturer, OEM**

producer who manufactures products or components that are purchased by a company and retailed under that purchasing company’s brand name

Note 1 to entry: The OEM refers to the company that originally manufactured the product.

Note 2 to entry: When referring to automotive parts, the OEM designates a

replacement part made by the manufacturer of the original part.

**3.1.53 配對(pairing)**

車輛與其所在之唯一 EV 供電設備(3.1.33 及 3.1.34)相關聯的過程，電力將通過電纜或無線技術自該設備傳送。

備考：配對過程有時稱為〝關聯(3.1.3)問題〞。

**3.1.53 pairing**

process by which a vehicle is correlated with the unique EV supply equipment (3.1.33 and 3.1.34) at which it is located and from which the power will be transferred either through a cable or through a wireless technology

Note 1 to entry: The pairing process is sometimes called the “association (3.1.3) problem”.

**3.1.54 付費單元(paying unit, PU)**

提供付費方法之 EV 供電設備(3.1.33 及 3.1.34)側的裝置。

例：付費方法：EIM (3.1.42)、現金、信用卡等。

備考： 若 EVCC (3.1.31)正常選擇付費方式，則付費單元向 SECC (3.1.68)指示該用戶是否被授權。

**3.1.54 paying unit, PU**

device on the EV supply equipment (3.1.33 and 3.1.34) side that offers payment methods

EXAMPLE Payment methods: EIM (3.1.42), cash, credit cards, etc.

Note 1 to entry: If the EVCC (3.1.31) normally chooses a payment method, then the paying unit indicates to the SECC (3.1.68) whether the customer is authorized or not.

**3.1.55 引導功能(pilot function)**

確保遵循 IEC 61851-1 之操作模式所要求與設備人身安全或資料傳輸相關的條件之電子或機械裝置。

**3.1.55 pilot function**

means, electronic or mechanical, that ensures the conditions related to the safety or the transmission of data required for the mode of operation, compliant with IEC 61851-1

**3.1.56 即插即充(plug and charge)**

**針對 WPT、PnC 之停車充電(park and charge for WPT, PnC)**

於 WPT (3.1.76)之情況下，用戶僅須插接或停車之識別(3.1.49)模式，其車輛及電能傳送之所有層面將自動獲取照顧，無需駕駛者進一步干預。

備考：電能傳送之層面可能包括負載控制、授權(3.1.5)及計費。

**3.1.56 plug and charge**

**park and charge for WPT, PnC**

identification (3.1.49) mode where the customer just has to plug or park, in case of WPT (3.1.76), their vehicle and all aspects of energy transfer are automatically

taken care of with no further intervention from the driver

Note 1 to entry: The aspects of energy transfer may include load control, authorization (3.1.5) and billing.

**3.1.57 私用網路電能管理系統(private network energy management system, PNEMS)**

負責管理私用網路中耗用、生產或儲存電力之設備的功能群組件。

備考 1. PNEMS 於滿足與電力提供者、DSO (3.1.24)、彈性營運者(3.1.45)或任何其他系統營運者之契約條件的同時，提供所預期之服務。

備考 2. PNEMS 與 CSO (3.1.14)於運營規劃功能與即時平衡功能之框架內，協商充電場所及 EV 供電設備(3.1.33 及 3.1.34)叢集的可用電力。

備考 3. 於本標準中，PNEMS 亦稱為 EMS (3.1.36)。

**3.1.57 private network energy management system, PNEMS**

functional component responsible for managing equipment consuming, producing or storing electricity in the private network

Note 1 to entry: A PNEMS provides the expected services while fulfilling contracted conditions with the electricity supplier, the DSO (3.1.24), the flexibility operator (3.1.45) or any other system operators.

Note 2 to entry: A PNEMS negotiates with the CSO (3.1.14) the power available for the charging site and the cluster of EV supply equipment (3.1.33 and 3.1.34) within the frame of an operational planning function and a real time balance function.

Note 3 to entry: In this document the PNEMS is also called EMS (3.1.36).

**3.1.58 電源插座(power outlet)**

插座或連接器，若為固定電纜，則為 EV (3.1.30)供電，通常與固定布線一起安裝。

**3.1.58 power outlet**

socket outlet or, in the case of a fixed cable, connector, that provides power to the EV (3.1.30), typically to be installed with the fixed wiring

**3.1.59 電源插座 ID (power outlet ID)**

車輛電源插座(3.1.58)之唯一識別(3.1.49)。

**3.1.59 power outlet ID**

unique identification (3.1.49) of the power outlet (3.1.58) to the vehicle

**3.1.60 電力傳送控制(power transfer control)**

依電能傳送排程(3.1.39)確認允許傳送自或傳送予 EV 供電設備(3.1.33 及 3.1.34)之最大電流的功能。

備考：電池之實際充電電流宜由 BMS (3.1.8)控制。其不屬本系列標準範圍內。

**3.1.60 power transfer control**

function that confirms the maximum current which is allowed to be transferred from or to the EV supply equipment (3.1.33 and 3.1.34) based on the energy transfer schedule (3.1.39)

Note 1 to entry: Actual charge current to the battery should be controlled by the

BMS (3.1.8). It is not in scope of the ISO 15118 series.

**3.1.61 主要行為者(primary actor)**

直接涉及電能傳送過程之個體。

**3.1.61 primary actor**

entity involved directly in the energy transfer process

**3.1.62 脈寬調變(pulse width modulation, PWM)**

脈衝控制，其中脈波寬度或頻率或兩者於各基本週期內調變以產生特定之輸出波形。

**3.1.62 pulse width modulation, PWM**

pulse control in which the pulse width or frequency, or both, are modulated within each fundamental period to produce a certain output waveform

**3.1.63 銷售費率表(sales tariff table)**

價格相關資訊隨時間變化之函數。

備考 1. 銷售費率表為計算電能傳送排程(3.1.39)提供輸入。

備考 2. 銷售費率表可由次要行為者(3.1.64)發布，例：EP (3.1.29)、EMS (3.1.36)或 EMSP (3.1.27)。

備考 3. 銷售費率表宜反映〝電力提供者之供需平衡〞及〝綠色電能的使用〞(例：風電、光電)。

**3.1.63 sales tariff table**

function of price related information over time

Note 1 to entry: The sales tariff table provides input for calculating an energy transfer schedule (3.1.39).

Note 2 to entry: The sales tariff table can be issued by a secondary actor (3.1.64), e.g. EP (3.1.29), EMS (3.1.36) or EMSP (3.1.27).

Note 3 to entry: The sales tariff table should reflect “supply and demand balance of the electricity provider” and “usage of green energy” (e.g. wind mill, photovoltaic).

備考 4. 所選定費率之資訊宜納入服務詳細紀錄中。

備考 5. 銷售費率表可定期更新。其可能隨國家或地區而異。

備考 6. 1 個用戶可能存在多個銷售費率表。

備考 7. 銷售費率表資訊宜以於電網側之正常波動不導致 EV (3.1.30)充電不足或成本增加的’方式建構之。

備考 8. 契約式電流限制可能隨時間變動，例：日間值較低，夜間值較高。

Note 4 to entry: Information of the chosen tariff should be included in the service detail record.

Note 5 to entry: The sales tariff table can be updated periodically. It may differ by country or EP.

Note 6 to entry: There may be multiple sales tariff tables existing for one customer.

Note 7 to entry: The sales tariff table information should be constructed in such a way that normal fluctuations on the grid side will not lead to an insufficiently charged EV (3.1.30) or cost increase.

Note 8 to entry: The contract-based current limitation might vary over time, e.g. lower value during daytime and higher value during the night.

**3.1.64 次要行為者(secondary actor)**

間接涉及電能傳送過程之個體。

備考 1. 次要行為者可於彼此間交換資訊。

備考 2. 次要行為者亦可能為單 1 個體。

**3.1.64 secondary actor**

entity involved indirectly in the energy transfer process

Note 1 to entry: Secondary actors may exchange information between each other.

Note 2 to entry: Secondary actors could also be a single entity.

**3.1.65 半線上(semi-online)**

SECC (3.1.68)或任何其他設備通常具進入線上之能力，但於線上無須與所參引使用案例(3.1.71)同步。

**3.1.65 semi-online**

status where the SECC (3.1.68) or any other device in general has the ability to go online, but being online is not required synchronously to the referring use case(s) (3.1.71)

**3.1.66 服務細節紀錄(service detail record, SDR)**

具 EMSP (3.1.27)計費所需之所有必要資訊的資料封包，通知用戶關於 V2G (3.1.74)會談並確保交易之可追蹤性。

備考： 某些資料可能來自 EV 供電設備(3.1.33 及 3.1.34)。某些資料可能最初由 EMOCH (3.1.26)所擁有。於 EMOCH 處可能建立某些資料。某些紀錄發送至 EMSP 以用於計費或通知其用戶。

**3.1.66 service detail record, SDR**

data package with all necessary information that an EMSP (3.1.27) needs for billing, informing the customer about the V2G (3.1.74) session and to ensure traceability of the transactions.

Note 1 to entry: Some data may be sent from the EV supply equipment (3.1.33 and 3.1.34). Some data may be originally owned by the EMOCH (3.1.26). Some data may be created at the EMOCH. Some records are sent to EMSP for billing or informing their customers.

**3.1.67 服務提供者(service provider)**

為整個 CSO (3.1.14)之用戶提供加值服務(3.1.72)的次要行為者(3.1.64)。

備考：EMAID 可用於啟動。

**3.1.67 service provider**

secondary actor (3.1.64) which offers value-added services (3.1.72) to customers

throughout the CSO (3.1.14)

Note 1 to entry: An EMAID may be used for activation.

**3.1.68 供電設備通訊控制器(supply equipment communication controller, SECC)**

實作對 1 或多個 EVCC (3.1.31)之通訊，且可能能與次要行為者(3.1.64)互動的個體。

備考 1. 參照 ISO 15118-2。

備考 2. 附錄 A 中提供可能架構之更多細節。

備考 3. 供電設備通訊控制器(3.1.68)之功能可控制輸入及輸出通道、資料加密或車輛與 SECC 間之資料傳送。

**3.1.68 supply equipment communication controller, SECC**

entity which implements the communication to one or multiple EVCCs (3.1.31) and which may be able to interact with secondary actors (3.1.64)

Note 1 to entry: See ISO 15118-2.

Note 2 to entry: Further details regarding possible architectures are given in Annex A.

Note 3 to entry: Functions of a supply equipment communication controller (3.1.68) may control input and output channels, data encryption, or data transfer between the vehicle and the SECC.

**3.1.69 標的設定(target setting)**

涵蓋下列使用者需量相關資訊之功能：

- 離場時間(3.1.21)。
- 充電所要求或可用於放電之電能總量。
- 電能傳送排程(3.1.39)。
- 電能傳送型式。

**3.1.69 target setting**

function which covers the following user demand-related information:

- departure time (3.1.21);
- amount of energy required for charging or available for discharging;
- energy transfer schedule (3.1.39); and
- energy transfer type

**3.1.70 觸發者(trigger)**

將於使用案例(3.1.71)中起動或成為條件之事件。

**3.1.70 trigger**

event that will start or be a condition in the use case (3.1.71)

**3.1.71 使用案例(use case)**

回應發起自系統外部之請求時的系統行為描述。

備考 1. 於系統工程中，使用案例說明〝誰〞能對所談論之系統做〝什麼〞。使用案例技術係藉由通過功能要求事項詳述情境驅動之線索，用以擷

取系統行為要求事項。

備考 2. 用語〝電能傳送情境(3.1.38)〞與本標準中之用語“使用案例〞同時使用。

**3.1.71 use case**

description of a system's behaviour as it responds to a request that originates from outside that system

Note 1 to entry: In systems engineering, a use case describes "who" can do "what" with the system in question. The use case technique is used to capture a system's behavioural requirements by detailing scenario-driven threads through functional requirements.

Note 2 to entry: The term "energy transfer scenario (3.1.38)" is used simultaneously to the term "use case" within this document.

**3.1.72 加值服務(value-added services, VAS)**

EV (3.1.30)與 EV 供電設備(3.1.33 及 3.1.34)間之純電能傳送未直接需要的元件。

**3.1.72 value-added services, VAS**

elements not directly needed for the pure energy transfer between the EV (3.1.30) and the EV supply equipment (3.1.33 and 3.1.34)

**3.1.73 車輛耦合器(vehicle coupler)**

將彈性電纜手動連接至 EV (3.1.30)以對牽引電池進行充電或放電的裝置，由兩部分組成：車輛連接器及車輛入口。

**3.1.73 vehicle coupler**

means of enabling the manual connection of a flexible cable to an EV (3.1.30) for the purpose of charging or discharging the traction batteries, consisting of two parts: a vehicle connector and a vehicle inlet

**3.1.74 車輛對電網(vehicle to grid, V2G)**

插接式 EV(3.1.30)與電網之互動，包括充電、放電及雙向通訊介面

備考： 此定義之第 1 部分取材自 V2G Domain Expert Working Group, SGIP, NIST 的範圍。

3.1.74 **vehicle** to grid, V2G

plug-in electric vehicle (3.1.30) interaction with the electric grid, including charging as well as discharging and bi-directional communication interface

Note 1 to entry: The first part of this definition is excerpted from the scope of the V2G Domain Expert Working Group, SGIP, NIST.

**3.1.75 車輛使用者(vehicle user)**

使用車輛並提供有關駕駛需要之資訊，因而影響電能傳送模式的個人或法人個體。

備考： 行駛需要(諸如可用範圍及可用時間)對達成最合適電能傳送情境(3.1.38)係屬必要。

**3.1.75 vehicle user**

person or legal entity using the vehicle and providing information about driving

needs and consequently influencing energy transfer patterns

Note 1 to entry: Driving needs, such as range and time of availability, are necessary to achieve the most appropriate energy transfer scenario (3.1.38).

**3.1.76 無線電力傳送(wireless power transfer, WPT)**

經由主要裝置與次要裝置間之電場及/或磁場或電磁波，將電能自電力來源傳送予電氣負載的傳送。

**3.1.76 wireless power transfer, WPT**

transfer of electrical energy from a power source to an electrical load via electric and or magnetic fields or waves between a primary and a secondary device

**3.2 控制模式**

**3.2 Control modes**

**3.2.1 排程模式(scheduled mode)**

EVCC (3.1.31)及 SECC (3.1.68)已依電能標的、電力及費率資訊協商滿足使用者行動性需要之電力剖繪的控制模式。

備考：於此種控制模式下，EV (3.1.30)負責滿足使用者之行動性需要。

**3.2.1 scheduled mode**

control mode where the EVCC (3.1.31) and SECC (3.1.68) have negotiated a power profile fulfilling the user's mobility needs and based on the energy target, power and tariff information

Note 1 to entry: In this control mode, the EV (3.1.30) is in charge of fulfilling the user’s mobility needs.

**3.2.2 動態模式(dynamic mode)**

其中次要行為者(3.1.64)系統控制電力潮流以滿足使用者之行動性需要及其自身約束，而無需協商的控制模式，

**3.2.2 dynamic mode**

control mode, without negotiation, where a secondary actor (3.1.64) system controls the power flow fulfilling the user's mobility needs and its own constraints

**3.3 架構通道**

**3.3 Architecture channel**

**3.3.1 雙架構通道(dual architecture channel)**

其中 2 個分離電能表計用於正向及反向電力潮流之電氣及資訊架構。

**3.3.1 dual architecture channel**

electrical and information architecture in which two separate energy meters are used for the forward and reverse power flow

**3.3.2 單架構通道(single architecture channel)**

其中 1 個電能表計用於正向及反向電力潮流之電氣及資訊架構。

**3.3.2 single architecture channel**

electrical and information architecture in which one single energy meter is used for both the forward and reverse power flows

**3.4 正向及反向電力傳送**

**3.4 Forward and reverse power transfer**

**3.4.1 正向電力傳送(forward power transfer, FPT)**

經由 EV 供電設備(3.1.33 及 3.1.34)將電能自外部電源傳送至車輛電池。

**3.4.1 forward power transfer, FPT**

power transfer from the external power supply to the vehicle battery via the EV supply equipment (3.1.33 and 3.1.34)

**3.4.2 反向電力傳送(reverse power transfer, RPT)**

經由 EV 供電設備(3.1.33 及 3.1.34)將電能自車輛電池傳送至家庭、負載或電網。

**3.4.2 reverse power transfer, RPT**

power transfer from the vehicle battery to home, loads or grid via the EV supply equipment (3.1.33 and 3.1.34)

**3.5 最小及最大電能請求限制**

**3.5 Minimum and maximum energy request limits**

**3.5.1 最小電能請求(minimum energy request)**

於 BPT (3.1.10)期間之任何時間，由 EV (3.1.30)所請求的電池中儲存之最小電能。

備考：若目前充電狀態與最小電能請求間之差值為負，則須立即充電。

**3.5.1 minimum energy request**

minimum energy stored in the battery requested by the EV (3.1.30) at any time during the BPT (3.1.10) period

Note 1 to entry: If the difference between the current state of charge and the minimum energy request is negative, immediate charging has to be performed.

**3.5.2 最大電能請求(maximum energy request)**

於 BPT (3.1.10)期間之任何時間，由 EV (3.1.30)所請求的電池中儲存之最大電能

備考：若目前充電狀態與最大電能請求間之差為正值，則能請求立即放電。

**3.5.2 maximum energy request**

maximum energy stored in the battery requested by the EV (3.1.30) at any time during the BPT (3.1.10) period

Note 1 to entry: If the difference between the current state of charge and the maximum energy request is positive, immediate discharging can be required.

**3.6 來源產生器模式**

**3.6 Source generator modes**

**3.6.1 電壓源產生器模式(voltage source generator mode)**

其中系統{EV (3.1.30) + EV 供電設備(3.1.33 及 3.1.34)}有能力對原本無法供電之導線供電的模式。

**3.6.1 voltage source generator mode**

mode in which the system {EV (3.1.30) + EV supply equipment (3.1.33 and 3.1.34)}

is able to power wires that would not be powered otherwise

**3.6.2 電流源產生器模式(current source generator mode)**

其中系統{EV (3.1.30) + EV 供電設備(3.1.33 及 3.1.34)}有能力獨立於電壓提供電流之模式。

**3.6.2 current source generator mode**

mode in which the system {EV (3.1.30) + EV supply equipment (3.1.33 and 3.1.34)} is able to supply current independently of the voltage

**4. 縮寫用語**

**4 Abbreviated terms**

| | |
|---|---|
| ACD | 自動連接裝置(automatic connection device) |
| BMS | 電池管理系統(battery management system) |
| CSO | 充電站營運者(charging station operator) |
| DCH | 需量結算所(demand clearing house) |
| EBC | EV 供電設備預約確認(EV supply equipment booking confirmation) |
| ECU | 電子控制單元(electronic control unit) |
| EEM | 電能表計(electric energy meter) |
| EIM | 外部識別方式(external identification means) |
| EMAID | 電氣行動機制鑑別識別符(e-mobility authentication identifier) |
| EMOCH | 電氣行動機制營運者結算所(e-mobility operator clearing house) |
| EMS | 電能管理系統(energy management system) |
| EMSP | 電氣行動機制服務提供者(e-mobility service provider) |
| EP | 電力提供者(electricity provider) |
| EV | 電動車輛(electric vehicle) |
| EVCC | 電動車輛通訊控制器(electric vehicle communication controller) |
| EVPS | 電動車輛電力供應(electric vehicle power supply) |
| EVSEID | 電動車輛供電設備識別符(electric vehicle supply equipment identifier) |
| FO | 車隊營運者(fleet operator) |
| FPT | 正向電力傳送(forward power transfer) |
| GW | 閘道器(gateway) |
| HAN | 家庭區域網路(home area network) |
| HEMS | 家庭電能管理系統(home energy management system) |
| HLC | 高層通訊(high level communication) |
| HMI | 人機介面(human machine interface) |
| LAN | 區域網路(local area network) |
| MO | 表計營運者(meter operator) |
| OEM | 原始設備製造者(original equipment manufacturer) |

| | |
|---|---|
| PLC | 電力線通訊(power line communication) |
| PnC | 即插即充(plug and charge)或 WPT 情況下之停車充電(park and charge)<br>plug and charge or park and charge in case of WPT |
| PNEMS | 私用網路電能管理系統(private network energy management system) |
| PU | 付費單元(paying unit) |
| PWM | 脈寬調變(pulse width modulation) |
| RCD | 剩餘電流裝置(residual current device) |
| RPT | 反向電力傳送(reverse power transfer) |
| SA | 次要行為者(secondary actor) |
| SDR | 服務詳細紀錄(service detail record) |
| SECC | 供電設備通訊控制器(supply equipment communication controller) |
| USER | 車輛使用者(vehicle user) |
| VAS | 加值服務(value-added service) |
| V2G | 車輛對電網(vehicle to grid) |
| WPT | 無線電力傳送(wireless power transfer) |

## 5. 要求事項

### 5.1 要求事項表列

## 5 Requirements

### 5.1 List of requirements

本標準之實作者應遵循附錄 E 的表 E.1 中所列出之要求事項。

Implementers of this document shall comply with the requirements listed in Ta ble E.1 of Annex E.

### 5.2 一般通訊要求事項

## 5.2 General communication requirements

本標準中之通訊可區分為 2 個概念，稱為〝基本信令〞及 HLC。本標準及本系列標準第 2 部或第 20 部)僅規定 HLC。

Communication in the context of this document could be differentiated into two concepts called “basic signalling” and HLC. This document and ISO 15118-2 or ISO 15118-20 specify only HLC.

HLC 將用以啟用如識別、付費、負載平衡、電能傳送控制及加值服務等機能。〝基本信令〞與 HLC 間之關係規定於本系列標準第 2 部、第 3 部、第 8 部及第 20 部中。於〝基本信令〞之全景中，定義諸如車輛狀態、設備人身安全的控制及引導處置，以及電能傳送過程初始化等項目(亦參照 3.1.30)。

HLC shall be used to enable features like identification, payment, load levelling, energy transfer control and value-added services. The relations between “basic signalling” and HLC are specified in ISO 15118-2, ISO 15118-3, ISO 15118-8 and ISO 15118-20. In the context of “basic signalling”, items such as vehicle states,

control pilot handling for safety and initialization of the energy transfer process are defined (see also 3.1.30).

於 AC 電能傳送之情況下，位於 EV 中的充電器應履行電能傳送控制。

In case of AC energy transfer, the charger located in the EV shall perform the energy transfer control.

於 DC 電能傳送之情況下，位於 EV 供電設備中的充電器應履行電能傳送控制。

In case of DC energy transfer, the charger located in the EV supply equipment shall perform the energy transfer control.

若 EV 及 EV 供電設備同時配備 HLC 裝置，則僅發生以 HLC 交換資訊。

Information exchange with HLC only occurs if both the EV and the EV supply equipment are equipped with a HLC device.

應考量數個選項。EV 與實作不同選項之 EV 供電設備間的互運性描述於 7.5 中。

Several options shall be considered. The interoperability between EVs and the EV supply equipment that implement the different options is described in 7.5.

— 關於 EV 供電設備側：
  — EV 供電設備未支援 HLC。
  — EV 供電設備支援 HLC。
  — EV 供電設備要求 HLC。

On the EV supply equipment side:

— EV supply equipment does not support HLC;
— EV supply equipment supports HLC; and
— EV supply equipment requires HLC.

— 關於 EV 側：
  — EV 未具任何 HLC 方式。
  — EV 支援 HLC。
  — EV 要求 HLC。

On the EV side:

— EV does not have any HLC means;
— EV supports HLC; and
— EV requires HLC.

由於通訊能力之初始失配，有某些組合要求逾時處置。此逾時持續時間確保整個初始化持續時間不超過使用者可接受之時段。逾時定義於本系列標準第 2 部、第 3 部、第 8 部及第 20 部中。

There are some combinations requiring timeout handling due to the initial mismatch of communication capabilities. This timeout duration ensures that the overall initialization duration does not exceed a user-acceptable period of time. Timeouts are defined in ISO 15118-2, ISO 15118-3, ISO 15118-8 and ISO 15118-20.

下列一般要求事項為定義第 7 節中所描述之使用案例元件奠定基礎：

- 本系列標準第 3 部及/或第 8 部中所定義之機制應用以建立 EVCC 與 SECC 間的通訊。

The following general requirements build the basis for defining the use cases elements described in Clause 7:

- The mechanisms defined in ISO 15118-3 and/or ISO 15118-8 shall be used to establish the communication between the EVCC and the SECC.
- EV 與次要行為者間之所有資料通訊係屬機密。應適用適當加密技術以保護 EV 與次要行為者間所交換之資料。
- All data communication between the EV and the secondary actor is confidential. Appropriate cryptography shall be applied to protect the data exchanged between the EV and the secondary actor.
- 應保護通訊資料不被修改或模仿(駭客攻擊)。
- 若要求分離計費，則所傳送之電能應於 EV 供電設備中量測。
- Communication data shall be protected against modification or imitation (hacking).
- If separate billing is required, the electric energy transferred shall be measured in the EV supply equipment.

計費原則(例：每小時)係由 EMSP 所定義，並將納入營運者及用戶間之契約協議中。

The billing principles, e.g. per hour, are defined by the EMSP and will be included in the contractual agreement between the operator and the customer.

備考 1. 本系列標準第 2 部描述實作保護措施之安全威脅情境。

NOTE 1 ISO 15118-2 describes the security threat scenarios against which protective measures are implemented.

備考 2. 所提供之電能亦能納入其他費用中(例：停車費)。

NOTE 2 The electric energy offered can also be included in other fees (e.g. a parking fee).

備考 3. 無自 EVCC 對本標準中所定義智慧型表計之直接通訊。取決於使用案例，表計資料將於 EVCC 與 SECC 間交換。SECC 與智慧型表計間之通訊不屬本標準範圍內。

NOTE 3 There is no direct communication from the EVCC to a smart meter defined within this document. Meter data will be exchanged between the EVCC and the SECC depending on the use case. The communication between the SECC and the smart meter is outside the scope of this document.

## 5.3 使用者特定要求事項

### 5.3.1 可靠性、可用性、錯誤處置及錯誤報告

## 5.3 User-specific requirements

### 5.3.1 Reliability, availability, error handling and error reporting

電能傳送應

－ 於預先決定之時間點前完成。
－ 於任何特殊情況下，亦即若電能傳送排程無法滿足，且若總電能無法於所發布之時間點傳送，則宜盡快觸發所規定的錯誤報告程序以通知使用者(參照本系列標準第 2 部及第 20 部)。

The energy transfer shall
－ be completed by a predetermined point in time; and
－ in the case of any exceptional circumstances, i.e. if the energy transfer schedule cannot be met and if the total energy amount cannot be transferred by the announced point in time, a specified error reporting procedure to inform the user should be triggered as soon as possible (see ISO 15118-2 and ISO 15118-20).

若有電能傳送排程之協商過程，例：由於電網的負載平衡所需，協定應實作方法以指示是否能滿足標的設定值。

If there is a negotiation process for the energy transfer schedule e.g. because of the load levelling needs of the electrical grid, the protocol shall implement methods to indicate whether the target setting values could be fulfilled or not.

若所請求之電能傳送排程無法滿足，則應啟動電能傳送排程之重新協商，以尋求替代方案。

In the event that the requested energy transfer schedule cannot be fulfilled, a re-negotiation of the energy transfer schedule shall be initiated for alternatives.

EV 製造者或 EMSP 能選擇合適方法以告知其用戶，關於所協商電能傳送排程之非可預期差異。

EV manufacturers or EMSPs can choose suitable methods to inform their customers about unexpected differences from the negotiated energy transfer schedule.

任何通訊錯誤應由 EV 供電設備抑或 EV 所檢測及控制。

Any communication error shall be detected and controlled either by the EV supply equipment or the EV.

依本系列標準及 IEC 61851-1 履行錯誤處置。

Error handling is performed according to the ISO 15118 series and IEC 61851-1.

**5.3.2 個資保護**

**5.3.2 Private data protection**

私人資訊及使用者資料僅能由所預期接收者讀取。私人資訊僅於必要時傳送予第三方。

Private information and user data shall only be readable by the intended recipient. Private information shall be transferred to third parties only when necessary.

備考：〝必要時〞意指僅當此方需私人資訊資料以遵循使用案例時，或當協定中所表示之要求時，才將資料傳送予該方。

NOTE “When necessary” means that data is transferred to a party only if this party needs the private information data to comply with a requirement expressed in a use case or in the protocol.

應告知使用者誰有權存取其私人資料。

Users shall be informed about who has access to their private data.

使用者應能將其儲存於其 EV 中之個人資料傳送予另一 EV，而不被其 EV 所阻止。

Users shall be able to transfer their personal data stored from their EV to another EV without being prevented from doing so by their EV.

**5.3.3 易於使用**

**5.3.3 Ease of use**

電能傳送排程過程可能複雜且精密。為確保其參與，解決方案應以清晰簡單之方式對使用者表現。同樣地，HMI 應盡量易於使用。然而，此易用性不應阻止使用者於 V2G 會談之前、期間或之後存取與其電氣行動機制需要相關的資訊，如標的及目前充電狀態(SOC)、電能傳送目前狀態及效率。

Energy transfer scheduling processes may be complex and sophisticated. In order to ensure their involvement, solutions shall be presented in a clear and simple manner to the users. Similarly, the HMI shall be as easy to use as possible. However, this ease of use shall not prevent the user from accessing, before, during or after the V2G session, the information related to his e-mobility needs like target and current state of charge (SOC), energy transfer current state and efficiency.

使用者應有權存取儲存於 EV 中之所有私人資訊，而無需第三方干預。

The user shall have access to all private information stored in the EV without third parties’ intervention.

使用者應能於無第三方干預之情況下移除儲存於 EV 中的所有私人資訊。

The user shall be able to remove all private information stored in the EV without third parties’ intervention.

**5.4 OEM 特定要求事項**

**5.4 OEM-specific requirements**

電能傳送排程係由次要行為者、EV 供電設備抑或 EV，依源自使用者、充電場所及電能網之資訊所計算，並傳送回電網以允許對其他 EV 規劃。

An energy transfer schedule is calculated either by a secondary actor, the EV supply equipment or the EV, based on the information from the user, charging site and energy grid and is transferred back to the grid to allow the planning of other EVs.

若要求，EVCC 及 SECC 應提供自任一側調適電能傳送排程的可能性。

The EVCC and SECC shall provide the possibility to adapt the energy transfer schedule from either side if required.

備考 1. 有可能將電能傳送排程區分為不同階段，如電能傳送延遲、電能傳送過程中斷及電能傳送進行中。

NOTE 1 It is possible to divide the energy transfer schedule into different phases

like energy transfer postponement, energy transfer process interruption and energy transfer in progress.

備考 2. 安裝(EV 供電設備及電氣布線)之電氣或實體限制較所請求電能傳送排程具更高優先序。

NOTE 2 Electrical or physical limits of the installation (EV supply equipment and electrical wiring) have higher priority than the requested energy transfer schedule.

若資訊可用，則 EV 可能有能力經由 EV 供電設備向 EMS 發送價格相關之資訊(例：每千瓦時的價格或 $CO_2$ %或 EV 已針對電池支付的最後價格)。然後，EMS 可使用此資訊決定未來任何充電或放電之策略。

If the information is available, the EV may be able to send prices-related information to the EMS via the EV supply equipment (e.g. price per kilowatt hour or CO2 % or the last price the EV has paid for charging the battery). Then, the EMS may use this information to decide on any charging or discharging strategy for the future.

為將與充電過程相關之憑證或其他使用者/用戶特定資訊儲存於 EV 中，應滿足下列要求事項(額外資訊參照附錄 B)：

To store certificates or other user-/customer-specific information related to the charging process in the EV, the following requirements shall be fulfilled (for additional information see Annex B):

(a) 於下列情況下，EV 之整個生命期內變更用戶特定資訊係屬可能：

- 於 EV 生產中。
- 於 EV 交付予用戶回應開始使用 EV 時。
- 當用戶變更電能契約時。
- 憑證逾期時。

a) It shall be possible over the lifetime of the EV to change customer-specific information under the following circumstances:

- at EV production;
- at EV delivery to customer response start of EV usage;
- when the energy contract is changed by the customer;
- when the certificate expires;
- 若 EVCC 或儲存使用者/用戶特定資料的組件將於維修廠更換。
- 車輛報廢時。
- 車輛遭竊時。
- 當使用者將車輛作為二手車出售時。

- if the EVCC or the component which stores the user-/customer-specific data will be replaced in a workshop;
- when the vehicle is discarded;

— when the vehicle is stolen;

— when the vehicle is sold as a used car by the user.

(b) 任何型式之用戶相關資料應依循下列要求事項及過程邊界條件：

— 用於 EV 特定資料或憑證之控制單元的儲存及處理能力有限。

— 由於 EV 之生產可能發生於交付予用戶之前數個月，因此不應於生產時寫入未來用戶或契約的特定資料。

b) Any type of customer-related data shall conform to the following requirements and process boundary conditions:

— Limited storage and processing capacity available at a control unit for EV-specific data or certificates.

— Since the production of the EV may happen months before delivery to a customer, no data specific to the future customer nor contract shall be written at production time.

— OEM 供應憑證可能於 EV 生命期期間變更。

備考：於 EV 中針對多個 OEM 供應憑證及多個契約憑證，提供安全資料儲存將有所助益。儲存於 EV 中之用戶相關資料可能使用 20 年以上。

— 宜有可能於獨立維修廠維護 EV。

— OEM provisioning certificate may be changed during EV life time.

NOTE It could be helpful to offer secure data storage in the EV for more than one OEM provisioning certificate and several contract certificates. Customer-related data stored in EVs may be used for more than 20 years.

— Maintenance of an EV at independent workshops should be possible.

**5.5 公用事業特定要求事項**

**5.5.1 電網控制或本地電能控制之功率限制**

**5.5 Utility-specific requirements**

**5.5.1 Power limiting for grid control or local energy control**

預期 EV 之大量推出將對輸電系統營運者(TSO)層面具輕微影響，但對配電系統營運者(DSO)層面則具巨大影響，尤其對中低壓線路及變壓器。為盡量減少由於大量 EV 同時充電所導致之過載情況及局部擾動，如 DSO、EP、FO 等外部電能行為者或如 EMS 等本地行為者，將須影響電能傳送排程及最大功率分布。EMS 將於此種影響中發揮核心作用，因外部行為者可能無法自然地直接接取 EV 供電設備通訊基礎設施。EMS 獲知本地或外部約束之方式，以及 EMS 將此等約束通知 SECC 的方式，同樣不屬本系列標準範圍。例：約束可以特定時段內之最大功率、充電為正或放電為負，以及財務或環境用語表示之。

The expected massive roll-out of EV will have a light impact at the transmission system operator (TSO) level, but a huge impact on the distribution system operator (DSO) level, especially on the medium and low-voltage lines and transformers. In

order to minimise overloading situations and local perturbations due to a large number of EVs charging in the same time, external energy actors like DSO, EP, FO, or local actors like EMS will have to influence the energy transfer schedule and maximum power profile. The EMS will play a central role in this influence as external actors may not have natural direct access to the EV supply equipment communication infrastructure. The way the EMS is informed of the local or external constraints, and similarly the way the EMS will inform the SECC of those constraints are out of scope of the ISO 15118 series. The constraints can be expressed for example in term of maximum power during a certain period of time, positive for charging or negative for discharging, and also in financial or environmental terms.

EV 供電設備於獲知電能 SA 之電能約束後，應準備並向 EVCC 傳達建立標的設定所必要之元件(第 7 節之使用案例 F)。

標的設定應取決於所選擇知控制模式。

The EV supply equipment, being informed of the energy constraints by energy SAs, shall prepare and communicate to the EVCC the elements necessary to establish the target setting (use cases F of Clause 7).

Target setting shall depend on the control mode selected.

SECC 應通知 EVCC 最大可用功率位準，以最佳化本地電網電能使用。於電能傳送期間之任何時間，EVCC 或 SECC 可觸發控制模式或電力排程的變更。

The SECC shall inform the EVCC of the maximum available power level to optimize local grid energy usage. Anytime during the energy transfer the EVCC or the SECC may trigger a change of the control mode or of the power schedule.

EV 對本系列標準之支援不應妨礙於充電場所未支援 HLC 之情況下使用基本信令(細節參照表 2)。

The support of the ISO 15118 series by EVs shall not prevent the usage of basic signalling in case the charging site does not support HLC (see Ta ble 2 for details).

### 5.5.2 EV 供電設備保護之電流及電壓限制

### 5.5.2 Current and voltage limits for EV supply equipment protection

於 EV 供電設備與 EV 間流通之最大標稱電流，不應超過供電額定裝置的額定值及所附接電纜組合的額定值。

電纜任何導線間之最大標稱電壓不應超過電纜組合的額定值。

The maximum nominal current circulating between the EV supply equipment and the EV shall not exceed the ratings of the supply rating installation and the ratings of the attached cable assembly.

The maximum nominal voltage between any wire of the cable shall not exceed the rating of the cable assembly.

SECC 應向 EVCC 指示可於 EV 與 EV 供電設備間流通之最大標稱電流。電流指示應對應不使本地裝置過載之情況下可流通的電流。

SECC 應向 EVCC 指示電纜組合之額定電壓。

The SECC shall indicate to the EVCC the maximum nominal current that can circulate between the EV and the EV supply equipment. The current indication shall correspond to the current that can circulate without overloading the local installation.

The SECC shall indicate to the EVCC the voltage rating of the cable assembly.

若電流或電壓於電能傳送過程中超過 EV 供電設備所指示之限制，則 EV 供電設備可使用本系列標準第 2 部預先定義的例行工作中斷電能傳送過程，於緊急情況下為基本信令例行工作。

If the current or the voltage exceeds the limits indicated by the EV supply equipment during the energy transfer process, the EV supply equipment may interrupt the energy transfer process using predefined routines of ISO 15118-2 and, in case of an emergency, basic signalling routines.

**5.5.3 EV 保護之電流及電壓限制**

**5.5.3 Current and voltage limits for EV protection**

EVCC 應依其組件額定值、目前工作條件(包括溫度)及內部約束，向 SECC 指示其電壓及電流限制(最大及最小，充電及放電)。

The EVCC shall indicate to the SECC its voltage and current limitations (both maximum and minimum, charging and discharging) based on its component rated values, on the current operating conditions (including temperature) and on internal limitations.

若電流或電壓超過 EV 所指示之限制，於電能傳送過程中，EV 可使用本系列標準第 2 部、第 20 部的預先定義例行工作中斷電能傳送過程，且於緊急情況下為基本信令例行工作。

If the current or the voltage exceeds the limits indicated by the EV, during the energy transfer process, the EV may interrupt the energy transfer process using predefined routines of ISO 15118-2, ISO 15118-20 and, in case of an emergency, basic signalling routines.

**5.5.4 充電服務之授權**

**5.5.4 Authorization of charging services**

EV 供電設備向 EV 自我識別並履行授權以檢查 EV 是否允許充電。通常，若 EV 或 USER 提供付費機制，則 EV 供電設備允許充電。為此，EVCC 可表現 EMAID，或 USER 可表現某些信用卡/轉帳卡或於 EV 供電設備上存入某些現金，或藉由 web 式或智慧型手機式服務授權。

The EV supply equipment identifies itself to the EV and performs authorization to check if the EV is allowed to charge. Typically, the EV supply equipment allows charging if the EV or the USER provides the mechanism for payment. For this purpose, the EVCC may present the EMAID, or the USER may present some credit card/debit card or deposit some cash at the EV supply equipment or do

authorization by a web- or smartphone-based service.

於使用契約憑證進行授權之情況下，協定應允許 EVCC 與 SECC 間交換契約相關資訊。

契約相關資訊之驗證應藉由車輛、EV 供電設備以及(若要求)與使用者間之接受或不接受指示達成之。應以防止濫用之方式對其管理。

In case of authorization using the contract certificate, the protocol shall allow the exchange of contract relevant information between the EVCC and the SECC.

The validation of the contract-relevant information shall be achieved by an indication of acceptance or non-acceptance between the vehicle, the EV supply equipment and, if needed, the user. It shall be managed in a way that misuses are prevented.

In case of the USER presenting payment-relevant information at the EV supply equipment, such an exchange of information is not applicable.

若 USER 於 EV 供電設備處表現付費相關之資訊，則此種資訊交換不適用。

例：停車資訊(將充電納入停車費)、EIM、轉帳卡/信用卡、現金、行動付費。

EXAMPLES Parking information (to integrate charge into parking fees), EIM, debit/credit card, cash, mobile payment.

**5.5.5 授權自 EV 至 EV 供電設備之電能傳送**

**5.5.5 Authorization of energy transfer from the EV to the EV supply equipment**

僅當由經驗證 SA 或使用者所委託時，EV 供電設備才允許自 EV 傳送電能。典型 RPT 系統係由具車載轉換器之 EV 提供 AC 電力，或由具車外轉換器的 EV 提供 DC 電力。

The EV supply equipment shall allow energy transfer from the EV only if mandated by a validated SA or by the user. Typical RPT systems are providing AC by the EV with an on-board converter or providing DC by the EV with an off-board converter.

備考：經驗證 SA 係與提供雙向或反向電力傳送服務之使用者簽訂有效契約的行為者。可能之 SA 示例為：EMS、EMSP、DSO、FO、EP…

NOTE A validated SA is an actor having a valid contract with the user providing bidirectional or reverse power transfer services. Example of possible SAs are: EMS, EMSP, DSO, FO, EP…

EV 供電設備應向 EV 提供本地電能品質要求。

於允許自 EV 傳送電能前，EV 供電設備應檢查強制電能傳送之 SA 的有效性。

The EV supply equipment shall provide local electricity quality requirements to the EV.

Before allowing energy transfer from the EV, the EV supply equipment shall check the validity of the SA mandating the energy transfer.

於 EIM 識別模式之情況下，SA 有效性檢查程序應藉由使用者接受或不接受來自 EV 的電能傳送之明確指示達成之。應以防止誤用之方式管理此指示。

In case of EIM identification mode, the SA validity checking procedure shall be achieved by an explicit indication of acceptance or non-acceptance by the user of the energy transfer from the EV. This indication shall be managed in a way that misuses are prevented.

於使用 EMAID 授權之情況下，協定應允許 SECC 與 SA 間交換契約相關資訊，以強制自 EV 傳送電能。

In case of authorization using an EMAID, the protocol shall allow the exchange of contract-relevant information between the SECC and the SA mandating the energy transfer from the EV.

於使用契約憑證授權之情況下，應藉由檢查 SA 憑證的有效性達成 SA 強制自 EV 傳送電能。

In case of authorization using the contract certificate, the validation of the SA mandating energy transfer from the EV shall be achieved by checking the validity of the SA certificate.

於使用契約憑證授權之情況下，若 EV 供電設備無法檢查 SA 憑證的有效性，則不允許自 EV 傳送電能。

經驗證之 SA 之 EMAID 應於 SDR 中註明。

In case of authorization using the contract certificate, and if the EV supply equipment is not able to check the SA certificate validity, then energy transfer from the EV shall not be allowed.

The EMAID of the validated SA shall be indicated in the SDR.

**5.5.6 修整**

**5.5.6 Retrofitting**

為允許藉由新增組件以升級既存充電場所(EV 供電設備)，HLC 系統之定義應使既存基礎設施升級遵循本系列標準成為可能。

In order to allow the upgrading of existing charging sites (the EV supply equipment) by adding a component, the HLC systems shall be defined in a way that an upgrade of the existing infrastructure in compliance with the ISO 15118 series is possible.

此外，若新組件未將既存組件完全整合至 EV 供電設備中(分離控制先導或 SECC 架構)，則新安裝之 SECC 亦應瞭解並處置 EV 供電設備的實體限制。

Furthermore, in case the new component does not fully integrate the existing components in the EV supply equipment (separated control pilot or SECC architecture), the newly installed SECC shall know and process the physical limits of the EV supply equipment as well.

**5.6 無線通訊要求事項**

**5.6.1 一般**

**5.6 Wireless communication requirements**

**5.6.1 General**

相較於傳導要求事項，於使用無線通訊介面時引入某些額外要求事項，因於傳導式電力傳送之情況下，HLC 可能於駕駛者插接之前起動。於 WPT 之情況下，不存在插接操作，且提出特定要求事項。

Compared to conductive requirements, some additional requirements are introduced when using the wireless communication interface, since in the case of conductive power transfer, HLC may start before the driver has plugged-in. In the case of WPT, no action of plug-in is present and specific requirements also arise.

**5.6.2 通訊基礎設施要求事項**

**5.6.2 Communication infrastructure requirements**

無線發現及關聯係無線行動裝置或 WLAN 裝置之使用者已知的過程。當使用無線通訊介面連接至 SECC 無線介面時，相同原理亦適用於 EV。

Wireless discovery and association is a process known by users of wireless mobile or WLAN devices. The same principle applies to EVs when using the wireless communication interface to connect to the SECC wireless interface.

當大量接入點係於範圍內時，發現及關聯通常可要求於有時超過 20 個項目的之表列中選擇特定服務。此情況針對行動使用者而言係屬可接受，但針對駕駛 EV 之使用者而言肯定不適用。目前於某些國家，若 EV 未停止或停放，此種駕駛者操控係屬禁止者。

When a large number of access points are in range, the discovery and association usually may require to select a particular service in a list of sometime more than 20 items. This situation can be acceptable for mobile users but is certainly not applicable for users driving their EVs. Currently in some countries, this kind of driver manipulation is forbidden if the EV is not stopped or parked.

為簡化並使駕駛者體驗更安全，且考量發現不應導致可用 SECC 之長表列，要求：

- 關於 SECC 側：
  - 針對發現及關聯，SECC 可廣播其識別及必要資訊(例：唯一 ID…)。
  - 各 SECC 可控制 1 或多個 EV 供電設備。此通訊鏈路之規格不屬本標準範圍內，然而，其資料速率不應降低整體系統性能。
  - 各 EV 供電設備應具僅對 1 個 SECC 之通訊鏈路。

In order to simplify and make the driver experience safer and considering that discovery should not lead to a long list of available SECCs, it is required that:

On the SECC side:

- SECCs may broadcast their identification and necessary information for discovery and association (e.g. unique id…).
- Each SECC may control one or many EV supply equipment. The specification of this communication link is out of scope of this document, however, its data rate shall not degrade the overall system performance.

– Each EV supply equipment shall have a communication link with one SECC only.

– 關於 EV 側：

– 無需任何駕駛者即可發現及關聯。

備考：由 EVCC 所接收之 SECC 範圍內的表列可受限於由 OEM 提供之應用(未於範圍內)，以使駕駛者體驗更簡單。

On the EV side:

– discovery and association shall be possible without any driver action.

NOTE The SECC's list in range received by the EVCC can be limited by the application (not in scope) provided by the OEM in order to make the driver experience more simple.

圖 1 提供基礎設施之例，其中唯一 SECC 控制 4 個 EV 供電設備。EV #1 僅與 SECC 通訊。

Figure 1 gives an example of infrastructure where a unique SECC controls 4 EV supply equipment. EV #1 is in communication only with the SECC.

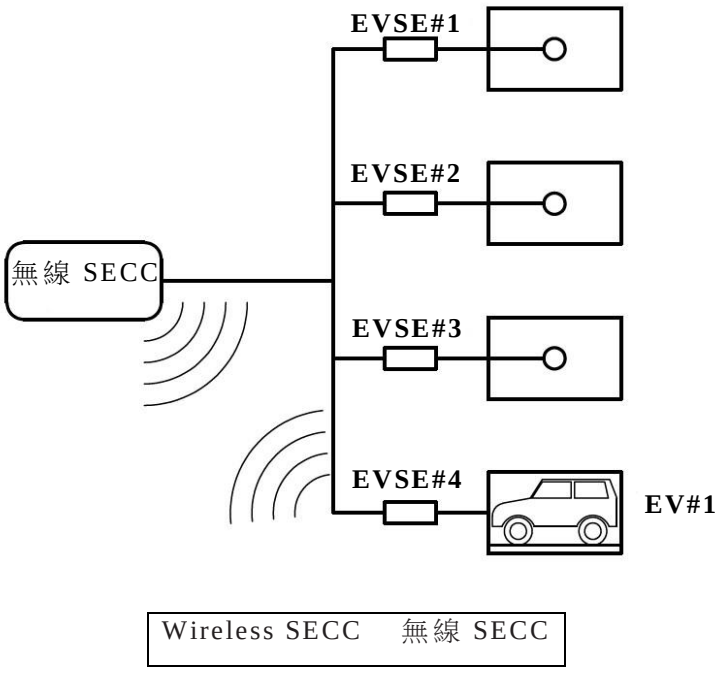



圖 1 具唯一 SECC 之基礎設施

Figure 1 – Infrastructure with a unique SECC

有關更多無線通訊要求事項，參照本系列標準第 8 部。

For more wireless communication requirements, see ISO 15118-8.

## 5.7 RPT 說明

**5.7.1 一般**

**5.7 RPT description**

**5.7.1 General**

某些 EV 及其他具電力推進驅動之車輛可用作電源。此等車輛可使用其內部儲能系統對外部負載提供電力。

Some electric vehicles and other vehicles with electric propulsion drives can act as a power supply. These cars can use their internal energy storage system to provide electricity power to external loads.

若為具電池之 EV，則對車輛電池充電 FPT 係屬必要。於 RPT 期間，耦合(EV-EV 電力系統)視為 DER。

5.7.2 提供定義 RPT 使用案例之必要資訊。

In case of an EV with battery, an FPT is necessary to charge the vehicle battery. The couple (EV - EV power system) is considered as DER during an RPT.

5.7.2 provides necessary information to define RPT use cases.

**5.7.2 一般資訊及要求事項**

**5.7.2 General information and requirements**

- 設計為能通過 EV 供電設備放電之 EV，應遵循適用於電流或電壓源及 DER 的所有相關電氣安全要求事項。
- An EV designed to be able to discharge energy through an EV supply equipment shall comply with all relevant electrical safety requirements applicable to the electrical current or voltage source and DER.
- EV 及 EV 電力系統應藉由電力傳送通道安全地連接。

  例：電力傳送通道由 EV 與 EV 電力系統間之電纜組合提供。
- The EV and the EV power system shall be safely connected by the power transfer channel.

EXAMPLE The power transfer channel is provided by cable assembly between the EV and the EV power system.

- 電力傳送系統由 EV 內部電源管理系統、電纜組合之電力傳送通道等，以及電力傳送通道與供電設備本地反向主電路間的連接組成。
- The power transfer system consists of the EV internal power management system, the power transfer channel of cable assembly etc. and connection between the power transfer channel and the local reverse main circuit of the power supply equipment.
- 通訊系統由 EVCC、SECC 及 EVCC 與 SECC 間之通訊通道組成，依本系列標準第 3 部或第 8 部中所描述。通訊系統應針對 RPT 提供控制功能及序列。
- The communication system consists of the EVCC, the SECC and the communication channel between the EVCC and the SECC as described in ISO 15118-3 or ISO 15118-8. The communication system shall provide control

functions and sequences for the RPT.

- 通訊道應由基本信令及/或 HLC 組成。基本信令藉由整形電壓信號，於 EV 與 EV 電力系統間提供具狀態協議之最小基本控制。另一方面，HLC 以 TCP/IP 協定交換 XML 式訊息，針對 RPT 提供延伸功能。FPT 基本信令之典型示例係由 IEC 61851-1:2017 之附錄 A 所提供。
- The communication channel shall consist of basic signalling and/or HLC. Basic signalling provides minimum basic control with state agreement between the EV and the EV power system by a shaped voltage signal. On the other hand, HLC exchanges XML-based messages with TCP/IP protocol, to provide extended functions for the RPT. A typical example of basic signalling for the FPT is provided by IEC 61851-1:2017, Annex A, “Pilot function through a control pilot circuit using PWM modulation and a control pilot wire”.
- 單一通道系統

此係最簡單之 RPT 系統。充電及放電使用相同電力傳送通道。如使用案例 A2，通道控制及訊息係由引導控制及 HLC 所確保。

- Single channel system

This is the simplest RPT system. Charging and Discharging use the same power transfer channel. Channel control and messages are ensured by pilot control and HLC just like in Use Case A2.

- 雙通道系統

此係具 2 個分離之反向電力通道的一般 RTP 系統。此系統已配備 2 個電力傳送通道，因此通道控制自引導控制傳送予 HLC 控制。於本標準中，描述 AC 及 DC 放電及充電系統。

- Dual channel system

This is the general RTP system with two separated reverse power channels. This system is equipped with two power transfer channels, so channel control is shifted from pilot control to HLC control. In this document, AC and DC discharging and charging systems are described.

- 產生器模式放電系統

於孤島情況下(例：若失去電網連接或家庭或建築物未連接至電網)，產生器模式放電系統充當電源，能自行起動並對家庭或建築物提供電力來源。

此等系統之典型示例描述於附錄 D 中。

- Generator mode discharging system

In islanding situation (for example if the grid connection is lost or when the home or building is not connected to the grid) a generator mode discharging system is acting as an electricity source and can start-up by itself and supply energy to the home or building.

Typical examples of these systems are described in Annex D.

### 5.8 可追蹤性要求事項

### 5.8 Traceability requirements

為提升所有行為者間電能交易之信任、可靠性及可追蹤性，有必要引入下列要求事項。此等要求事項之範圍僅限於將 EV 與 EV 供電設備間之電能傳送貨幣化的基礎設施。

In order to increase trust, reliability and traceability in energy transactions among all actors, it is necessary to introduce the following requirements. The scope of these requirements is limited to infrastructure where energy transfer between the EV and the EV supply equipment is monetized.

- 於電能傳送循環中(使用案例 F0 至 F4)，EV 供電設備應量測自電網流入及流出至電網之有效電能及無效電能(有效充電、無效充電、有效放電、無效放電)。
- During the energy transfer loop (use cases F0 to F4), the EV supply equipment shall measure active and reactive energy flowing from and to the grid (active charging, reactive charging, active discharging, reactive discharging).
- 於電能傳送循環期間(使用案例 F0 至 F4)，SECC 及 EVCC 應具可能請求關於有效電能及無效電能表計指標知資訊以供核可。若合理性檢查未成功，則 EVCC 或 SECC 將回傳錯誤代碼，指示不成功之檢查導致終止 V2G 會談。
- During the energy transfer loop (use cases F0 to F4), the SECC and the EVCC shall have the possibility to request information about the active and reactive energy meter indexes for approval. In case of failing plausibility check, the EVCC or the SECC shall return an error code indicating a failing check leading to terminating the V2G session.
- 於電能傳送循環(使用案例 H)結束時，EV 供電設備可產生服務詳細紀錄，包含(於適當之電氣行動機制相關資訊間)下列資訊塊：
- At the end of the energy transfer loop (use case H), the EV supply equipment may produce a service detail record containing, among other appropriate e-mobility related information, the following block of information:

1. 電能傳送循環開始之時戳。
2. 所使用之控制模式(動態或經排程)。
3. 充電型式 AC 或 DC，單相或三相。
4. 識別：EVID、EVSEID、電網供電點識別。

1. Timestamp of the beginning of the energy transfer loop.
2. Control modes used (dynamic or scheduled).
3. Type of charge AC or DC, single phase or 3 phases.
4. Identification: EVID, EVSEID, Grid Delivery Point identification.

5. 傳送至 EV 之總有效電能及無效電能。

6. 自 EV 傳送之總有效電能及無效電能。
7. 電能傳送循環結束時之時戳。
8. 所涉及之 EMAID 及行為者 ID (若有)。

5. Total active and reactive energy transferred to the EV.
6. Total active and reactive energy transferred from the EV.
7. Timestamp at the end of the energy transfer loop.
8. EMAIDs and actors IDs involved (if any).

— V2G 會談中斷旗標，其指示於電能傳送循環期間發生否定之合理性檢查。

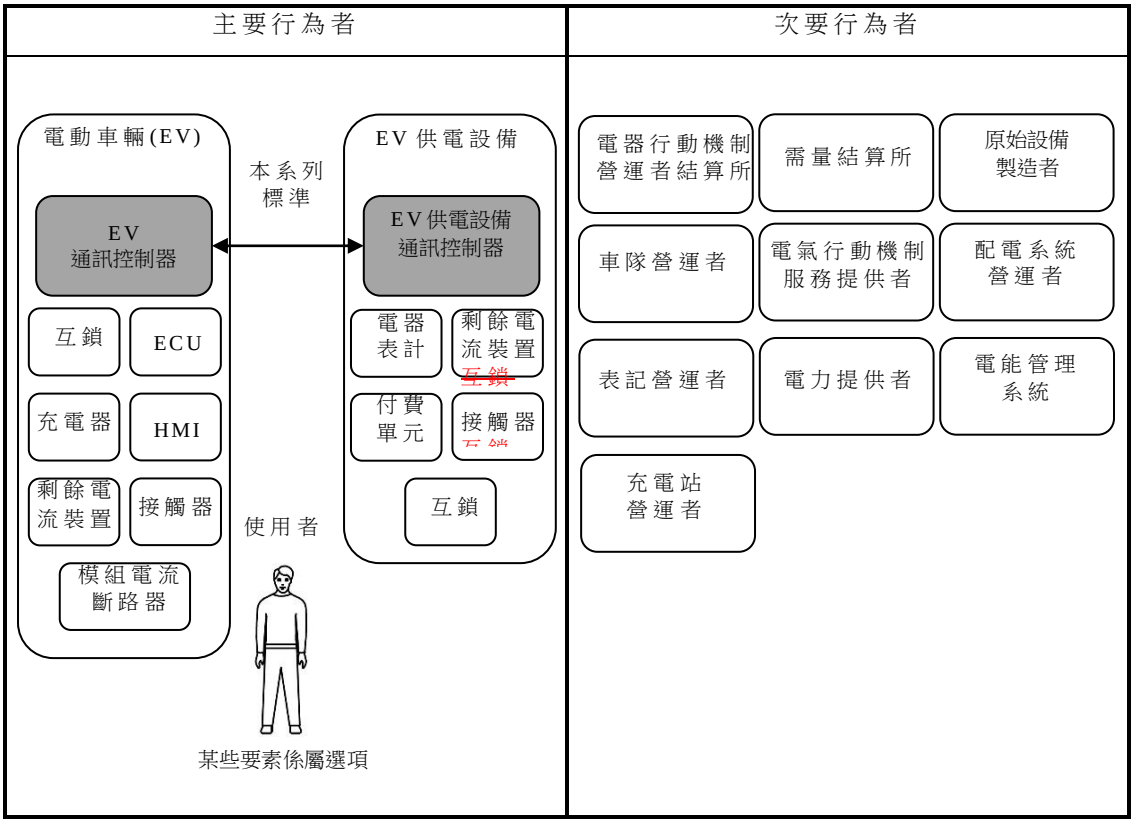
— V2G session interruption flag indicating that a negative plausibility check occurred during the energy transfer loop.

## 6. 行為者

## 6 Actors

圖 2 顯示可能直接或間接涉及本系列標準電能傳送程序之所有主要行為者及次要行為者。第 7 節中之使用案例元件描述將於適用的情況下包含該等行為者及功能。

Figure 2 shows all primary and secondary actors that may be involved directly or indirectly in the energy transfer procedure of the ISO 15118 series. The use case element descriptions in Clause 7 will incorporate, where applicable, those actors and functions.




| Primary actors　主要行為者 |
|---|


圖 2 總體情境中之行為者示例概觀

Figure 2 − Overview with examples of participating actors in the overall scenario

主要行為者直接涉及電能傳送過程。EVCC 與 SECC 間之資訊流應依 CNS 13204 之開放系統互連(OSI)參考模型的所有層規定之。

Primary actors are directly involved in the energy transfer process. The information flow between the EVCC and the SECC shall be specified according to all layers of the Open Systems Interconnection (OSI) reference model in accordance with ISO 7498.

USER 於使用充電基礎設施對 EV 進行充電或放電之整個過程中扮演重要角色。為實作 EV 供電設備，瞭解此角色以及電能傳送系統與車輛 USER 間之互動至關重

要。然而，建立與 USER 行為相關之要求事項不屬本標準範圍內。若於本標準中使用語〝USER〞作為要求之主題，則更多的是為標準的實作者提供指引，而非定義 USER 之確切行為。

The USER plays an important role in the full context of charging or discharging EVs using the charging infrastructure. For implementing the EV supply equipment, it is crucial to understand this role and the interactions between the energy transfer system and the vehicle USER. However, it is out of scope of this document to establish requirements relative to USER behaviour. If the term “USER” is used in this document as the subject of a requirement, it is more to provide guidance for the implementer of the document than to define the exact behaviour of the USER.

儘管本標準未規定主要行為者與次要行為者間之協定，但訊息係定義於本系列標準第 2 部及第 20 部中，其中包含於此等行為者間交換資料的元件。

Although this document does not specify the protocol between the primary actors and a secondary actor, there are messages defined in ISO 15118-2 and ISO 15118-20 which include elements to exchange data between these actors.

備考 1. 由於向 EVCC 提供電能傳送過程所需之資訊，次要行為者能涉及電能傳送過程。次要行為者能向 SECC 提供電能傳送過程所需之任何資訊。若要求，部分資訊可於 V2G 通訊會談期間自 SECC 傳送予 EVCC。取決於使用案例元件，其能涉及，但本系列標準中未描述特定關係。由於國家特定之特點，向 SECC 提供資訊能由金融及需量結算所及表計營運者等中心化行為者為之，亦可直接由次要行為者(亦即 EP、配電系統營運者、EMS、EMSP)為之。

NOTE 1 Secondary actors can be involved in the energy transfer process due to supplying information to the EVCC needed for the energy transfer process. Secondary actors can supply to the SECC any information needed for the energy transfer process. If needed, part of this information can be transferred to the EVCC by the SECC during the V2G communication session. Depending on the use case element, they can be involved but a specific relation is not described in the ISO 15118 series. Due to country-specific characteristics, the supply of information to the SECC can be done by centralised actors such as the financial and demand clearing house and meter operator, or directly by secondary actors i.e. EP, distribution system operator, EMS, EMSP.

備考 2. 並非所有主要行為者有必要位於 EV 供電設備內。

NOTE 2 Not all primary actors are necessarily located within the EV supply equipment.

## 7. 使用案例元件

### 7.1 一般

## 7 Use case elements

### 7.1 General

本節描述 EVCC 與 SECC 間通訊所必要使用案例元件，以便於 V2G 通訊序列之前及期間授權、起動、管理及終止電能傳送。本系列標準第 2 部、第 20 部、第 3 部及第 8 部中定義完成經識別使用案例的通訊。若無論 EV 或 EV 供電設備皆無任何 HLC 裝置，則適用基本信令。

This clause describes the use case elements necessary for the communication between the EVCC and the SECC in order to authorize, start, manage and terminate the energy transfer before and during a V2G communication sequence. The communication to accomplish the identified use cases is defined in ISO 15118-2, ISO 15118-20, ISO 15118-3 and ISO 15118-8. If neither the EV nor the EV supply equipment have any HLC device, basic signalling applies.

為 EV 充電或放電係要求 10 個基本使用案例功能群組之過程(參照表 2)。針對各功能群組，可能有數個基本使用案例。各使用案例宜為基本使用案例之組合(參照附錄 C)。

Charging or discharging an EV is a process that requires ten functional groups of elementary use cases (see Table 2). For each functional group, several elementary use cases are possible. Each use case should be a combination of elementary use cases (see Annex C).

相較於 ISO 15118-1:2013，無線通訊引入與配對、精細定位及 ACD 鏈接之 2 個新功能群組。為保持既存之功能字母[A-H]不變，針對配對及精細定位定義新的字母[P]。字母[I]亦用於 ACD。

Compared to ISO 15118-1:2013, wireless communication introduces two new functional groups linked to pairing and fine positioning and ACD. In order to keep the existing functional letter [A-H] unchanged, a new letter [P] has been defined for pairing and fine positioning. Also letter [I] is used for ACD.

本標準中提及所有可能之基本使用案例：

a. 通訊會談之起動：EV 及 EV 供電設備通訊會談的啟動。其為進行中之序列設定基礎，例：PLC 通訊插接、無線通訊 SECC 發現、PWM 可用性、HLC。

All possible elementary use cases are mentioned in the document:

a. Start of communication session: initiation of the EV and the EV supply equipment communication session. It sets the basis for the on-going sequences e.g. plug-in for PLC communication, discovery of the SECC for wireless communication, availability of PWM, HLC etc.;

b. 通訊設置：建立 EVCC 與 SECC 間之關聯及相關的連接。

c. 憑證處置：與憑證相關之所有事物。

b. Communication set-up: establishes the association and relevant connection between the EVCC and the SECC;

c. Certificate handling: everything related to certificates;

d. 識別及授權：識別及授權之方法。

p. 配對及精細定位：配對及 WPT 所需之特定元件。

d. Identification and authorization: methods for identification and authorization;

p. Pairing and fine positioning: specific element needed for pairing and WPT;

e. 標的設定及電能傳送排程：自 EV 以及自 SECC 及次要行為者起動電能傳送過程所需之資訊。

e. Target setting and energy transfer scheduling: information needed from the EV as well as from the SECC and the secondary actor to start the energy transfer process;

f. 電力潮流控制及重新排程：電能傳送過程中之元件。

g. 加值服務。

f. Power flow controlling and re-scheduling: elements during the energy transfer;

g. Value-added services;

h. 電能傳送期間結束：用以發出電能傳送結束信令之觸發者。

i. ACD 連接/解連。

h. End of energy transfer period: triggers for signalling the end of the energy transfer;

i. ACD connect/disconnect.

取決於 EV 供電設備、EV 或用於電能傳送過程之營運案例，存在使用案例實作的變異。

表 1 提供依功能分群之所有使用案例元件的概觀。附錄 C 中列表現例。

Variations of use case implementations exist, depending on the EV supply equipment, the EV or the business case used for the energy transfer process.

Table 1 provides an overview of all use case elements grouped by function. Examples are listed in Annex C.

表 1　使用案例元件功能群組

Table 1 – Use case elements function groups

| 使用案例元件功能<br>Use case element function | 說明<br>Description |
|---|---|
| A | 通訊會談之起動。<br>Start of communication session |
| B | 通訊設置。<br>Communication set-up |
| C | 憑證處置。<br>Certificate handling |
| D | 識別、鑑別及授權。<br>Identification, authentication and authorization |

| | |
|---|---|
| P | 配對及精細定位。<br>Pairing and fine positioning |
| E | 標的設定及電能傳送排程。<br>Target setting and energy transfer scheduling |
| F | 電能傳送控制及重新排程。<br>Energy transfer controlling and re-scheduling |
| G | 加值服務。<br>Value-added services |
| H | 電能傳送期間之結束。<br>End of energy transfer period |
| I | ACD 連接/解連<br>ACD connect/disconnect |

備考：該等群組未規定使用案例元件之實作次序，或哪些元件係屬要求者或選項。

NOTE The groups do not specify the order in which the use case elements will be implemented, or which elements are required or optional.

## 7.2 任務群組

### 7.2 Task groups

完整之充電或放電情境分離為任務群組，以容許對基本使用案例加以分類(參照表2)。針對各任務群組，可能有數個基本使用案例。各使用案例能為基本使用案例之組合。以〝W〞起始之任務群組特定於無線通訊(表 2 中之灰色區)。

The complete charging or discharging scenario is separated into task groups to allow the classification of the elementary use cases (see Table 2). For each task group, several elementary use cases are possible. Each use case can be a combination of elementary use cases. Task groups starting with "W" are specific to wireless communication (in grey in Table 2).

備考：出於與 ISO 15118-1:2013 相容之故，E3 不再存在。於本系列標準之所有各部中，使用案例 E3 將參引使用案例 E2。

NOTE For compatibility reasons with ISO 15118-1:2013, E3 does not exist anymore. In all parts in the ISO 15118 series, use case E3 will refer to use case E2.

表 2　使用案例元建之概觀

Table 2 − Overview of elements of use cases

| 傳導任務群組<br>Conductive task group | 無線任務群組<br>Wireless task group | 使用案例編號<br>Use case No. | 使用案例元件名稱<br>Use case element name |
|---|---|---|---|
| A | | A1 | Plug-in and forced high-level communication (插接及強制高層通訊) |
| | | A2 | Plug-in with concurrent IEC 61851-1 and high-level communication (具現行 IEC 61851-1 及高層通訊之插接) |
| | WA | WA1 | discovery with reservation (具預約之發現) |
| | | WA2 | Manual or automatic discovery without reservation (未預約之手動或自動發現) |
| B | | B1 | EVCC/SECC conductive communication set-up (EVCC/SECC 傳導式通訊設置) |
| | WB | WB1 | EVCC/SECC wireless communication set-up (EVCC/SECC 無線通訊設置) |
| C | | C1 | Certificate update (憑證更新) |
| | | C2 | Certificate installation (憑證安裝) |
| D | | D1 | Authorization using contract certificates performed at the EV supply equipment (於 EV 供電設備處使用契約憑證履行授權) |
| | | D2 | Authorization using contract certificates performed with the help of an SA (以 SA 協助使用契約憑證履行授權) |
| | | D3 | Authorization at EV supply equipment using external credentials performed at the EV supply equipment (於 EV 供電設備處履行使用外部憑證於 EV 供電設備處授權) |
| | | D4 | Authorization at EV supply equipment using external credentials performed with the help of an SA (以 SA 協助履行使用外部憑證於 EV 供電設備處授權) |
| | WD | WD1 | Authentication with prior reservation (以先前預約鑑別) |
| P | WP | | Pairing and fine positioning (配對及精細定位) |
| | | WP1 | WPT fine positioning (WPT 精細定位) |
| | | WP2 | WPT fine positioning without communication support (無通訊支援之 WPT 精細定位) |
| | | WP3 | Conductive power transfer pairing (傳導性電力傳 |

| | | | |
|---|---|---|---|
| | | | 送配對) |
| | | WP4 | WPT pairing (WPT 配對) |
| E | | E1 | AC charging with load levelling based on HLC (依 HLC 之負載平衡 AC 充電) |
| | WE | WE1 | WPT target setting and energy transfer scheduling (WPT 標的設定及電能轉送排程) |
| | | E2 | Optimized charging with scheduling to secondary actor (以對次要行為者排程最佳化充電) |
| | | E3 | Reserved (保留) |
| | | E4 | DC charging with load levelling based on high-level communication (具依高層通訊之負載平衡的 DC 充電) |
| | | E5 | Resume to authorized charge schedule (經授權充電排程之再續) |
| | | E6 | Reverse power transfer with load levelling based on HLC (具依 HLC 負載平衡之反向電力傳送) |
| | | E7 | Reverse power transfer on stand-alone operation (分離運作時之反向電力傳送) |
| | | E8 | Fast responding energy transfer services based on dynamic control mode (依動態控制模式之快速回應電力傳送服務) |
| | | E9 | Managed bidirectional power transfer into the grid (受管理雙向電力傳送進入電網) |
| F | | F0 | Energy transfer loop (電能傳送循環) |
| | | F1 | Energy transfer loop with metering information exchange (具計量資訊交換之電能傳送循環) |
| | WF | WF1 | WPT charging loop (WPT 充電循環) |
| | | F2 | Energy transfer loop with interrupt from the SECC (具源自 SECC 中斷之電能傳送循環) |
| | | F3 | Energy transfer loop with interrupt from the EVCC or user (具源自 EVCC 或使用者中斷之電能傳送循環) |
| | | F4 | Energy transfer control based on dynamic control mode (依動態控制模式之電能傳送控制) |
| G | | G1 | Value added services (加值服務) |
| | WG | WG1 | ACD system status check (ACD 系統狀態檢查) |
| | | G2 | Energy transfer details (電能傳送細節) |
| H | | H1 | End of energy transfer period (電能傳送期間結束) |
| | WH | WH1 | WPT end of energy transfer (電能傳送 WPT 結束) |

| | | | |
|---|---|---|---|
| I | WI | WI1 | ACD connect/disconnect (ACD 連接/解連) |

**7.3 任務群組說明**

**7.3.1 通訊過程[A]之起動**

**7.3.1.1 一般**

**7.3 Task groups description**

**7.3.1 Start of communication process [A]**

**7.3.1.1 General**

第 1 群組使用案例 A 參引表 2 中詳述之 4 個元件。

The first group of use case A refers to 4 elements detailed in Table 2.

前 2 個元件係針對傳導式通訊(conductive communication)：

- A1：插接及強制高層通訊。
- A2：插接及並行 IEC 61851-1 與 HLC。

後 2 個則針對無線通訊：

- WA1：具預約之發現。
- WA2：未預約之發現。

The first two elements are for conductive communication:

- A1: Plug-in and forced high-level communication; and
- A2: Plug-in and concurrent IEC 61851-1 and HLC.

The last two are for wireless communication:

- WA1: discovery with reservation; and
- WA2: discovery without reservation.

**7.3.1.2 組合及通訊能力**

**7.3.1.2 Combinations and communication capabilities**

若 EV 供電設備實作 HLC，則發生下列 2 種情況：

The following two cases occur if an EV supply equipment implements HLC:

- (A1) EV 供電設備所要求之 HLC，PWM 信號(依 IEC 61851-1)為 5 %，EV 供電設備將不提供電力予未支援 HLC 之 EV。
- A1) HLC required by the EV supply equipment, the PWM signal (according to IEC 61851-1) at 5 %, the EV supply equipment will not provide power to EVs that do not support HLC; and
- (A2) HLC 選項，EV 供電設備甚至將提供電力予該等未支援 HLC 之 EV。
- A2) HLC optional, the EV supply equipment will provide power even to those EVs that do not support HLC.

表 3 顯示 EV 供電設備與支援或未支援 HLC 之 EV 的不同組合，以及如何處理此等案例。

Table 3 shows the different combinations of the EV supply equipment and EVs that do, or do not, support HLC and how these cases are treated.

表 3　EV 與 EV 供電設備通訊能力之組合

Table 3 − Combinations of EV and EV supply equipment communication capabilities

| | 未實作本系列標準之 EV<br>EV ISO 15118 not implemented | 未要求但實作本系列標準之 EV<br>EV ISO 15118 implemented, not required | 已實作且要求本系列標準之 EV<br>EV ISO 15118 implemented and required |
|---|---|---|---|
| 未實作本系列標準供電設備之 EV 15118 [a]<br>EV supply equipment ISO 15118 not implemented [a] | 依基本信令充電－不屬本系列標準範圍內。<br>Charging according basic signalling – not inside the scope of the ISO 15118 series. | EV 側上使用案例元件 A1、A2、WA1 及 WA2 之未成功結束狀況。未建立 HLC。依不屬本系列標準範圍內之基本信令充電。<br>Failure end condition of use case element A1, A2, WA1 and WA2 on EV side. No establishment of HLC. Charging according basic signalling out of scope of the ISO 15118 series. | EV 側上使用案例元件 A1、A2、WA1 及 WA2 之未成功結束狀況。電能傳送係屬不可能。<br>Failure end condition of use case element A1, A2, WA1 and WA2 on EV side. Energy transfer is not possible. |
| 未要求但實作本系列標準之 EV [b]<br>EV supply equipment ISO 15118 implemented, not required [b] | EV 供電設備側上使用案例元件 A1、A2、WA1 及 WA2 之未成功結束狀況。未建立 HLC。依基本信令充電－不屬本系列標準範圍內。<br>Failure end condition of use case element A1, A2, WA1 and WA2 on EV supply equipment side. No establishment of HLC. Charging according basic signalling – out of scope of the ISO 15118 series. | 參照案例元件 A1、A2、WA1 及 WA2。<br>See use case element A1, A2, WA1, WA2. | 參照案例元件 A1、A2、WA1 及 WA2。<br>See use case element A1, WA1 and WA2. |
| 已實作且要求本系列標準之 EV [c]<br>EV supply equipment ISO 15118 implemented and required [c] | EV 供電設備側上使用案例元件 A1、WA1 及 WA2 之未成功結束狀況。無法充電。<br>Failure end condition of use case element A1, WA1 and WA2 on EV supply equipment side. Charging is not possible. | 參照案例元件 A1、WA1 及 WA2。<br>See use case element A1, WA1 and WA2. | 參照案例元件 A1、WA1 及 WA2。<br>See use case element A1, WA1 and WA2. |

備考：　本系統標準第 2 部及第 20 部描述關於訊息流及互動之序列圖。本系統標準第 3 部中描述關於本標準與本系統標準間互連之時序圖。

NOTE Sequence diagrams about message flow and interaction are described in ISO 15118-2 and ISO 15118-20. A timing diagram about the interconnection between IEC 61851-1 and the ISO 15118 series is described in ISO 15118-3.

註[a]　該功能性不可用。

The functionality is not available.

(b) 該功能性可用；若對方亦已實作該功能性，則該使用適用。

The functionality is available; the usage applies, if the counterpart has the functionality implemented as well.

(c) 該功能性可用，強制使用。若於對方處該功能性不可用，則無法充電。

The functionality is available, the usage enforced. If the functionality is not available at the counterpart, charging is not possible.

### 7.3.2 插接及強制 HLC

### 7.3.2 Plug-in and forced HLC

表 4　插接及強制 HLC

Table 4 − Plug in and forced HLC

| 編號<br>No. | 型式<br>Type | 說明<br>Description |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 插接及強制 HLC (遵循 IEC 61851-1 之本系列標準)。<br>Plug-in and forced HLC (the ISO 15118 series in compliance with IEC 61851-1) |
| 2 | 使用案例元件 ID (Use case element ID) | A1 |
| 3 | 目標(Objectives) | 於使用者插接後建立 HLC。<br>Establishing of HLC after the user plugs in. |
| 4 | 說明(Description) | 此使用案例涵蓋源自 EV 供電設備之初始 PWM 信令(IEC 61851-1)，為要求 HLC 及模式 3/模式 4 充電，任務週期為 5 %。<br>This use case covers the initial PWM signalling (IEC 61851-1) from the EV supply equipment, with a 5 % duty cycle in order to require HLC and mode 3/mode 4 charging.<br>所涉及之行為者為：<br>− 主要行為者：EV、EV 供電設備、EVCC、SECC。<br>The actors involved are:<br>− Primary actors: EV, EV supply equipment, EVCC, SECC.<br>情境說明：<br>− 連接 EV 與 EV 供電設備間之電纜。<br>− EV 供電設備指示 5 % PWM 任務週期。 |

| | | |
|---|---|---|
| | | — EV 解譯 PWM 任務週期。<br>— EVCC 及 SECC 建立實體及資料鏈路層連接(詳細序列定義於本系列標準第 3 部中)。<br>— 通訊設置(使用案例功能群組 B)有能力起動。<br>Scenario description:<br>— Connect the cable between the EV and EV supply equipment;<br>— The EV supply equipment indicates a 5 % PWM duty cycle;<br>— The EV interprets the PWM duty cycle;<br>— The EVCC and the SECC establish the physical and data link layer connection (The detailed sequence is defined in ISO 15118-3); and<br>— Communication set-up (use case function group B) is able to start. |
| 5 | 先決條件( Prerequisites) | — EV 應以適當電纜實體連接至 EV 供電設備。<br>— EV 及 EV 供電設備要求依 IEC 61851-1 之引 導功能及基本信令。<br>— EV 及 EV 供電設備應具依本系列標準第 2 部及第 3 部之較高層通訊裝置。<br>— The EV shall be connected physically to the EV supply equipment with the appropriate cable.<br>— The EV and EV supply equipment require pilot function and basic signalling in accordance with IEC 61851-1.<br>— The EV and EV supply equipment shall have a higher level communication device in accordance with ISO 15118-2 and ISO 15118-3. |
| 6 | 要求事項(Requirements) | — 於資料鏈路層成功地建立 HLC。<br>— 初始化過程之時序應依本系列標準第 3 部。<br>— Successful set-up of HLC at the data link layer.<br>— Timing for the initialization process shall be according to ISO 15118-3.<br>— 觸發者：<br>— EV 供電設備：EV 與 EV 供電設備正確連接。<br>— 針對 EV：插頭表現及依 IEC 61851-1 所要求指示 HLC 之 PWM 任務週期。 |

| | | |
|---|---|---|
| | | — Triggers:<br>– for the EV supply equipment: The EV is connected properly to the EV supply equipment; and<br>– for the EV: Plug present and PWM duty cycle indicating HLC required according to IEC 61851-1. |
| 7 | 結束狀況 (End conditions) | 成功結束情況：<br>— 於資料鏈路層成功地建立 HLC。<br>Success end conditions:<br>— Successful set-up of HLC at the data link layer.<br>未成功結束情況：<br>— 於資料鏈路層未建立 HLC 或 PWM 信令失效。<br>— SECC及EVCC未正確關聯或於繫結過程中發生逾時。<br>Failure end conditions:<br>— No establishment of HLC at the data link layer or failure of the PWM signal.<br>— No correct association of SECC and EVCC or timeout in the binding process occurs. |

### 7.3.3 WA1：具預約之發現

### 7.3.3 WA1: discovery with reservation

表 5　具預約之發現

Table 5 − discovery with reservation

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具預約之發現。<br>Discovery with reservation |
| 2 | 使用案例元件 ID (Use case element ID) | WA1 |
| 3 | 目標 (Objectives) | 此使用案例之目的為藉由負責預約的營運者所接收之訊息自動地發現 SECC。<br>The goal of this use case is to automatically discover the SECC based on the information received by the operator in charge of reservation. |
| 4 | 說明( Description) | 駕駛者依鏈結預約 ID 之資訊選擇正確的 SECC ID。若 SECC ID 已儲存於應用記憶體中(例：當其係納入預約回應或於到達該場所時指派)，則該應用自動代表駕駛者選擇正確之 SECC ID。<br>所涉及之主要行為者為：USER、EVCC、SECC。<br>The driver selects the right SECC ID according to the information linked to the reservation ID. If the SECC ID is already stored in the application memory, e.g. as it was included in the reservation response or assigned upon arrival at the site, the application automatically selects the right SECC ID on behalf of the driver.<br>Primary actors involved are: USER, EVCC, SECC. |
| 5 | 先決條件 (Prerequisites) | EV 正接近充電場所區域。EVCC 無線介面係於 SECC 無線介面之範圍內。<br>駕駛者已預約 EV 供電設備且已接收有效之預約 ID。<br>例： 此預約 ID 已通過 ETSI TS 101 556-3 中所規定之預約協定而獲得。預約 ID 之格式可能為文數字。<br>An EV is approaching a charging site area. The EVCC wireless interface is in the range of the SECC wireless interface.<br>The driver has reserved an EV supply equipment and has received a valid reservation ID.<br>As an example, this reservation ID could have been obtained through a reservation protocol as specified in ETSI TS 101 556-3. The format of the reservation ID may be alphanumerical. |
| 6 | 要求事項 (Requirements) | EVCC 及 SECC 以遵循本系列標準第 8 部之主動無線介面為特徵。<br>於範圍內時，適當之顯示器(能為車載 EV 系統或如 |

| | | |
|---|---|---|
| | | 智慧型手機的獨立系統)顯示目前廣播其 ID 之所有本地 SECC 的表列。<br>EVCC and SECC feature active wireless interfaces complying with ISO 15118-8.<br>When in range, the appropriate display (could be an on-board EV system or an independent system like a smartphone) shows the list of all local SECCs currently broadcasting their ID. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ 成功地發現 SECC。<br>Success end conditions:<br>－ Successful SECC discovery.<br>未成功結束狀況：<br>－ 表列中之 SECC 未對應於預約時所接收的 SECC ID。<br>－ 由駕駛者或應用中止發現。<br>－ 預約未匹配或逾期。<br>Failure end conditions:<br>－ SECCs in the list do not correspond to the SECC ID received during reservation;<br>－ discovery aborted by the driver or application; and<br>－ reservation mismatch or expiration. |

### 7.3.4 具併行 IEC 61851-1 及 HLC 之插接

### 7.3.4 Plug-in with concurrent IEC 61851-1 and HLC

表 6 具並行 IEC 61851-1 及 HLC 之插接

Table 6 − Plug-in with concurrent IEC 61851-1 and HLC

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具並行 IEC 61851-1 及 HLC 之插接。<br>Plug-in with concurrent IEC 61851-1 and HLC |
| 2 | 使用案例元件 ID ( Use case element ID) | A2 |
| 3 | 目標(Objectives) | 與 IEC 61851-1 模式 3 充電並行地建立 HLC。<br>Establish HLC concurrently with IEC 61851-1 mode 3 charging. |
| 4 | 說明(Description) | 此使用案例涵蓋源自 EV 供電設備之初始基本信令(IEC 61851-1)，以及並行工作的高層通訊及模式 3 |

| | | |
|---|---|---|
| | | 充電。<br>備考： 若 HLC 未成功，則 CSO 能依 IEC 61851-1，藉由啟用充電提供落回解決方案。<br>This use case covers the initial basic signalling (IEC 61851–1) from the EV supply equipment and high-level communication working concurrently and mode 3 charging.<br>NOTE CSO can offer a fall-back solution if HLC fails by enabling charging according to IEC 61851–1.<br>所涉及之行為者為：<br>－ 主要行為者：EV、EV 供電設備、EVCC 及 SECC。<br>The actors involved are:<br>－ Primary actors: EV, EV supply equipment, EVCC, SECC.<br>情境說明：<br>－ 插接 EV 與 EV 供電設備間之電纜。<br>－ EV 供電設備設定指示 HLC 所要求之 5%任務週期。<br>－ EV 將 PWM 任務週期解譯為安全信號。<br>－ EVCC 及 SECC 建立實體層及資料鏈路層連接(詳細序列定義於本系列標準第 3 部中)。<br>－ 通訊設置(使用案例功能群組 B)有能力起動。<br>Scenario description:<br>－ plug-in the cable between the EV and EV supply equipment;<br>－ the EV supply equipment sets a duty cycle of 5 % indicating that HLC is required;<br>－ the EV interprets the PWM duty cycle as a safety signal;<br>－ the EVCC and SECC establish the physical and data link layer connection (The detailed sequence is defined in ISO 15118-3); and<br>－ Communication set-up (use case function group B) is able to start. |
| 5 | 先決條件(Prerequisites) | －　EV 應以適當之電纜實體地插接 EV 供電設備。<br>－　EV 及 EV 供電設備要求基本信令。<br>－　EV 及 EV 供電設備應依本系列標準第 2 部及第 3 部，具較高層通訊裝置。 |

| | | |
|---|---|---|
| | | — The EV shall be plugged physically to the EV supply equipment with the appropriate cable.<br>— The EV and EV supply equipment require basic signalling.<br>— The EV and EV supply equipment shall have a higher level communication device in accordance with ISO 15118-2 and ISO 15118-3. |
| 6 | 要求事項(Requirements) | — 於資料鏈路層成功地建立 HLC。<br>— 初始化過程之時序應依本系列標準第 3 部。<br>— Successful set up of HLC at the data link layer.<br>— Timing for the initialization process shall be according to ISO 15118-3.<br>— 觸發者：<br>— 針對 EV 供電設備：EV 係正確地連接至 EV 供電設備。<br>— 針對 EV：插頭表現應依 IEC 61851-1。<br>— Triggers:<br>– For the EV supply equipment: The EV is connected properly to the EV supply equipment; and<br>– For the EV: Plug present shall be according IEC 61851-1. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 於資料鏈路層成功地設置 HLC。<br>Success end conditions:<br>— Successful set-up of HLC at the data link layer.<br>未成功結束狀況：<br>— 於資料鏈路層未建立 HLC。<br>— PWM 信號未成功。<br>— SECC 與 EVCC 未正確關聯或於繫結過程中發生逾時。<br>Failure end conditions:<br>— no establishment of HLC at the data link layer;<br>— failure of the PWM signal; and<br>— no correct association of the SECC and the EVCC or timeout in the binding process occurs. |

**7.3.5 WA2：未預約之發現**

**7.3.5 WA2: discovery without reservation**

表 7　未預約之發現

Table 7 − discovery without reservation

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | 未預約之發現。<br>Discovery without reservation |
| 2 | 使用案例元件 ID (Use case element ID) | WA2 |
| 3 | 目標 (Objectives) | 此元件之目的為手動或自動選擇 SECC。<br>The goal of this element is to select manually or automatically an SECC. |
| 4 | 說明 (Description) | 駕駛者選取與其充電地點選擇相關之 1 個 SECC ID。(若 SECC ID 已儲存於應用記憶體中，則應用將自動代表駕駛者選擇正確之 SECC ID)。假設若要求通行碼，則由 CSO 或 EMSP 於本地將其提供予駕駛者。<br>所涉及之主要行為者為：USER、EV 供電設備、SECC。<br>所涉及之次要行為者為：CSO、EMSP、DCH。<br>The driver selects one SECC ID in relation with its charging site choice (if the SECC's ID is already stored in the application memory, the application automatically selects the right SECC's ID on behalf of the driver). It is assumed that if a password is required, it is given to the driver locally by the CSO or by the EMSP.<br>Primary actors involved are: USER, EV supply equipment, SECC.<br>Secondary actors involved are: CSO, EMSP, DCH. |
| 5 | 先決條件(Prerequisites) | EV 正接近充電場所區域。EVCC 無線介面於 SECC 無線介面之範圍內。<br>An EV is approaching a charging site area. The EVCC wireless interface is in range of The SECC wireless interface. |
| 6 | 要求事項 (Requirements) | EVCC 及 SECC 以遵循本系列標準第 8 部要求事項之主動無線介面為特徵。<br>於範圍內時，適當之顯示器(能為車載 EV 系統或如智慧型手機的獨立系統)顯示目前廣播其 ID 的所有本地 SECC 之列表。<br>EVCC and SECC feature active wireless interfaces complying with ISO 15118-8 requirements.<br>When in range, the appropriate display (could be an on-board EV system or an independent system like a smartphone) shows the list of all local |

| | | |
|---|---|---|
| | | SECCs currently broadcasting their ID. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ 成功地發現 SECC。<br>－ Successful SECC discovery.<br>未成功結束狀況：<br>－ 列表中之 SECC 未對應駕駛者的優選。<br>－ 由駕駛者或應用中止發現。<br>－ SECCs in the list do not correspond to the driver's preferred choice; and<br>－ discovery aborted by the driver or application. |

### 7.4 通訊設置[B]

### 7.4.1 EVCC/SECC 傳導式通訊設置

### 7.4 Communication set-up [B]

### 7.4.1 EVCC/SECC conductive communication set-up

表 8 EVCC/SECC 通訊設置

Table 8 – EVCC/SECC communication set-up

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | EVCC/SECC 傳導式通訊設置。<br>EVCC/SECC conductive communication set-up |
| 2 | 使用案例元件 ID (Use case element ID) | B1 |
| 3 | 目標 (Objectives) | 此使用案例元件之目的係於 EVCC 與 SECC 間建立通訊鏈路且正確地關聯。<br>The goal of this use case element is to establish a communication link between the EVCC and the SECC and a correct association. |
| 4 | 說明(Description) | 主要行為者為 SECC 及 EVCC。EVCC 與 SECC 於應用層間無資訊交換。<br>所涉及之行為者為：<br>－主要行為者：EVCC、SECC。<br>The primary actors are the SECC and the EVCC. There is no information exchange between the EVCC and the SECC at the application layer.<br>The actors involved are:<br>－ Primary actors: EVCC, SECC. |

| | | |
|---|---|---|
| 5 | 先決條件 (Prerequisites) | 應成功地依使用案例元件 A1 或 A2 建立插接流程。<br><br>Plug-in process according to use case elements A1 or A2 shall be established successfully. |
| 6 | 要求事項 (Requirements) | SECC 與 EVCC 應有能力 1 對 1 關聯。<br><br>— EVCC 應藉由本系列標準第 2 部或第 20 部中所述之協定繫結至 SECC。<br><br>— 此繫結之時序應與由本系列標準第 2 部或第 20 部所述的要求事項一致。<br><br>— EVCC 及 SECC 應交換關於所支援之本系列標準第 2 部或第 20 部協定版本的資訊，並使用最新的通用協定版本。<br><br>The SECC and EVCC shall be capable of being associated one-to-one.<br><br>— The EVCC shall be bound to the SECC by the protocol described in ISO 15118-2 or ISO 15118-20.<br><br>— The timing of this binding shall be in line with the requirements given by ISO 15118-2 or ISO 15118-20.<br><br>— The EVCC and the SECC shall exchange information about the supported ISO 15118-2 or ISO 15118-20 protocol versions and use the latest common protocol version. |
| 7 | 結束狀況 (End conditions) | 成功結束狀況：<br><br>— SECC 與 EVCC 正確關聯並繫結，亦即 EVCC 有能力依所協商之本系列標準第 2 部或第 20 部協定版本於應用層向 SECC 發送第 1 個請求。<br><br>— The SECC and the EVCC are associated and bound correctly, i.e. the EVCC is able to send the first request to the SECC on the application layer according to the negotiated ISO 15118-2 or ISO 15118-20 protocol version.<br><br>未成功結束狀況：<br><br>— 本系列標準第 2 部或第 20 部協定版本之協商未成功。<br><br>— Negotiation of the ISO 15118-2 or ISO 15118-20 protocol version failed. |

### 7.4.2 WB1：EVCC/SECC 無線通訊設置

### 7.4.2 WB1: EVCC/SECC wireless communication set-up

表 9 EVCC/SECC 無線通訊設置

Table 9 − EVCC/SECC wireless communication set-up

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | EVCC/SECC 無線通訊設置。<br>EVCC/SECC wireless communication set-up |
| 2 | 使用案例元件 ID (Use case element ID) | WB1 |
| 3 | 目標 (Objectives) | 此使用案例元件之目的係於 EVCC 與 SECC 間建立無線通訊鏈路且正確地關聯。<br>The goal of this use case element is to establish a wireless communication link between the EVCC and the SECC and a correct association. |
| 4 | 說明(Description) | EVCC 與 SECC 間之無線通訊鏈路的建立，詳述於本系列標準第 8 部中。<br>所涉及之主要行為者為：EVCC、SECC。<br>Establishment of the wireless communication link between the EVCC and the SECC is detailed in ISO 15118-8.<br>Primary actors involved are: EVCC, SECC. |
| 5 | 先決條件 (Prerequisites) | 依 WA1 或 WA2 之發現應成功地建立。<br>Discovery according to WA1 or WA2 shall be established successfully. |
| 6 | 要求事項(Requirements) | − SECC 應有能力與 EVCC 關聯。<br>− EVCC 應藉由本系列標準第 20 部及第 8 部中所描述之協定及時序與 SECC 繫結。<br>− EVCC 及 SECC 應交換關於本系列標準第 8 部所支援之協定版本的資訊，並使用最新通用協定版本。<br>− The SECC and EVCC shall be capable of being associated.<br>− The EVCC shall be bound with the SECC by the protocol and timings described in ISO 15118-20 and ISO 15118-8.<br>− EVCC and SECC shall exchange information about the supported ISO 15118-8 protocol version and use the latest common protocol version. |
| 7 | 結束狀況 (End conditions) | 成功結束狀況：<br>− SECC 與 EVCC 係正確地關聯並繫結，亦即 EVCC 有能力依本系列標準第 20 部協定於應用層向 SECC 發送第 1 個請求。<br>− The SECC and the EVCC are associated and bound correctly, i.e. the EVCC is able to send the first request to the SECC on the application layer |

| | | |
|---|---|---|
| | | according to the ISO 15118-20 protocol.<br>未成功結束狀況：<br>— 本系列標準第 20 部協定之協商未成功。<br>— Negotiation of the ISO 15118-20 protocol failed. |

**7.5 憑證處置[C]**

**7.5.1 憑證更新**

**7.5 Certificate handling [C]**

**7.5.1 Certificate update**

表 10 憑證更新

Table 10 − Certificate update

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 憑證更新。<br>Certificate update |
| 2 | 使用案例元件 ID (Use case element ID) | C1 |
| 3 | 目標 (Objectives) | 將 EV 中無效或逾期的憑證替換為來自次要行為者之新的有效憑證。<br>Replace the invalid or expired certificate in the EV with a new and valid certificate from the secondary actor. |
| 4 | 說明 (Description) | 此使用案例涵蓋 EV 中無效憑證之更新。因此，EVCC 使用與 SECC 所建立之 HLC 啟動憑證更新過程，來自核發的次要行為者處檢索新憑證。<br>備考 1. 能有替代之通訊路徑進行憑證更新。然而，此等不屬本標準範圍內。<br>備考 2. 逾期憑證是否更求更新取決於 SA 之業務決定。<br>備考 3. 若 SA 不允許更新憑證，則能適用使用案例元件 C2。<br>This use case covers the update of an invalid certificate in the EV. Therefore, the EVCC is initiating a certificate update process using the established HLC with the SECC to retrieve a new certificate from the issuing secondary actor.<br>NOTE 1 There can be alternative communication paths to do a certificate update. However, these are outside the scope of this |

| | | |
|---|---|---|
| | | document.<br><br>NOTE 2 Whether an expired certificate is subject to be updated depends on the business decision of the SA.<br><br>NOTE 3 If there is no permission from the SA to update the certificate, use case element C2 can apply.<br><br>自 SECC 至次要行為者並回傳之憑證更新過程，不屬本標準範圍內。<br><br>所涉及之行為者為：<br><br>－主要行為者：EVCC、SECC。<br><br>－次要行為者：EMOCH、FO、EMSP。<br><br>The certificate update process from the SECC to the secondary actor and back is outside the scope of this document.<br><br>The actors involved are:<br><br>－ Primary actors: EVCC, SECC.<br><br>－ Secondary actors: EMOCH, FO, EMSP.<br><br>情境說明：<br><br>－ EVCC 請求 SECC 更新憑證，提供關於核發憑證之次要行為者的資訊。<br><br>－ SECC 啟用與次要行為者之通訊鏈接，或提供將更新的憑證作為本地複本。<br><br>－ SECC 向包含 EVCC 特定資訊之次要行為者請求 EVCC 的憑證更新。<br><br>－ 核發個體向提出請求之 SECC 提供新憑證。<br><br>－ SECC 將新憑證轉發予 EVCC。<br><br>Scenario description:<br><br>－ The EVCC requests a certificate update by the SECC, providing information about the secondary actor who has issued the certificate.<br><br>－ SECC enables a communication link to the secondary actor or provide the certificates to be updated as a local copy.<br><br>－ SECC requests a certificate update for the EVCC from the secondary actor containing EVCC-specific information.<br><br>－ The issuing entity provides a new certificate to the requesting SECC.<br><br>－ The SECC forwards the new certificate to the EVCC. |

| | | |
|---|---|---|
| 5 | 先決條件(Prerequisites) | － 應成功地建立依使用案例元件 B1 或 WB1 之通訊設置。<br>－ EV (亦即 EVCC)應具電能契約之有效憑證(契約憑證)。<br>－ SECC 與次要行為者間之半線上連接應屬可能，或將更新的憑證應於 SECC 上為可用。<br>－ Communication set-up according to use case element B1 or WB1 shall be established successfully.<br>－ The EV (i.e. EVCC) shall possess a valid certificate for an energy contract (contract certificate).<br>－ Semi-online connection between the SECC and the secondary actor shall be possible or certificates to be updated shall be available on the SECC. |
| 6 | 要求事項 (Requirements) | EVCC 應支援憑證更新過程。SECC 應支援憑證更新過程。<br>觸發者：<br>－ EVCC/SECC 檢測出 EV 之憑證已逾期。<br>－ 剩餘生命期有限。<br>The EVCC shall support the certificate update process. The SECC shall support the certificate update process.<br>Trigger:<br>－ The EVCC/SECC detects that the certificate of the EV has expired.<br>－ Limited remaining lifetime. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ 來自次要行為者之有效憑證(契約憑證)應儲存於 EVCC 中。<br>－ The valid certificate (contract certificate) from the secondary actor shall be stored in the EVCC.<br>未成功結束狀況：<br>－ 由於通訊問題，憑證更新未成功。<br>－ 由於次要行為者拒絕，憑證更新未成功。<br>－ Certificate update failed due to a communication issue. |

| | | |
|---|---|---|
| | | − Certificate update failed due to rejection by the secondary actor. |

### 7.5.2 憑證安裝

### 7.5.2 Certificate installation

表 11　憑證安裝

Table 11 − Certificate installation

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 憑證安裝。<br>Certificate installation |
| 2 | 使用案例元件 ID (Use case element ID) | C2 |
| 3 | 目標(Objectives) | 於 EV 中安裝來自次要行為者之新憑證。<br>Installation of a new certificate from the secondary actor in the EV. |
| 4 | 說明 (Description) | 若此種憑證不可用，或憑證已逾期或無效，則此使用案例涵蓋將憑證(契約憑證)安裝於 EV 中。因此，EVCC 使用與 SECC 建立之 HLC 啟動憑證安裝過程，來自核發的次要行為者處檢索憑證。EV 係藉由使用 OEM 早期(例：於 EV 生產時)安裝之憑證(OEM 供應憑證)加以識別。<br>備考：能有替代之通訊路徑用於憑證更新。然而，此等不屬本標準範圍內。<br>自 SECC 至次要行為者並回傳之憑證安裝/傳送過程，不屬本標準範圍內。<br>This use case covers the installation of a certificate (contract certificate) into the EV if no such certificate is available yet or if it has expired or is invalid. Therefore, the EVCC is initiating a certificate installation process using the established HLC with the SECC to retrieve a certificate from the issuing secondary actor. The EV is identified by using a certificate (OEM provisioning certificate) that was installed by the OEM earlier (e.g. at EV production).<br>NOTE There can be alternative communication paths for doing a certificate installation. However, these are outside the scope of this document.<br>The certificate installation/transfer process from the SECC to the secondary actor and back is outside the scope of this document.<br>所涉及之行為者為：<br>－主要行為者：EVCC、SECC。 |

| | | |
|---|---|---|
| | | －次要行為者：EMOCH、FO、EMSP。<br>The actors involved are:<br>－ Primary actors: EVCC, SECC.<br>－ Secondary actors: EMOCH, FO, EMSP.<br>情境說明：<br>－ EVCC 請求 SECC 安裝憑證。<br>－ SECC 啟用與次要行為者之通訊鏈接，或提供將作為本地複本所安裝的憑證。<br>－ 為此，SECC 須確定與 EV 車輛擁有者簽訂契約之次要行為者。因此，其須將 OEM 提供之憑證(或其 ID)發送至：<br>－ 結算所/所有已知之結算所。<br>－ 優選之次要行為者/所有已知的次要行為者。<br>Scenario description:<br>－ The EVCC requests a certificate installation by the SECC.<br>－ The SECC enables a communication link to the secondary actor or provides the certificates to be installed as local copy.<br>－ For this purpose, the SECC has to identify the secondary actor which has a contract with the owner of the EV.<br>Therefore, it has to send the OEM provisioning certificate (or its ID) to:<br>－ the clearing house / all known clearing houses; and<br>－ the preferred secondary actor / all known secondary actors.<br>對應之契約可能由次要行為者所識別，例：經由開機憑證的憑證 ID。此 ID 於契約建立時自用戶傳送予次要行為者。(首先，OEM 須將此 ID 傳送予用戶，例：於 EV 交付時)。<br>－ SECC 向發覺包含 EVCC 特定資訊(OEM 供應憑證)之次要行為者請求 EVCC 憑證安裝。<br>－ 核發個體應向提出請求之 SECC 提供憑證及對應的私密金鑰。至少須使用舊之 EVCC OEM 供應憑證加密私密金鑰。<br>－ SECC 應將新憑證及對應之(加密的)私密金鑰轉發予 EVCC。<br>The corresponding contract may be identified by |

| | | |
|---|---|---|
| | | the secondary actor, for instance, via the certificate ID of the Bootstrap certificate. This ID is transferred from the customer to the secondary actor at contract creation. (First, the OEM has to transfer this ID to the customer e.g. at EV delivery).<br><br>— The SECC requests a certificate installation for the EVCC from the secondary actor found containing EVCC-specific information (OEM provisioning certificate).<br><br>— The issuing entity shall provide a certificate and the corresponding private key to the requesting SECC. At least the private key has to be encrypted using the old EVCC OEM provisioning certificate.<br><br>— The SECC shall forward the new certificate and the corresponding (encrypted) private key to the EVCC. |
| 5 | 先決條件(Prerequisites) | — 應成功地建立依使用案例元件 B1 之通訊設置。<br><br>— 無契約憑證。EV 中無有效之契約憑證。<br><br>— 由 OEM 所建立之開機憑證於 EV 中係屬可用。<br><br>— SECC 與次要行為者間之線上連接應屬可能，或待更新的憑證應於 SECC 上可用。<br><br>— Communication set-up according to use case element B1 shall be established successfully.<br><br>— No contract certificate resp. no valid contract certificate is available in the EV.<br><br>— A Bootstrap certificate created by the OEM is available in the EV.<br><br>— Online connection between the SECC and the secondary actor shall be possible or certificates to be updated shall be available on the SECC. |
| 6 | 要求事項 (Requirements) | SECC 支援憑證安裝過程。<br><br>SECC 應啟用與次要行為者之通訊鏈接或，提供安裝中的契約憑證作為本地複本。<br><br>The SECC supports the certificate installation process.<br><br>The SECC shall enable a communication link to the secondary actor or provide the contract certificate being installed as local copy.<br><br>觸發者：<br><br>EVCC 分別檢測出 SECC 信號，表明 EV 的憑 |

| | | |
|---|---|---|
| | | 證係下列之一：<br>－ 已逾期。<br>－ 係屬無效。<br>－ 仍有效，但僅剩有限之生命期(而非適用 C1)。<br>Trigger:<br>The EVCC detects resp. SECC signals that the certificate of the EV either<br>－ has expired.<br>－ is invalid.<br>－ is still valid but only has a limited lifetime (instead of applying C1). |
| 7 | 結束狀況 (End conditions) | 成功結束狀況：<br>－ 來自次要行為者之有效憑證(契約憑證)應儲存於 EVCC 中。<br>－ 開機憑證(由 OEM 建立)於 EV 中仍屬可用。<br>－ The valid certificate (contract certificate) from the secondary actor shall be stored in the EVCC.<br>－ The Bootstrap certificate (created by the OEM) is still available in the EV.<br>未成功結束狀況：<br>－ 由於通訊議題，憑證安裝未成功。<br>－ 由於次要行為者拒絕，憑證安裝未成功。<br>－ 憑證安裝未成功，因未發覺具匹配契約之次要行為者。<br>－ Certificate installation failed due to a communication issue.<br>－ Certificate installation failed due to rejection by the secondary actor.<br>－ Certificate installation failed because no secondary actor with a matching contract can be found. |

**7.6 識別及鑑別[D]**

**7.6.1 概觀**

**7.6 Identification and authorization [D]**

**7.6.1 Overview**

EV 供電設備向 EV 自我識別，並履行授權以檢查 EV 是否被允許充電。通常，若 EV 或 USER 提供付費機制，則 EV 供電設備允許充電。為此，EVCC 可表現契約憑證，或 USER 可表現某些信用卡/轉帳卡，或於 EV 供電設備上存入某些現金。

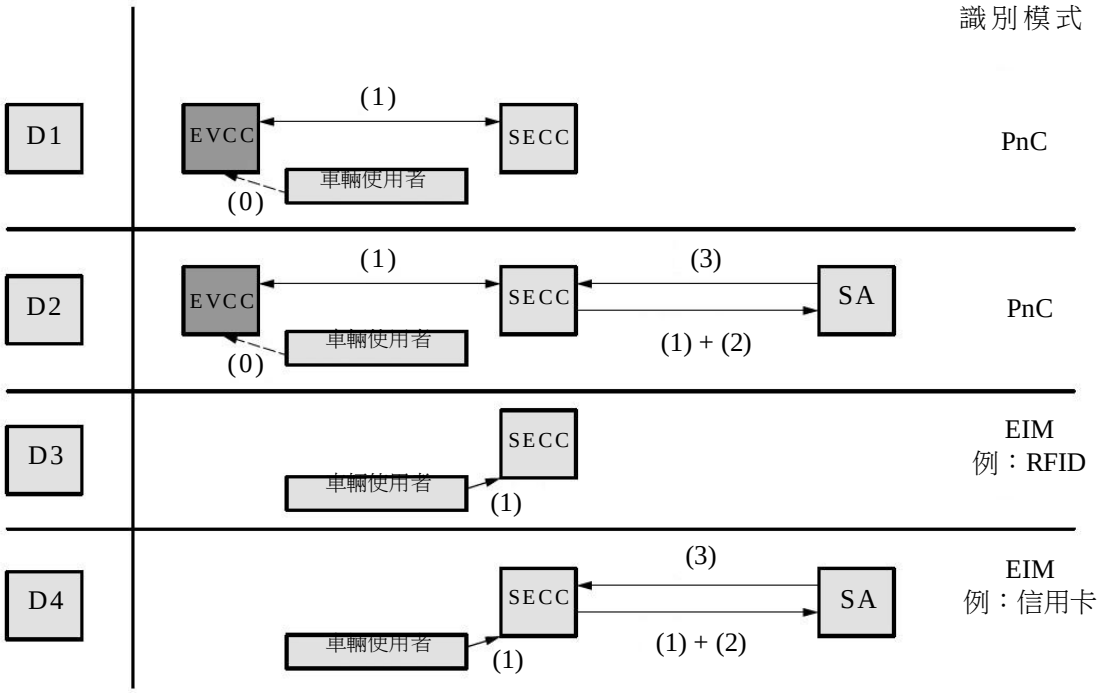
The EV supply equipment identifies itself to the EV and performs authorization to check if the EV is allowed to be charged. Typically, the EV supply equipment allows charging if an EV or USER provides the mechanism for payment. For this purpose, the EVCC may present the contract certificate, or the USER may present some credit card/debit card, or deposit some cash at the EV supply equipment.

取決於 EV 供電設備之基礎設施及 EV 的能力，授權使用者之方法有所不同。圖 3 對可能之情境進行分類，通常為 2 個主要群組：使用契約憑證之 PnC，以及未使用契約憑證履行所的識別/授權之 EIM。儘管本系列標準未規定實作外部識別方法之要求事項(EIM－D3 及 D4))，但本系列標準第 2 部及第 20 部中所定義的訊息集契約支援此 2 種識別型式。針對 EIM，本系列標準第 3 部概述 HLC 與基本信令間所必要之同步要求事項。

Depending on the EV supply equipment infrastructure and the capabilities of the EV, the methods of authorizing a user differ. Figure 3 classifies the possible scenarios, in general there are two major groups: PnC where contract certificates are used and EIM where the identification/authorization is performed without using contract certificates. Although the ISO 15118 series does not specify requirements for the implementation of external identification methods (EIM – D3 and D4)), the message sets defined in ISO 15118-2 and ISO 15118-20 support both identification types. In case of EIM, ISO 15118-3 outlines the necessary synchronisation requirements between HLC and basic signalling.

圖 3 可視為可能之識別/授權方式及其位置的圖形概觀。

Figure 3 may be taken as the graphical overview of the possible identification/authorization means and their location.




圖例：

| | |
|---|---|
| ——— | 必備 |
| — — — — | 選項 |
| (0) | 啟動 |
| (1) | 信符(例：EMAID) |
| (2) | 例：EVSEID |
| (3) | 例：授權 |

| |
|---|
| Vehicle user　車輛使用者 |
| Idetification mode　識別模式 |
| EIM e.g. RFID　EIM 例：RFID |
| EIM e.g. Credit card　EIM 例：信用卡 |
| Key　圖例： |
| mandatory　必備 |
| optional　選項 |
| activation　啟動 |
| credential (e.g. EMAID)　信符(例：EMAID) |
| e.g. EVSEID　例：EVSEID |
| e.g. authorization　例：授權 |

圖 3　識別情境的圖形概述

Figure 3 − Graphical overview of scenarios for identification

此等授權選項為該場域可能實作之指標。針對本系列標準，僅該等選項被列為使用案例元件，其要求於 EVCC 與 SECC 間之訊息層上交換資訊。

These authorization options are an indicator of possible implementations in the field. For the ISO 15118 series, only those options are listed as use case elements, which require informational exchange on the message level between the EVCC and the SECC.

若電能傳送係由第三方所授權，則不要求充電或放電授權。

例：於停車場，停車費可能包括車輛之電能耗用或家用插座的充電或放電。

No authorization for charging or discharging is required if the authorization to transfer energy is done by a third party.

EXAMPLE At a car park where parking fees could include the energy consumption of the vehicle or charging or discharging at domestic household socket.

**7.6.2 於 EV 供電設備處使用契約憑證履行授權**

**7.6.2 Authorization using contract certificates performed at the EV supply equipment**

表 12　於 EV 供電設備處使用契約憑證履行授權

Table 12 − Authorization using contract certificates performed at the EV supply equipment

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | 於 EV 供電設備處使用契約憑證履行授權。<br>Authorization using contract certificates performed at the EV supply equipment |
| 2 | 使用案例元件 ID (Use case element ID) | D1 |
| 3 | 目標(Objectives) | 藉由使用 EV 供電設備上之本系列標準第 2 部或第 20 部訊息，查驗契約的有效性。<br>Verify the validity of the contract by using the ISO 15118-2 or ISO 15118-20 message set at the EV supply equipment. |
| 4 | 說明(Description) | 此使用案例涵蓋於 EV 供電設備上使用契約憑證之授權過程。識別宜使用依本系列標準第 2 部或第 20 部 PnC 識別模式中所約定之 ID (契約憑證)為之。<br>所涉及之行為者為：<br>－　主要行為者：EVCC、EV、SECC、EV 供電設備、HMI。<br>－　次要行為者：EMOCH、EMSP。<br>This use case covers the authorization process using contract certificates at the EV supply equipment. The identification should be made with an ID (contract certificate) as stipulated in ISO 15118-2 or ISO 15118-20 PnC identification mode.<br>The actors involved are:<br>－ Primary actors: EVCC, EV, SECC, EV supply equipment, HMI.<br>－ Secondary actors: EMOCH, EMSP.<br>情境說明：<br>－　USER 將車輛與充電站連接並啟動提供 ID 之服務。此亦能自動完成。<br>－　SECC 與 EVCC 交換其 ID (EMAID 及 EV 供電設備 ID)。<br>－　SECC 可決定將來自 EVCC 之 ID 結合其自有 ID 轉發予次要行為者。<br>－　服務應於成功驗證 ID 後起動。<br>Scenario description: |

| | | |
|---|---|---|
| | | — The USER connects the car with the station and activates the service offering the ID. This could also be done automatically.<br>— The SECC and the EVCC exchange their IDs (EMAID and EV supply equipment ID).<br>— The SECC may decide to forward the IDs from the EVCC associating its own IDs to the secondary actors.<br>— Service should start after successful verification of the IDs. |
| 5 | 先決條件(Prerequisites) | — 應成功地建立依使用案例元件 B1 之通訊設置。<br>— 授權所要求之所有資訊應儲存於 SECC 中，以防 SECC 未與計費事件同步建立線上連接。<br>— Communication set-up according to use case element B1 shall be established successfully.<br>— All required information for authorization shall be stored in the SECC in case the SECC does not establish online connections synchronously to the charging event. |
| 6 | 要求事項 (Requirements) | — 若授權未自動發起，則 USER 應於將 EV 連接至 EV 供電設備後之特定時間內通過 HMI (車內)啟動授權。<br>— SECC 應與 EVCC 交換其 ID (EV 供電設備 ID)。<br>— EVCC 應將其 ID (EMAID)對 SECC 交換。<br>— If the authorization is not automatically launched, the USER shall activate the authorization through the HMI (in the car) within a specific time after connecting the EV to the EV supply equipment.<br>— The SECC shall exchange its IDs (EV supply equipment ID) to the EVCC.<br>— The EVCC shall exchange its IDs (EMAID) to the SECC.<br>— 觸發者：<br>— 自 EVCC 初始化授權過程。<br>— 應於特定時間內回覆或接受付款(ID)。此時序係依本系列標準第 2 部或第 20 部中所約定。<br>— Trigger:<br>— Initialization of the authorization process from |

| | | |
|---|---|---|
| | | the EVCC.<br>– Reply or acceptance of the payment (ID) shall be done within a specific time. This timing is stipulated in ISO 15118-2 or ISO 15118-20. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>– 授權過程成功；定義會談 ID 並起動所要求之服務(充電或加值)。<br>– The authorization process is successful; a session ID is defined and the required service (charging or value added) starts.<br>未成功結束狀況：<br>– 授權過程未成功。<br>– 所要求之服務未起動。<br>– 使用者可能被告知未成功之原因(亦即契約已逾期、契約遭閉鎖－遭竊車輛、遭竊契約、待重新起動的程序、授權伺服器不 可用)。<br>– The authorization process fails.<br>– The required service does not start.<br>– The user might be informed about the reason for failure (i.e. contract has expired, contract has been blocked – stolen car, stolen contract, procedure to be restarted, authorization server not available). |

### 7.6.3 使用以 SA 協助履行契約憑證之授權

### 7.6.3 Authorization using contract certificates performed with the help of an SA

表 13　使用以 SA 協助履行契約憑證之授權

Table 13 – Authorization using contract certificates performed with the help of an SA

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 使用以 SA 協助履行契約憑證之授權。<br>Authorization using contract certificates performed with the help of an SA |
| 2 | 使用案例元件 ID (Use case element ID) | D2 |
| 3 | 目標 (Objectives) | 藉由使用本系列標準第 2 部或第 20 部訊息集合，以來自次要行為者之驗證，驗證契約的有效性。<br>Verify the validity of the contract with a validation from a secondary actor by using the ISO 15118-2 or ISO 15118-20 message set. |

| | | |
|---|---|---|
| 4 | 說明(Description) | － 此使用案例涵蓋使用具 SA 協助之契約憑證的授權過程。識別應使用依本系列標準第 2 部或第 20 部 PnC 識別模式中所約定之 ID (契約憑證)為之。<br><br>－ This use case covers the authorization process using contract certificates with the help of an SA. The identification should be made with an ID (contract certificate) as stipulated in ISO 15118-2 or ISO 15118-20 PnC identification mode.<br><br>所涉及之行為者為：<br><br>－ 主要行為者：EV、EVCC、EV 供電設備、 SECC、HMI。<br><br>－ 次要行為者：EMOCH、EMSP。<br><br>The actors involved are:<br><br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, HMI.<br><br>－ Secondary actors: EMOCH, EMSP.<br><br>情境說明：<br><br>－ USER 將車輛連接至充電站並啟動提供 ID 之服務。此亦可自動完成。<br><br>－ SECC 與 EVCC 交換其 ID (EMAID 及 EV 供電設備)。針對驗證，此等被轉發予次要行為者。<br><br>－ 次要行為者以同意或不同意回覆。<br><br>－ 成功授權 ID 後起動服務。<br><br>Scenario description:<br><br>－ The USER connects the car to the station and activates the service offering the ID. This could also be done automatically.<br><br>－ The SECC and the EVCC exchange their IDs (EMAID and EV supply equipment). Those are forwarded to the secondary actor for validation.<br><br>－ The secondary actor replies with an agreement or non-agreement.<br><br>－ Service starts after successful authorization of the IDs. |
| 5 | 先決條件(Prerequisites) | － 應成功地建立依使用案例元件 B1 之通訊設置。<br><br>－ 授權所要求之所有資訊應儲存於 SECC 中，以防 SECC 未與計費事件同步建立線上連接。<br><br>－ Communication set-up according to use case |

| | | |
|---|---|---|
| | | element B1 shall be established successfully.<br>— All required information for authorization shall be stored in the SECC in case the SECC does not establish online connections synchronously to the charging event. |
| 6 | 要求事項(Requirements) | — 若授權未自動發起，USER 須於將 EV 連接至 EV 供電設備後之特定時間內通過人機界面(於車內)啟動授權。<br>— SECC 應與 EVCC 交換其 ID (EV 供電設備 ID)。<br>— EVCC 應與 SECC 交換其 ID (EMAID)。<br>— SECC 應將 ID (來自 EVCC 結合其自身 ID 之 EMAID) (EV 供電設備 ID)轉發予次要行為者。<br>— If the authorization is not automatically launched, the USER has to activate the authorization through the HMI (in the car) within a specific time after connecting the EV to the EV supply equipment.<br>— The SECC shall exchange its IDs (EV supply equipment ID) to the EVCC.<br>— The EVCC shall exchange its IDs (EMAID) to the SECC.<br>— The SECC shall forward the IDs (EMAID from the EVCC associating its own IDs) (EV supply equipment ID) to the secondary actors.<br>— 觸發者：自 EVCC 初始化授權過程。<br>應於特定時間內回覆或接受付款(ID)。此時序係依本系列標準第 2 部或第 20 部中所約定。<br>— Trigger: Initialization of the authorization process from the EVCC.<br>Reply or acceptance of the payment (ID) shall be done within a specific time. This timing is stipulated in ISO 15118-2 or ISO 15118-20. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 授權過程成功，會談 ID 已定義，所要求之服務(充電、放電或加值)起動。<br>— The authorization process is successful, a session ID is defined and the required service (charging, discharging or value added) starts.<br>未成功結束狀況：<br>— 授權過程未成功，次要行為者未給予授權。<br>— 所要求之服務未起動。 |

| | | |
|---|---|---|
| | | － 使用者可能被告知未成功之原因(亦即契約已逾期、契約已閉鎖、車輛或契約遭竊、程序待重新起動、授權伺服器不可用)。<br>－ The authorization process fails, no authorization given by the secondary actor.<br>－ The required service does not start.<br>－ The user might be informed about the reason for failure (i.e. contract has expired, contract has been blocked, stolen car or contract, procedure to be restarted, authorization server not available). |

### 7.6.4 於 EV 供電設備處使用 EV 供電設備處所履行之外部憑證授權

### 7.6.4 Authorization at the EV supply equipment using external credentials performed at the EV supply equipment

表 14　於 EV 供電設備處使用 EV 供電設備處所履行之外部憑證授權

Table 14 − Authorization at the EV supply equipment using external credentials performed at the EV supply equipment

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | 於 EV 供電設備處使用 EV 供電設備處所履行之外部憑證授權。<br>Authorization at the EV supply equipment using External Credentials performed at the EV supply equipment |
| 2 | 使用案例元件 ID (Use case element ID) | D3 |
| 3 | 目標(Objectives) | 於 EV 供電設備上使用憑證進行授權，該憑證係於本系列標準第 2 部或第 20 部 EIM 識別模式中所描述車輛的外部。<br>Authorization at the EV supply equipment with credentials, which are external to the vehicle as described in ISO 15118-2 or ISO 15118-20 EIM identification mode. |
| 4 | 說明 (Description) | USER 藉由使用所提供之識別方法於 EV 供電設備上識別其自己。<br>備考： 取決於識別型式，CSO 可能無法鑑別 ID，因此可能不授權服務。<br>SECC 能決定將 ID (EMAID)結合其自有 ID (EV 供電設備 ID)，轉發予次要行為者。<br>宜於成功驗證 Id 後起動服務。<br>The USER identifies himself/herself at the EV supply equipment by using one of the |

| | | |
|---|---|---|
| | | identification methods offered.<br><br>NOTE Depending on the identification type, the CSO could not have the possibility to authenticate the IDs and therefore might not authorize the service.<br><br>The SECC can decide to forward the IDs (EMAID) associating its own IDs (EV supply equipment ID) to the secondary actors.<br><br>Service should start after successful verification of the Ids.<br><br>所涉及之行為者為：<br><br>－ 主要行為者：USER、EV 供電設備、HMI、SECC。<br><br>－ 次要行為者：EMOCH、EMSP。<br><br>The actors involved are:<br><br>－ Primary actors: USER, EV supply equipment, HMI, SECC.<br><br>－ Secondary actors: EMOCH, EMSP. |
| 5 | 先決條件 (Prerequisites) | 應成功地建立依使用案例元件 B1 或 WB1 之通訊設置。<br><br>Communication set-up according to use case element B1 or WB1 shall be established successfully. |
| 6 | 要求事項(Requirements) | －USER 應於將 EV 連接至 EV 供電設備後之特定時間內啟動授權，或 EV 供電設備應具人機界面或任何其他方式授權重新起動授權過程。<br><br>－ 例：USER 應使用 HMI 鍵入識別碼或 EV 供電設備所提供之任何其他授權方法。<br><br>－ SECC 應評估授權，若接受，則持續通訊流程。<br><br>－ The USER shall activate the authorization within a specific time after connecting the EV to the EV supply equipment or the EV supply equipment shall have an HMI or any other method to authorize the restart of the authorization process.<br><br>－ The USER shall, for example, use an HMI to type in the identification code or any other authorization method offered at the EV supply equipment.<br><br>－ The SECC shall evaluate the authorization and, if accepted, proceed with the communication flow.<br><br>－ 觸發者：<br><br>－ 授權應於 EV 供電設備上進行並由 USER |

| | | |
|---|---|---|
| | | 啟動。<br>– Trigger:<br>– The authorization shall be made at the EV supply equipment and activated by the USER. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>–授權過程成功，會談 ID 已定義，所要求之服務(充電、放電或加值)起動。<br>– The authorization process is successful, a session ID is defined and the required service (charging, discharging or value-added) starts.<br>未成功結束狀況：<br>– 授權過程未成功。<br>– 所要求之服務未起動。<br>– 可能告知使用者未成功之原因(亦即識別方式已逾期、契約已閉鎖－遭竊車輛、遭竊契約、待重新起動的程序、識別方式故障)。<br>– The authorization process fails.<br>– The required service does not start.<br>– The user might be informed about the reason for failure (i.e. identification means has expired, contract has been blocked – stolen car, stolen contract, procedure to be restarted, identification means out of order). |

### 7.6.5 以 SA 協助使用外部憑證於 EV 供電設備處授權

### 7.6.5 Authorization at the EV supply equipment using external credentials performed with the help of an SA

表 15　以 SA 協助使用外部憑證於 EV 供電設備處授權

Table 15 − Authorization at the EV supply equipment using external credentials performed with the help of an SA

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | 以SA協助使用外部憑證於EV供電設備處授權。<br>Authorization at the EV supply equipment using external credentials performed with the help of an SA |
| 2 | 使用案例元件 ID (Use case element ID) | D4 |
| 3 | 目標(Objectives) | 於次要行為者協助下，使用車輛外部之憑證對EV供電設備進行授權。<br>Authorization at the EV supply equipment with credentials, which are external to the vehicle, with the help of a secondary actor. |
| 4 | 說明(Description) | 此使用案例涵蓋次要行為者宜如何驗證識別之過程。USER藉由使用所提供之EIM識別方法，於EV供電設備上自我識別。<br>備考：　取決於識別型式，CSO 可能無法鑑別 ID，因此可能不授權服務。<br>This use case covers the process of how identification should be validated by a secondary actor. The USER identifies himself/herself at the EV supply equipment by using one of the EIM identification methods offered.<br>NOTE Depending on the identification type, the CSO could not have the possibility to authenticate the IDs and therefore might not authorize the service.<br>所涉及之行為者為：<br>－　主要行為者：USER、EV 供電設備、SECC、HMI。<br>－　次要行為者：EMOCH、EMSP。<br>The actors involved are:<br>－ Primary actors: USER, EV supply equipment, SECC, HMI.<br>－ Secondary actors: EMOCH, EMSP.<br>情境說明：<br>－　針對驗證，SECC 將 ID (EV 供電設備 ID 及 EMAID)轉發予次要行為者。<br>－　次要行為者以同意或不同意回覆。<br>－　成功驗證 ID 後起動服務。 |

| | | |
|---|---|---|
| | | Scenario description:<br>— The SECC forwards the IDs (EV supply equipment ID and EMAID) to the secondary actor for validation.<br>— The secondary actor replies with an agreement or non-agreement.<br>— Service starts after successful verification of the IDs. |
| 5 | Prerequisites (先決條件) | — 應成功地建立依使用案例元件 B1 之通訊設置。<br>—要求 SECC 與次要行為者間之線上連接。<br>— Communication set-up according to use case element B1 shall be established successfully.<br>— Online connection between the SECC and secondary actors is required. |
| 6 | Requirements (要求事項) | — USER 應於將 EV 連接至 EV 供電設備後之特定時間內啟動授權，或 EV 供電設備應具 HMI 以授權重新起動識別過程。<br>— USER 應於 EV 供電設備(例：HMI)上使用識別方法。<br>— 針對驗證，SECC 應將識別發送至次要行為者。<br>— The USER shall activate the authorization within a specific time after connecting the EV to the EV supply equipment or the EV supply equipment shall have an HMI to authorize the restart of the identification process.<br>— The USER shall use the identification method at the EV supply equipment (e.g. HMI).<br>— The SECC shall send the identification to the secondary actor for validation.<br>— 觸發者：<br>— 授權應於 EV 供電設備上進行並由 USER 啟動。<br>— Trigger:<br>— The authorization shall be made at the EV supply equipment and activated by the USER. |
| 7 | End conditions (結束狀況) | 成功結束狀況：<br>— 授權過程成功，會談 ID 已定義，所要求之服務(充電、放電或加值)起動。<br>— The authorization process is successful, a session ID is defined and the required service |

| | | |
|---|---|---|
| | | (charging, discharging or value-added) starts.<br>未成功結束狀況：<br>— 授權過程未成功。<br>— USER 於 EV 供電設備上所履行之識別未經次要行為者驗證。<br>— 所要求之服務未起動。<br>— 使用者可能被告知未成功之原因(亦即契約已逾期、契約已閉鎖、車輛或契約遭竊、程序待重新起動、識別伺服器不可用)。<br>— The authorization process fails.<br>— The identification performed by the USER at the EV supply equipment is not validated by the secondary actor.<br>— The required service does not start.<br>— The user might be informed about the reason for failure (i.e. contract has expired, contract has been blocked, stolen car or contract, procedure to be restarted, identification server not available). |

### 7.6.6 WD1：以先前之預約授權

### 7.6.6 WD1: Authentication with prior reservation

表 16　以先前之預約授權

Table 16 − Authentication with prior reservation

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱 (Use case element name) | 以先前之預約授權。<br>Authentication with prior reservation |
| 2 | 使用案例元件 ID (Use case element ID) | WD1 |
| 3 | 目標 (Objectives) | 此使用案例元件之目的為驗證預約是否有效，然後向駕駛者指示對應於依預約過程中所確認充電要求事項的適當 EV 供電設備。<br>The goal of this use case element is to authenticate that a reservation is valid and then to indicate to the driver the appropriate EV supply equipment corresponding to the charging requirements as confirmed during the reservation process. |
| 4 | 說明 (Description) | 於無線關聯成功後，SECC 可要求確認預約有效以持續下個步驟。此元件允許 CSO 驗證與第三方(特別是負責預約之 EMSP) |

| | | |
|---|---|---|
| | | 之交易。<br><br>－ CSO 後端檢查 EV 或 EV 使用者之預約及相關資料，以及與其 EMSP 簽訂的涵蓋預約服務付費的服務契約。若無法檢查，則應於停車及配對後向駕駛者提出其他識別/付費方式(EIM 模式、預付款、信用卡…。<br><br>After a successful wireless association, the SECC may require a confirmation that the reservation is valid to continue further steps. This element allows the CSO to validate the transaction with third parties (in particular the EMSP responsible of the reservation).<br><br>－ The CSO backend checks the EV or EV user's reservation and related data, and the contract of service with its EMSP covering reservation service payment. If checking is not possible, other way of identification/payment should be proposed to the driver (EIM mode, pre-payment, credit card…) after parking and pairing.<br><br>－ 若預約有效，則 SECC 可向 EV 指示適當之 EV 供電設備所在位置。〝適當之 EV 供電設備〞意指調適依預約過程期間所確認之 EV 要求事項。<br><br>－ 若預約驗證未成功，則 SECC 將通知 EVCC，且於可能之情況下為其配置可用的 EV 供電設備(如未預約)。<br><br>－ If the reservation is validated, the SECC may indicate to the EV where the appropriate EV supply equipment is located. “Appropriate EV supply equipment” means adapted to the EV requirements as confirmed during the reservation process.<br><br>－ If the reservation validation fails, the SECC notifies it to the EVCC and, if possible, assigns it an available EV supply equipment as without reservation.<br><br>駕駛者向 SECC 指示預約編號之方式不屬本標準範圍內。此外，SECC 上游通訊，且由 SECC 用以向 EVCC 指示所配置 EV 供電設備所在處之方法，亦不屬本系列標準範圍內。<br><br>例： 即時地圖、EV 供電設備上之閃光燈、接近 EV 供電設備時可於 EV 中顯示的唯一編號。 |

| | | |
|---|---|---|
| | | The way the driver indicates the reservation number to the SECC is out of scope of this document. Also, SECC upstream communications and means used by the SECC to indicate to the EVCC where the allocated EV supply equipment is, is out of scope of the ISO 15118 series.<br><br>EXAMPLE Real-time maps, flashing light on the EV supply equipment, unique number that can be visualized in the EV when approaching the EV supply equipment.<br><br>所涉及之主要行為者為：USER、EV 供電設備、EVCC、SECC。<br><br>所涉及之次要行為者為：CSO、EMSP。<br><br>The primary actors involved are: USER, EV supply equipment, EVCC, SECC.<br><br>The Secondary actors involved are: CSO, EMSP. |
| 5 | 先決條件 (Prerequisites) | WB1 中所描述之關聯係屬成功。預約已由負責預約之 EMSP 所確認。<br><br>Association described in WB1 is successful. A reservation has been validated by the EMSP responsible of reservations. |
| 6 | 要求事項 (Requirements) | － SECC 應向 EVCC 詢問預約編號。<br><br>－ EVCC 應向 SECC 指示 EBC 中所指示之預約編號。<br><br>－ SECC 應將預約之拒絕或接受通知 EVCC。<br><br>－ SECC 可配置適當之 EV 供電設備。<br><br>－ The SECC shall ask the EVCC the reservation number.<br><br>－ The EVCC shall indicate to the SECC the reservation number indicated in the EBC.<br><br>－ The SECC shall notify rejection or acceptance of the reservation to the EVCC.<br><br>－ The SECC may allocate an appropriate EV supply equipment. |
| 7 | 結束狀況 (End conditions) | 成功結束狀況：<br><br>－ 預約已驗證。<br><br>－ EV 供電設備已配置予 EV。<br><br>－ The reservation has been validated.<br><br>－ An EV supply equipment has been |

| | | |
|---|---|---|
| | | allocated to EV.<br>未成功結束狀況：<br>— 本系列標準第 2 部或第 20 部協定未成功。<br>— EMSP 宣稱預約無效，且無可用之 EV 供電設備。<br>— ISO 15118-2 or ISO 15118-20 protocol failed.<br>— The reservation is declared invalid by the EMSP and there is no available EV supply equipment. |

**7.7 配對及精細定位**

**7.7.1 WP1：WPT 精細定位**

**7.7 Pairing and fine positioning**

**7.7.1 WP1: WPT fine positioning**

精細定位之技術定義不屬本標準範圍內(定義參照 IEC 61980)，但定義支援精細定位的訊息及信號則為本系列標準之責任。於 EV 觸發配對之前，精細定位應成功。IEC 61980 中提出不同之精細定位機制。

The technical definition of fine positioning is out of scope of this document (see IEC 61980 for the definition), but it is the responsibility of the ISO 15118 series to define the messages and signal to support fine positioning. Fine positioning shall be successful before the EV triggers pairing. There are different mechanisms for fine positioning being proposed in IEC 61980.

表 17　WPT 精細定位

Table 17 − WPT fine positioning

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | WPT 精細定位。<br>WPT fine positioning |
| 2 | 使用案例元件 ID (Use case element ID) | WP1 |
| 3 | 目標 (Objectives) | 此元件之目的為觸發主要裝置與次要裝置的對齊序列。<br>The goal of this element is to trigger the sequence of alignment of primary and secondary devices. |
| 4 | 說明(Description) | EV 自 SECC 所提供之列表中選擇精細定位方法。EVCC 藉由向 SECC 發送訊息觸發定位過程之起動。EV 及/或 EV 供電設備檢查其相對位置，直至達到適當位置並完成精細定位過程。EV 與 EV 供電設備相互通知精細定位狀態。<br>The EV selects a fine positioning method out of the list offered by the SECC. The EVCC triggers the start of the positioning process by sending a message to the SECC. The EV and/or EV supply equipment check their relative position until the appropriate position is reached and the fine positioning process is finished. The EV and EV supply equipment inform each other of the fine positioning status.<br>所涉及之行為者為：<br>主要行為者：USER、EV 供電設備、SECC、EV、EVCC。<br>The actors involved are:<br>Primary actors: USER, EV supply equipment, SECC, EV, EVCC. |
| 5 | 先決條件 (Prerequisites) | − EV 位於主要裝置之適當距離處。<br>− 交換關於可用定位技術之資訊。<br>− The EV is at the appropriate distance of the primary device.<br>− Information on available positioning technologies has been exchanged. |
| 6 | 要求事項(Requirements) | − 應成功地建立無線通訊(WB)。<br>− 應於無線通訊(WB)建立後立即檢查與精細定位技術之相容性。 |

| | | |
|---|---|---|
| | | — Wireless communication (WB) shall be successfully established.<br>— The compatibility with respect to the fine positioning technologies shall be checked just after the establishment of the wireless communication (WB). |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 主要裝置與次要裝置正確對齊。<br>— Primary and secondary devices are correctly aligned.<br>未成功結束狀況：<br>— 本系列標準第 20 部精細定位協定未成功。<br>— 支援精細定位機制之 EV 與可用的 EV 供電設備精細定位機制失配。<br>— 精細定位未成功。<br>— ISO 15118-20 fine positioning protocol failed.<br>— EV supported fine positioning mechanisms don't match the available EV supply equipment fine positioning mechanism.<br>— Fine positioning failed. |

### 7.7.2 WP2：無通訊支援之 WPT 精細定位

### 7.7.2 WP2: WPT fine positioning without communication support

若 EV 使用獨立之定位系統(例：由車輛進行獨立光學定位)，則交換本系列標準第 20 部中所定義的精細定位資訊，但未協助精細定位。即使於此情況下，有必要確認 EVCC 與 SECC 間之成功定位狀態。

If the EV uses stand-alone positioning system e.g. stand-alone optical positioning by the vehicle, then fine positioning messages defined in ISO 15118-20 are exchanged but do not aid the fine positioning. Even in this case, confirmation about successful positioning status between the EVCC and the SECC is necessary.

表 18　無通訊支援之 WPT 精細定位

Table 18 − WPT fine positioning without communication support

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 無通訊支援之 WPT 精細定位。<br>WPT fine positioning without communication support |
| 2 | 使用案例元件 ID (Use case element ID) | WP2 |
| 3 | 目標(Objectives) | 於 EVCC 與 SECC 間共享獨立定位之結果，無需通訊定位參數。就系統之狀態作出協議。<br>Share the result of the stand-alone positioning without communicating positioning parameters, between the EVCC and the SECC. Make an agreement about the status of the system. |
| 4 | 說明 (Description) | 為避免車輛於行駛過程中出現通訊不穩定或干擾，於通訊建立前，已成功完成車輛對停車位及 WPT 裝置之單機精細定位。該控制於控制循環中無通訊延遲，改善回饋控制之反應時間以滿足並使用。<br>若單機光學精細定位成功完成，則應起動通訊設置。<br>To avoid instability or interferences of communication while the vehicle is moving, stand-alone fine positioning of the vehicle to the park space and WPT device is successfully finished before communication set-up. This control does not have communication delay in the control loop, response time of the feedback control is improved to be satisfied and used.<br>If stand-alone optical fine positioning is successfully finished, the communication set-up shall be started.<br>於通訊建立後與配對過程前，應將光學定位結果自 EVCC 發送至 SECC。<br>所涉及之行為者為：<br>－主要行為者：EVCC、SECC。<br>After the communication set-up and before the pairing process, the result of optical positioning shall be sent from the EVCC to the SECC.<br>The involved actors are:<br>－ Primary actors: EVCC, SECC. |

| | | |
|---|---|---|
| 5 | 先決條件(Prerequisites) | － 光學單機精細定位於通訊建立前成功完成。<br>－ 通訊設置成功完成。<br>－ Optical stand-alone fine positioning is successfully finished before communication set-up.<br>－ Communication set-up is successfully finished. |
| 6 | 要求事項 (Requirements) | － EVCC 向 SECC 發送光學獨立定位之結果。<br>－ 若結果係可接受，則 SECC 以〝OK〞回應 EVCC。<br>－ The EVCC send to the SECC the results of optical stand-alone positioning.<br>－ The SECC respond to the EVCC with “OK” if the result is acceptable. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EVCC 及 SECC 共享主要裝置與次要裝置正確對齊之狀態。<br>－ The EVCC and the SECC share the status that primary and secondary devices are correctly aligned.<br>未成功結束狀況：<br>－ 自 EVCC 發送之精細定位結果就 SECC 而言係屬不可接受。<br>－ The result of fine positioning sent from the EVCC is not acceptable for the SECC. |

### 7.7.3 WP3：傳導式電能傳送配對

### 7.7.3 WP3: Conductive energy transfer pairing

無線通訊本身無法確保 EV 正確停放。然後有必要配對以避免錯誤停車。

配對應使用既存之 IEC 61851-1 引導線以調變特定的狀態變化。本系列標準第 20 部中描述配對特定之訊息。

Wireless communication cannot ensure by itself that EVs are correctly parked. Pairing is then necessary to avoid wrong parking.

The pairing shall use the existing IEC 61851-1 pilot line to modulate specific state variations. Pairing-specific messages are described in ISO 15118-20.

表 19　傳導式電能傳送配對

Table 19 − Conductive energy transfer pairing

| 編號 | 型式 | 說明 |
|---|---|---|

| | | |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 傳導式電能傳送配對。<br>Conductive power transfer pairing |
| 2 | 使用案例元件 ID (Use case element ID) | WP3 |
| 3 | 目標(Objectives) | 此元件之目的係於傳導式電能傳送之情況下起動配對序列。<br>The goal of this element is to start the pairing sequence in case of conductive energy transfer. |
| 4 | 說明(Description) | EVCC 與 SECC 交換授權以起動配對序列。於來自 SECC 之肯定回答規定切換次數後，起動配對。EV 起動 BCB 狀態切換序列(BCB狀態切換定義於本系列標準第 3 部中)。檢測出正確觸發序列之 EV 供電設備會，通知 SECC 配對觸發檢測。SECC 通知 EVCC 正確之切換接收。取決於所檢測出之位置是否方便，SECC 可能決定要求 EVCC 變更位置。<br>The EVCC and the SECC exchange authorization to start a pairing sequence. After a positive answer from the SECC specifying the number of toggles, pairing starts. EV starts the sequence of BCB states toggle (BCB state toggle are defined in ISO 15118-3). The EV supply equipment that detects the correct sequence of toggles informs the SECC of the pairing toggles detection. The SECC informs the EVCC of the correct toggles reception. Depending on whether the location detected is convenient or not, the SECC may decide to ask the EVCC to change the location.<br>所涉及之行為者為：<br>主要行為者：EVCC、SECC、EV、EV 供電設備。<br>The actors involved are:<br>Primary actors: EVCC, SECC, EV, EV supply equipment. |
| 5 | 先決條件(Prerequisites) | － EV 已插接並停放。<br>－ EVCC 及 SECC 處於狀態 B(參照 IEC 61851-1)。<br>－ 應成功地建立無線通訊(WB)。<br>－The EV is plugged and parked.<br>－ The EVCC and the SECC are in state B (see IEC 61851-1).<br>－ Wireless communication (WB) shall |

| | | |
|---|---|---|
| | | be successfully established. |
| 6 | 要求事項(Requirements) | － SECC1 次僅能接受 1 個傳導對。<br>－ 切換序列定義於本系列標準第 20 部中。<br>－ The SECC may accept only one conductive pairing at a time.<br>－ Toggle sequence is defined in ISO 15118-20. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EV 及 EV 供電設備已正確地配對。<br>－ The EV and the EV supply equipment are correctly paired.<br>未成功結束狀況：<br>－ 本系列標準第 20 部配對協定未成功。<br>－ EVCC 未收到來自 SECC 之任何配對授權。<br>－ EV 供電設備未收到正確數量的切換。<br>－ 配對未成功。<br>－ ISO 15118-20 pairing protocol failed.<br>－ The EVCC does not receive any pairing authorization from the SECC.<br>－ The EV supply equipment doesn't receive the correct number of toggles.<br>－ Pairing failed. |

### 7.7.4 WP4：WPT 配對

### 7.7.4 WP4: WPT pairing

EV 通過本系列標準第 20 部中所描述之訊息觸發配對。本系列標準第 2 部中描述不屬本標準範圍內之配對機制。

EV triggers pairing through messages described in ISO 15118-20. Pairing mechanisms, out of scope of this document, are described in IEC 61980-2.

表 20　WPT 配對

Table 20 – WPT pairing

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element | WPT 配對。 |

| | | |
|---|---|---|
| | name) | WPT pairing |
| 2 | 使用案例元件 ID (Use case element ID) | WP4 |
| 3 | 目標(Objectives) | 此使用案例元件之目的係於 WPT 之情況下起動配對序列。<br>The goal of this use case element is to start the pairing sequence in case of WPT. |
| 4 | 說明(Description) | 起動 EV 與 EV 供電設備以交換同步訊息，直到雙方備妥起動配對序列。取決於所使用之技術，配對信號可由 EV 或 EV 供電設備發送。接收方處置配對信號，並通知發射方配對信號處置成功與否。<br>The EV and the EV supply equipment start to exchange synchronisation messages until both parties are ready to start the pairing sequence. Depending on the technology used, the pairing signal can be sent either by the EV or by the EV supply equipment. The receiving party processes the pairing signal and informs the emitting party whether the pairing signal processing is successful or not.<br>所涉及之行為者為：<br>主要行為者：EV 供電設備、SECC、EV、EV 供電設備。<br>The actors involved are:<br>Primary actors: EV supply equipment, SECC, EV, EV supply equipment. |
| 5 | 先決條件(Prerequisites) | － 已成功完成精細定位。<br>－ EV 停止並停放。<br>－ 應成功地建立無線通訊(WB)。<br>－ 交換關於可用之配對技術的資訊。<br>－ Fine positioning has been successfully done.<br>－ The EV is stopped and parked.<br>－ Wireless communication (WB) shall be successfully established.<br>－ Information on available pairing technologies has been exchanged. |
| 6 | 要求事項(Requirements) | 應於無線通訊(WB)建立後立即檢查配對技術之相容性。<br>The compatibility with respect to the pairing technologies shall be checked just |

| | | |
|---|---|---|
| | | after the establishment of the wireless communication (WB). |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EV 與 EV 供電設備正確配對。<br>－ The EV and the EV supply equipment are correctly paired.<br>未成功結束狀況：<br>－ 本系列標準第 20 部配對協定未成功。<br>－ EV 或 EV 供電設備尚未備妥配對。<br>－ 配對未成功。<br>－ ISO 15118-20 paring protocol failed.<br>－ The EV or the EV supply equipment are not ready for pairing.<br>－ Pairing failed. |

**7.8 標的設定及電能傳送排程[E]**

**7.8.1 依 HLC 之負載平衡 AC 充電**

**7.8 Target setting and energy transfer scheduling [E]**

**7.8.1 AC charging with load levelling based on HLC**

表 21 依 HLC 之負載平衡 AC 充電

Table 21 − AC charging with load levelling based on HLC

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 依 HLC 之負載平衡 AC 充電。<br>AC charging with load levelling based on HLC |
| 2 | 使用案例元件 ID (Use case element ID) | E1 |
| 3 | 目標(Objectives) | 此使用案例僅涵蓋本地充電場所內之充電(而非放電)。於本地設施之限制內動態調整將傳送至 EV 的最大 AC 電流。<br>This use case covers only charging (and not discharging) within a local charging site. Dynamic adjustment of the maximum AC current to be transferred to the EV within the limits of the local installation. |
| 4 | 說明(Description) | SECC 與 EVCC 使用 HLC 交換關於 AC 電流限制之資訊。為保護 EV 供電設備，SECC 將可自插座汲取之最大電力傳送予 EVCC。 |

| | | |
|---|---|---|
| | | 例： 簡單負載平衡能於停車場或家中進行，其中並非所有 AC 電源插座能供給完整之 AC 電流，因此需動態調整 EV 可汲取的最大 AC 電流。<br><br>The SECC and the EVCC exchange information about the AC current limits using HLC. The SECC communicates the maximum power that can be drawn from the outlet, in order to protect the EV supply equipment, to the EVCC.<br><br>EXAMPLE Simple load levelling can be in a car park or at home, where not all AC power outlets can deliver full AC current and, therefore, need to dynamically adjust the maximum AC current that the EV can draw.<br><br>所涉及之行為者為：<br><br>— 主要行為者：USER、EV 供電設備、SECC。<br><br>The actors involved are:<br><br>— Primary actors: USER, EV supply equipment, SECC. |
| 5 | 先決條件(Prerequisites) | 若依所適用使用案例元件 D 之授權，則應成功地建立。<br><br>If the authorization according to use case elements D is applied, it shall be established successfully. |
| 6 | 要求事項(Requirements) | — EVCC 應向 SECC 詢問最大 AC 電流限制。<br><br>— SECC 應回覆每相所容許之最大 AC 電流。<br><br>— EV 應不超過 AC 電流限制。<br><br>— The EVCC shall ask for the maximum AC current limit from the SECC.<br><br>— The SECC shall reply with the maximum allowed AC current per phase.<br><br>— The EV shall not exceed the AC current limit.<br><br>觸發者：<br><br>— 充電授權應已完成，EV 應備妥回收電能。<br><br>Trigger:<br><br>— The charging authorization shall be completed and the EV shall be ready to |

| | | |
|---|---|---|
| | | retrieve energy. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EV 供電設備於最大本地設施限制內供給 AC 電流。<br>－ EV 於 EV 供電設備所給定之本地限制內充電。<br>－ The EV supply equipment delivers the AC current within the maximum local installation limits.<br>－ The EV charges within the given local limits of the EV supply equipment.<br>未成功結束狀況：<br>－ 由於接觸器失效，EV 供電設備未供給 AC 電力。<br>－ 電流超過 EV 供電設備之最大值。<br>－ The EV supply equipment does not deliver AC power due to contactor failure.<br>－ The current exceeds the max values of the EV supply equipment. |

**7.8.2 WE1：WPT 標的設定及充電排程**

**7.8.2 WE1: WPT target setting and charge scheduling**

表 22　WPT 標的設定及充電排程

Table 22 − WPT target setting and charge scheduling

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | WPT 標的設定及充電排程。<br>WPT target setting and charge scheduling |
| 2 | 使用案例元件 ID (Use case element ID) | WE1 |
| 3 | 目標(Objectives) | 此使用案例僅涵蓋本地充電場所內之充電。動態調整 EV 於本地設施限制內之最大無線電力傳送。<br>This use case covers only charging within local charging site. Dynamic adjustment of the maximum wireless power transfer to be drawn by the EV within the limits of the local installation. |
| 4 | 說明(Description) | SECC 與 EVCC 使用 HLC 交換關於無線電力傳送限制之資訊。SECC 能自 WPT 汲取之最大功率傳達予 EVCC，以保護 EV 供電設備。<br>The SECC and the EVCC exchange information about the wireless power transfer limits using HLC. The SECC communicates the maximum power that can be drawn from the WPT, in order to protect the EV supply equipment, to the EVCC.<br>例： 簡單負載平衡可於停車場或家中進行，並非所有 WPT 能供給完整之無線功率，因此需動態調整 EV 可汲取的最大無線功率。<br>所涉及之行為者為：USER、EV 供電設備、SECC。<br>EXAMPLE Simple load levelling can be in a car park or at home, where not all WPT can deliver full wireless power and, therefore, need to dynamically adjust the maximum wireless power that the EV can draw.<br>The actors involved are: USER, EV supply equipment, SECC. |
| 5 | 先決條件(Prerequisites) | − 若適用依使用案例元件 WD1 之授權，則應成功地建立。<br>− If the authorization according to use case elements WD1 is applied, it shall be established successfully. |
| 6 | 要求事項(Requirements) | − EVCC 應向 SECC 請求最大無線功率限制。 |

| | | |
|---|---|---|
| | | － SECC 應以所容許之最大無線功率回覆。<br>－ EV 不應超過無線功率限制。<br>－ 觸發者：充電授權應已完成，EV 應備妥回收電能。<br>－ The EVCC shall ask for the maximum wireless power limit from the SECC.<br>－ The SECC shall reply with the maximum allowed wireless power.<br>－ The EV shall not exceed the wireless power limit.<br>－ Trigger: The charging authorization shall be completed and the EV shall be ready to retrieve energy. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EV 供電設備於最大本地設施限制內供給無線功率。<br>－ EV 於 EV 供電設備所給定之本地限制內充電。<br>－ The EV supply equipment delivers wireless power within the maximum local installation limits.<br>－ The EV charges within the given local limits of the EV supply equipment.<br>未成功結束狀況：<br>－ 由於 WPT 失效，EV 供電設備無法供給無線功率。<br>－ The EV supply equipment does not deliver wireless power due to WPT failure. |

**7.8.3 來源自次要行為者之排程最佳化充電**

**7.8.3 Optimized charging with scheduling from secondary actors**

表 23　來源自次要行為者之排程最佳化充電

Table 23 − Optimized charging with scheduling based on information from secondary actors

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 來源自次要行為者之排程最佳化充電。<br>Optimized charging with scheduling based on information from secondary actors |
| 2 | 使用案例元件 ID (Use case element ID) | E2 |
| 3 | 目標(Objectives) | 由 EV 依來自次要行為者之資訊所計算的排程充電，以最佳化充電。能動態調整由 EV 所汲取功率之預期狀況。<br>Charging according to a schedule that was calculated by the EV based on information from secondary actors to optimize charging. Prognosis of the power drawn by the EV which can be dynamically adjusted. |
| 4 | 說明(Description) | 此使用案例涵蓋充電過程，其中包含關於本地設施、電網排程及銷售費率表之資訊。以此等資訊，EV 供電設備能動態地對供應鏈中之變化做出反應，以減少高峰需量或供過於求的情況，並將新的邊界條件傳達予 EV，以便對應地計算或變更充電排程。此外，次要行為者可存取所預測之電能傳送排程，以增強電力供應排程。<br>次要行為者需向 SECC 傳達關於本地設施之實際資訊(例：功率限制、本地發電)、電網排程及銷售費率表。<br>This use case covers the charging process with information about local installation, grid schedule and sales tariff table. With this information, the EV supply equipment can dynamically react to changes in the supply chain to reduce peak demand or oversupply situations and communicate the new boundary conditions to the EV with the intention to calculate or change the charging schedule accordingly. Additionally, the predicted energy transfer schedule becomes accessible to secondary actors in order to enhance electricity supply scheduling.<br>The secondary actors need to communicate to the SECC the actual information about the local installation (e.g. power limits, local power generation), grid schedule and sales tariff table.<br>所涉及之行為者為： |

| | | |
|---|---|---|
| | | － 主要行為者：EV、EVCC、EV 供電設備、SECC。<br>－ 次要行為者：DCH、EMSP、EMS。<br>The involved actors are:<br>－ Primary actors: EV, EVCC, EV supply equipment, SECC.<br>－ Secondary actors: DCH, EMSP, EMS.<br>情境說明：<br>－ USER 於 EV 上輸入電氣行動機制需要。<br>－ 針對使用者所提供之離場時間，EV 計算為電池完全充電 (kWh)所需的電能。<br>－ EVCC 將 EV 所需電能、離場時間及充電能力發送至 SECC，SECC 可能將其轉發予次要行為者。<br>－ EV 將計算充電排程，並將其傳達至 EV 供電設備。<br>－ EV 收到訊息內容後，將依實際限制起動充電，進入充電循環。<br>Scenario descriptions:<br>－ The USER inputs e-mobility needs at the EV.<br>－ The EV calculates the required amount of energy needed in order to fully charge (kWh) the battery for the user-provided departure time.<br>－ The EVCC sends the required energy amount, departure time and charging capability of the EV to the SECC, which might forward it to a secondary actor.<br>－ The EV will calculate a charging plan and communicate it back to the EV supply equipment.<br>－ The EV will start charging according to the actual limitation if it received the message content to enter the charging loop.<br>備考 1. 次要行為者收集〝需量及預期狀況〞。(例：來自 EV 供電設備之本地實體限制、本地發電、來自 DCH 的電網排程、來自 EP 或 EMSP 之銷售費率表、來自 EMS 的本地功 |

| | | |
|---|---|---|
| | | 率最佳化)。此動作可能於充電事件之前履行。<br><br>備考 2. 各 EV 供電設備之相關邊界條件係由次要行為者或 SECC 所計算。<br><br>NOTE 1 A secondary actor collects “Demand and prognosis”. (e.g. Local physical limits from the EV supply equipment, local power generation, grid schedule from the DCH, Sales tariff table from the EP or EMSP, local power optimisation from the EMS). This action might be performed prior to the charging event.<br><br>NOTE 2 The relevant boundary conditions for each EV supply equipment are calculated by a secondary actor or the SECC. |
| 5 | 先決條件(Prerequisites) | — 若適用依使用案例元件 D 之授權，則應成功地建立。<br><br>— SECC 應有能力自/向次要行為者轉發資訊。<br><br>— 應考量本地設施限制。<br><br>— If the authorization according to use case elements D is applied, it shall be established successfully.<br><br>— The SECC shall be able to forward information from/to the secondary actor.<br><br>— Consideration oflocal installation limits shall be available. |
| 6 | 要求事項(Requirements) | — USER 應輸入將納入排程中之電氣行動機制需要。<br><br>— EVCC、SECC 及次要行為者可觸發充電排程之重新安排。<br><br>— The USER shall input his e-mobility needs to be included in the schedule.<br><br>— The EVCC, the SECC and secondary actors can trigger a re-scheduling of the charging schedule.<br><br>觸發者：<br><br>— 充電授權已完成，EV 已備妥回收電能。<br><br>— 充電循環建立，其中發生 1 次中斷。<br><br>— EV 處於充電暫停狀態(例：依 IEC |

| | | |
|---|---|---|
| | | 61851-1 之狀態 B)，SECC 有必要重新協商充電排程。<br>Trigger:<br>— the authorization of charging has been completed and the EV is ready to retrieve energy;<br>— the charging loop is established and one of the interrupts occurs; or<br>— the EV is in a charging pause, e.g. state B according to IEC 61851-1, and the SECC has the necessity to renegotiate the charging schedule. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— EV 將依所協商之排程起動充電。<br>— The EV will start charging according to the negotiated schedule.<br>未成功結束狀況：<br>— 計算器未計算符合標的所要求之充電總量(kWh)。<br>— 次要行為者未收集〝標的設定〞及〝需量及預期狀況〞資訊。<br>— 次要行為者或 SECC 未提供(新的)邊界條件。<br>— EV 將不起動充電。<br>— The calculator does not calculate the required amount of charging (kWh) to meet the target.<br>— A secondary actor does not collect the “Target set” and “Demand and prognosis” information.<br>— A secondary actor or the SECC does not provide (new) boundary conditions.<br>— The EV will not start charging. |

### 7.8.4 具依 HLC 之負載平衡的 DC 充電

### 7.8.4 DC charging with load levelling based on HLC

表 24　具依 HLC 之負載平衡的 DC 充電

Table 24 – DC charging with load levelling based on HLC

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element | 具依 HLC 之負載平衡的 DC 充電。 |

| | | |
|---|---|---|
| | name) | DC charging with load levelling based on HLC. |
| 2 | 使用案例元件 ID(Use case element ID) | E4 |
| 3 | 目標(Objectives) | 於不考量複雜電網情況及次要行為者之情況下進行充電。於本地設施之限制內動態調整 EV 的最大 DC 功率。<br><br>Charging without considering complex grid situations and secondary actors. Dynamic adjustment of the maximum DC power to be drawn by the EV within the limits of the local installation. |
| 4 | 說明(Description) | EV 供電設備與 EV 將使用 HLC 交換關於 DC 功率限制之資訊。EV 供電設備將傳達可自插座汲取之最大 DC 功率，以保護 EV 的供電設備。<br><br>The EV supply equipment and the EV will exchange information about the DC power limits using HLC. The EV supply equipment will communicate the maximum DC power that can be drawn from the outlet in order to protect the supply equipment to the EV.<br><br>EV 與 EV 供電設備交換電池管理系統之控制資訊。<br><br>所涉及之行為者為：<br><br>— 主要行為者：EV、EVCC、EV 供電設備、SECC。<br><br>The EV and the EV supply equipment exchange control information for the battery management system.<br><br>The actors involved are:<br><br>— Primary actors: EV, EVCC, EV supply equipment, SECC. |
| 5 | 先決條件(Prerequisites) | — 若適用依使用案例元件 D 之授權，則應成功地建立。<br><br>— 應選擇模式 4 充電(依 IEC 61851-1)。<br><br>— If the authorization according use case elements D is applied, it shall be established successfully.<br><br>— Mode 4 charging (according to IEC 61851-1) shall be selected. |
| 6 | 要求事項(Requirements) | — EV 應向 EV 供電設備詢問最大 DC 功率、電壓及電流限制。<br><br>— EV 供電設備應回覆限制。 |

| | | |
|---|---|---|
| | | — EV 應提供關於所需之電壓及電流的資訊。<br>— 電能傳送循環將起動。<br>— The EV shall ask for the maximum DC power, voltage and current limits from the EV supply equipment.<br>— The EV supply equipment shall reply with the limits.<br>— The EV shall provide information about demanded voltage and current.<br>— The energy transfer loop will begin. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— EV 供電設備應於本地設施之最大限制內供給 DC 電力。<br>— EV 應於 EV 供電設備所給定之本地限制內充電。<br>— EV 供電設備應有能力供給電力，直到使用者解連。<br>— The EV supply equipment shall deliver DC power within the maximum local limits of installation.<br>— The EV shall be charged within the given local limits of the EV supply equipment.<br>— The EV supply equipment shall be able to deliver power until the user disconnects.<br>未成功結束狀況：<br>— 由於接觸器失效，EV 供電設備將無法提供 DC 電力。<br>— EV 與 EV 供電設備間之協商未成功。<br>— EV 供電設備未向 EV 供給電力。<br>— The EV supply equipment will not deliver DC power, due to contactor failure.<br>— Negotiation between the EV and the EV supply equipment failed.<br>— No power delivery from the EV supply equipment to the EV. |

**7.8.5 再續經授權充電排程**

### 7.8.5 Resume to authorized charging schedule

表 25　再續經授權充電排程

Table 25 − Resume to authorized charging schedule

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 再續經授權充電排程。<br>Resume to authorized charging schedule |
| 2 | 使用案例元件 ID (Use case element ID) | E5 |
| 3 | 目標(Objectives) | 重新起動休眠中之充電排程。<br>Restart sleeping charging schedule. |
| 4 | 說明(Description) | 此使用案例涵蓋對曾經授權且休眠中之充電排程的再續過程。<br>所涉及之行為者為：<br>－ 主要行為者：EV、EVCC、EV 供電設備、SECC。<br>This use case covers the resume process to the once authorized and sleeping charging schedule.<br>The actors involved are:<br>－ Primary actors: EV, EVCC, EV supply equipment, SECC.<br>情境說明：<br>－ 最佳化充電排程通常導致排程內之暫停或進入休眠狀態。於休眠狀態之情況下，EVCC 及 SECC 通常既無法相互通訊，且無法由對方喚醒。此取決於所使用之通訊技術。因此，本系列標準第 3 部依所使用之實體層及依 IEC 61851-1 之概念及要求事項，提供關於如何自 EV 或 EV 供電設備側，自休眠模式重新建立通訊的方法及概念。<br>Scenario description:<br>－ Optimizing charging schedule often lead to pause or went-to-sleep status within the schedule. In case of a sleep status, the EVCC and the SECC are, in general, neither able to communicate to each other nor can be woken up by the counterpart. This depends on the communication technology used. Therefore, ISO 15118-3 provides means and concepts as to how the communication can be re-established from sleep mode, either from the EV or EV |

| | | |
|---|---|---|
| | | supply equipment side, depending on the physical layer used and IEC 61851-1 based concepts and requirements.<br><br>— 喚醒觸發可於 EV 或 EV 供電設備端啟動。接收該初始觸發之個體應有能力依本系列標準第 3 部喚醒對方。<br><br>— HLC 將重新建立，並安全地再續識別及授權。<br><br>— EVCC 及/或 SECC 將自內部記憶體或 EMSP 識別/接收關於暫停充電排程之資訊，以便於其彼此間共享。若雙方接受此暫停之充電排程，則其將自中斷點再續。<br><br>— The wake-up trigger could be initiated either on the EV or EV supply equipment side. The entity which receives this initial trigger shall be able to wake up the counterpart according to ISO 15118-3.<br><br>— HLC will be re-established and identification and authorization resumed securely.<br><br>— The EVCC and/or SECC will recognise/receive information about the suspended charging schedule from the internal memory or the EMSP to share it between them. If both accept this suspended charging schedule, it will be resumed from the interrupted point. |
| 5 | 先決條件(Prerequisites) | — 最佳化之充電排程已於使用案例 E2 中獲取授權。<br><br>— 依使用案例元件 H1 暫停充電排程。<br><br>— EV 及 EV 供電設備依本系列標準第 3 部指示休眠模式。<br><br>— The optimized charging schedule is already authorized in use cases E2.<br><br>— The charging schedule is paused according use case element H1.<br><br>— The EV and the EV supply equipment indicate sleep mode according to ISO 15118-3. |
| 6 | 要求事項(Requirements) | — EV 或 EV 供電設備於充電排程重新起動時獲取初始喚醒觸發。<br><br>若 EV 供電設備獲取初始喚醒觸發，則應依本系列標準第 3 部喚醒 EV/EVCC。<br><br>若 EV 獲取初始喚醒觸發，則應依本系列 |

| | | |
|---|---|---|
| | | 標準第 3 部喚醒 EV 供電設備/SECC。<br>— HLC 應重新建立，識別、鑑別、授權應成功結束。<br>— 若邊界條件保持不變，則應執行 E2 並導致與最初議定之充電排程相同。<br>— 充電過程應自再續點重新起動。<br>— Either the EV or the EV supply equipment gets an initial wake-up trigger at the restart time of the charging schedule.<br>a. If the EV supply equipment gets the initial wake-up trigger, it shall wake up the EV/EVCC according to ISO 15118-3.<br>b. If the EV gets the initial wake-up trigger, it shall wake up the EV supply equipment/SECC according to ISO 15118-3.<br>— HLC shall be re-established and identification, authentication, authorization shall be ended successfully.<br>— E2 shall be executed and lead to the same charging schedule as original agreed if the boundary conditions remain unchanged.<br>— The charging process shall be re-started from the resume point. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— SECC 及 EVCC 接受先前暫停之計費會談的資訊，並同意再續。<br>— EVCC 回到充電排程之暫停點並重新起動充電。<br>— Information of the former suspended charging session is accepted by both the SECC and the EVCC and they agree to resume it.<br>— The EVCC goes back to the suspended point of the charging schedule and restarts charging.<br>未成功結束狀況：<br>— 喚醒對方未成功。<br>— SECC、EVCC 或兩者均不接受前次會談之資訊。<br>充電排程之協商導致不同結果，且可依經變更的排程再續充電。 |

| | | |
|---|---|---|
| | | 無法再續充電過程，因所要求之中間使用案例元件之一導致未成功結束條件。<br><br>— Wake up of counterpart was unsuccessful.<br><br>— Information of the former session is not accepted by either the SECC, the EVCC or both.<br><br>a. Negotiation of the charging schedule leads to different results and charging can be resumed according to the changed schedule.<br><br>b. It is not possible to resume the charging process because one of the required intermediate use case elements leads to a failure end condition. |

**7.8.6 具依 HLC 之具負載平衡的反向電力傳送**

**7.8.6 Reverse power transfer with load levelling based on HLC**

表 26　具依 HLC 負載平衡之反向電力傳送

Table 26 − Reverse power transfer with load levelling based on HLC

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具依 HLC 負載平衡之反向電力傳送。<br><br>Reverse power transfer with load levelling based on HLC |
| 2 | 使用案例元件 ID(Use case element ID) | E6 |
| 3 | 目標(Objectives) | 此使用案例涵蓋 AC 及 DC 反向電力傳送。依來自 EMS 通過 EV 電力系統之請求，於本地設施之限制內動態調整由 EV 所供給的最大 AC 或 DC 電流。<br><br>This use case covers both AC and DC reverse power transfer. Dynamic adjustment of the maximum AC or DC current to be delivered by the EV within the limits of the local installation, and according to the request from the EMS through the EV power system. |
| 4 | 說明 (Description) | SECC 及 EVCC 使用高層通訊交換關於 AC 或 DC 電流限制之資訊。SECC 向 EVCC 傳達可自插座汲取之最大電流，以保護 EV 電力系統。SECC 亦依來自 HEMS 之請求向 EVCC 傳達必要的電流。將排定反向電力傳送，包括 EMS 要求事項或電網之需量請求。<br><br>備考： 高層資訊不能牴觸 IEC 61851-1 中所定義之設備人身安全要求事項。此基本政策無法於任何使用案例中發生變化，包括反向電力傳送。<br><br>The SECC and the EVCC exchange information about the AC or DC current limits using high-level communication. The SECC communicates to the EVCC the maximum current that can be drawn from the outlet in order to protect the EV power system. The SECC also communicates to the EVCC the necessary current based on the request from the HEMS. Reverse power transfer will be scheduled including EMS requirements or demand request from the grid.<br><br>NOTE High-level information cannot be in contradiction to the safety requirements defined in IEC 61851-1. This basic policy cannot have changes in any use cases, including reverse power transfer.<br><br>所涉及之行為者為：<br><br>－ 主要行為者：USER、EV 供電設 |

| | | |
|---|---|---|
| | | 備、SECC。<br>－ 次要行為者：EMS。<br>The involved actors are:<br>－ Primary actors: USER, EV supply equipment, SECC.<br>－ Secondary actors: EMS. |
| 5 | 先決條件 (Prerequisites) | － 由 IEC 61851-1:2017 附錄 A 所提供之 C 或 D 控制狀態協議，應於 EV 與 EV 電力系統間成功地建立。<br>－ Control state agreement of C or D, given by IEC 61851-1:2017, Annex A, between EV and EV power system shall be established successfully. |
| 6 | 要求事項 (Requirements) | － EVCC 與 SECC 交換關於必要之 AC 或 DC 電流及其限制的資訊。<br>－ EVCC 及 SECC 獲取反向電力傳送排程。<br>－ 於 AC 情況下，EVCC 檢查來自 EV 之 AC 電流頻率與來自電網的 AC 電流頻率是否相等且同步。<br>－ 觸發者：EV 與 EV 電力系統間之 C 或 D 控制狀態協議，包括 EV、EV 電力系統及 HEMS 內部的必要準備。<br>－ The EVCC and the SECC exchange information about necessary AC or DC current and their limitations.<br>－ The EVCC and the SECC get a schedule of reverse power transfer.<br>－ In AC case the EVCC checks that the frequency of AC current flowing from the EV and the AC current frequency coming from grid are equal and synchronised.<br>－ Trigger: Control state agreement of C or D between the EV and the EV power system, including necessary preparation within the EV, the EV power system and the HEMS. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ EV 於本地設施之最大限制內進行 AC 或 DC 放電。<br>－ EV 於 EV 電力系統之本地限制內進行所請求之 AC 或 DC 放電。<br>－ The EV discharges AC or DC current |

| | | |
|---|---|---|
| | | within the maximum local limits of installation.<br><br>－ The EV discharges the requested AC or DC current within the local limits of the EV power system.<br><br>未成功結束狀況：<br><br>－ 於 AC 之情況下，EVCC 無法確保電網與 EV 間之頻率同步。<br><br>－ 由於 RPT 排程未達成一致，EV 不進行 AC 或 DC 放源。<br><br>－ In case of AC the EVCC can't ensure that frequencies are synchronized between the grid and the EV.<br><br>－ The EV does not discharge AC or DC power due to no agreement of the RPT schedule. |

### 7.8.7 單機運作時之反向電力電力傳送

### 7.8.7 Reverse power transfer stand-alone operation

表 27　單機運作時之反向電力電力傳送

Table 27 − Reverse power transfer on stand-alone operation

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 自電網解連獨立運作時之反向電力傳送。<br><br>Reverse power transfer on stand-alone operation disconnected from the grid. |
| 2 | 使用案例元件 ID (Use case element ID) | E7 |
| 3 | 目標(Objectives) | 此使用案例涵蓋單機運作時之 AC 及 DC 反向電力傳送，與電網解連。於此情況下，來自 HEMS 或電網之資訊可能為不可用。於該情況下，EV 將視為電壓產生器。<br><br>This use-case covers both AC and DC reverse power transfer on stand-alone operation, disconnected from the grid. In this type of situation information from the HEMS or the grid might be not available. In that case the EV will be considered as a voltage generator. |
| 4 | 說明(Description) | SECC 與 EVCC 使用高層通訊交換關於 AC 或 DC 電流限制之資訊。SECC 向 EVCC 傳達可自插座汲取之最大功率，以保護 EV 電力系統。<br><br>備考： 高層資訊不能牴觸 IEC 61851-1 中所定義之設備人身安全要求 |

| | | |
|---|---|---|
| | | 事項。此基本政策於任何使用案例中不發生變化，包括反向電力傳送。<br><br>The SECC and the EVCC exchange information about the AC or DC current limits using high-level communication. The SECC communicates to the EVCC the maximum power that can be drawn from the outlet in order to protect the EV power system.<br><br>NOTE The high-level information cannot be in contradiction to the safety requirements defined in IEC 61851-1. This basic policy can have no changes in any use cases, including reverse power transfer.<br><br>所涉及之行為者為：<br><br>－ 主要行為者：USER、EV 供電設備、SECC。<br><br>The involved actors are:<br><br>－ Primary actors: USER, EV supply equipment, SECC. |
| 5 | 先決條件(Prerequisites) | － 由 IEC 61851-1:2017 附錄 A 所提供之 C 或 D 控制狀態協議，應於 EV 與 EV 電力系統間成功地建立。<br><br>－ EV 供電設備應由獨立於電網之自身電源供電(例：使用內部電池)<br><br>－ Control state agreement of C or D, given by IEC 61851-1:2017, Annex A, between the EV and the EV power system shall be established successfully.<br><br>－ The EV supply equipment shall be supplied by its own power supply independent of the grid (e.g. with an internal battery). |
| 6 | 要求事項(Requirements) | － SECC 儘管並非由電網供電，但有能力安全運行並與 EVCC 通訊。<br><br>－ EVCC 與 SECC 交換關於最大 AC 或 DC 電流及電壓之資訊。<br><br>－ 針對 AC 連接，SECC 應向 EVCC 提供所有必要之資訊，以確保有能力滿足本地電網規格的技術要求。必要時，此資訊將於充電循環期間動態地更新。<br><br>－ The SECC, although not supplied by the grid, is able to operate safely and to communicate with the EVCC.<br><br>－ The EVCC and the SECC exchange |

| | | |
|---|---|---|
| | | information about the maximum AC or DC current and voltage.<br>— For AC connections the SECC shall provide all necessary information to the EVCC to ensure that the technical requirements of the local grid code can be met. Where necessary this information will be updated dynamically during the charging loop.<br>觸發者：<br>— EV 與 EV 電力系統間之 C 或 D 控制狀態協議，包括 EV、EV 電力系統及 HEMS 內部的必要準備。<br>Trigger:<br>— Control state agreement of C or D between EV and EV power system, including necessary preparation within EV, EV power system and HEMS. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— EV 於本地設施之最大限制內進行 AC 或 DC 放電。<br>— EV 於其自身之限制內放電。<br>— The EV discharges AC or DC current within the maximum local limits of installation.<br>— The EV discharges within its own limitations.<br>未成功結束狀況：<br>— 由於 RPT 排程未達成一致，EV 將不進行 AC 或 DC 放電。<br>— The EV does not discharge AC or DC power due to no agreement of the RPT schedule. |

### 7.8.8 依動態控制模式之快速回應電能傳送服務

### 7.8.8 Fast responding energy transfer services based on dynamic control mode

表 28　依動態控制模式之快速回應電能傳送服務

Table 28 − Fast responding energy transfer services based on dynamic control mode

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 基於動態控制模式之快速回應服務。<br>Fast responding services based on dynamic control mode. |

| | | |
|---|---|---|
| 2 | 使用案例元件 ID (Use case element ID) | E8 |
| 3 | 目標(Objectives) | 此使用案例涵蓋 AC 及 DC 充電及放電。其亦涵蓋考量複雜電網情況，以及電網服務次要行為者之 AC 或 DC 雙向電力傳送的動態調整。儘管使用動態控制模式，SECC 亦負責確保電氣行動機制需要(離場時間；最低及標的電能請求)。<br><br>This use case covers both AC and DC charging and discharging. It covers also dynamic adjustment of the AC or DC bidirectional power transfer considering complex grid situations and secondary actors for grid services. Although using dynamic control mode, the SECC is also responsible for ensuring e-mobility needs (departure time; minimum and target energy request). |
| 4 | 說明 (Description) | EV 供電設備與 EV 將使用 HLC 交換關於 AC 或 DC 功率限制之資訊。<br><br>EV 於電能傳送之前向 EV 供電設備提供其行動性需要。<br><br>EV 亦將提供最大及最小電能請求。最小及最大電能請求定義可用/允許之電池範圍，以確保 BPT 服務。<br><br>EVCC 與 SECC 將交換其充電及放電實體約束(電壓、電流、功率)。<br><br>於 AC 之情況下，EV 供電設備將傳達本地電網的電壓及頻率標稱值，以便 EV 查驗其相容性。<br><br>備考： 高層資訊不能牴觸 IEC 61851-1 中所定義之設備人身安全要求事項。<br><br>The EV supply equipment and the EV will exchange information about the AC or DC power limits using HLC.<br><br>The EV provides its mobility needs to the EV supply equipment before energy transfer.<br><br>The EV will also provide the maximum and minimum energy request. The minimum and maximum energy requests define the usable/allowed battery range to ensure BPT services.<br><br>The EVCC and the SECC will exchange their charging and discharging physical limitations (voltage, current, power).<br><br>In case of AC, the EV supply equipment will communicate the nominal value of |

| | | |
|---|---|---|
| | | voltage and frequency of the local grid in order for the EV to verify its compatibility.<br><br>NOTE High-level information cannot be in contradiction to the safety requirements defined in IEC 61851-1.<br><br>行為者為：<br><br>－ 主要行為者：EV、EVCC、EV 供電設備、SECC、USER。<br><br>－ 次要行為者：EMS、彈性營運者。<br><br>The actors are:<br><br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, USER.<br><br>－ Secondary actor: EMS, flexibility operator.<br><br>情境說明：<br><br>－ EVCC 與 SECC 交換其實體限制。<br><br>－ EVCC 向 SECC 發送使用者行動性需要之資訊。<br><br>－ SECC 將使用者行動性需要傳送予 EMS，EMS 將考量或將此資訊轉發予彈性營運者。<br><br>Scenario description:<br><br>－ The EVCC and the SECC exchange their physical limitations.<br><br>－ The EVCC sends to the SECC the user mobility needs.<br><br>－ The SECC transfers the user mobility needs to the EMS which will either take it into consideration or forward this information to the flexibility operator. |
| 5 | 先決條件(Prerequisites) | － EV 及 EV 供電設備有能力支援動態控制模式。<br><br>－ SECC 已提出動態控制模式。<br><br>－ EVCC 已選定動態控制模式。<br><br>－ 使用者與彈性營運者間存在有效契約。<br><br>－ The EV and the EV supply equipment are able to support dynamic control mode.<br><br>－ The SECC has proposed dynamic control mode.<br><br>－ The EVCC has chosen dynamic control |

| | | |
|---|---|---|
| | | mode.<br><br>— A valid contract exists between the user and the flexibility operator.<br><br>— 使用者已將 EV 組態設定為於此位置，或於提供時選擇此動態控制模式服務。<br><br>— 需要時，EV 及充電站，或與彈性營運者簽訂契約之 EV 及充電站，可能已證明為電網備載提供者。<br><br>— EV 與充電站，或 EV 與充電站與彈性營運者簽約，遵循市場規則。<br><br>— The user has configured the EV to select this dynamic control mode service either at this location or when offered.<br><br>— If needed, the EV and the charging station, or the EV and the charging stations in contract with the flexibility operator, may have been certified as grid reserve providers.<br><br>— The EV and the charging station, or the EV and the charging stations in contract with the flexibility operator, abide by the market rules. |
| 6 | 要求事項(Requirements) | — EVCC 與 SECC 應交換關於其實體約束之資訊。<br><br>— 針對 AC 連接，SECC 應向 EVCC 提供所有必要之資訊，以確保有能力滿足本地電網規格的技術要求。必要時，此資訊將於充電循環期間動態地更新。<br><br>— SECC 應將行動性需要傳送予適當之 SA。<br><br>— The EVCC and the SECC shall exchange information about their physical limitations.<br><br>— For AC connections the SECC shall provide all necessary information to the EVCC to ensure that the technical requirements of the local grid code can be met. Where necessary this information will be updated dynamically during the charging loop.<br><br>— The SECC shall transfer the mobility needs to the appropriate SA.<br><br>— SECC 及 SA 應優先考量使用者行動性需要，而非系統及電網服務。 |

| | | |
|---|---|---|
| | | — SECC 及 SA 應遵循由使用者或 EV 所定義之實體限制及電能最小/最大範圍。<br><br>— 若於識別階段提到與彈性營運者之契約，則該契約應於電能傳送起動前由彈性營運者加以驗證。<br><br>— The SECC and SAs shall give preference to user mobility needs over system and grid services.<br><br>— The SECC and SAs shall comply with physical limitations and energy minimum/maximum range defined by the user or the EV.<br><br>— If a contract with a flexibility operator has been mentioned during identification phases, then the contract shall be validated by the flexibility operator before the energy transfer starts. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br><br>— EV 將由 SECC 電源請求起動 AC 或 DC 充電及/或放電。<br><br>— EV 將於本地設施及 EV 條件之最大限制內起動 AC 或 DC 充電及/或放電。<br><br>— The EV will start charging and/or discharging AC or DC current abiding by the SECC power request.<br><br>— The EV will start charging and/or discharging AC or DC current within the maximum limits oflocal installation and EV conditions.<br><br>未成功結束狀況：<br><br>— 依本地電網之電壓及頻率標稱值，EVCC 將評估其相容性，若不相容則結束會談。<br><br>— EV 將不起動充電或放電。<br><br>— 與彈性營運者之契約尚未驗證。<br><br>— Based on the voltage and frequency nominal value of the local grid, the EVCC will evaluate its compatibility and end session if it is not compatible.<br><br>— The EV will not start charging or discharging.<br><br>— The contract with flexibility operator has not been validated. |

### 7.8.9 受管理雙向電力傳送進入電網及/或家庭

### 7.8.9 Managed bidirectional power transfer into the grid and/or into the home

表 29　受管理雙向電力傳送進入電網及/或家庭

Table 29 − Managed bidirectional power transfer into the grid and/or into the home

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 營運使用案例(Business use case) | 受管理雙向電力傳送進入電網及/或家庭。<br>Managed bidirectional power transfer into the grid and/or into the home |
| 2 | 使用案例 ID (Use case ID) | E9 |
| 3 | 目標(Objectives) | 依本地 EMS 及 EV 所發送之訊息，雙向電力傳送至電網及/或家庭。此使用案例描繪於 BPT 之全景中，協商及重新協商如何就緒，以及附加的要求事項為何。<br>Bidirectional power transfer into the grid and/or into the home based on messages sent by the local EMS and the EV. This use case is an illustration of how negotiation and re-negotiation take place in the context of BPT and what are the requirements attached. |
| 4 | 說明(Description) | 一組 EV (可能 1 個)插接一組 EV 供電設備(可能 1 個)並已成功地建立 HLC。EV 供電設備係通過電網供電點所供應，總電能由 EMS 管理，EMS 有能力接收來自 DSO 或彈性營運者(若有)之訊息，以便為電網提供輔助服務。EMS 亦可能負責最佳化本地生產。<br>A group of EVs (could be one) are plugged-in at a group of EV supply equipment (could be one) and have established a successful HLC. The EV supply equipment are supplied through a grid delivery point and the total energy is managed by an EMS able to receive messages from the DSO or from a flexibility operator (if any) in order to offer ancillary services to the grid. The EMS may also be in charge of optimizing local production.<br>EMS 依接收自 DSO、其彈性營運者或本地 DER 或電能價格之約束及/或誘因，不斷最佳化消費及生產。例：DSO 可於特定持續時間內自特定時間，起動定期向 EMS 發送特定之最大功率雙向分布。EMS 亦可接收與價格相關之資訊，用於自電網耗用電能並將電能回饋至電網中。由於其他本地 DER 可能涉及此傳送，因此由 EMS 決定係配置全部或僅配置一部分與電網所 |

| | | |
|---|---|---|
| | | 交換之來自 EV 電池或向 EV 電池交換的電能。<br><br>The EMS is continuously optimizing the consumption and production based on constraints and/or incentives received from the DSO, from its flexibility operator or local DER or energy prices. For example, the DSO may regularly send to the EMS a certain bidirectional profile of maximum power during a specific duration, starting at certain time. The EMS may also receive price-related information for consuming from and feeding back energy into the grid. As other local DER may participate in this transfer it is up to the EMS to decide whether to allocate all or only a part of the energy to be exchanged with the grid from or to the EV batteries.<br><br>例： 另一 DER 可能係 EV 本身。於此情況下，EV 可於特定持續時間內自特定時間起動向 EMS 發送特定之最大功率雙向分布。若可用，亦包括用於將電能回饋至基礎設施之價格相關資訊。<br><br>然後，EMS 計算所有 EV 應傳送之總最大功率曲線(正或負)，並定期通知 SECC 此需量。若可用，EMS 亦將電能價格(耗用及回饋)傳達予 SECC。<br><br>Another DER for example may be an EV itself. In this case the EV may send a certain bidirectional profile of maximum power during a specific duration, starting at a certain time to the EMS. If available, also including price-related information for feeding back energy into the infrastructure.<br><br>The EMS then calculates the aggregated maximum power profile (positive or negative) that all EVs should transfer and informs periodically the SECCs of this demand. If available, the EMS also communicates prices for energy (consuming and feeding back) to the SECCs.<br><br>備考 1. EMS 用於通知 SECC 之訊息的方式及形式不屬本系列標準範圍內。例：可通過與 CSO 之溝通通道。於此情況下，CSO 將取決於 EV 之需量及契約於所有 EV 間配置可用電力。<br><br>NOTE 1 The way and form of messages used by the EMS to inform the SECC is out of scope of the ISO 15118 series. For example, it could be through a |

| | | |
|---|---|---|
| | | communication channel with the CSO. In that case the CSO would distribute the available power among all EVs depending on their e-mobility needs and contracts.<br><br>備考 2. 若有可能且需要，EMS (經由 CSO)可能需詢問既存電氣行動機制結算所，使用者與彈性營運者間所簽署契約是否可被與運作 EMS 之前提電能營運者簽訂契約的彈性營運者所接受。<br><br>NOTE 2 If possible and needed, the EMS, via the CSO, can need to ask an existing e-mobility clearing house if the contracts signed between the users and the flexibility operators can be accepted by the flexibility operator having a contract with the premise energy operator operating the EMS.<br><br>備考 3. EMS 於向各 SECC 發送資訊之前，可修改最初所接收的功率、持續時間及起始日期，以使其適應電網規格、本地約束或市場機會。<br><br>NOTE 3 The EMS, before sending the information to each SECC, can modify the power, the duration and the starting date originally received in order to adapt them to grid codes, local constraints or market opportunities.<br><br>EMS 經由 CSO 通知 SECC，向 EVCC 發送重新協商訊息，以啟動與行動性需要、新標的設定、排程及費率相關之資訊交換。<br><br>由 EV 內部觸發(變更之行動性需要、新的標的設定等)通知，EVCC (等效於 SECC)能觸發重新協商。<br><br>重新協商成功後，SECC 通知 EMS 雙向電力傳送之實際排程。若要求，EMS 可決定配置新資源。<br><br>The SECCs, notified by the EMS via the CSO, send a renegotiation message to the EVCCs in order to initiate the exchange of information related to mobility needs, new target settings, scheduling and tariffs.<br><br>Equivalent to the SECC, the EVCC, notified by an EV internal trigger (changed mobility needs, new target settings, etc.), can trigger a renegotiation.<br><br>After the renegotiation is successfully done, SECCs inform the EMS of the actual scheduling of the bidirectional power |

| | | |
|---|---|---|
| | | transfers. If needed, the EMS may decide to allocate new resources.<br><br>於雙向電力傳送序列期間及之後，需量測所傳送的電能，以便確定傳送之真實性並確保交易的可追蹤性。<br><br>量測可於 EV、EV 供電設備或兩者中進行。最終，EV 供電設備將發出 SDR，以通知使用者及其他 SA 所傳送之電能。SDR 應反映電能傳送之細節，且可於 EV 供電設備無法存取所有量測值的情況下使用來自 EV 之資訊。<br><br>During and after the bidirectional power transfer sequences, the energy transferred needs to be measured in order to establish the reality of the transfer and ensure traceability of the transactions.<br><br>Measurements can be done in the EV, the EV supply equipment or both. Eventually, an SDR is issued by the EV supply equipment in order to notify the users and other SAs of the energy transferred. The SDR shall reflect the details of energy transfers and may use information from the EV in case the EV supply equipment does not have access to all measurements.<br><br>期間及精確度等量測參數係取決於本地法規，且於 BPT 會談之前由適當之 SA 傳達予 SECC。<br><br>所涉及之行為者為：<br><br>— 主要行為者：EV、EVCC、EV 供電設備、SECC。<br><br>— 次要行為者：EMS、DSO、CSO、彈性營運者、電氣行動機制結算所、EMSP、USER。<br><br>Measurement parameters like period and precision depend on local regulations and have been communicated by the appropriate SA to the SECC before the BPT session.<br><br>The actors involved are:<br><br>— Primary actors: EV, EVCC, EV supply equipment, SECC.<br><br>— Secondary actors: EMS, DSO, CSO, flexibility operator(s), e-mobility clearing house, EMSP, user. |
| 5 | 先決條件(Prerequisites) | — 使用者或建築物電能營運者或兩者與 1 或多個彈性營運者簽訂有效契約，以於電網中傳送電能。 |

| | | |
|---|---|---|
| | | － EV 供電設備經地方當局(例：DSO)證明，可向電網注入電能。證明可能取決於本地電網及安全法規。<br><br>－ EVCC 成功地與 SECC 進行本系列標準 HLC 會談，與其交換關於其 EMSP 契約之資訊。<br><br>－ 考量應可用之本地設施限制。<br><br>－ The users or the building energy operator or both have valid contracts with one or more flexibility operators for transferring energy in the grid.<br><br>－ The EV supply equipment are certified by the local authority (e.g. DSO) to inject energy into the grid. Certification may depend on the local grid and safety codes.<br><br>－ The EVCCs are engaged in a successful ISO 15118 HLC session with the SECCs with whom they have exchanged information about their EMSP contract.<br><br>－ Consideration oflocal installation limits shall be available. |
| 6 | 要求事項(Requirements) | － 使用者應輸入其電氣行動機制需要。<br><br>－ EVCC 及 SECC 應交換關於其雙向實體限制之資訊。<br><br>－ EVCC 與 SECC 應交換關於電能可用性(隨時間變化的電力)，以及耗用電能或回饋電能之價格(隨時間變化的電力價格)之資訊。<br><br>－ The users shall input their e-mobility needs.<br><br>－ EVCCs and SECCs shall exchange information about their bidirectional physical limitations.<br><br>－ EVCCs and SECCs shall exchange information about availability of energy (power over time) and prices for consuming energy or feeding back energy (price for power over time).<br><br>備考 4. 向系統供電之價格可由電能本身設定。此意指，自電網耗用電能之價格可由電能行為者設置及溝通(溝通通道及協定不於本標準的範圍內)。自 EV 向系統回饋電能的價格可(直接或間接)設置並由 EV 傳 |

| | | |
|---|---|---|
| | | 達。於此種情況下，通訊通道可是 EV 與 EV 供電設備間之本系列標準 HLC。<br><br>NOTE 4 The prices for feeding energy into the system can be set by the sources of energy themselves. That means, that the prices for consuming energy from the grid can be set and communicated by the energy actors (communication channel and protocols are out of scope of this document). The prices for feeding back energy from an EV into the system can be set (directly or indirectly) and communicated by the EV. In that case the communication channel can be the ISO 15118 HLC between the EV and the EV supply Equipment.<br><br>— EVCC 應向 SECC 發送關於其彈性契約之資訊，以便 EMS 檢查其有效性，且於需要時通過電氣行動機制結算所漫游至其彈性營運者。<br><br>— 所有 EV 供電設備應量測有效傳送至電網之電能，同時考量本地電網規格及彈性契約量測要求。<br><br>— EV 可檢查由 EV 供電設備所量測之電能。<br><br>— EVCCs shall send information about their flexibility contract to the SECC in order for the EMS to check their validities and, if needed, roam to its flexibility operator through an e-mobility clearing house.<br><br>— All EV supply equipment shall measure the energy effectively transferred to the grid, taking into account local grid codes and flexibility contract measurement requirements.<br><br>— EVs may check the energy measured by the EV supply equipment.<br><br>— 若要求，EV 供電設備應產生 SDR，其指示日期、持續時間、傳送自及傳送至電池之電能，以及由彈性契約所要求的所有其他量測值(例：負載曲線、有效及/或無效電能、電流品質、頻率…)。<br><br>— SDR 應發送至 EMSP 及 EMS。SDR 應由 EV 供電設備簽署並加密。可能由 EV 檢查。<br><br>— If required, the EV supply equipment shall produce an SDR indicating the date, |

| | | |
|---|---|---|
| | | duration, energy transferred, from and to the battery, and all other measurements required by the flexibility contract (e.g. load curves, active and/or reactive energy, quality of current, frequency…).<br><br>— The SDRs shall be sent to the EMSP and to the EMS. The SDR shall be signed and encrypted by the EV supply equipment. It may be checked by the EV.<br><br>觸發者：<br><br>— 已完成放電授權，EV 準備傳送電能。<br><br>— 充電循環已建立，其中發生 1 次中斷，SECC 或 EVCC 有必要重新協商。若重新協商之結果為雙向服務，則可起動此使用案例。<br><br>Triggers:<br><br>— The authorization of discharging has been completed and EVs are ready to transfer energy.<br><br>— The charging loop is established and one of the interrupts occurs and the SECC or the EVCC has the necessity to renegotiate. If the result of the renegotiation is a bidirectional service then this use case can start. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br><br>— EV 供電設備於本地最大設施限制內並依重新協商期間議定之條件傳送電力。<br><br>— EV 將依使用者之行動性需要充電。<br><br>— The EV supply equipment is transferring power within the maximum local limits of installation and according the conditions agreed during the renegotiations.<br><br>— EVs will be charged according the mobility needs of the users.<br><br>未成功結束狀況：<br><br>— 由於接觸器失效，EV 供電設備無法傳送電力。<br><br>— EV 與 EV 供電設備間之協商未成功。<br><br>— EV 供電設備與 EV 間無電力傳送。 |

| | | |
|---|---|---|
| | | － 彈性契約無法被 SA 評鑑為有效。<br>－ The EV supply equipment is not able to transfer power due to contactor failure.<br>－ Negotiation between the EV and the EV supply equipment failed.<br>－ No power transfer between the EV supply equipment and the EV.<br>－ Flexibility contracts can't be assessed as valid by the SAs. |

**7.9 電能傳送控制及重新排程[F]**

**7.9.1 電能傳送循環**

**7.9 Energy transfer controlling and re-scheduling [F]**

**7.9.1 Energy transfer loop**

表 30　電能傳送循環

Table 30 − Energy transfer loop

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 電能傳送循環。<br>Energy transfer loop |
| 2 | 使用案例元件 ID (Use case element ID) | F0 |
| 3 | 目標(Objectives) | 持續電能傳送過程，直至達到成功條件並啟用傳送電能計費。<br>Continue energy transfer process until success conditions reached and enable billing of transferred energy. |
| 4 | 說明(Description) | 此使用案例涵蓋基本電能傳送循環。行為者間需交換下列資訊：<br>所涉及之行為者為：<br>－ 主要行為者：EV、EVCC、EV 供電設備、SECC。<br>This use case covers the basic energy transfer loop. The following information needs to be exchanged between the actors:<br>The actors involved are:<br>－ Primary actors: EV, EVCC, EV supply equipment, SECC.<br>自 EVCC 至 SECC：EV 狀態(依本系列標準第 2 部或第 20 部所約定)。<br>自 SECC 至 EVCC：EV 供電設備狀態(例： |

| | | |
|---|---|---|
| | | 最大電流，依本系列標準第 2 部或第 20 部中所約定)。<br><br>From the EVCC to the SECC: EV status (as stipulated in ISO 15118-2 or ISO 15118-20).<br><br>From the SECC to the EVCC: EV supply equipment status (e.g. maximum current, as stipulated in ISO 15118-2 or ISO 15118-20). |
| 5 | 先決條件(Prerequisites) | — E1、E2、E4、E5、E6 或 E7 標的設定或電能傳送排程使用案例應成功地建立。<br><br>— 電能傳送循環應係作用中。<br><br>— E1, E2, E4, E5, E6 or E7 target setting or energy transfer scheduling use cases shall be successfully established.<br><br>— The energy transfer loop shall be active. |
| 6 | 要求事項(Requirements) | — EVCC 應依本系列標準第 2 部或第 20 部，於所規定時框內向 SECC 發送目前狀態。<br><br>— SECC 應以未具中斷旗標之方式回覆。<br><br>— EVCC 及 SECC 應遵循可追蹤性要求事項。<br><br>— The EVCC shall send the SECC the current status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br><br>— The SECC shall reply with no interrupt flag.<br><br>— The EVCC and the SECC shall comply with traceability requirements. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br><br>— 電能傳送循環持續。<br><br>— The energy transfer loop continues.<br><br>未成功結束狀況：<br><br>— 電能傳送循環將停止。<br><br>— 由於可追蹤性檢查未成功，電能傳送循環終止。<br><br>— The energy transfer loop will be stopped.<br><br>— The energy transfer loop is terminated |

| | | |
|---|---|---|
| | | due to traceability check fails. |

**7.9.2 具計量資訊交換之電能傳送循環**

**7.9.2 Energy transfer loop with metering information exchange**

表 31　具計量資訊交換之電能傳送循環

Table 31 − Energy transfer loop with metering information exchange

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具計量資訊交換之電能傳送循環。<br>Energy transfer loop with metering information exchange |
| 2 | 使用案例元件 ID (Use case element ID) | F1 |
| 3 | 目標(Objectives) | 持續電能傳送過程，直至達到成功條件並啟用傳送電能計費。<br>Continue the energy transfer process until success conditions are reached and enable billing of transferred energy. |
| 4 | 說明(Description) | 此使用案例涵蓋具表計讀數之基本電能傳送循環。為可靠地控制電能傳送，所有涉及之 SA 應有能力證明電能傳送自或傳送至特定 EV/用戶。因此，EV 須確認電能於特定時間傳送自或傳送至特定 EV 供電設備。關於 EVCC 與 SECC 間之通訊，1 種可能性為車輛對來自 SECC 之表計讀數加以簽署，以確認已接收表計紀錄。車輛可於 EV 供電設備量測之電能與所傳送電能間進行合理性檢查，以驗證於電能傳送過程中是否存在非可預期的高電能損失。<br>This use case covers the basic energy transfer loop with meter reading. For reliable control of the energy transferred, all SAs involved shall be able to prove that energy was transferred to or from a specific EV/customer. It is therefore mandatory for an EV to confirm that energy was transferred at a certain time and from or to a certain EV supply equipment. With respect to the communication between the EVCC and the SECC, one possibility is that the vehicle signs the meter readings from the SECC to confirm the reception of the meter record. The vehicle may perform a plausibility check between the EV supply equipment measured energy amount and the transferred energy amount to validate if there is an unexpected high-energy loss during the energy transfer process.<br>所涉及之行為者為：<br>− 主要行為者：EV、EVCC、EV 供電設備、SECC。<br>依本系列標準第 2 部或第 20 部中所約定，行為者間應交換下列資訊： |

| | | |
|---|---|---|
| | | 自 EVCC 至 SECC：EV 狀態、具正負號表計讀數。<br><br>自 SECC 至 EVCC：EV 供電設備狀態、表計讀數。<br><br>The actors involved are:<br><br>— Primary actors: EV, EVCC, EV supply equipment, SECC.<br><br>As stipulated in ISO 15118-2 or ISO 15118-20, the following information shall be exchanged between the actors:<br><br>From the EVCC to the SECC: EV status, signed meter reading.<br><br>From the SECC to the EVCC: EV supply equipment status, meter reading. |
| 5 | 先決條件(Prerequisites) | — 依使用案例元件 E1、E2、E6 或 E7 之標的設定或電能傳送排程應成功地建立。<br><br>— 電能傳送循環應係作用中。<br><br>— Target setting or energy transfer scheduling according to use case elements E1, E2, E6 or E7 shall be established successfully. |
| | | — The energy transfer loop shall be active. |
| 6 | 要求事項(Requirements) | — EVCC 應依本系列標準第 2 部或第 20 部，於所規定之時框內向 SECC 發送目前狀態。<br><br>— SECC 應以未具中斷旗標之方式回覆。<br><br>— SECC 應向 EVCC 發送表計讀數以供簽署。<br><br>— The EVCC shall send the SECC the current status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br><br>— The SECC shall reply with no interrupt flag.<br><br>— The SECC shall send a meter readout to the EVCC for signing.<br><br>— SECC 應將經簽署之表計讀數發送至 EMSP。<br><br>— EVCC 及 SECC 應遵循可追蹤性要求事項。<br><br>— 針對 AC 連接，若於充電循環控制 |

| | | |
|---|---|---|
| | | 期間未提供表計讀數，則 EV 可能立即停止任何反向電力潮流。<br>— The SECC shall send the signed meter readout to the EMSP.<br>— The EVCC and the SECC shall comply with traceability requirements.<br>— For AC connections, if no meter reading is provided during the charging loop control then the EV may stop immediately any reverse power flow. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— EVCC 接收計量資訊並為其建立簽署。<br>— SECC 接收計量資訊之簽署。<br>— 電能傳送循環持續。<br>— The EVCC receives the metering information and creates a signature for it.<br>— The SECC receives the signature of the metering information.<br>— The energy transfer loop continues.<br>未成功結束狀況：<br>— 資訊驗證未成功，例：所供給之電能不同於所接收的電能。<br>— 針對特定期間內或預先規定之電量，SECC 未收到簽署的表計讀數。<br>— 由於未收到 EVCC 驗證，EV 供電設備停止電能傳送。<br>— 由於可追蹤性檢查未成功，電能傳送循環終止。<br>— 電能傳送循環將停止。<br>— The validation of the information fails, e.g. the delivered energy amount is different from the received energy amount.<br>— The SECC has not received the signed meter reading for a certain period or for a pre-specified amount of energy.<br>— The EV supply equipment stops energy transfer as the EVCC validation was not received.<br>— The energy transfer loop is terminated due to traceability check fails. |

| | | |
|---|---|---|
| | | — The energy transfer loop will be stopped. |

### 7.9.3 WF1：WPT 充電循環

### 7.9.3 WF1: WPT charging loop

表 32　WPT 充電循環

Table 32 – WPT charging loop

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | WPT 充電循環。<br>WPT charging loop. |
| 2 | 使用案例元件 ID(Use case element ID) | WF1 |
| 3 | 目標(Objectives) | 持續充電過程，直至達到成功條件並啟用傳送電能計費。<br>Continue the charging process until success conditions are reached and enable billing of transferred energy. |
| 4 | 說明(Description) | 此使用案例涵蓋基本電能傳送循環。行為者間應交換下列資訊：<br>所涉及之行為者為：<br>— 主要行為者：EV、EVCC、EV 供電設備、SECC。<br>自 EVCC 至 SECC：EV 狀態(依本系列標準第 20 部所約定)。<br>自 SECC 至 EVCC：EV 供電設備狀態(例：依本系列標準第 20 部中所約定之最大無線功率)。<br>This use case covers the basic energy transfer loop. The following information shall be exchanged between the actors:<br>The actors involved are:<br>— Primary actors: EV, EVCC, EV supply equipment, SECC.<br>From the EVCC to the SECC: EV status (as stipulated in ISO 15118-20).<br>From the SECC to the EVCC: EV supply equipment status (e.g. maximum wireless power, as stipulated in ISO 15118-20). |
| 5 | 先決條件(Prerequisites) | — 依使用案例元件 WE 之標的設定或計費排程應成功地建立。<br>— 電能傳送循環應係作用中。 |

| | | |
|---|---|---|
| | | − Target setting or charging scheduling according to use case elements WE shall be established successfully.<br>− The energy transfer loop shall be active. |
| 6 | 要求事項(Requirements) | EVCC 應依本系列標準第 20 部，於所規定時框內向 SECC 發送目前狀態。<br>− SECC 應以未具中斷旗標之方式回覆。<br>− EVCC 及 SECC 應遵循可追蹤性要求事項。<br>The EVCC shall send the SECC the current status in a specified time frame according to ISO 15118-20.<br>− The SECC shall reply with no interrupt flag.<br>− The EVCC and the SECC shall comply with traceability requirements. |
| 7 | End conditions (結束狀況) | 成功結束狀況：<br>− 電能傳送循環持續。<br>− The energy transfer loop continues.<br>未成功結束狀況：<br>− 電能傳送循環將停止。<br>− 由於可追蹤性檢查未成功，電能傳送循環終止。<br>− The energy transfer loop will be stopped.<br>− The energy transfer loop is terminated due to traceability check fails. |

### 7.9.4 具源自 SECC 中斷之電傳送循環

### 7.9.4 Energy transfer loop with interrupt from the SECC

表 33　具源自 SECC 中斷之電傳送循環

Table 33 − Energy transfer loop with interrupt from the SECC

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具源自 SECC 之中斷的電傳送循環。<br>Energy transfer loop with interrupt from the the SECC |
| 2 | 使用案例元件 ID (Use case element ID) | F2 |

| | | |
|---|---|---|
| 3 | 目標(Objectives) | 持續電能傳送過程，直到 SECC 中斷電能傳送循環。<br><br>Continue the energy transfer process until the SECC interrupts the energy transfer loop. |
| 4 | 說明(Description) | EVCC 為〝客戶端〞，恆請求源自 SECC 之資訊。若 SECC 想要中斷電能傳送循環，例：更新充電排程或負載平衡之新設定點，則此使用案例將描述該過程。<br><br>所涉及之行為者為：<br><br>－ 主要行為者：EV、EVCC、EV 供電設備、SECC。<br><br>The EVCC is the “client” and always requests information from the SECC. If an SECC wants to interrupt the energy transfer loop, for example with an updated charging schedule or new set-point for the load levelling, then this use case will describe the process.<br><br>The actors involved are:<br><br>－ Primary actors: EV, EVCC, EV supply equipment, SECC.<br><br>行為者間應交換下列資訊：<br><br>自 EVCC 至 SECC：EV 狀態(依本系列標準第 2 部或第 20 部中所約定)。<br><br>自 SECC 至 EVCC：EV 供電設備狀態(依本系列標準第 2 部或第 20 部中所約定)、SECC 中斷、由 USER 所提供之新離場時間。<br><br>備考： 若由 USER 設定新離場時間並由 SECC 傳送，則對應之 SA 負責安全之傳送方式。<br><br>The following information shall be exchanged between the actors:<br><br>From the EVCC to the SECC: EV status (as stipulated in ISO 15118-2 or ISO 15118-20).<br><br>From the SECC to the EVCC: EV supply equipment status (as stipulated in ISO 15118-2 or ISO 15118-20), SECC interrupt, new departure time provided by the USER.<br><br>NOTE In case of a new departure time set by the USER and transmitted by the SECC, the corresponding SA takes care of a secured way of transmission. |
| 5 | 先決條件(Prerequisites) | － 應成功地建立依 E 之使用案例元件 |

| | | |
|---|---|---|
| | | 的標的設定或電能傳送排程。<br>— 電能傳送循環應係作用中。<br>— Target setting or energy transfer scheduling according to use case elements of E shall be established successfully.<br>— The energy transfer loop shall be active. |
| 6 | 要求事項(Requirements) | — SECC 應依本系列標準第 2 部或第 20 部，於所規定時框內向 EVCC 發送目前狀態。<br>— 由 SECC/次要行為者所設定之電能傳送過程中斷旗標。<br>— EVCC 應再次初始化電能傳送設置過程。<br>— EVCC 及 SECC 應遵循可追蹤性要求事項。<br>— The SECC shall send the EVCC the current status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br>— The energy transfer process interrupt flag set by the SECC/secondary actor.<br>— The EVCC shall initialize the energy transfer set-up process again.<br>— The EVCC and the SECC shall comply with traceability requirements. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 發生電能傳送循環中斷，電能傳送設置抑或起動電能傳送過程結束。<br>— The energy transfer loop interrupt occurred and either the energy transfer set-up or end of energy transfer process starts.<br>未成功結束狀況：<br>— 電能傳送循環不再起動。<br>— 由於可追蹤性檢查未成功，電能傳送循環終止。<br>— The energy transfer loop does not start again.<br>— The energy transfer loop is terminated due to traceability check fails. |

### 7.9.5 具源自 EVCC 或 USER 中斷之電能傳送循環

### 7.9.5 Energy transfer loop with interrupt from the EVCC or USER

表 34　具源自 EVCC 或 USER 中斷之電能傳送循環

Table 34 − Energy transfer loop with interrupt from the EVCC or USER

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 具源自 EVCC 或 USER 中斷之電能傳送循環。<br><br>Energy transfer loop with interrupt from the EVCC or USER |
| 2 | 使用案例元件 ID (Use case element ID) | F3 |
| 3 | 目標(Objectives) | EVCC 或 USER 中斷電能傳送循環之可能性。<br><br>Possibility for the EVCC or USER to interrupt the energy transfer loop. |
| 4 | 說明(Description) | EVCC 或 USER 於下列情況下中斷電能傳送過程：電能傳送排程發生變化，或 EV 中發生非可預測之事件或使用者回傳且想要離開。<br><br>The EVCC or the USER interrupts the energy transfer process when e.g. the energy transfer schedule changes or an unpredictable event in the EV occurs or the USER returns and wants to leave.<br><br>所涉及之行為者為：<br><br>－　主要行為者：EV、EVCC、EV 供電設備、SECC、USER。<br><br>The actors involved are:<br><br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, USER.<br><br>此使用案例涵蓋具來自 EVCC 或 USER 之中斷的基本電能傳送循環。<br><br>－　EVCC 應依本系列標準第 2 部或第 20 部，於所規定時框內發送 EV 狀態。<br><br>This use case covers the basic energy transfer loop with interrupt from the EVCC or USER.<br><br>－ The EVCC shall send an EV status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br><br>－　SECC 應依本系列標準第 2 部或第 20 部，於所規定時框內回覆 EV 供 |

| | | |
|---|---|---|
| | | 電設備狀態。<br>— EV 將持續進行電能傳送設置過程，抑或電能傳送過程結束。<br>— The SECC shall reply with an EV supply equipment status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br>— The EV will continue either with the energy transfer set-up process or with the end of the energy transfer process.<br>依本系列標準第 2 部或第 20 部中所約定，行為者間應交換下列資訊：<br>自 EVCC 至 SECC：EV 狀態、EVCC 中斷、新離場時間。<br>自 SECC 至 EVCC：EV 供電設備狀態。<br>As stipulated in ISO 15118-2 or ISO 15118-20, the following information shall be exchanged between the actors:<br>From the EVCC to the SECC: EV status, EVCC Interrupt, new departure time.<br>From the SECC to the EVCC: EV supply equipment status. |
| 5 | 先決條件(Prerequisites) | — 應成功地建立依 E 之使用案例元件的標的設定或電能傳送排程。<br>— 電能傳送循環應係作用中。<br>— Target setting or energy transfer scheduling according to use case elements of E shall be established successfully.<br>— The energy transfer loop shall be active. |
| 6 | 要求事項(Requirements) | — EVCC 應依本系列標準第 2 部或第 20 部，於所規定時框內向 SECC 發送目前狀態。<br>— SECC 應依本系列標準第 2 部或第 20 部於規定的時框內作出回覆。<br>— EV 或 USER 應重新排程或終止電能傳送過程。<br>— EVCC 及 SECC 應遵循可追蹤性要求事項。<br>— The EVCC shall send the SECC the current status in a specified time frame according to ISO 15118-2 or ISO 15118-20.<br>— The SECC shall reply in a specified |

| | | |
|---|---|---|
| | | time frame according to ISO 15118-2 or ISO 15118-20.<br>— The EV or the USER shall re-schedule or terminate the energy transfer process.<br>— The EVCC and the SECC shall comply with traceability requirements. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 發生電能傳送循環中斷，起動電能傳送設置或電能傳送結束過程。<br>— The energy transfer loop interrupt occurred and either the energy transfer set-up or end-of-energy transfer process starts.<br>未成功結束狀況：<br>— 電能傳送過程不再起動。<br>— 由於可追蹤性檢查未成功，電能傳送循環終止。<br>— The energy transfer process does not start again.<br>— The energy transfer loop is terminated due to traceability check fails. |

### 7.9.6 依動態控制模式之電能傳送控制

### 7.9.6 Energy transfer control based on dynamic control mode

表 35　依動態控制模式之電能傳送控制

Table 35 − Energy transfer control based on dynamic control mode

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 依動態控制模式之電能傳送控制。<br>Energy transfer control based on dynamic control mode |
| 2 | 使用案例元件 ID (Use case element ID) | F4 |
| 3 | 目標(Objectives) | 持續電能傳送過程，直至達到成功條件，並啟用對電網之快速回應服務。<br>Continue the energy transfer process until success conditions are reached and enable fast responding services to the grid. |
| 4 | 說明(Description) | 此使用案例涵蓋 AC 及 DC 電能傳送循環。其亦涵蓋與無效功率補償相關之服務。<br>此使用案例說明 SECC 控制於電能傳送循環中所傳送之有效及無效功率量的情況。功率應於 E8 使用案例元件中所定義邊界及標的之範圍內。若否，則循環中斷並進入結束狀況。<br>於循環期間，SECC 可依 SA 要求事項及行動性需要變更功率邊界，以及有效及/或無效功率標的。EVCC 將盡最大努力跟隨變更或中斷循環，若無法依行動性需要專門遵循新之條件。<br>This use case covers both the AC and DC energy transfer loop. It covers also services related to reactive power compensation.<br>This use case describes the situation where the SECC controls the amount of active and reactive power to be transferred during the energy transfer loop. The power shall be within the boundaries and target defined in E8 use case element. If not, the loop breaks and goes to end conditions.<br>During the loop the SECC may change the power boundaries and the active and/or reactive power targets based on SA requirements and mobility needs. The EVCC will make its best efforts to follow the changes or break the loop if it is not possible to follow the new conditions specially according to mobility needs. |

| | | |
|---|---|---|
| | | 於充電循環期間，EV 可能變更電流及功率邊界。SECC 依 EVCC 所提供之資訊調適其標的。<br><br>於循環期間，EVCC 更新與行動性需要相關之電能請求。例：若 EV 正傳送電能至電網，則滿足行動性需要所需之總電能將增加。<br><br>During the charging loop, the EV may change the current and power boundaries. The SECC adapts its targets based on the information provided by the EVCC.<br><br>During the loop, the EVCC updates its energy requests in relation with mobility needs. For example, if the EV is transferring energy to the grid, the total amount of energy needed to comply with mobility needs will increase.<br><br>所涉及之行為者為：<br><br>— 主要行為者：EV、EVCC、EV 供電設備、SECC。<br><br>— 次要行為者：使用者、EMS、似 EMS 之電能行為者、DSO 或彈性營運者。<br><br>The involved actors are:<br><br>— Primary actors: EV, EVCC, EV supply equipment, SECC.<br><br>— Secondary actors: user, EMS, energy actors like EMS, DSO or flexibility operator. |
| 5 | 先決條件(Prerequisites) | — 應成功地建立依使用案例元件 E6，基於動態控制模式之標的設定或雙向電力傳送。<br><br>— 雙向電力傳送循環應作用中。<br><br>— Target setting or bidirectional power transfer based on dynamic control mode according to use case element E6 shall be established successfully.<br><br>— The bidirectional power transfer loop shall be active. |
| 6 | 要求事項(Requirements) | — 動態控制模式下，雙向電力傳送循還訊息之履行時間及逾時應參數化，以確保快速回應服務。<br><br>— 於控制循環期間，EV 及 EV 供電設備應考量所有相關之本地電網規格，若適用，則應符合 EN 50549-1。 |

| | | |
|---|---|---|
| | | — The performance time and timeouts for the bidirectional power transfer loop messages in dynamic control mode shall be parameterized in order to ensure fast responding services.<br><br>— During the control loop the EV and the EV supply equipment shall take into account all relevant local grid codes and if applicable, shall conform to EN 50549-1.<br><br>— 於三相電能傳送之情況下，EV 應盡最大努力平衡三相間之功率。<br><br>— EVCC 及 SECC 應遵循可追蹤性要求事項。<br><br>— In case of three-phase energy transfer, the EV shall make its best efforts to balance the power among the three phases.<br><br>— The EVCC and the SECC shall comply with traceability requirements.<br><br>— 於 AC 之情況下，若使用雙通道架構，EVCC 應向 SECC 指示電力潮流方向。然後，SECC 有能力藉由 HLC 履行相關之接觸器控制。<br><br>— 於 DC 之情況下，SECC 應向 EVCC 指示目前的電流及電壓值。<br><br>— In case of AC and if a dual channel architecture is used, the EVCC shall indicate the power flow direction to the SECC. The SECC is then able to perform the relevant contactor control by HLC.<br><br>— In case of DC, the SECC should indicate to the EVCC the present current and voltage value.<br><br>— 於 AC 之情況下，SECC 應向 EVCC 指示有效及無效功率的標的設定點。<br><br>— SECC 應發送元件以通知 EV 通道組態(雙通道或單通道)變更進行中或已完成。<br><br>— In case of AC, the SECC should indicate to the EVCC the target set point of active and reactive power.<br><br>— The SECC shall send an element to inform the EV that channel configuration (dual or single channel) change is ongoing or finished. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br><br>— 以適當之有效功率及無效功率交 |

| | | |
|---|---|---|
| | | 換完成雙向電力傳送。<br>— Bidirectional power transfer is done with appropriate active power and reactive power exchanges.<br>未成功結束狀況：<br>— 雙向電力傳送係以不適當之有效功率及無效功率交換所完成。<br>— 本系列標準第 20 部中所定義之逾時時間內未發送雙向電力傳送循還訊息。<br>— 由於可追蹤性檢查未成功，電能傳送循環終止。<br>— Bidirectional power transfer is done with inappropriate active power and reactive power exchanges.<br>— Bidirectional power transfer loop messages have not been sent within timeouts defined in ISO 15118-20.<br>— The energy transfer loop is terminated due to traceability check fails. |

**7.10 加值服務[G]**

**7.10.1 加值服務**

**7.10 Value-added services [G]**

**7.10.1 Value-added services**

表 36　加值服務

Table 36 − Value-added services

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 加值服務。<br>Value-added services |
| 2 | 使用案例元件 ID (Use case element ID) | G1 |
| 3 | 目標(Objectives) | EVCC 與 SECC 間之 VAS 資訊交換。<br>VAS information exchange between the EVCC and the SECC. |
| 4 | 說明(Description) | 使用 IP 協定連接至本地網域(EV 供電設備)或網際網路之選項服務。<br>除各種使用案例元件中所描述之純 EV 充電功能外，未來的應用及環境中可能亦將出現額外加值服務，以最大限制地為用戶提供便利。<br>例： 預約公共充電場所、沿途可用之地點、下次使用所要求的電能。<br>Optional services that may connect to the local network domain (EV supply equipment) or the internet using IP protocols.<br>In addition to the function of pure charging of electric vehicles, which are described in the various use case elements, additional value-added services to maximize the customer convenience may arise in future applications and environments.<br>EXAMPLE Reservation of a public charging site, spots availability along the journey, required energy for next usage.<br>情境說明：<br>－OEM 或 USER 請求 VAS。<br>－SECC 向 EVCC 請求服務。<br>－SECC 選路資訊。<br>Scenario description:<br>－ The OEM or user requests VAS.<br>－ The SECC requests service from the EVCC.<br>－ The SECC routes information. |
| 5 | 先決條件(Prerequisites) | － 若要求，於使用 VAS 之前需適用合適的授權方法。 |

| | | |
|---|---|---|
| | | － SECC 宜為線上。<br>－ EV 及 EV 供電設備有能力啟用加值服務。<br>－ If required a suitable authorization method needs to be applied prior to using VAS.<br>－ The SECC should be online.<br>－ The EV and the EV supply equipment are capable of enabling value-added services in general. |
| 6 | 要求事項(Requirements) | EV 供電設備應提供加值服務。<br>觸發者：<br>－ USER 須請求資訊。<br>The EV supply equipment shall offer the value-added service.<br>Trigger:<br>－ The USER has to request information. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>－ USER 或次要行為者收到所請求之資訊。<br>－ The USER or the secondary actor receives the requested information.<br>未成功結束狀況：<br>－ USER 或次要行為者未收到所請求之資訊。<br>－ The USER or the secondary actor does not receive the requested information. |

### 7.10.2 WG1：ACD 系統狀態檢查

### 7.10.2 WG1: ACD system status check

此使用案例元件係可選擇之服務，其中 EV/EV 供電設備能於電能傳送之前、期間及之後檢查系統狀態，與電能傳送過程並行。

This use case element is a selectable service where the EV/EV supply equipment can check the system status before, during and after energy transfer in parallel to the energy transfer procedure.

表 37　ACD 系統狀態檢查

Table 37 − ACD system status check

| 編號 | 型式 | 說明 |
|---|---|---|

| | | |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | ACD 系統狀態檢查。<br>ACD system status check |
| 2 | 使用案例元件 ID (Use case element ID) | WG1 |
| 3 | 目標(Objectives) | EV/EV 供電設備於 HLC 建立後隨時檢查系統狀態，以免於電能傳送過程之前/期間/之後，因非可預期情況損壞 EV 及 EV 供電設備。<br>For the EV/EV supply equipment to check the system status at all times after establishment of HLC so that there will be no damage to both the EV and EV supply equipment due to unexpected conditions before/during/after the energy transfer process. |
| 4 | 說明(Description) | 此使用案例係屬服務，選擇後將與電能傳送過程並行運行。<br>所涉及之行為者為：<br>— 主要行為者：EV、EVCC EV 供電設備、SECC。<br>基本使用案例說明：<br>— HLC 建立後，EV 能選擇額外服務，其履行系統狀態之不間斷檢查。<br>This use case is a service which when selected will run in parallel to the energy transfer process.<br>The actors involved are:<br>— Primary actors: EV, EVCC EV supply equipment, SECC.<br>Basic elementary use case description:<br>— After HLC establishment, the EV can select the additional service which performs constant checking on the system status.<br>— 若電能傳送涉及 ACD，則 EV 須選擇系統狀態服務，且僅能於提供該服務之 EV 供電設備上充電或放電。<br>— 系統狀態服務一經選擇即可使用。<br>— 若選擇，則 EVCC 應於整個電能傳送過程中支援系統狀態服務。<br>— If the energy transfer involves ACD, the EV has to select the system status |

| | | |
|---|---|---|
| | | service, and can only charge or discharge at an EV supply equipment which provides this service.<br><br>— The system status service may be used as soon as it was selected.<br><br>— If selected, the EVCC shall support the system status service throughout the whole energy transfer process.<br><br>— EVCC 與 SECC 間交換訊息以查詢及報告其系統狀態。若於檢查系統狀態期間發生錯誤，則應中止電能傳送過程。<br><br>— 若由本系列標準之外的其他通道(例：IEC 61851-1 引導)處置安全錯誤，則 HLC 僅用以通知通訊控制器錯誤後抵達新狀態。<br><br>— Messages are exchanged between the EVCC and the SECC to query and report on its system status. If an error occurs during checking of the system status, the energy transfer process shall be aborted.<br><br>— In case of safety errors handled by another channel than ISO 15118 (e.g. IEC 61851-1 pilot wire) HLC is used only to inform communication controllers of the new state reached after the error. |
| 5 | 先決條件(Prerequisites) | — HLC 已建立。<br><br>— 系統狀態服務係由 EV 供電設備所提供，且由 EV 所選擇。<br><br>— HLC is established.<br><br>— The system status service is offered by the EV supply equipment and selected by the EV. |
| 6 | 要求事項(Requirements) | — 若選擇，則 EVCC 應於整個電能傳送過程中支援系統狀態服務。<br><br>— EVCC 與 SECC 間交換訊息以查詢及報告其系統狀態。若於檢查系統狀態期間發生錯誤，則應中止電能傳送過程。<br><br>— If selected, the EVCC shall support the system status service throughout the whole energy transfer process.<br><br>— Messages are exchanged between the EVCC and the SECC to query and report on its system status. If an error occurs during checking of the system status, the energy transfer process shall be aborted. |

| | | |
|---|---|---|
| | | 觸發者：<br>— EV 啟動系統狀態服務。<br>Trigger<br>— The EV initiates the system status service. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 每當於整個電能傳送過程中進行查詢時，即報告系統狀態。<br>— The system status is reported whenever a query is made throughout the energy transfer procedure.<br>未成功結束狀況：<br>— EV 抑或 EV 供電設備於電能傳送程序結束前，EV 抑或 EV 經選擇後之任何時間點無法提供系統狀態服務。<br>— Either the EV or the EV supply equipment is not able to provide the system status service at any point of time after it is selected before the energy transfer procedure has ended. |

### 7.10.3 電能傳送細節

### 7.10.3 Energy transfer details

表 38　電能傳送細節

Table 38 − Energy transfer details

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 電能傳送細節。<br>Energy transfer details |
| 2 | 使用案例元件 ID (Use case element ID) | G2 |
| 3 | 目標(Objectives) | 向車輛使用者或次要行為者提供目前電能傳送過程之資訊。<br>Information supply of current energy transfer process to the vehicle user or secondary actor. |
| 4 | 說明(Description) | 此使用案例涵蓋與 SECC 交換關於目前電能傳送過程之資訊。能針對 SECC 提供電池狀態及充電狀態等參數。SECC 或次要行為者察覺其電能傳送過程之狀態，將資訊交付予車輛使用者。<br>This use case covers the exchange of |

| | | |
|---|---|---|
| | | information regarding the current energy transfer process to the SECC. Parameters like battery status and state of charge could be provided for the SECC. The SECC or secondary actor, aware of the status of its energy transfer process, delivers information to the vehicle user.<br><br>所涉及之行為者為：<br><br>－ 主要行為者：EV、EVCC、EV 供電設備、SECC、HMI。<br><br>The actors involved are:<br><br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, HMI.<br><br>情境說明：<br><br>－ 請求 SDR。<br><br>－ SECC 向 EVCC 請求紀錄。<br><br>－ EVCC 於請求被接受後將紀錄發送至 SECC。<br><br>－ SECC 針對次要行為者或 HMI 提供資訊。<br><br>Scenario Description:<br><br>－ An SDR is requested.<br><br>－ The SECC requests a record from the EVCC.<br><br>－ The EVCC sends the record to the SECC after the request is accepted.<br><br>－ The SECC provides information for the secondary actor or HMI.<br><br>行為者間需交換下列資訊：<br><br>自 EVCC 至 SECC：依所請求列表之 EV 充電及放電的細節。若所請求之資訊無法自 EV 側獲取，則應予以說明。<br><br>自 SECC 至 EVCC：對請求電能傳送細節，所請求之電能傳送細節列表之授權。<br><br>The following information needs to be exchanged between the actors:<br><br>From the EVCC to the SECC: EV charging and discharging details according to the requested list. It shall be indicated if the requested information is not available from the EV side.<br><br>From the SECC to the EVCC: Authorization to request energy transfer details, list of requested energy transfer |

| | | |
|---|---|---|
| | | details. |
| 5 | 先決條件(Prerequisites) | － 應成功地建立依 E 之使用案例元件的標的設定或電能傳送排程。<br>－ 電能傳送循環應係作用中。<br>－ EV 有能力交付電能傳送細節。<br>－ Target setting or energy transfer scheduling according to use case elements of E shall be established successfully.<br>－ The energy transfer loop shall be active.<br>－ The EV is capable of delivering energy transfer details. |
| 6 | 要求事項(Requirements) | － USER/HMI 或次要行為者已請求資訊。<br>－ EVCC 及 SECC 應遵循可追蹤性要求事項。<br>－ The USER/HMI or secondary actor has requested information.<br>－ The EVCC and the SECC shall comply with traceability requirements. |
| 7 | 結束狀況 (End conditions) | 成功結束狀況：<br>－ USER 或次要行為者接收所請求之資訊。<br>－ The USER or secondary actor receives the requested information.<br>未成功結束狀況：<br>－ USER 或次要行為者未接收請求的資訊。<br>－ The USER or secondary actor does not receive the requested information. |

**7.11 電能傳送期間之結束[H]**

**7.11.1 一般**

**7.11 End of energy transfer process [H]**

**7.11.1 General**

EVCC 應藉由向 SECC 發送請求以結束電能傳送過程，且 SECC 應藉由於充電及解除鎖定機能(若實作)之情況下關閉電源以回應。僅當使用者啟動過程結束而電能傳送過程仍在進行時，才可能有必要此關閉序列之所有或單一步驟。

The EVCC should end the energy transfer process by sending a request to the SECC and the SECC should respond by switching off the power in case of

charging and releasing the locking feature (if implemented). All or single steps of this shutdown sequence may only be necessary if the energy transfer process is still in progress when the user initiates the end of the process.

若系統已配備鎖定機能，且於目前電能傳送會談期間已至少啟動 1 次，則於發生依 IEC 61851-1 自〝C〞(或〝D〞)至〝B〞之狀態轉換前不應撤銷。

If the system is equipped with a locking feature and it has been activated at least once during the current energy transfer session, it shall not be deactivated before the state transition from “C” (or “D”) to “B” according to IEC 61851-1 occurs.

備考：若 EV 與 EV 供電設備間之實體連接因非可預期解連或其他錯誤而受損，進而影響電能傳送系統的電氣安全，則適用 IEC 61851-1 之程序。

NOTE If the physical connection between the EV and the EV supply equipment is impaired by an unexpected disconnect or other error, impacting the electrical safety of the energy transfer system, the procedures of IEC 61851–1 apply.

**7.11.2 電能傳送過程之結束**

**7.11.2 End of energy transfer process**

表 39　電能傳送過程之結束

Table 39 − End of energy transfer process

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | 電能傳送過程之結束。<br>Ending energy transfer process |
| 2 | 使用案例元件 ID ( Use case element ID) | H1 |
| 3 | 目標( Objectives) | 以安全可靠之方式關閉電能傳送過程，同時交換後續程序所要求的所有相關資訊。<br>Closing down the energy transfer process in a safe and secure way whilst exchanging all relevant information required for subsequent procedures. |
| 4 | 說明( Description) | 此使用案例涵蓋基本之結束電能傳送過程。<br>所涉及之行為者為：<br>－　主要行為者：EV、EVCC、EV 供電設備、SECC、USER。<br>This use case covers the basic ending energy transfer process.<br>The actors involved are:<br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, USER.<br>基本使用案例說明： |

| | | |
|---|---|---|
| | | — USER 返回 EV 或 EV 供電設備並啟動電能傳送過程之結束。<br><br>— 通常，USER 請求結束 EV 側之電能傳送過程，EVCC 即告訴 SECC 電能傳送過程將結束。<br><br>Basic elementary use case description:<br><br>— The USER returns to the EV or EV supply equipment and initiates the end of energy transfer process.<br><br>— Usually the USER requests the end of the energy transfer process on the EV side and the EVCC will tell the SECC that the energy transfer process will end.<br><br>— 針對 USER 於 EV 供電設備端指示此特定情境，例：使用替代方式之鑑別，SECC 將請求 EVCC 結束電能傳送過程。<br><br>備考 1. SECC 藉由依本系列標準第 2 部或第 20 部之設定通知參數指示充電會談的結束。<br><br>— For specific scenarios where the USER is indicating this on the EV supply equipment side, e.g. using authentication by alternative means, the SECC will request the EVCC to end the energy transfer process.<br><br>NOTE 1 The SECC Indicates the end of the charging session by setting the notification parameter according to ISO 15118-2 or ISO 15118-20.<br><br>— 依 IEC 61851-1，EV 切換至狀態 B。<br><br>— EV 供電設備依 IEC 61851-1 斷開主開關。<br><br>— 若於 EV 供電設備側產生 SDR，則其將被傳送予經授權之次要行為者。<br><br>— 若適用，EV 供電設備一旦依 IEC 61851-1 檢測出狀態 A，即釋放 EV 供電設備上之連接器。<br><br>— The EV switches to state B according to IEC 61851-1.<br><br>— The EV supply equipment opens main switches according to IEC 61851-1.<br><br>— If an SDR is generated on the EV supply equipment side, it will be |

| | | |
|---|---|---|
| | | transferred to authorized secondary actors.<br>— If applicable, the EV supply equipment releases the connector on the EV supply equipment as soon as it detects state A according to IEC 61851-1.<br>EVCC 與 SECC 間進行資訊端電能傳送過程之交換。<br>備考 2. 各步驟之確切序列及本質取決於先前的使用案例。<br>Between the EVCC and the SECC the information end energy transfer process is exchanged.<br>NOTE 2 The exact sequence and nature of each step depends on the preceding use cases. |
| 5 | 先決條件(Prerequisites) | 依使用案例元件 F2 或 F3 或 F4 之充電控制及重新排程應成功地建立。<br>或依本系列標準第 2 部或第 20 部中所定義之條件結束電能傳送。<br>Charge controlling and re-scheduling according to use case elements F2 or F3 or F4 shall be established successfully; or<br>End of energy transfer according to conditions defined in ISO 15118-2 or ISO 15118-20. |
| 6 | 要求事項(Requirements) | 可能依可追蹤性要求事項產生 SDR，並發送至經授權之次要行為者。<br>觸發者：<br>電能傳送循環應已完成。<br>USER、EV 供電設備或 EV 啟動電能傳送過程之結束。<br>The SDR may be generated according to traceability requirements and sent to authorized secondary actors.<br>Trigger:<br>The energy transfer loop shall be completed.<br>The USER, the EV supply equipment or the EV initiates the end of energy transfer process. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 流程終止，且計費程序正常終止。<br>— SDR 已發送至經授權之 SA。 |

| | | |
|---|---|---|
| | | — The process is terminated and the billing procedure is terminated normally.<br>— The SDR is sent to the authorized SA.<br>未成功結束狀況：<br>— 程序未正常終止，資訊丟失。<br>— EV 不遵守 EV 供電設備之指示及 IEC 61851-1:2017 附錄 A 中之序列。<br>— The procedure is not terminated normally and information is lost.<br>— The EV does not respect the indication of the EV supply equipment and the sequence as for IEC 61851-1:2017, Annex A. |

**7.12 充電 WH1 之 WPT 結束**

**7.12.1 一般**

**7.12 WPT end of charge WH1**

**7.12.1 General**

EVCC 應通過向 SECC 發送請求以結束充電過程，而 SECC 應通過關閉電源並解除鎖定機能(若已實作)以回應。僅當使用者啟動過程結束時充電過程仍在進行時，才可能有必要此關閉序列之所有或單一步驟。

The EVCC should end the charging process by sending a request to the SECC and the SECC should respond by switching off the power and releasing the locking feature (if implemented). All or single steps of this shutdown sequence may only be necessary if the charge process is still in progress when the user initiates the end of the process.

若系統已配備(車輪)鎖定機能，且於目前充電會談期間已至少啟動 1 次，則於依 IEC 61980-2 自〝WPT_S_STO〞狀態轉換至〝WPT_S_SB〞狀態前不應撤銷。

If the system is equipped with a (wheel) locking feature and it has been activated at least once during the current charging session, it shall not be deactivated before the state transition from “WPT_S_STO” to “WPT_S_SB” according to IEC 61980-2.

備考：若 EV 與 EV 供電設備間之實體連接因非可預期解鎖或其他錯誤而受損，進而影響充電系統的電氣安全，則適用 IEC 61980-2 之程序。

NOTE If the physical connection between the EV and the EV supply equipment is impaired by an unexpected unlock or other error, impacting the electrical safety of the charging system, the procedures of IEC 61980-2 apply.

**7.12.2 充電 WH1 之 WPT 結束**

**7.12.2 WPT end of charge WH1**

表 40　充電之 WPT 結束

Table 40 − WPT end of charge

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | Use case element name (使用案例元件名稱) | 充電之 WPT 結束。<br>WPT end of charge |
| 2 | Use case element ID (使用案例元件 ID) | WH1 |
| 3 | Objectives (目標) | 以安全可靠之方式關閉充電過程，同時交換後續程序所要求的所有相關資訊。<br>Closing down the charging process in a safe and secure way whilst exchanging all relevant information required for subsequent procedures. |
| 4 | Description (說明) | 此使用案例涵蓋基本之結束充電過程。所涉及的行為者為：<br>－　主要行為者：EV、EVCC、EV 供電設備、SECC、USER。<br>This use case covers the basic ending charging process. The actors involved are:<br>－ Primary actors: EV, EVCC, EV supply equipment, SECC, USER.<br>基本使用案例說明：<br>－　使用者返回 EV 或 EV 供電設備，並起動結束充電過程。<br>－　通常使用者於 EV 端請求結束充電過程，EVC 將告訴 SECC 充電過程將結束。<br>－　針對使用者於 EV 供電設備端正指示之特定情境，例：藉由替代方式使用鑑別，SECC 將請求 EVCC 結束充電過程。<br>Basic elementary use case description:<br>－ The user returns to the EV or the EV supply equipment and initiate ending the charge process.<br>－ Usually the user requests the end of the charging process on the EV side and the EVCC will tell the SECC that the charging process will end.<br>－ For specific scenarios where the user is indicating this on the EV supply equipment side, e.g. using authentication by alternative means the SECC will request the EVCC to end the charging |

| | | |
|---|---|---|
| | | process.<br><br>－ 為指示充電會談之結束，SECC 將依本系列標準第 20 部使用 EVSENotificationType 中之值 StopCharging。<br><br>－ EV 依本系列標準第 20 部發送具終止參數之電力供給請求。<br><br>－ For indicating the end of a charging session the SECC would use the value StopCharging in the EVSENotificationType according to ISO 15118-20.<br><br>－ The EV sends the power delivery request with termination parameter according to ISO 15118-20.<br><br>－ EV 供電設備依 IEC 61980-2 關閉無線電力傳送。<br><br>－ SDR 於 EV 供電設備側產生。此可能傳送予經授權之次要行為者。<br><br>－ 若適用，EV 供電設備將釋放 EV (車輪)鎖。<br><br>－ The EV supply equipment switches off wireless power transfer according to IEC 61980-2.<br><br>－ The SDR is generated on the EV supply equipment side. This may be transferred to authorize secondary actors.<br><br>－ If applicable, the EV supply equipment releases the EV (wheel) lock.<br><br>EVCC 與 SECC 交換充電結束之資訊。<br><br>備考： 各步驟之確切序列及本質取決於先前的使用案例。<br><br>The EVCC and the SECC exchange the information of end of charge.<br><br>NOTE The exact sequence and nature of each step depends on the preceding use cases. |
| 5 | Prerequisites (先決條件) | 依使用案例元件 WF 之充電控制及重新排程應成功地建立。<br><br>或依本系列標準第 20 部中所定義之條件結束充電。<br><br>Charge controlling and re-scheduling according to use case elements WF shall be established successfully; or<br><br>End of charging according conditions |

| | | |
|---|---|---|
| | | defined in ISO 15118-20. |
| 6 | Requirements (要求事項) | SDR 應依可追蹤性要求事項產生並發送予經授權之次要行為者。<br>觸發者：<br>— 充電循環應已完成。<br>— 使用者、EV 供電設備或 EV 啟動充電結束過程。<br>The SDR shall be generated according to traceability requirements and sent to authorized secondary actors.<br>Trigger:<br>— The charging loop shall be completed.<br>— The user, the EV supply equipment or the EV initiates the end of charge process. |
| 7 | End conditions (結束狀況) | 成功結束狀況：<br>— 計費程序正常終止。<br>— SDR 發送至經授權之 SA。<br>— The billing procedure is terminated normally.<br>— The SDR is sent to authorized SAs.<br>未成功結束狀況：<br>— 程序未正常終止，資訊丟失。<br>— 由於 WPT 失效，EV 供電設備將無法供電。<br>— The procedure is not terminated normally and information is lost.<br>— The EV supply equipment will not deliver power, due to WPT failure. |

**7.13 ACD 連接/解連 WI**

**7.13.1 ACD 連接/解連 WI**

**7.13 ACD connect/disconnect WI**

**7.13.1 ACD connect/disconnect WI**

表 41　ACD 連接/解連 WI

Table 41 − ACD connect/disconnect WI

| 編號 | 型式 | 說明 |
|---|---|---|
| 1 | 使用案例元件名稱(Use case element name) | ACD 連接/解連。<br>ACD connect/disconnect |
| 2 | 使用案例元件 ID (Use case element ID) | WI |
| 3 | 目標(Objectives) | 通過無線通訊使用 HLC 連接及解連 EV 與 EV 供電設備間之充電裝置。<br>To use HLC over wireless communication for connecting and disconnecting charging devices between the EV and the EV supply equipment. |
| 4 | 說明(Description) | 此使用案例涵蓋於 HLC 建立後無需 USER 干預之情況下，連接及解連充電裝置的過程。<br>所涉及之行為者為：<br>－　主要行為者：EV、EVCC EV 供電設備、SECC。<br>This use case covers the procedure of connecting and disconnecting charging devices after the establishment of HLC without USER intervention.<br>The actors involved are:<br>－ Primary actors: EV, EVCC EV supply equipment, SECC.<br>基本使用案例說明：<br>－　EVCC 與 SECC 交換充電裝置之參數以確保互運性。<br>－　當充電裝置/方法參數匹配時，EV 通過 EVCC 及 SECC 請求 EV 供電設備起動 ACD 連接過程。<br>Basic elementary use case description:<br>－ The EVCC and the SECC exchange parameters for charging devices to ensure interoperability.<br>－ When the charging device/methods parameter matches, the EV requests the EV supply equipment through the EVCC and the SECC to start an ACD connection process.<br>－　EVCC 與 SECC 於連接過程中交換訊息，直到成功連接充電裝置，以便能進行電能傳送過程。 |

| | | |
|---|---|---|
| | | — 電能傳送結束時，EV 通過 EVCC 及 SECC 請求 EV 供電設備起動 ACD 解連過程。<br>— EVCC 與 SECC 於解連過程中交換訊息，直到充電裝置解連成功，EV 能離開充電場所。<br>— The EVCC and the SECC exchange messages during the connecting procedure until the charge device is successfully connected so that the energy transfer procedure can proceed.<br>— At the end of power transfer, the EV requests the EV supply equipment through the EVCC and the SECC to start the ACD disconnection process.<br>— The EVCC and the SECC exchange messages during the disconnection procedure till the charging device is successfully disconnected and the EV can leave the charging site. |
| 5 | 先決條件(Prerequisites) | — HLC 已建立。<br>— EVCC 啟動服務以檢查系統狀態。<br>— HLC is established.<br>— The EVCC initiates the service to check the system status. |
| 6 | 要求事項(Requirements) | 觸發者：<br>— 充電裝置型式適合 EV 與 EV 間之供電設備。<br>— EVCC 藉由向 SECC 發送對應之訊息以啟動連接/解連請求。<br>Trigger:<br>— The charging device type fits between the EV and the EV supply equipment.<br>— The EVCC initiates connect/disconnect requests by sending the corresponding message to the SECC. |
| 7 | 結束狀況(End conditions) | 成功結束狀況：<br>— 充電裝置連接/解連成功。<br>— The charge device is connected/disconnected successfully.<br>未成功結束狀況：<br>— 充電裝置未連接。<br>— 丟失 HLC 終止連接/解連程序。 |

| | | |
|---|---|---|
| | | — ACD 未於適當時間內到達其初始位置。<br>— The charge device is not connected.<br>— Loss of HLC terminates the connecting/disconnecting procedure.<br>— The ACD doesn't reach within appropriate time its home position. |

# 附錄 A
# (規定)
# 傳導充電基礎設施架構

Annex A
(informative)
Conductive charging infrastructure architecture

## A.1 概觀

### A.1.1 一般資訊

## A.1 Overview

### A.1.1 General information

針對設置智慧型充電基礎設施，配電拓撲、控制引導處置、控制邏輯分布、接觸器及 PLC 調變解調器可分為 3 個主要子群組。

For setting up an intelligent charging infrastructure, the topology of power distribution, control pilot handling, distribution of control logic, contactors and PLC modems can be divided into three major subgroups.

作為進一步討論及文件之基礎，本附錄總結此等拓撲結構並討論其典型應用、要求事項、優勢及挑戰。

As a basis for further discussions and documents, this annex summarizes these topologies and discusses their typical application, requirements, advantages and challenges.

### A.1.2 假設

### A.1.2 Assumptions

本附錄假設所有描述之拓撲使用 EV 供電設備與 EV 間的分離控制副線，依 SAE J1772 及 IEC 61851-1:2017 之附錄 A。

This Annex Assumes that all the topologies described use an individual control pilot wire between the EV supply equipment and the EV, according to SAE J1772 and IEC 61851-1:2017, Annex A.

本附錄假設使用依本系列標準第 3 部之 PLC。稍後可能於標準草案編輯的過程中新增對應之無線通訊附錄。

This Annex Assumes that PLC according to ISO 15118-3 is used. A corresponding annex with wireless communication may be added later on during the draft edition process.

PLC 連接將不聚焦於特定技術。然而，針對各拓撲，需關注信號傳播路徑及常用實體介質之尺寸。

The PLC connection will not focus on a specific technology. However, for each topology attention needs to be given to the signal travel paths and the dimensions of the commonly used physical media.

任何單一網路節點(於共同實體介質內)係相同碰撞領域之一部分，此意指與相同碰撞領域中的所有其他網路節點共享整個頻寬。

Any individual network node, within a common physical medium, is part of the same collision domain, which means sharing the whole bandwidth with all other network nodes in the same collision domain.

每當使用語〝EV〞時，即假設具整合 PLC 通訊之 EV，例：EVCC 及 PLC。

Whenever the term “electric vehicle” is used, an electric vehicle with integrated PLC communication is assumed, e.g. EVCC and PLC.

該系統將相容於既存及未來之 HAN 及 LAN。

The systems will be compatible with existing and future HANs and LANs.

**A.1.3 可適用符號**

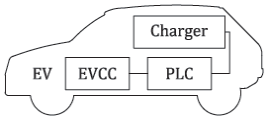
**A.1.3 Applicable symbols**

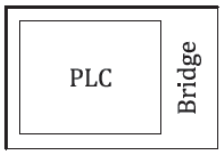
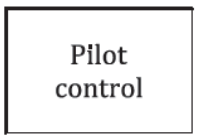
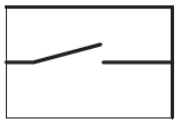
下表規定符號及其相關聯之說明。

The table below specifies symbols with its associated description.

表 A.1　可適用之符號

Table A.1 − Applicable symbols

| 符號<br>Symbol | 說明<br>Description |
|---|---|
|  | 具經整合應用層實作、PLC 介面及 AC 充電器之 EV。<br>EV with integrated application layer implementation, PLC interface and AC charger. |
| GW | 應用層閘道器，其終止 1 個應用層協定並連接至另 1 個應用層協定。<br>Application layer gateway, which terminates an application layer protocol and interfaces to another application layer protocol. |
| EVCC | EV 通訊控制器，例：依本系列標準第 2 部或第 20 部實作應用層之實例。<br>Electric vehicle communication controller, e.g. instance which is implementing the application layer according to ISO 15118-2 or ISO 15118-20. |
| SECC | 供電設備通訊控制器，例：依本系列標準第 2 部或第 20 部實作應用層之實例。<br>Supply equipment communication controller, e.g. instance which is implementing the application layer according to ISO 15118-2 or ISO 15118-20. |
| Secondary actor | 次要行為者側之應用層實作，介接閘道器的應用層實作。<br>Application layer implementation on the secondary actor side, to interface with the application layer implementation of the gateway. |

| | |
|---|---|
|  | 整合於分離之智慧型控制單元中的供電設備通訊控制器，其提供次要行為者資料。<br>Supply equipment communication controller integrated in a detached intelligent control unit, which provides secondary actor data. |
|  | 分離 IP 子網路之路由器。若使用虛線，則其係屬選項。<br>Router that separates IP subnets. If dashed lines are used it is optional. |
|  | PLC 對 HAN、LAN 或其他實體層轉換器。橋接器履行 MAC 定址。<br>PLC to HAN, LAN or other physical layer converter. Bridge performs MAC addressing. |
|  | 用以消除/減少電磁輻射之選項濾波裝置，參照本系列標準第 3 部。<br>此可中斷 PLC 通訊。<br>Optional filter device to eliminate/reduce electromagnetic emissions, see ISO 15118-3 for details.<br>This may break the PLC communication. |
|  | 依 IEC 61851-1 履行控制引導處置之個體。<br>Entity performing the control pilot handling according to IEC 61851-1. |
|  | 用以將充電電源切換至充電耦合器之接觸器。<br>Contactor to switch charging power to the charging coupler. |
|  | PLC 旁路及 PWM 濾波裝置。<br>PLC bypass and PWM filter device. |
|  | 若 PLC 係〝內嵌〞使用，則控制先導及 PLC 通訊線路。<br>Control pilot and PLC communication line if PLC is used “in line”. |
|  | EV 供電設備控制器與本系列標準相關個體間之選項控制流。<br>Optional control flow between the EV supply equipment controller and entities related to the ISO 15118 series. |
|  | 若 PLC 係經由主電源使用，則為配電及 PLC 通訊線路。<br>Power distribution and PLC communication line if PLC is used via mains. |
|  | PLC 橋接器與 SECC 或 GW 間之本地傳輸介質，若 PLC 晶片與 SECC 或 GW 係於相同電路板上，則可於電路板內部；若 PLC 橋接器使用 HAN 設施連接至 SECC，則其可能為 HAN。<br>Local transmission media between the PLC bridge and the SECC, or the GW, which may be inside a circuit board if the PLC chip and the SECC or the GW are on the same circuit board; it may be a HAN if the PLC bridge is connected to the SECC using a HAN |

| | |
|---|---|
| | installation. |
|  | 識別相同應用層上之通訊對應方的線，例：於 2 個個體間建立應用層會談。<br><br>應用層閘道器將此種通訊路徑分為 2 側，一側使用應用層 1，另一側使用應用層 2。<br><br>Line identifying the communication counterparts on the same application layer, e.g. an application layer session is established between the two entities.<br><br>An application layer gateway divides such a communication path into two sides, one using an application layer 1 and another using an application layer 2. |

**A.1.4 網路架構**

**A.1.4 Network characteristics**

有 2 個通訊路徑：

– EVCC↔SECC

– SECC↔次要行為者

There are two communication paths:

– EVCC ↔ SECC

– SECC ↔ Secondary actor

備考：EVCC 與 SA 間之通訊不屬本標準範圍內。

NOTE Communication between the EVCC and the SA is out of the scope of this document.

儘管 SECC 與次要行為者之通訊不屬本系列標準範圍內，但某些本系列標準訊息要求此通訊，因此本系列標準將規定某些要求是項以確保 EVCC 與次要行為者間的互運性。

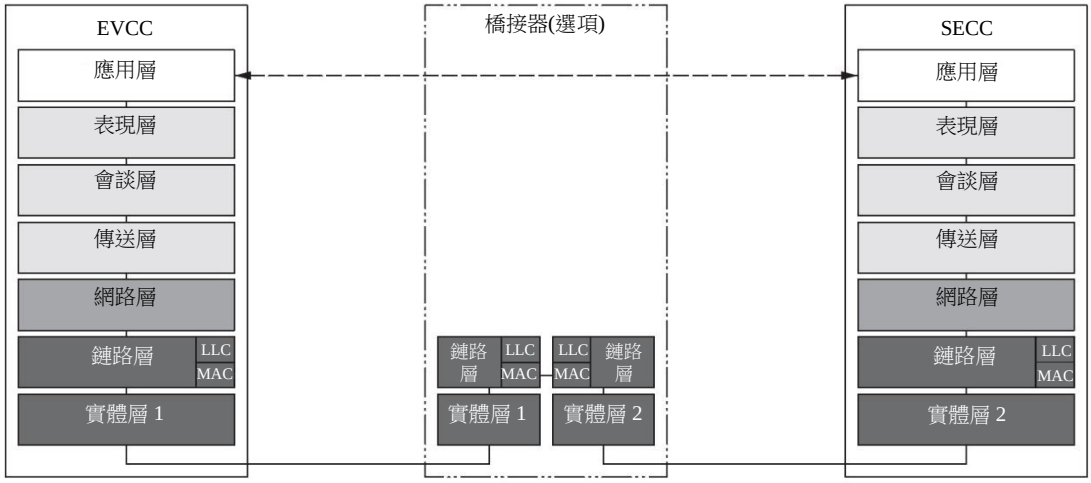
Although the SECC to secondary actor communication is outside the scope of the ISO 15118 series, some ISO 15118 messages require this communication, and thus the ISO 15118 series will specify some requirements to ensure the interoperability between the EVCC and the secondary actor.

取決於系統架構，此等通訊路徑涉及用以建立及維護通訊之不同組件。各圖旨在概述最一般之情況。若所顯示之所有組件係分離存在於特定實作中，則取決於 OEM 及 EV 供電設備提供者。

Depending on the system architecture, these communication paths involve different components for establishing and maintaining communication. The drawings are intended for outlining the most general cases. If all of the components shown are separately present in a specific implementation, it is up to the OEM and the EV supply equipment supplier.

EVCC 與 SECC 間之通訊可分為 2 種設置，具體取決於 SECC 對 EVCC 係屬〝本地〞(圖 A.1)或〝遠端〞(圖 A.2)。

Communication between the EVCC and the SECC can be divided into two set-ups, depending on whether the SECC is “local” (Figure A.1) to the EVCC or “remote” (Figure A.2).



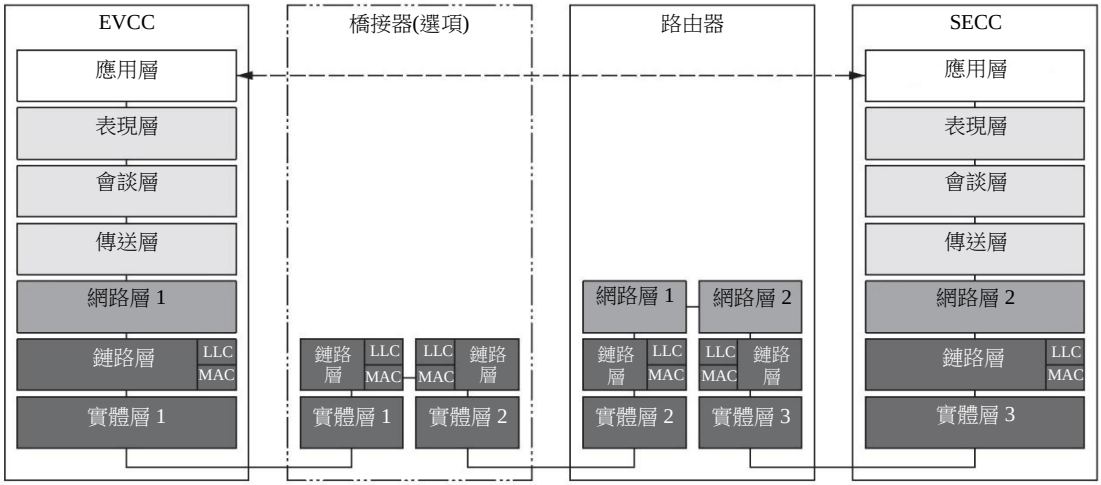

圖例

| | |
|---|---|
| ◄- - - -► | 應用之端對端通訊 |
| MAC | 介質接取控制 |
| LLC | 邏輯鏈路連接 |

| |
|---|
| Application Layer　應用層 |
| Ppesentation Layer　表現層 |
| Session Layer　會談層 |
| Transport Layer　傳送層 |
| Network Layer　網路層 |
| Link Layer　鏈路層 |
| PHY1 Layer　PHY1 層 |
| Bridge (opt.)　橋接器(選項) |
| PHY2 Layer　PHY2 層 |
| Key　圖例 |
| end-to-end communication of application　應用之端對端通訊 |
| media access control　介質接取控制 |
| logical link connection　邏輯鏈路連接 |

圖 A.1　〝本地〞設置中之 EVCC 對 SECC 通訊

Figure A.1 – EVCC to SECC communication in a “local” set-up




圖例

| | |
|---|---|
| ◄- - - -► | 應用之端對端通訊 |
| MAC | 介質接取控制 |
| LLC | 邏輯鏈路連接 |

| |
|---|
| Application Layer　應用層 |
| Ppesentation Layer　表現層 |
| Session Layer　會談層 |
| Transport Layer　傳送層 |
| Network1 Layer　網路 1 層 |
| Network2 Layer　網路 2 層 |
| Network Layer1　網路層 1 |
| Network Layer2　網路層 2 |
| Link Layer　鏈路層 |
| PHY1 Layer　PHY1 層 |
| Bridge (opt.)　橋接器(選項) |
| Router　路由器 |
| PHY2 Layer　PHY2 層 |
| PHY3 Layer　PHY3 層 |
| Key　圖例 |
| end-to-end communication of application　應用之端對端通訊 |
| media access control　介質接取控制 |
| logical link connection　邏輯鏈路連接 |

圖 A.2　〝遠端〞設置中之 EVCC 對 SECC 通訊

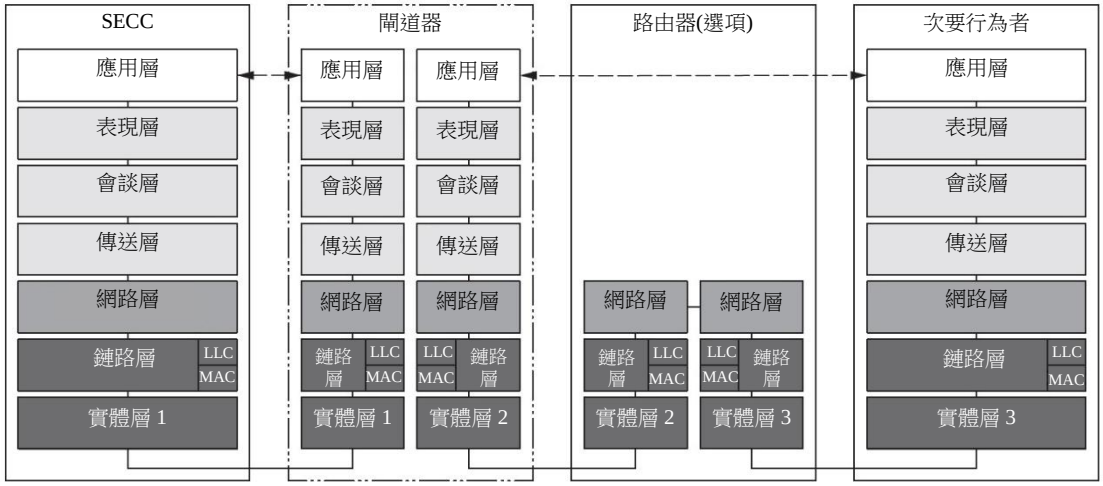
Figure A.2 – EVCC to SECC communication in a “remote” set-up

取決於安裝架構，多個〝橋接器〞及路由器可能係屬必要。

Depending on the installation architecture, multiple “bridges”, routers might be necessary.

圖 A.3 顯示一般情況，要求應用閘道器以與網路/應用層進行通訊。

Figure A.3 shows the general case, requiring an application gateway for communication to the network/application layer.




圖例

| | |
|---|---|
| ◄- - - -► | 應用之端對端通訊 |
| MAC | 介質接取控制 |
| LLC | 邏輯鏈路連接 |

| | |
|---|---|
| Application Layer | 應用層 |
| Presentation Layer | 表現層 |
| Session Layer | 會談層 |
| Transport Layer | 傳送層 |
| Network Layer | 網路層 |
| Link Layer | 鏈路層 |
| PHY1 Layer | PHY1 層 |
| GW | 閘道器 |
| Router (opt.) | 路由器(選項) |
| Sec. Actor | 次要行為者 |

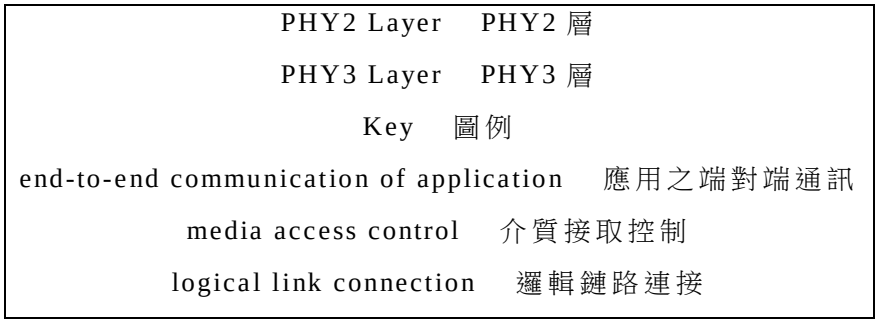



圖 A.3 SECC 使用應用閘道器與次要行為者通訊

Figure A.3 − SECC communicates with the secondary actor using an application gateway

## A.2 SECC 及 EVCC 設置之變異

PLC 使用案例之典型 SECC 及 EVCC 設置能分為：

− SECC 及 EVCC 於所有 OSI 層上之 1:1 通訊關係。SECC 管理 1 個 EVCC，知悉其連接至哪個插座。參照圖 A.4 (a)。

Typical SECC and EVCC set-ups for PLC use cases can be divided into:

− 1:1 communication relationship between an SECC and an EVCC over all OSI layers. The SECC manages one EVCC, knowing to which outlet it is connected. See Figure A.4 a).

− 1 個 SECC 與多個 EVCC 間之 1:n 通訊關係。SECC 管理多個 EVCC，知悉哪個 EVCC 連接至哪個插座。SECC 可能為本地或遠端(於 IP 位址基礎上通訊)。參照圖 A.4 (b)。

− 1:n communication relationship between one SECC and multiple EVCCs. The SECC manages multiple EVCCs, knowing which EVCC is connected to which outlet. The SECC may be local or remote (communication done on an IP address basis). See Figure A.4 b).

圖 A.4(a)及(b)描繪由本系列標準第 2 部或第 20 部及第 3 部所支援之系統架構。於任何情況下，各電源插座具自有之 PWM 控制器，用以監視接地連續性(參照 IEC 61851-1)。

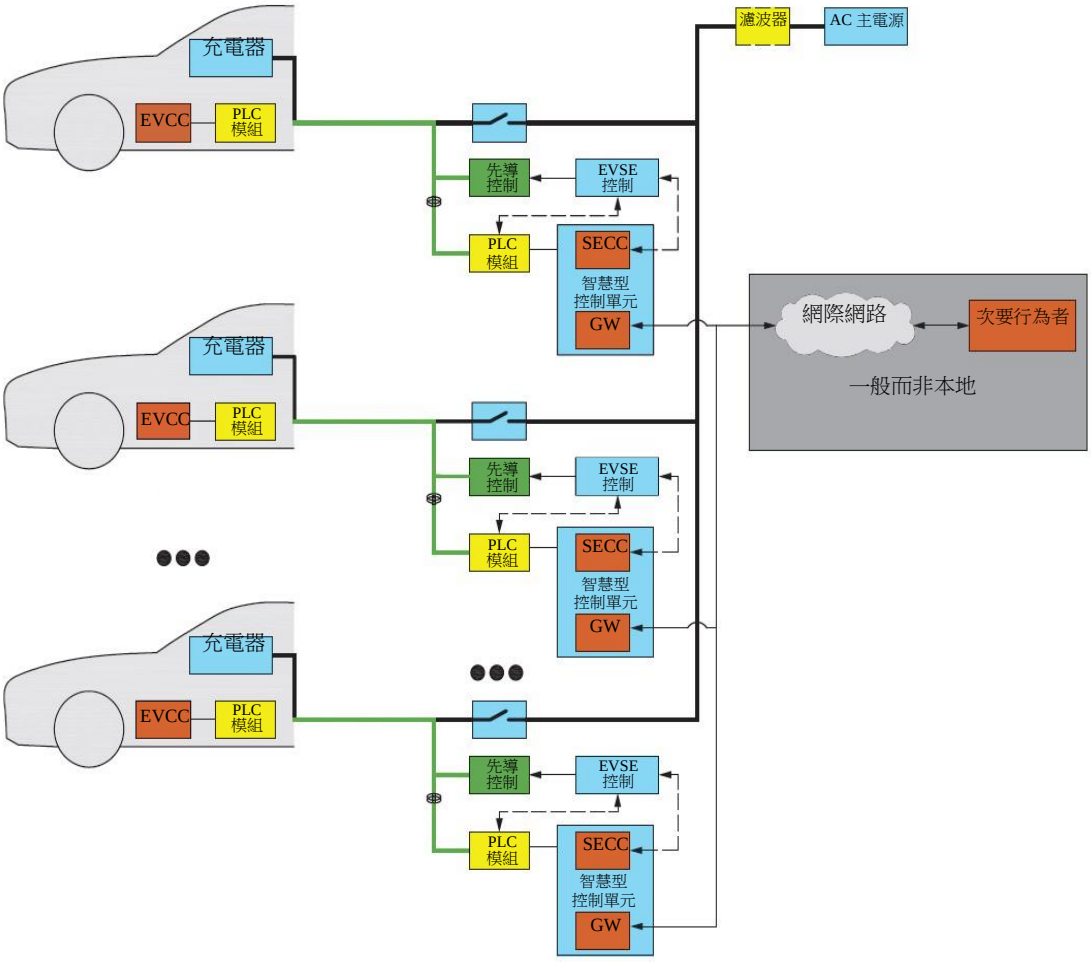
Figures A.4 a) and A.4 b) are illustrating system architectures that are supported by ISO 15118-2 or ISO 15118-20 and ISO 15118-3. In any case, each power outlet has its own PWM controller, for monitoring earth continuity (see IEC 61851-1).

(a) 通訊架構設置 PLC 1

(b) 一般通訊架構設置 PLC 2

a) Communication architecture set-up PLC 1

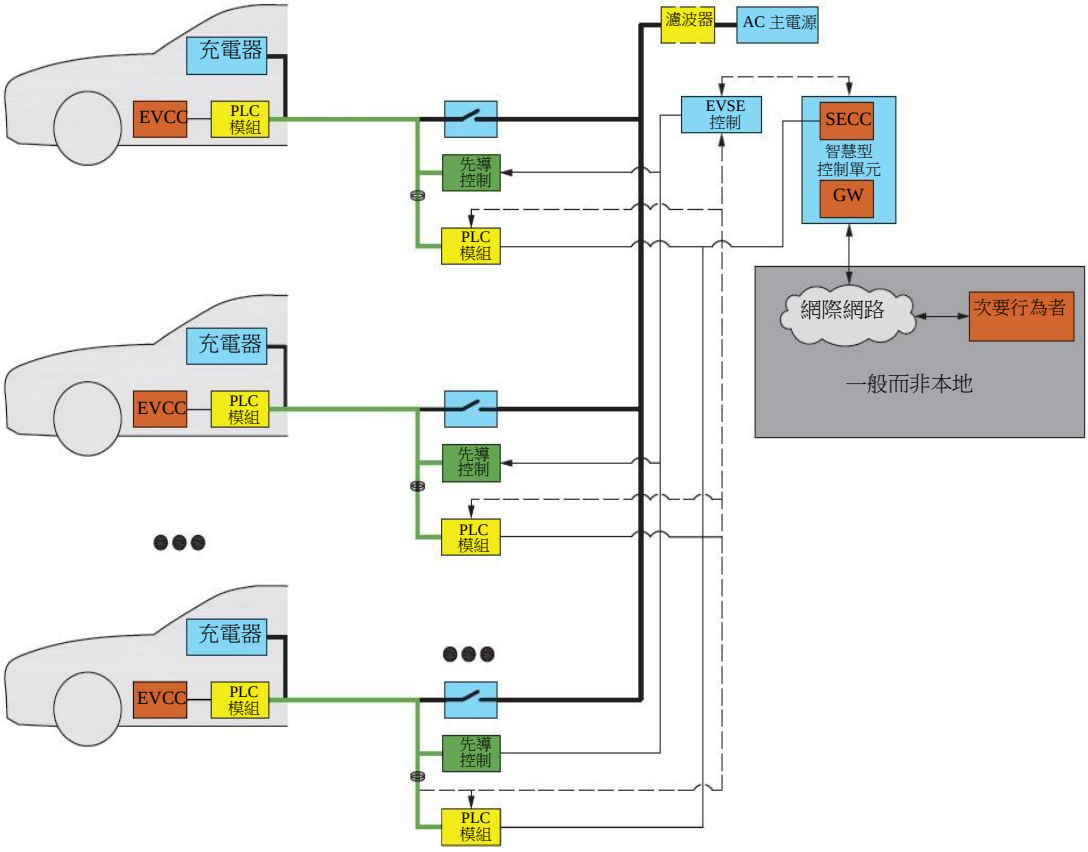
b) General communication architecture set-up PLC 2




| | |
|---|---|
| Charger | 充電器 |
| PLC module | PLC 模組 |
| Pilot Control | 先導控制 |
| EVSE Control | EVSE 控制 |
| Intelligent control unit | 智慧型控制單元 |
| Filter | 濾波器 |
| AC main | AC 主電源 |
| Internet | 網際網路 |
| Secondary Actor | 次要行為者 |
| In General not local | 一般而非本地 |

(a) 通訊架構設置 PLC 1

a) Communication architecture set-up PLC 1




| | |
|---|---|
| Charger | 充電器 |
| PLC module | PLC 模組 |
| Pilot Control | 先導控制 |
| EVSE Control | EVSE 控制 |
| Intelligent control unit | 智慧型控制單元 |
| Filter | 濾波器 |
| AC main | AC 主電源 |
| Internet | 網際網路 |
| Secondary Actor | 次要行為者 |
| In General not local | 一般而非本地 |

(b) 一般通訊架構設置 PLC 2

b) General communication architecture set-up PLC 2

圖 A.4 系統架構

Figure A.4 – System architectures

此等通訊設置之特性及可能性定義如下：

— IEC 61851-1 中所描述之控制先導處置。取決於基礎設施設置，各工作週期可指示所要求之 HLC 抑或指示插座的實際最大額定功率。

The characteristics and possibilities of these communication set-ups are defined below:

— The control pilot handling is described in IEC 61851-1. Depending on the infrastructure set-up, each duty cycle may either indicate HLC required or indicate the actual maximum power rating of the outlet.

— PLC 裝置間應足夠接近，詳細要求事項參照本系列標準第 3 部。

— The PLC devices should be sufficiently close to each other, see ISO 15118-3 for detailed requirements.

取決於 PLC 技術，額外元件(此處未顯示)可能係屬必要，參照本系列標準第 3 部。

Depending on the PLC technology, additional elements may be necessary (not shown here), see ISO 15118-3.

— 實體層與資料鏈路層之關聯恆基於連接設備的 MAC 位址，使用本地橋接器/裝置，有關細節及限制，參照本系列標準第 3 部：

— 每電源插座 1 個 PLC 橋接器/裝置。

— The association on physical and data link layer is always done based on the MAC addresses of the connected devices, with local bridge(s)/device(s), see ISO 15118-3 for details and limitations:

— One PLC bridge/device per power outlet.

— 關於各實體插座之 SECC 數量的替代方案。

— 每實體電源插座 1 個 SECC，參照圖 A.4 (a)。

— 1 個 SECC 用於多個實體電源插座，負責處置與連接至此等電源插座之所有 EVCC 的通訊，參照圖 A.4 (b)。

— Alternatives regarding the number of SECCs per physical outlet.

— One SECC per physical power outlet, see Figure A.4 a).

— One SECC for multiple physical power outlets that is handling the communication to all EVCCs connected to these power outlets, see Figure A.4 b).

— 關於 EV 供電設備控制器、PLC 模組與 SECC 互動之替代方案。

— 若 EV 供電設備控制器有可能與 PLC 模組互動，則可確保基礎設施側之 PLC 模組與 EV 側的正確 PLC 模組相關聯，並於 EV 電源間實作控制流設備控制器及 PLC 模組。細節規定於本系列標準第 3 部中。

— Alternatives regarding the interaction of the EV supply equipment controller, PLC module and SECC.

— If the EV supply equipment controller has the possibility to interact with the

PLC module, it is possible to ensure that the PLC module on the infrastructure side is associated with the correct PLC module on the EV side, with implemented control flow between the EV supply equipment controller and the PLC module. Details are specified in ISO 15118-3.

- 若 SECC 需知悉哪個 EVCC 連接至哪個實體插座，則 SECC 可能需與 EV 供電設備控制器互動，以自特定 EV 供電設備獲取額外資訊，且於 EV 供電設備控制器間實作控制流及 SECC。
- If the SECC needs to know which EVCC is connected to which physical outlet, the SECC might need the possibility to interact with the EV supply equipment controller to get additional information from the specific EV supply equipment with implemented control flow between the EV supply equipment controller and the SECC.
- 若無必要準確識別 EV 連接至哪個插座，則 PLC 模組可能無需與 EV 供電設備控制器互動。
- If it is not necessary to identify exactly to which outlet the EV is connected, the PLC module might not need to interact with the EV supply equipment controller.
- 於任何情況下，SECC 與所連接之各 EVCC 間應用層上的端對端通訊係屬可能。
- End-to-end communication on the application layer between the SECC and each connected EVCC is possible in all cases.
- SECC 可要求應用閘道器與次要行為者交換資訊。相較於 SECC 個體，實作該次要行為者之個體通常位於其他地方，參照圖 A.4(a)及 A.4(b)中之灰色突顯框。此應用閘道器的已定義於本系列標準範圍內。
- The SECC may require an application gateway to exchange information with a secondary actor. The entity implementing this secondary actor is generally located elsewhere compared to the SECC entity, see grey highlighted boxes in Figures A.4 a) and A.4 b). The definition of this application gateway is within the scope of the ISO 15118 series.
- 通過 PLC 模組及路由器或 SECC 與 HAN 進行選項之 EVCC IP 通訊。
- Optional EVCC IP communication to HAN through PLC module and router or SECC.

## A.3 計費過程相關元件的位置

## A.3 Location of charging process related elements

一般而言，電能傳送過程可分為不同元件。其為：

- 標的設定。
- 需量及預期狀況。
- 排程。
- 充電控制。

The energy transfer process can be split into different elements, in general. These are:

— Target Setting;

— Demand and Prognosis;

— Scheduling; and

— Charging Control.

〝標的設定〞涵蓋所有種類之使用者需量相關的資訊，諸如：

— 將選擇哪種型式之服務，FPT、RPT 或 BPT。

— 將選擇哪種型式之控制模式，已排程或動態。

— 電氣行動機制需要為何。

“Target Setting” covers all kinds of user demand-related information such as:

— What type of service will be selected, FPT, RPT or BPT.

— What type of control mode will be selected, scheduled or dynamic.

— What are the e-mobility needs.

— 充電過程完成時。

— 需多少電能。

— 充電優選，如快速充電、最便宜充電、最少 $CO_2$ 充電等。

— EP。

— When the charging process is finished.

— How much energy is needed.

— Charging preferences like fast charging, cheapest charging, least CO2 charging, etc.

— EP.

〝需量及預期狀況〞涵蓋適用於實際電能傳送過程之電網及本地設施約束的彙集，例：

— 包含基於電網、電能生產、電能需量及用戶契約資訊之價格、效率或 $CO_2$ 含量資訊相對於時間的銷售費率表，連同選項的契約式電流限制。

“Demand and Prognosis” covers the collection of grid and local installation limits which apply to the actual energy transfer process, e.g.

— sales tariff table containing a price, efficiency or CO2 content information vs. time based on grid, energy production, energy demand and customer contract information, along with an optional contract-based current limitation;

— 由於本地設施及本地電力需量情況，於特定 EV 供電設備處包含電流相對於時間限制之電網排程。

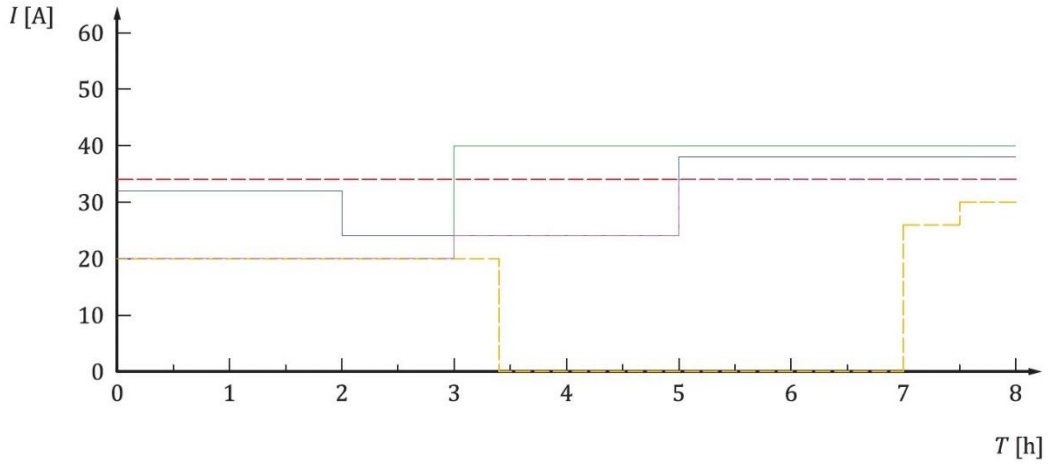
— grid schedule containing a current vs. time limitation at the specific EV supply equipment due to local installation and local electricity demand situation.

〝排程〞涵蓋包括必要時編譯〝標的設定〞及〝需量及預期狀況〞資訊，以針對

目前電能傳送過程建立電能傳送加以排程,亦即充電/放電電流及時間預期狀況。參照圖 A.5。

"Scheduling" covers the compilation of "target setting" and "demand and prognosis" information when necessary to create an energy transfer schedule, i.e. charging/discharging current vs. time prognosis, for the current energy transfer process. See Figure A.5.

- 計算符合用戶要求事項之電能傳送排程，其遵守電氣行動機制需要、銷售費率表中的目前限制、電網排程及本地設施。
- 計算結果為允許自或向 EV 供電設備傳送之最大功率的排程。
- Calculate an energy transfer plan to meet customer requirements, which respects e-mobility needs, current limitations from the sales tariff table, grid schedule and local installation.
- The result of the calculation is a timetable of maximum power allowed to be transferred from or to the EV supply equipment.
- 該排程遵守費率限制、電網限制、本地基礎設施限制及 EV 限制。位準選擇器組合費率限制、電網限制及本地基礎設施限制。
- The schedule respects tarifflimitations, grid limitations, local infrastructure limitations and EV limitations. The level selector does the combination of tarifflimitations, grid limitations and local infrastructure limitations.




圖例：

T　時間
Time

I　電流
Current

———　由次要參與者向 SECC/EVCC 所提供之契約式電流限制，包含於自

SECC 至 EVCC 的銷售費率表中。

contract-based current limitation provided by the secondary actor to the SECC/EVCC, contained in the sales tariff table from the SECC to the EVCC

由次要參與者於 SECC 處所提供之可用電網式電流限制，包含在自 SECC 至 EVCC 的電網調度中。

grid-based current limitation available at the SECC provided by the secondary actor, contained in the grid schedule from the SECC to the EVCC

邏輯實體限制，插座及電纜之最小額定值。

logical physical limit, minimum of rating of the outlet and cable

位準選擇於 EV 或 EV 供電設備處所為之最小銷售費率及電網電流限制。

level selection minimum of sales tariff and grid current limitations done at the EV or the EV supply equipment

充電時 EV 依循之經排程電流限制，包含於來自 EVCC 或 SECC 的充電排程中。

scheduled current limitation the EV follows while charging, contained in the charge schedule from the EVCC or the SECC

圖 A.5　排程於通訊電流上之效應

Figure A.5 – Effects of scheduling on communicated current

〝充電控制〞包括依〝排程〞結果對計費過程進行控制。

備考：電池之實際充電電流係由 BMS 所控制。其不屬本標準範圍內。

BMS 於由〝充電控制〞所提供之電流限制下為電池充電。

此等元件間僅於充電情況下之合作，依圖 A.6 中所示。

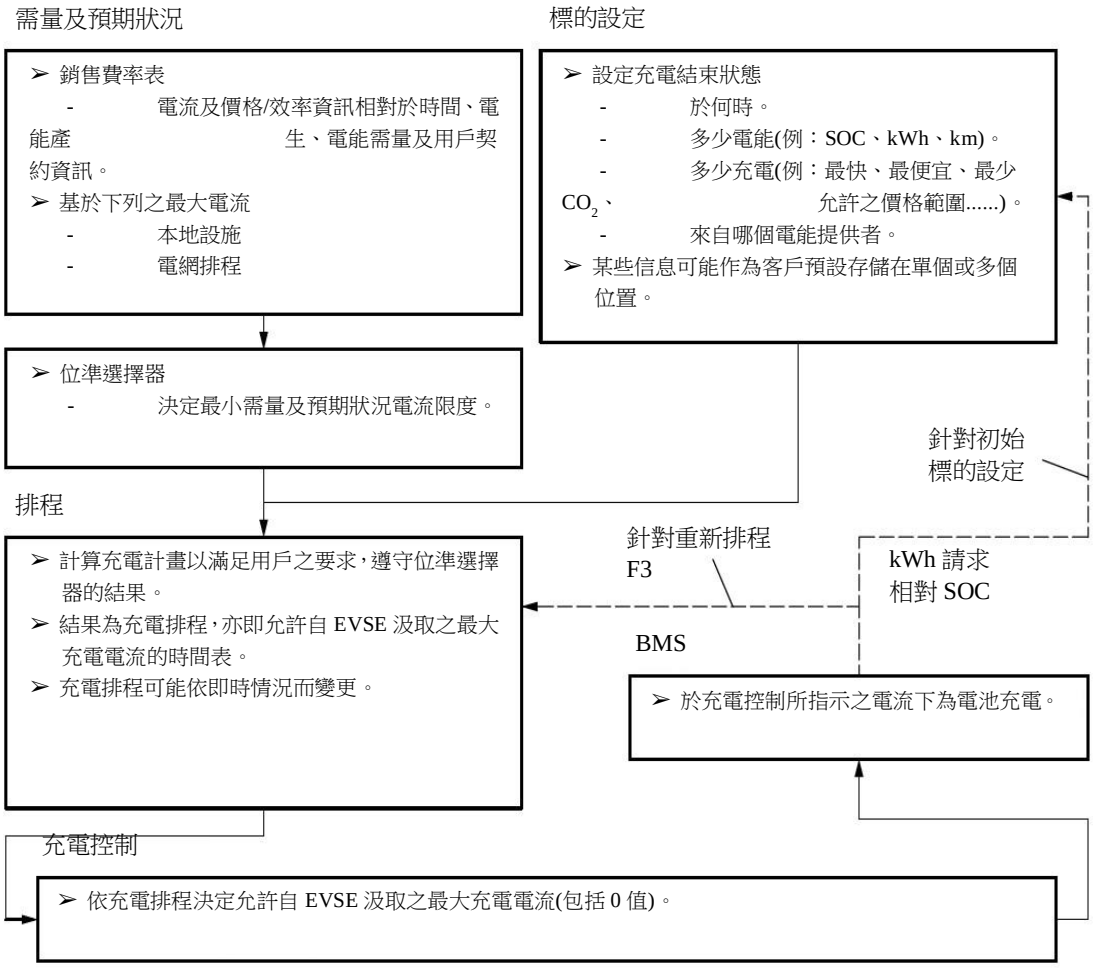
“Charging Control” covers the control of the charging process according to “Scheduling” results.

NOTE Actual charging current to the battery is controlled by the BMS. It is outside the scope of this document.

The BMS charges the battery under the current limitations provided by “Charging Control”.

The cooperation between these elements is shown in Figure A.6 in the context of charging only.

充電過程流程圖




| | |
|---|---|
| Charge Process Flowchart　充電過程流程圖<br>Demand and prognosis　需量及預期狀況<br>Target Setting　標的設定<br>Schedulling　排程<br>Charge control　充電控制<br>For Initial Target Setting　針對初始標的設定<br>For Re-schedulling F2　針對重新排程 F2<br>kWh Request Relative SOC　Wh 請求相對 SOC | |
| →Sales Traiff Table<br>－Current and price/efficiency information vs time, energy production, energy demand and customer contract information.<br>→Max current based on<br>－local installation | →銷售費率表<br>－電流及價格/效率資訊相對於時間、電能產生、電能需量及用戶契約資訊。<br>→基於下列之最大電流 |

| | |
|---|---|
| − Grid schedure | − 本地設施<br>− 電網排程 |
| →Level Selector<br>− Determine the minimum of demand and prognosis current limitations. | →位準選擇器<br>− 決定最小需量及需量及預期狀況電流限制。 |
| →Calculate a plan of charaging to meet customer requirement, respecting the level selector result.<br>→Result is a charge schedule, i.e., time table of maximum charge current allowed to be withdrawn from EVSE.<br>→Charge schedule may be changed according to real time situation. | →計算充電計畫以滿足用戶之要求，遵守位準選擇器的結果。<br>→結果為充電排程，亦即允許自 EVSE 汲取之最大充電電流的時間表。<br>→充電排程可能依即時情況而變更。 |
| →Set the status of the end of charge<br>− By when<br>− How much energy (e.g., SOC, kWh, km)<br>− How to charge (e.g., fastest, cheapest. CO2 min, allowed price range, ...)<br>− From which energy provider.<br>→Some information may be stored at single or multiple locations as a custumer preset. | →設定充電結束狀態<br>− 於何時。<br>− 多少電能(例：SOC、kWh、km)。<br>− 如何充電(例：最快、最便宜、最少 $CO_2$、允許之價格範圍...)。<br>− 來自哪個電能提供者。<br>→某些信息可能作為客戶預設存儲在單個或多個位置。 |
| →Charge battery under the current directed by Charge Control. | →於充電控制所指示之電流下為電池充電。 |
| →Determine the maximum charge current that is allowed to withdrawn from EVSE including zero value according to charge schedule. | →依充電排程決定允許自 EVSE 汲取之最大充電電流(包括 0 值)。 |

圖 A.6　僅充電過程流程圖示例

Figure A.6 − Example of charging only process flow chart

於 AC 及 DC 之情況下，〝需量及預期狀況〞係屬次要行為者的任務。充電過程流程圖中之其餘元件能位於 EV、EV 供電設備抑或次要行為者中。取決於針對特定系統之決定，將出現用於使用者互動、資料傳送、與次要行為者的通訊鏈路可用性等之附加設備。參照表 A.2 及 A.3。

In the case of AC and DC, “Demand and Prognosis” is a task of a secondary actor. The remaining elements in the charging process flow chart can either be located in the EV, the EV supply equipment or at a secondary actor. Depending on the decision

for a specific system, additional equipment for user interaction, data transfer, availability of a communication link to a secondary actor, etc. arise. See Tables A.2 and A.3 for details.

表 A.2　若排程及電能傳送控制係主要位於基礎設施側，則要求額外設備

Table A.2 − Additional equipment required if scheduling and energy transfer control is mainly located on the infrastructure side

| 階段<br>Stage | 功能<br>Function | 設備之位置及示例<br>Location and example of equipment | | | |
|---|---|---|---|---|---|
| | | EV | EV 供電設備<br>EV supply equipment | 次要行為者 1<br>Secondary actor 1 | 次要行為者 2<br>Secondary actor 2 |
| 標的設定<br>Target Setting | 電能傳送結束狀態之設定。<br>Setting of the status of the end of energy transfer | 開關/按鈕等。<br>Switch/button etc. | | | |
| | 設定 EV 充電所需之電能及充電能力。<br>Setting of the required amount of energy needed for the charging and charging capability of the EV | 由 BMS (Wh 計算器)所計算。<br>Calculated by the BMS (Wh calculator) | SECC 可能轉發資訊，具體取決於 SECC/EV 供電設備之設置。<br>The SECC may forward the information, depending on the set-up of the SECC/ EV supply equipment | 儲存標的設定資料以供進一步處理之資料庫。<br>Database to store the target setting data for further processing | |
| 需量及預期狀況<br>Demand and Prognosis | 銷售費率表之發展。<br>Development of the sales tariff table | | | 儲存銷售費率表以進行排程之資料庫。<br>Database to store the sales tariff table for scheduling | 電能提供者或 EMSP。<br>Energy provider or EMSP |
| | 電網排程之決定。<br>Determination of the grid schedule | | | 於 DCH 或 CSO 處之資料庫。<br>Database at the DCH or CSO | |
| | 本地限制之決定。<br>Determination oflocal limitation | | 提供插座額定值及電纜額定值之控制器。<br>Controller | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | providing the outlet rating and the cable rating | | |
| | 位準選擇器。<br>Level selector | | | 使用資料庫及充電場所資訊之控制器。<br>Controller using the database and charging site information | |
| 排程<br>Scheduling | 依〝標的設定〞及〝需量及預期狀況〞資訊之排程計算。<br>Schedule calculation according to “Target Setting” and “Demand and Prognosis” information | | 儲存充電排程之資料庫。<br>Database to store the charging schedule | 排程計算器結果發送至充電場所。<br>Schedule calculator result sent to charging site | |
| | EV 或使用者確認充電排程(選項)。<br>The EV or user confirms the charging schedule (Optional) | 充電排程確認。<br>Charging schedule confirmation | | | |
| 充電控制<br>Charging Control | 告知當時之最大充電電流。自充電排程中提取。<br>Inform the maximum charging current at that time. Pick up from the charging schedule | 依循電流限制之控制器。<br>Controller to follow the current limitation | 依循充電排程並通知 EV 電流限制之控制器。<br>Controller to follow the charging schedule and inform the EV about the current limitation | | |
| | 由於環境條件變更(t°、…)而重新協商(選項)。<br>Renegotiation due to environmental condition changes (t°, ..) (optional) | EVCC 回傳〝標的設定〞。<br>The EVCC returns to “Target Setting” | | | |
| | 由於 EV 供電設備 | | 回傳〝標的設 | 回傳〝標的設 | |

| | | | | | |
|---|---|---|---|---|---|
| | 或次要行為者方之環境條件變更而重新協商。<br>Renegotiation due to changed environmental condition on the EV supply equipment or the secondary actor side | | 定〞或〝需量及預期狀況〞。<br>Return to “Target Setting” or “Demand and Prognosis” | 定〞或〝需量及預期狀況〞。<br>Return to “Target Setting” or “Demand and Prognosis” | |

表 A.3　若排程及充電控制係主要位於 EV 側，則要求額外設備

Table A.3 − Additional equipment required if scheduling and charging control is mainly located on the EV side

| 階段<br>Stage | 功能<br>Function | 設備之位置及示例<br>Location and example of equipment | | | |
|---|---|---|---|---|---|
| | | EV | EV 供電設備<br>EV supply equipment | 次要行為者 1<br>Secondary actor 1 | 次要行為者 2<br>Secondary actor 2 |
| 標的設定<br>Target Setting | 充電結束狀態之設定。<br>Setting of the status of the end of charging | 該關/按鈕等。<br>Switch/button etc. | | | |
| | 設定 EV 所要求之充電量及充電能力。<br>Setting the required amount of charging and charging capability of the EV | 由 BMS (kWh 計算器)所計算。<br>Calculated by the BMS (kWh calculator) | SECC 可轉發資訊，取決於 SECC/EV 供電設備之設置。<br>The SECC may forward the information, depending on the set-up of the SECC/EV supply equipment | | |
| 需量及預期狀況<br>Demand and Prognosis | 銷售費率表之發展。<br>Development of the sales tariff table | | SECC 將銷售費率表轉發至 EVCC。<br>The SECC forwards the sales tariff table to the EVCC | | 電能提供者或 EMSP。<br>Energy Provider or EMSP |

| | | | | | |
|---|---|---|---|---|---|
| | 電網排程之決定。<br>Determination of the grid schedule | | SECC 將電網排程轉發予 EVCC。<br>The SECC forwards the grid schedule to the EVCC | 於 DCH 或 CSO 處之資料庫。<br>Database at the DCH or CSO | |
| | 本地限制之決定。<br>Determination oflocal limitation | 提供電纜額定值之控制器。<br>Controller providing the cable rating | 提供插座額定值之控制器；SECC 將此資訊轉發至 EVCC。<br>Controller providing the outlet rating; the SECC forwards this information to the EVCC | | |
| | 位準選擇器。<br>Level selector | 控制器決定 SECC 所提供之所有電流限制資訊中的最小值。<br>Controller determines the minimum of all current limitation information provided by the SECC | | | |
| 排程<br>Scheduling | 依〝標的設定〞及〝需量及預期狀況〞資訊之排程計算。<br>Schedule calculation according to “Target Setting” and “Demand and Prognosis” information | 計算充電排程之控制器。<br>Controller to calculate a charging schedule | | | |
| | EV 或使用者提供充電排程予 SECC。<br>The EV or user provides the charging schedule to the SECC | EVCC 提供充電排程予 SECC。<br>The EVCC provides the charging schedule to the SECC | 充電排程確認。<br>Charging schedule confirmation | | |

| | | | | | |
|---|---|---|---|---|---|
| 充電控制<br>Charging Control | 告知當時之最大充電電流。自充電排程中提取。<br>Inform the maximum charging current at that time. Pick up from the charging schedule | 依循電流限制之控制器。<br>Controller to follow the current limitation | | | |
| | 由於環境條件變更(t° …)而重新協商(選項)。<br>Renegotiation due to environmental condition changes (t°, ..) (optional) | EVCC 回傳〝標的設定〞。<br>The EVCC returns to “Target Setting” | | | |
| | 由於 EV 供電設備或次要行為者側之環境條件變更而重新協商(選項)。<br>Renegotiation due to changed environmental condition on the EV supply equipment or the secondary actor side (optional) | | 回傳〝標的設定〞或〝需量及預期狀況〞。<br>Return to “Target Setting” or “Demand and Prognosis” | 回傳〝標的設定〞或〝需量及預期狀況〞<br>Return to “Rarget Setting” or “Demand and Prognosis” | |

# 附錄 B
# (參考)
# 安全性
# Annex B
# (informative)
# Security

## B.1 標的使用案例之分析
### B.1.1 一般
## B.1 Analysis of target use cases
### B.1.1 General

下列情境於 7.1 中描述為使用案例矩陣之一部分。此等使用案例可作為稍後導出安全要求事項之起點。針對使用案例分析之焦點係置於通訊關係，以及通訊各方間所交換的資料上。

The following scenarios are described as part of the use case matrix in 7.1. These use cases serve as a starting point for the derivation of security requirements later on. The focus for the analysis of the use cases is placed on the communication relations, as well as the data exchanged between the communicating parties.

對映至安全要求事項之安全概念範圍內的使用案例描述於表 B.1 中。

Use cases in scope of the security concept mapped to the security requirements are described in Table B.1.

下列將密碼學適用於通訊之目的係摘自〝Handbook of Applied Cryptography〞[24]，且於此重複以較易於瞭解密碼學措施。

The following goals of applying cryptography to communication are an extract from the Handbook of Applied Cryptography [24] and are repeated here for easier understanding of the cryptographic measures.

(a) 機密性係屬服務，用於對除經授權擁有資訊者外之所有人保密資訊內容。提供機密性的方法甚多，自實體保護至數學演算法，此等方法使資料難以理解。

1) Confidentiality is a service used to keep the content of information from all but those authorized to have it. There are numerous approaches to providing confidentiality, ranging from physical protection to mathematical algorithms, which render data unintelligible.

(b) 資料完整性係因應未經授權變更資料之服務。為確保資料完整性，須具備檢測未經授權各方之資料調處的能力。資料調處包括諸如插入、刪除及替換等情事。

2) Data integrity is a service that addresses the unauthorized alteration of data. To assure data integrity, one must have the ability to detect data manipulation by unauthorized parties. Data manipulation includes such things as insertion,

deletion, and substitution.

(c) 鑑別係與識別相關之服務。此功能適用於個體及資訊本身。進入通訊之雙方宜相互識別。通過通道所交付之資訊宜依來源、來源日期、資料內容、發送時間等加以鑑別。出於此等原因，密碼學之此層方面通常分為2個主要類別：個體鑑別及資料來源鑑別。資料來源鑑別隱含地提供資料完整性(若訊息被修改，則來源已變更)。

3) Authentication is a service related to identification. This function applies to both entities and information itself. Two parties entering into a communication should identify each other. Information delivered over a channel should be authenticated as to origin, date of origin, data content, time sent, etc. For these reasons, this aspect of cryptography is usually subdivided into two major classes: entity authentication and data origin authentication. Data origin authentication implicitly provides data integrity (for if a message is modified, the source has changed).

(d) 不可否認性係防止個體否認先前承諾或動作之服務。當由於個體否認已採取某些動作而引起爭議時，要求解決該情況之方式。例：1個個體可能授權另一個體購買財產，卻隨後拒絕授予此種授權。需要涉及受信任第三方之程序以解決爭議。〝可歸責性〞等同於〝不可否認性〞。

4) Non-repudiation is a service that prevents an entity from denying previous commitments or actions. When disputes arise due to an entity denying that certain actions were taken, a means to resolve the situation is required. For example, one entity may authorize the purchase of property by another entity and later deny such authorization was granted. A procedure involving a trusted third party is needed to resolve the dispute. “Accountability” is equivalent to the term “nonrepudiation”.

(e) 隱私係與個人資料保護有關。個人資料意指與經識別或可識別之自然人相關的任何資訊；可識別之個人係能直接或間接識別者，特別是藉由參引識別碼或特定於其身體、生理、心理、經濟、文化或社會身分的1或多個因素。

5) Privacy is related to personal data protection. Personal data means any information relating to an identified or identifiable natural person; an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity.

關於資料通訊之額外目的，定義如下：

(f) 可靠性/可用性係服務可用且可靠地工作之性質。可用性及/或通訊可靠性之下降可能損害所提供的服務。

An additional goal regarding the data communication is defined below.

6) Reliability/Availability is the property of a service of being available and

working reliably. Degradation of availability and/or communication reliability potentially compromises an offered service.

表 B.1　使用案例元件及其安全要求事項

Table B.1 − Use case elements and their security requirements

| 編號<br>No. | 使用案例元件名稱/分群<br>Use case element name/grouping | 不可否認性<br>Non-repudiation | 真確性<br>Authenticity | 機密性<br>Confidentiality | 隱私<br>Privacy | 完整性<br>Integrity | 真實性及可用性<br>Reliability and availability |
|---|---|---|---|---|---|---|---|
| A | | | | | | | |
| A1 | Plug-in and forced high-level communication (插接及強制高層通訊) | | | | | | |
| WA1 | Automatic discovery with reservation (具預約之自動發現) | | X | X | X | X | X |
| A2 | Plug-in with concurrent IEC 61851-1 and high-level communication (具現行 IEC 61851-1 及高層通訊之插接) | | | | | | |
| WA2 | Manual or automatic discovery without reservation (未預約之手動或自動發現) | | | | | | |
| B | | | | | | | |
| B1 | EVCC/SECC communication set-up (EVCC/SECC 通訊設置) | | | | | | |
| WB1 | EVCC/SECC wireless communication set-up (EVCC/SECC 無線通訊設置) | | X | X | X | X | X |
| C | | | | | | | |
| C1 | Certificate update (憑證更新) | | X | X | X | X | X |
| C2 | Certificate installation (憑證安裝) | | X | X | X | X | X |
| D | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| D1 | Authorization using contract certificates performed at the EV supply equipment (於 EV 供電設備處使用契約憑證履行授權) | | X | X | X | X | X |
| WD1 | Authorization with prior reservation (以先前之預約授權) | | X | X | X | X | X |
| D2 | Authorization using contract certificates performed with SA help (以 SA 協助履行之使用契約憑證授權) | | X | X | X | X | X |
| D3 | Authorization at EV supply equipment using external credentials performed at the EV supply equipment (於 EV 供電設備處履行使用外部憑證於 EV 供電設備處授權) | | X | | | X | X |
| D4 | Authorization at EV supply equipment using external credentials performed with SA help (EV 供電設備處以 SA 協助履行之外部憑證授權) | | X | | | X | X |
| P | | | | | | | |
| WP1 | WPT fine positioning (WPT 精細定位) | | X | | | X | X |
| WP2 | WPT fine positioning without communication support (無通訊支援之 WPT 精細定位) | | | | | | |
| WP3 | Conductive power tranfer pairing (傳導性電力傳送配對) | | X | | | X | X |
| WP4 | WPT pairing (WPT 配對) | | X | | | X | X |
| E | | | | | | | |
| E1 | AC energy transfer with load levelling based on high-level communication (依高層通訊之負載平衡 AC 電能傳送) | | X | | | X | X |
| WE1 | WPT target setting and energy transfer scheduling (WPT 標的設定及電能轉送排程) | | X | | | X | X |
| E2 | Optimized energy transfer with scheduling the secondary | | X | X | X | X | X |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | actor (WPT 標的設定及電能傳送排程) | | | | | | |
| E4 | DC energy transfer with load levelling based on high-level communication (依高層通訊之負載平衡 DC 電能傳送) | | X | | | X | X |
| E5 | Resume to authorized charge schedule (經授權充電排程之再續) | | X | | | X | X |
| E6 | Reverse power transfer with load levelling based on HLC (具依 HLC 負載平衡之反向電力傳送) | | x | | | | |
| E7 | Reverse power transfer on stand-alone operation (分離運作時之反向電力傳送) | | X | | | X | X |
| E8 | Fast responding energy transfer services based on dynamic control mode (依動態控制模式之快速回應電力傳送服務) | | X | | | X | X |
| E9 | Managed bidirectional power transfer into the grid (受管理雙向電力傳送進入電網) | | X | | | X | X |
| F | | | | | | | |
| F0 | Energy transfer loop (電能傳送循環) | | X | | | X | X |
| F1 | Energy transfer loop with metering information exchange (具計量資訊交換之電能傳送循環) | X | X | X | X | X | X |
| WF1 | WPT charging loop (WPT 充電循環) | | X | X | X | X | X |
| F2 | Energy transfer loop with interrupt from the SECC (具源自 SECC 中斷之電能傳送循環) | | X | X | X | X | X |
| F3 | Energy transfer loop with interrupt from the EVCC or user (具源自 EVCC 或使用者中斷之電能傳送循環) | | X | X | X | X | X |
| F4 | Energy transfer control based on dynamic control mode (依動態控制模式之電能傳送控制) | | X | X | X | X | X |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| G | | | | | | | |
| G1 | Value-added services (加值服務) | | | | | | |
| WG1 | ACD system status check (ACD 系統狀態檢查) | | X | X | X | X | X |
| G2 | Charging details (充電細節) | | | | | | |
| H | | | | | | | |
| H1 | End of charging process (充電過程之結束) | | | | | X | X |
| WH1 | WPT end of energy transfer (電能傳送之 WPT 結束) | | | | | X | X |
| WI | ACD connect/disconnect (ACD 連接/解連) | | | | | X | X |

備考： 使用案例 C1 僅於已包括新的私密金鑰之交換的情況下才具機密性要求事項。使用案例 G1 通常具安全要求事項，但不屬 V2G CI 規格範圍內。

NOTE Use case C1 only has confidentiality requirements if the exchange of new private keys is included. Use case G1 has security requirements in general, but outside the scope of the V2G CI specification.

下面分析此等使用案例以判定通訊對等方以及通訊資料。此外，宜調查此通訊以判定其對所提供服務之重要性。此資訊係導出安全要求事項的基礎之一。

These use cases are analysed below to determine the communication peers, as well as the communicated data. Moreover, this communication should be investigated to determine its criticality to the service provided. This information is one basis for the derivation of security requirements.

**B.1.2 個體**

**B.1.2.1 General**

上述使用案例涉及下列 2 節中所描述之個體。

The use cases described above involve the entities described in the following two subclauses.

**B.1.2.2 使用者相關**

**B.1.2.2 Customer-related**

表 B.2　個體之說明

Table B.2 − Description of entities

| 個體<br>Entity | 說明<br>Description |
|---|---|
| 契約<br>Contract | 用戶與行動機制營運者間關於提供充電服務之協議。契約係由 EMAID 所識別。<br>An agreement between the customer and a mobility operator for providing charging services. The contract is identified by an EMAID. |

**B.1.2.3 EMSP**

表 B.3　各組織方之說明

Table B.3 − Description of organisational parties

| 組織<br>Organization | 說明<br>Description |
|---|---|
| | 參引第 6 節。<br>Reference to Clause 6 |
| 行動機制營運者<br>Mobility operator | 用戶及其簽訂提供 EV 充電服務契約之組織。行動機制營運者(mobility operator)可能為 CSO、EP 或第三方。<br>The organisation to which a customer has a contract for providing EV charging services. The mobility operator might be the CSO, an EP or a third party. |

**B.1.3 信任關係**

**B.1.3 Trust relationships**

下表分解資訊流 EV、EV 供電設備及 SA。

The following table breaks down the information flow EV, EV supply equipment and SA.

表 B.4　相關對等方間之通訊關係及所交換的資料

Table B.4 − Communication relations and exchanged data between involved peers

| 編號<br>No. | 對等方 1<br>Peer 1 | 對等方 2<br>Peer 2 | 通訊型式、交換之資料<br>Communication type, exchange data |
|---|---|---|---|
| 1 | EV | EV 供電設備/EV 供電設備營運者<br>EV supply equipment/ EV supply equipment operator | 充電控制資料、契約、EV 供電設備 ID、實體限制(設備人身安全監視)、表計資訊、充電排程、設備人身安全監視資料。<br>Charging control data, contract, EV supply equipment-ID, physical limits (safety monitoring), meter information, charge plan, safety monitoring data |
| 2 | EV | 結算所<br>Clearing house | 計費資訊、計費資訊(間接)、費率資訊。<br>Charging information, billing information (indirect), tariff information |
| 3 | EV | VAS | 與通訊相關之加值服務。<br>Value added service related communication |
| 4 | EV 供電設備<br>EV supply equipment | EV 供電設備營運者<br>EV supply equipment operator | 契約、限制、表計資訊、充電計畫。<br>Contracts, limits, meter information, charge plan |
| | | | SW 更新。<br>SW-Updates |
| 5 | EV 供電設備<br>EV supply equipment | 結算所<br>Clearing house | 契約、限制、表計資訊、充電計畫、計費紀錄。<br>Contracts, limits, meter information, charge plan, billing record |
| 6 | EV 供電設備<br>EV supply equipment | EMSP | 契約、充電控制。<br>Contract, charge control |
| 7 | EV 供電設備<br>EV supply equipment | 電能提供者<br>Energy provider | |

為實現本附錄介紹中所述之使用案例，宜調查有關信任關係的假設，以確保通常所使用之信任密碼憑證，進而影響安全要求事項、安全架構及安全措施的選擇(演算法、機制等)。

To realize the use cases stated in the introduction of this security annex, assumptions regarding the trust relations should be investigated to ensure trust cryptographic credentials are typically used and thus influence the security requirements, security architecture and the selection of security measures (algorithms, mechanisms, etc.).

信任關係大程度取決於不同對等方間之服務關係，因此取決於所涉及各方間所交換的資料，依表 B.4 中所表現。

The trust relations depend considerably on service relations between the different peers and therefore on the data exchanged between the involved parties as presented in Table B.4.

此外，表 B.5 提供關於不同對等方及其安全相關互動及/或功能之某些假設的資訊。

In addition, Table B.5 provides information about certain assumptions regarding the different peers in relation with their security relevant interactions and/or functions.

表 B.5　信任及架構假設

Table B.5 − Trust and architecture assumptions

| 編　號<br>No | 對等方<br>Peer | 假設<br>Assumptions |
|---|---|---|
| 1 | 車輛 Vehicle | − 具向其他對等方識別且自我鑑別之方法，例：藉由使用 EMAID 及加密金鑰材料。<br>− Has means to identify and authenticate itself towards other peers, e.g. by using an EMAID and cryptographic key material. |
| 2 | EV 供電設備/CSO<br>EV supply equipment/ CSO | − EV 供電設備於電能傳送期間內交付正確之表計資訊。<br>− EV 供電設備可控制電能傳送過程。<br>− The EV supply equipment delivers correct meter information during the energy transfer cycle.<br>− The EV supply equipment may control the energy transfer process.<br>− 車輛、結算所及行動機制營運者可能需通過 EV 供電設備傳　送費率資訊等資訊，但 EV 供電設備無法存取此等資訊。<br>− EV 供電設備具鑑別其他對等方之方式。<br>− The vehicle, clearing house and mobility operator may need to transfer information such as tariff information through the EV supply equipment without the EV supply equipment having access to the information.<br>− The EV supply equipment has means to authenticate towards other peers.<br>− 將不向 EV 供電設備提供結算所或車輛之計費資訊(於此情　況下計費與個人用戶資料有關)。<br>− 未因應 PLC 連接間之串音(而是實體量測的議題)。<br>− The EV supply equipment will not be provided with billing information from the clearing house or the vehicle (billing in this context is related to personal customer data).<br>− Crosstalk between PLC connections is not addressed (rather an |

| | | |
|---|---|---|
| | | issue for physical measures). |
| 3 | SA<br>(結算所)<br>(clearing house) | — 結算所正確地處理計費。<br>— 結算所具鑑別其他對等方之方式。<br>— The clearing house processes the billing correctly.<br>— The clearing house has means to authenticate towards other peers. |
| 4 | SA<br>(VAS 提供者)<br>(VAS provider) | — VAS 供應與電能傳送及相關計費正交。<br>— VAS provisioning is orthogonal to the electricity energy transfer and the associated billing. |
| 5 | 全部<br>All | — 所有各方具彼此間溝通之方式。<br>— All parties have means to communicate with each other. |

### B.1.4 針對傳送資訊之威脅

### B.1.4 Threats for transmission information

所交換資料之分析瞄準判定資料的關鍵性，進而確定其對服務供應之影響。其亦因應不同資料型式所要求之潛在資料保護。關於安全技術之一般背景資訊，參照 ISO/IEC 15408-1。

The analysis of exchanged data targets the determination of criticality of the data and thus their influence on the service provisioning. It also addresses potential data protection required for the different data types. For general background information about security techniques refer to ISO/ IEC 15408-1.

表 B.6　對等方間之通訊關係及所交換的資料

Table B.6 − Communication relations and exchanged data between peers

| 編號<br>No | 資料/服務<br>Data/Service | 優先序類別<br>Priority Class | 受威脅之安全標的<br>Threatened security goal | | | |
|---|---|---|---|---|---|---|
| | | | 整合性<br>Integrity | 機密性<br>Confidentiality | 不可否認性<br>Non-Repudiation | 可用性<br>Availability |
| 1 | 充電控制資料、實體限定充電排程、安全監視資料。<br>Charging control data, physical limits charging plan, safety monitoring data | | X | | | X |
| 2 | 計費資訊。<br>Billing information | | X | (X)<br>(若個人化) | X | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | (if personalised) | | |
| 3 | 費率資訊。<br>Tariff information | | X | X | (X)<br>(若個人化)<br>(if personalised) | X |
| 4 | SW 更新。<br>SW updates | | (X)<br>(OEM 特定)<br>(OEM specific) | (X)<br>(OEM 特定)<br>(OEM specific) | | |
| 5 | VAS communication | | X<br>(取決於 VAS，不屬車輛與 EV 供電設備通訊範圍內)<br>(depending on VAS, outside the scope of vehicle to EV supply equipment communication) | | | |
| 6 | 實體組件相關識別資訊(例：EV 供電設備 ID)。<br>Identity information related to physical components (e.g. EV supply equipment ID) | | X | | | X |
| 7 | 個人身分相關資訊(例：EMAID)。<br>Identity information related to persons (e.g. EMAID) | | X | X | | |
| 8 | 充電服務。<br>Charging Service | | | | | X |

# 附錄 C
# (參考)
# 衍生自使用案例元件之充電情境例

Annex C

(informative)

Examples of charging scenarios derived from the use case elements

## C.1 一般

## C.1 General

本附錄旨在顯示第 7 節中所定義之使用案例元件，能用以建構特定情境的方式。此等各情境提供數種方式，且各為衍生自第 7 節中所描述元件之使用案例。目標係未納入本標準中之所有可能的通訊使用案例。然而，本附錄提供某些典型情境，其顯示不同使用案例元件之使用。此等情境係用作測試以查驗基本使用案例之完整性。

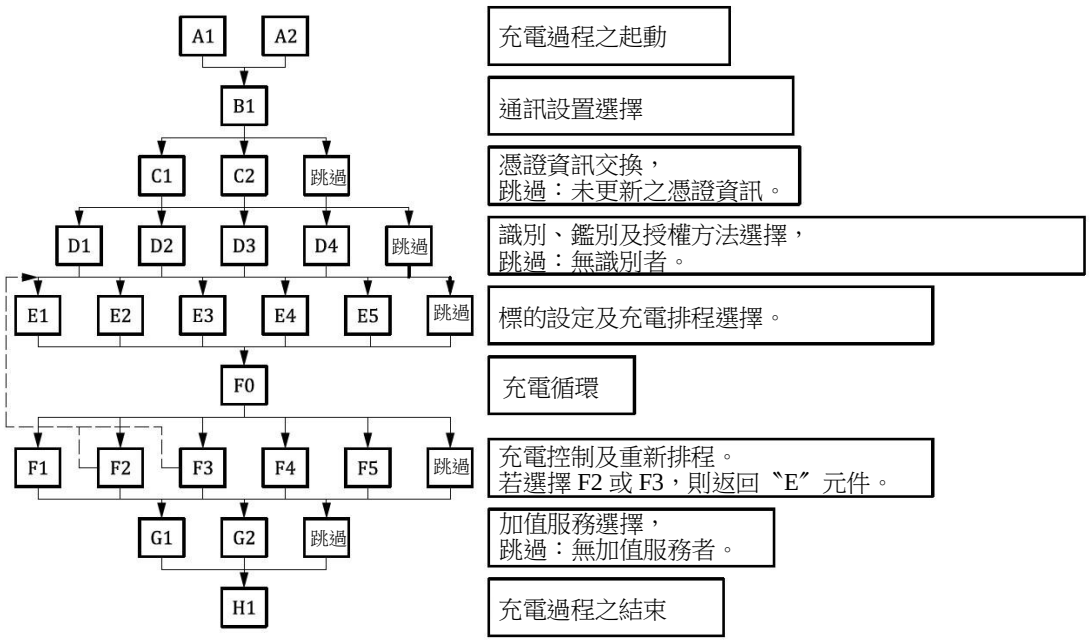
This annex is intended to show the way in which the use case elements defined in Clause 7 can be used to construct specific scenarios. Each of these scenarios offers several ways and each of these is a use case derived from the elements described in Clause 7. The aim is not to include all possible communication use cases in this document. However, this annex presents some typical scenarios that show the use of the different use case elements. The scenarios are used as tests to verify the completeness of the elementary use cases.

下列情境僅適用於充電情況。

The following scenarios present situation for charging only.

## C.2 車隊營運/停車場充電

## C.2 Fleet operation/car park charging




Start of charging process　充電過程之起動。

Communication set-up selection　通訊設置選擇。

Certification info. exchange Skip: No certification info. Update　憑證資訊交換，跳過：未更新之憑證資訊。

Identification, authentication and auyhorisation method selection Skip: No Identification　識別、鑑別及授權方法選擇，跳過：無識別者。

Target setting and charging scheduling selection　標的設定及充電排程選擇。

Charging loop　充電循環

Charging controlling and re-schedulling selection. If F2 or F3 selected, back to “E” elements.　充電控制及重新排程。若選擇 F2 或 F3，則返回〝E〞元件。

Value-added service selection, Skip: No value-added service　加值服務選擇，跳過：無加值服務者。

End of charging process　充電過程之結束。

圖 C.1　車隊營運/停車場充電之圖形概觀

Figure C.1 − Graphical overview of fleet operation/car park charging

車隊運營之使用案例可能為電氣行動機制初始階段的首批使用案例之一。知悉此種情況可能存在高度相異之實作，此使用案例描述充分提供車隊運營的數種可能性。

The use case of fleet operation might be one of the first use cases in the initial phase of electrical mobility. Knowing that there might be highly varied realizations of such, this use case describes several possibilities to supply a fleet operation

sufficiently.

一般而言，車隊運營將涉及許多車輛，車隊管理者知悉其限制。

Generally speaking, fleet operation will involve a number of vehicles with limits known by the fleet manager.

備考 1. 針對停車場情況，適用極相似之情境。因此，下列序列係針對車隊營運者所編寫，但可易於替換為停車場營運者。

NOTE 1 For car park situations, a very similar scenario applies. Therefore, the following sequence is written for a fleet operator but could easily be exchanged to a car park operator.

使用案例元件之序列如下(參照圖 C.1)：

- 以選項所要求之本系列標準(A1)抑或 IEC 61851-1 與本系列標準(A2)並行起動充電過程。

The succession of use case elements is as follows (see Figure C.1):

- Start of the charging process with optional either required ISO 15118 (A1) or concurrent IEC 61851-1 and ISO 15118 (A2).
- (B1)要求關聯並繫結。
- 若憑證係用於鑑別過程(D1、D2)，則亦宜支援憑證元件(C1、C2)以實作平穩運作。
- (B1) association and binding is required.
- If certificates are used for the authentication process (D1, D2) the certificate elements (C1, C2) should be supported as well for smooth operation.
- 宜選定識別、鑑別及授權使用案例元件(D1-D4)之一。若無必要識別，則將跳過此序列。若用戶係就電能使用計費，則除基本充電循環元件(F0)外，亦應支援對應之元件(F1)。
- One of the identification, authentication and authorization use case elements (D1-D4) might be chosen. If no identification is necessary, this sequence will be skipped. If the customer is billed for the usage of the energy, the according element (F1) should be supported in addition to the basic charging loop element (F0).
- 取決於所選定之負載平衡方式(本地設施/遵守電網條件)，適用使用案例元件(E1：本地)或(E2：電網條件)。衍生自此決定，宜整合中斷條件(F2)及(F3)。
- Depending on the chosen way ofload levelling (local installation/respecting grid conditions) use case elements (E1; local) or (E2; grid conditions) apply. Derived from this decision the interrupt conditions (F2) and (F3) should be integrated.
- 若車隊營運者想要計量各車輛之電能耗用，並獲取關於充電的某些額外資訊，則應包括(F1)+(G2)。
- If the fleet operator wants to meter the energy consumption of each car and get some additional information about the charging, they should include (F1)+(G2).

備考 2. 於車隊運營之情況下，加值服務元件(G1)可用以將實際的車輛路線，自車

隊營運者的管理系統直接下載至車輛中。

NOTE 2 In case of fleet operation, the value-added service element (G1) could be used to download actual car routes directly into the vehicle from the management system of the fleet operator.

－ 最後，宜使用(H1)完成充電過程之結束。

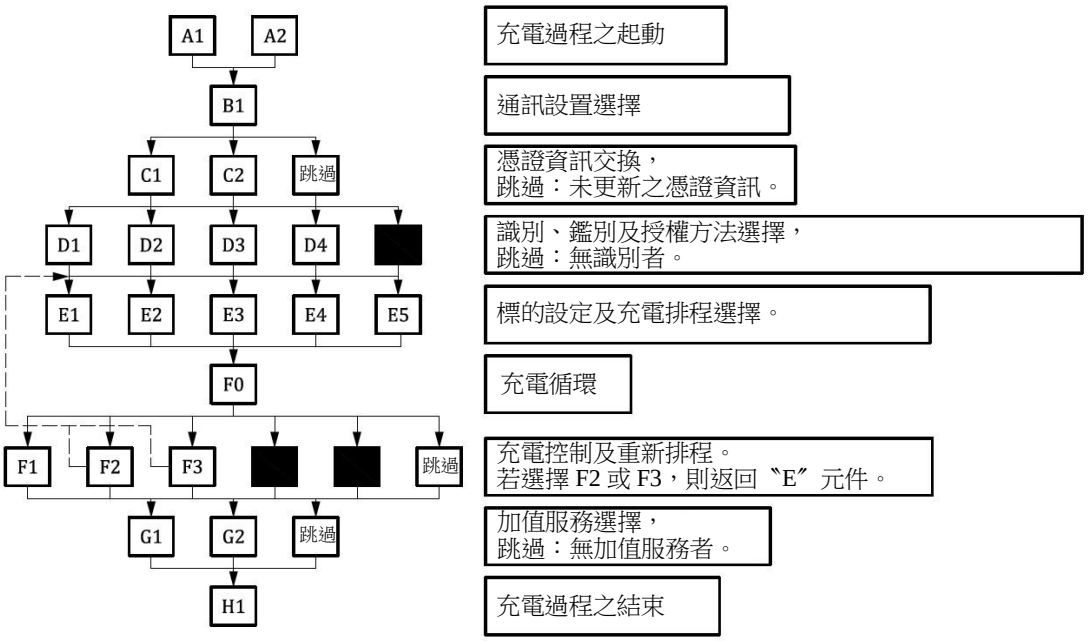
－ Finally, the ending of the charging process should be done by using (H1).

**C.3 路邊公用充電**

**C.3 Public charging at kerb side**

備考：所有塗黑之項目似乎不適用於此種情況中。

NOTE All blacked out items do not seem to be applicable within this scenario.




備考：所有塗黑之項目似乎不適用於此情況。

NOTE All blacked out items do not seem to be applicable within this scenario.

| |
|---|
| Start of charging process　充電過程之起動。 |
| Communication set-up selection　通訊設置選擇。 |
| Certification info. exchange Skip: No certification info. Update　憑證資訊交換，跳過：未更新之憑證資訊。 |
| Identification, authentication and auyhorisation method selection Skip: No Identification　識別、鑑別及授權方法選擇，跳過：無識別者。 |
| Target setting and charging scheduling selection　標的設定及充電排程選擇。 |
| Charging loop　充電循環 |
| Charging controlling and re-schedulling selection. If F2 or F3 selected, back to “E” |

| |
|---|
| elements.　充電控制及重新排程。若選擇 F2 或 F3，則返回〝E〞元件。<br>Value-added service selection, Skip: No value-added service　加值服務選擇，跳過：無加值服務者。<br>End of charging process　充電過程之結束。 |

圖 C.2　路邊公用充電之圖形概觀

Figure C.2 − Graphical overview of public charging at kerb side

場景描述如下(參照圖 C.2)：

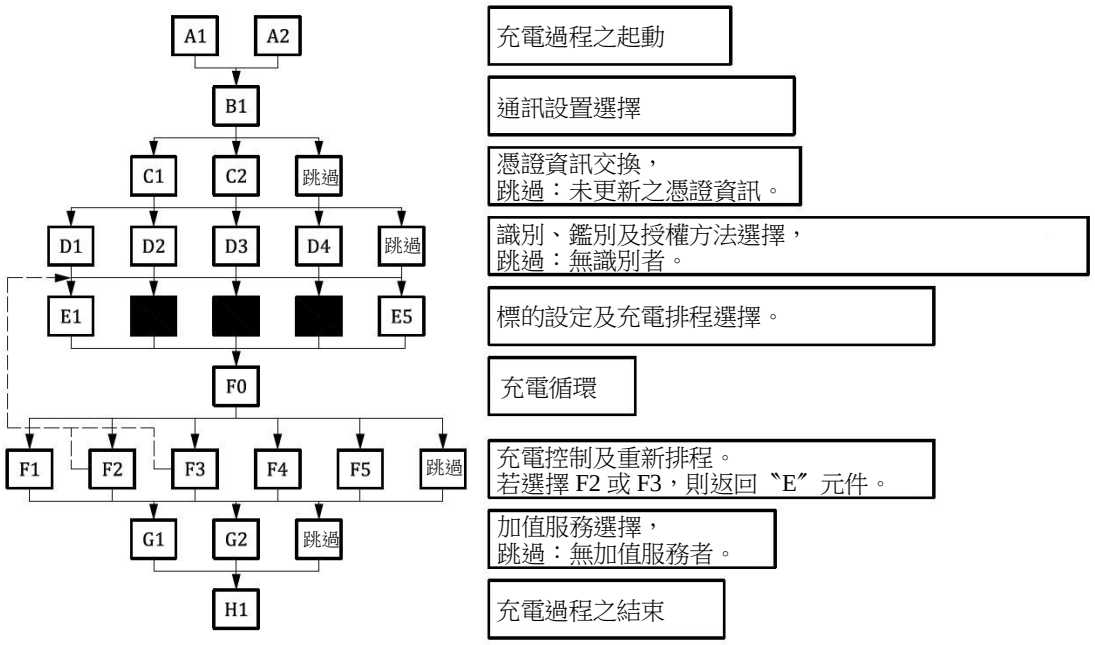
- 以選項所要求之本系列標準(A1)抑或 IEC 61851-1 與本系列標準(A2)並行起動充電過程。

The scenario description is as follows (see Figure C.2):

- Start of the charging process with optional either required ISO 15118 (A1) or concurrent IEC 61851-1 and ISO 15118 (A2).
- (B1)要求關聯並繫結。
- 若憑證係用於鑑別過程(D1、D2)，則亦宜支援憑證元件(C1、C2)以實作平穩運作。
- (B1) association and binding is required.
- If certificates are used for the authentication process (D1, D2) the certificate elements (C1, C2) should be supported as well for smooth operation.
- 宜選定識別、鑑別與授權使用案例元件(D1-D4)之一。若用戶係就電能使用計費，則除基本充電循環元件(F0)外，亦應支援對應之元件(F1)。
- One of the identification, authentication and authorization use case elements (D1-D4) should be chosen. If the customer is billed for the usage of the energy the according element (F1) should be supported in addition to the basic charging loop element (F0).
- 取決於所選定之負載平衡方式(本地設施/遵守電網條件)，適用使用案例元件(E1：本地)或(E2：電網條件)。衍生自此決定，宜整合中斷條件(F2)及(F3)。
- Depending on the chosen way ofload levelling (local installation/respecting grid conditions) use case elements (E1; local) or (E2; grid conditions) apply. Derived from this decision the interrupt conditions (F2) and (F3) should be integrated.
- 若啟用，則可能整合寬帶服務 (G1)。
- 最後，宜使用(H1)完成充電過程之結束。
- If enabled, broadband services (G1) might be integrated.
- Finally, the ending of the charging process should be done by using (H1).

**C.4 私用充電**

**C.4 Private charging**




備考：所有塗黑之項目似乎不適用於此情況。

NOTE All blacked out items do not seem to be applicable within this scenario.

Start of charging process　充電過程之起動。

Communication set-up selection　通訊設置選擇。

Certification info. exchange Skip: No certification info. Update　憑證資訊交換，跳過：未更新之憑證資訊。

Identification, authentication and auyhorisation method selection Skip: No Identification　識別、鑑別及授權方法選擇，跳過：無識別者。

Target setting and charging scheduling selection　標的設定及充電排程選擇。

Charging loop　充電循環

Charging controlling and re-schedulling selection. If F2 or F3 selected, back to “E” elements.　充電控制及重新排程。若選擇 F2 或 F3，則返回〝E〞元件。

Value-added service selection, Skip: No value-added service　加值服務選擇，跳過：無加值服務者。

End of charging process　充電過程之結束。

圖 C.3　私用充電之圖形概觀

Figure C.3 − Graphical overview of private charging

場景描述如下(參照圖 C.3)：

– 以選項所要求之本系列標準(A1)抑或 IEC 61851-1 與本系列標準(A2)並行起動充電過程。

The scenario description is as follows(see Figure C.3):

– Start of the charging process with optional either required ISO 15118 (A1) or concurrent IEC 61851-1 and ISO 15118 (A2).

–(B1)要求關聯並繫結。

– 若憑證係用於鑑別過程(D1、D2),則亦宜支援憑證元件(C1、C2)以實作平穩運作。

– (B1) association and binding is required.

– If certificates are used for the authentication process (D1, D2) the certificate elements (C1, C2) should be supported as well for smooth operation.

– 宜選定識別、鑑別與授權使用案例元件(D1-D4)之一,以防充電站與其他人共享。若無必要識別,則將跳過此序列。若用戶係就電能使用計費,則除基本充電循環元件(F0)外,亦宜支援符合之元件(F1)。

– One of the identification, authentication and authorization use case elements (D1-D4) might be chosen, in case the charging station is shared with others. If no identification is necessary, this sequence should be skipped. If the customer is billed for the usage of the energy, the according element (F1) should be supported in addition to the basic charging loop element (F0).

– (E1)可能選定於 EV 供電設備側以簡單之負載平衡充電,以限定連接成本,或將此種功能增強至使用者的智慧型電網控制器。衍生自此決定,宜整合中斷條件(F2)及(F3)。

– (E1) charging with simple load levelling at the EV supply equipment side may be chosen to limit connectivity costs or such function is enhanced to the user's smart grid controller. Derived from this decision the interrupt conditions (F2) and (F3) should be integrated.

備考: 使用案例元件 E2-E4 並非實作此場景之目標所必要者,然而於某些情況下其可能適用(例:於監管框架中)。

NOTE The use case elements E2-E4 are not needed to fulfil the objective of this scenario, however there might be some cases in which they could apply (e.g. in regulatory framework).

– 若為充電站安裝分離之表計,則要求功能(F1)+(G2)以履行有效計費。於設施中之〝外部〞表計(G2)之情況下,可引入以提高用戶的便利程度。

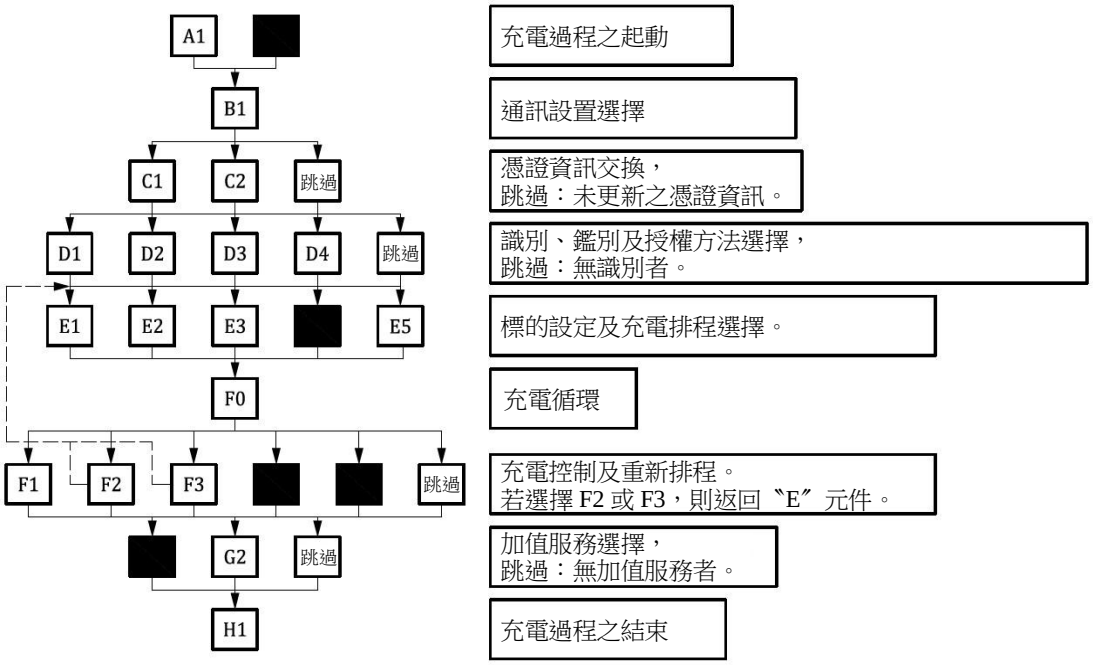
– If a separate meter for the station is installed, the functions (F1)+(G2) are required to perform a valid billing. In the case of an "external" meter in the installation (G2) could be introduced to increase the convenience level of the customer.

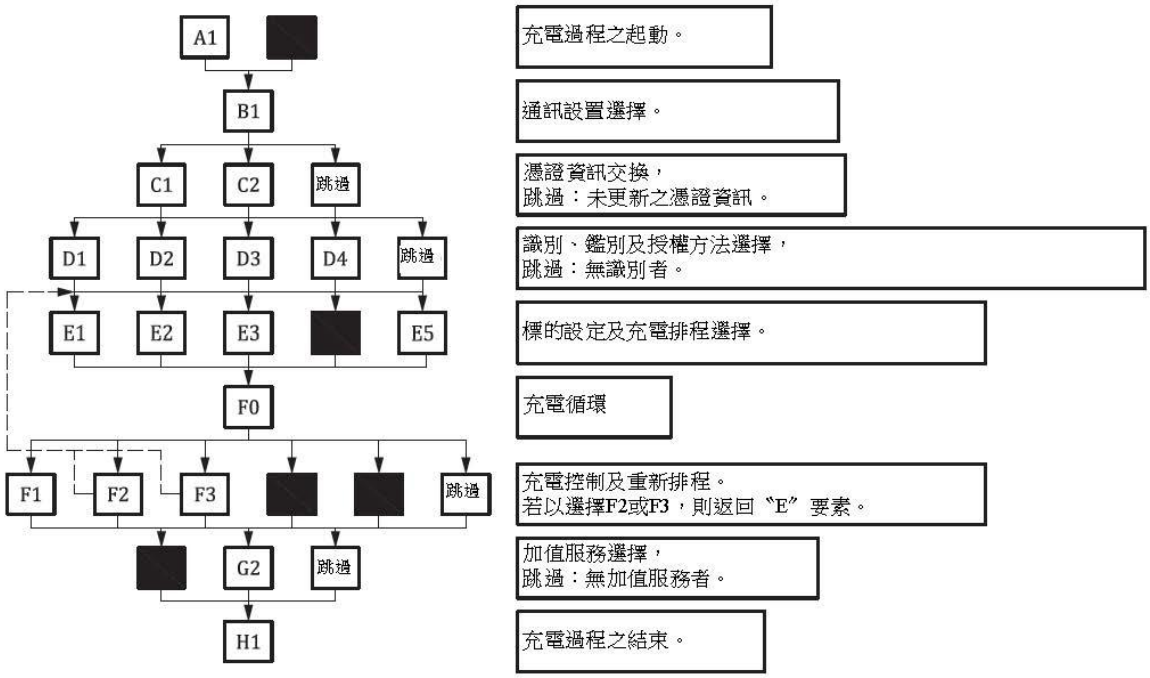
– 動態控制模式(F4)之元件可適用於私用充電場景,具體取決於裝置(及各 V2G 個體)的能力。

- The elements for dynamic control mode (F4) may apply in the private charging scenario, depending on the capabilities of the installation (and each V2G entity).
- 若啟用，則可能整合寬帶服務(G1)。
- 最後，宜使用無需資料終止之(H1)以完成計費過程的結束。
- If enabled, broadband services (G1) might be integrated.
- Finally, the ending of the charging process should be done by using (H1) that does not need data termination.

**C.5 使用特定車隊及於 EV 與 EV 供電設備間傳送資訊之行動機制應用(僅充電)**

**C.5 Mobility application using a specific fleet and information transmitted between the EV and the EV supply equipment (charging only)**






備考：所有塗黑之項目似乎不適用於此情況。

NOTE All blacked out items do not seem to be applicable within this scenario.

Start of charging process　充電過程之起動。

Communication set-up selection　通訊設置選擇。

Certification info. exchange Skip: No certification info. Update　憑證資訊交換，跳過：未更新之憑證資訊。

Identification, authentication and auyhorisation method selection Skip: No Identification　識別、鑑別及授權方法選擇，跳過：無識別者。

Target setting and charging scheduling selection　標的設定及充電排程選擇。

Charging loop　充電循環

Charging controlling and re-schedulling selection. If F2 or F3 selected, back to “E” elements.　充電控制及重新排程。若選擇 F2 或 F3，則返回〝E〞元件。

Value-added service selection, Skip: No value-added service　加值服務選擇，跳過：無加值服務者。

End of charging process　充電過程之結束。

圖 C.4　使用特定車隊之行動性應用的圖形概述及 EV 與 EV 供電設備間所傳輸之資訊

Figure C.4 − Graphical overview of mobility application using a specific fleet and information transmitted between the EV and the EV supply equipment

行動性應用通常可由相對同質之車隊所組成。此例係針對具完整服務之付費的同樣車輛之車隊所建構者。車隊可能有獨立之 GPRS/GPS 資料傳送以與中央管理部

門通訊。客戶端藉由任何契約相關資訊自我識別，例：EMAID、EIM 或類似名稱。行動性應用之邏輯與由車輛擁有者充電相反。於藉由外部方式(例：EIM)進行識別之情況下，EV 使用者將於其上車時自我識別並停止充電。當其歸還車輛時，其將結束其租賃。若用戶需針對公里數或電能付費，或兩者，則由營運者決定。
Mobility applications may generally be composed of a relatively homogeneous fleet of vehicles. This example is constructed for a fleet of identical vehicles with payment of the complete service. Fleets probably have independent GPRS/GPS data transfer to communicate with a central management. The client identifies himself by any contract relevant information, e.g. EMAID, EIM or similar. The logic of mobility applications is the inverse of charging by a vehicle owner. In a case where the identification is done by external means (e.g. EIM) the EV user will identify himself when he takes the vehicle and so stops the charging. He will end his rental when he returns the vehicle. If the customer needs to pay for km or for energy, or both, it is up to the operator.

當車輛歸還時(參照圖 C.4)：

- 以所要求之本系列標準(A1)起動充電過程。

When the vehicle is returned (see Figure C.4):

- Start of the charging process with required ISO 15118 (A1).
- (B1)要求關聯並繫結。
- 若憑證係用於鑑別過程(D1、D2)，則亦宜支援憑證元件(C1、C2)以實作平穩運作。
- (B1) association and binding is required.
- If certificates are used for the authentication process (D1, D2) the certificate elements (C1, C2) should be supported as well for smooth operation.
- 宜選定識別、鑑別與授權使用案例元件(D1-D4)之一。若無必要識別，則將跳過此序列。若用戶係就電能使用計費，則除基本充電循環元件(F0)外，亦應支援對應之元件(F1)。
- One of the identification, authentication and authorization use case elements (D1-D4) might be chosen. If there is no identification necessary, this sequence should be skipped. If the customer is billed for the usage of the energy the according element (F1) should be supported in addition to the basic charging loop element (F0).
- 取決於所選定之負載平衡方式(本地設施/遵守電網條件)，適用使用案例元件(E1：本地)或(E2：電網條件)。衍生自此決定，宜整合中斷條件(F2)及(F3)。
- Depending on the chosen way ofload levelling (local installation/respecting grid conditions) use case elements (E1; local) or (E2; grid conditions) apply. Derived from this decision the interrupt conditions (F2) and (F3) should be integrated.
- 計量各車輛之電能耗用並獲取關於充電的某些額外資訊，要求使用使用案例元件(F1)及(G2)。

- To meter the energy consumption of each car and get some additional information about the charging the use case elements (F1) and (G2) are required.
- 動態控制模式(F4)之元件可能適用。
- 若啟用，則可能整合 VAS (G1)。
- The elements for dynamic control mode (F4) might apply.
- If enabled, VAS (G1) might be integrated.
- 若選定電能式計費，則要求(G2)於所使用之識別方法與耗用間進行對映。若否，則應跳過(G2)。
- (G2) is required to do a mapping between the used identification method and the consumption if an energy-based billing is chosen. If not, (G2) should be skipped.

當車輛出租時(參照圖 C.4)：

- 於收費機處識別客戶端，除使用車輛鑰匙進出車輛之〝正常〞可能性(接著其可能導致充電過程結束)外，藉由 EIM 金鑰開啟以識別客戶端。

When the vehicle is taken out for hire (see Figure C.4):

- Client identification at the payment post, or by EIM key opening beside the “normal” possibility of accessing the car with the ignition key (which then might cause an end of charging process).
- 車輛與充電樁間之資料傳送。若 G1 使用案例元件用於此通訊，則可能有必要依 B1 元件重新建立通訊。
- Data transfer between the vehicle and the charge post. If the G1 use case element is used for this communication it might be necessary to re-establish the communication according to the B1 element.
- 宜使用無需資料終止之(H1)以完成計費過程的結束。
- 拔出插頭釋放車輛以供駕駛。
- Ending of the charging process should be done by using (H1) that does not need data termination.
- Unplugging releases the vehicle for driving.

## C.6 無線通訊序列示例

### C.6.1 一般

## C.6 Wireless communication sequence examples

### C.6.1 General

本系列標準第 8 部中所描述之無線通訊為本系列標準第 3 部中所描述既存 PLC 通訊的替代解決方案。此意指無線通訊宜支援本系列標準第 20 部中所描述之 HLC 訊息，有如其係以 PLC 方式傳送一般。

Wireless communication described in ISO 15118-8 is an alternative solution to the existing PLC communication described in ISO 15118-3. This means that wireless communication should support HLC messages described in ISO 15118-20 as if they were transported with PLC means.

由於無線通訊可用於傳導式電能傳送以及無線電力傳送(WPT)，因此與傳導式通訊之主要區別為，通訊可於傳導式電能傳送的插接事件之前起動。

As wireless communication may be used for conductive energy transfer as well as for wireless power transfer (WPT), the major difference with conductive communication is that communication may start before the plug-in event of conductive energy transfer.

插拔之動作就 WPT 而言並無意義，因此 EV 與 EV 供電設備間實體連接電纜的動作，由 EV 與 SECC 無線介面之關聯所取代。針對通訊， EV 之發現過程於關聯前識別正確的 SECC。

The action of plugging is meaningless for WPT, therefore the action of physically connecting cables for communication between the EV and the EV supply equipment is replaced by the association of the wireless interfaces of the EV and the SECC. Prior to the association, a discovery process of the EV identifies the right SECC for communication.

由於 1 個 SECC 可用於多個 EV 供電設備與 EV 通訊，因此使用配對過程以判定將向 EV 傳送電力之正確 EV 供電設備。

Since one SECC may be used for several EV supply equipment to communicate with the EV, a pairing process is used to determine the correct EV supply equipment which will transfer power to the EV.

藉由於時間上以不同方式安排此等過程，可能出現下列非詳盡之情況列表：

— 駕駛者可決定先停車，然後啟動 HLC 及選項之加值服務。

By arranging these processes differently in time, the following non-exhaustive list of situations may come up:

— driver may decide to park first and then start HLC and optional value-added services;

— 駕駛者可決定於停車前等待 HLC 及 VAS。

— 駕駛者可於充電場所預約停車位。

— driver may decide to wait for HLC and VAS before parking;

— driver may have reserved a parking place in a charging site or not;

— 於傳導性電力傳送之情況下，駕駛者可於插接前請求 VAS。

— 重新啟動處於休眠模式之 EV 無線介面的使用案例。

— in the case of conductive power transfer, the driver may request VAS before plug-in;

— use case for re-activating the wireless interface of an EV that is in sleep mode,

— 於 ACD 之情況下，通過 HLC 控制〝插接〞(建立實體鏈路)及〝拔出〞(解連實體鏈路)動作

— in case of ACD, the "plug-in" (establish physical link) and "plug-out" (disconnect physical link) action is controlled through HLC

### C.6.2 與傳導性電力傳送一起使用之無線通訊

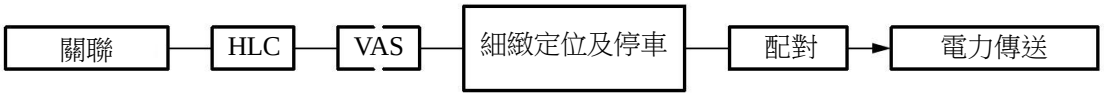
### C.6.2 Wireless communication used with conductive power transfer

於無 PLC 通訊之傳導性電力傳送之情況下，2 個完全不同的序列之例描繪如下：

In case of conductive power transfer without PLC communication, examples of two completely different sequences are illustrated hereafter.

於圖 C.5 之情況下，駕駛者接近充電場所區域。一旦於無線 SECC 之範圍內，發現及無線關聯即就緒。然後能啟動 HLC。使用案例 C 至 E 適用於無線通訊，不宜應變更。然後，若鑑別成功，則可提供選項之需鑑別的加值服務。然後駕駛者停車並插接。成功配對後，能起動電力傳送。

In Figure C.5 situation, the driver approaches the charging site area. Once in range of the wireless SECC, discovery and wireless association take place. Then HLC can start. Use cases C to E are applicable to wireless communication and should not change. Then, if the authentication was successful, optional value-added services needing authentication may be offered. Then the driver parks and plugs-in. After a successful pairing the power transfer can start.




| |
|---|
| Association　關聯 |
| Fine positioning and Parking　精細定位及停車 |
| Pairing　配對 |
| Power Transfer　電力傳送 |

圖 C.5　描繪〝先關聯後停車〞情況之序列

Figure C.5 − Sequence illustrating the situation “associate then park”

於圖 C.6 之情況下，駕駛者接近充電場所區域，決定先停車並插接。然後駕駛者開啟無線介面及發現，無線關聯並起動 HLC。配對可確認駕駛者所選擇地點及 EV 供電設備是否可用於電力傳送。若地點經確認，則使用案例 C 至 E 之序列即就緒。經鑑別後選項之 VAS 可用。然後起動電力傳送。

In the situation of Figure C.6, the driver approaches the charging site area and decides to park and plug first. Then the driver switches on the wireless interface and discovery, wireless association and HLC start. The pairing may confirm or not that the place and EV supply equipment the driver selected are available for power transfer. If the place is confirmed, then sequences of use cases C to E take place. Optional VAS becomes available after authentication. Then power transfer starts.

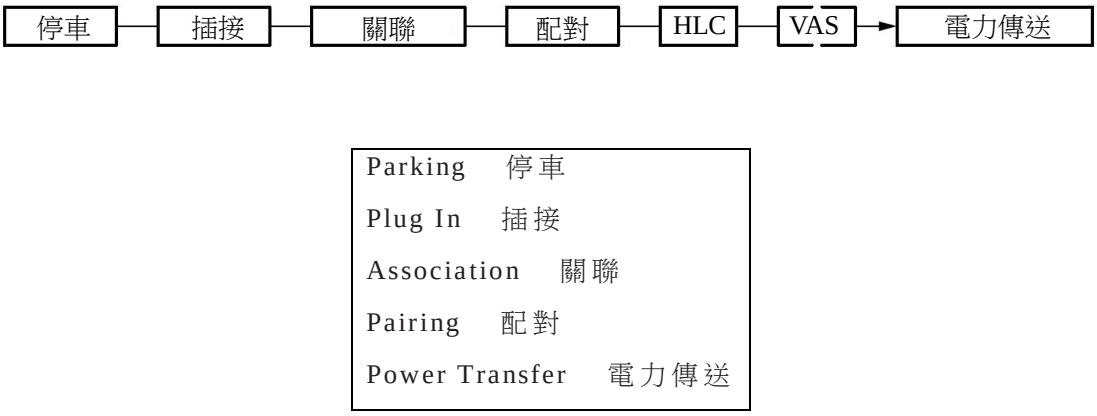



圖 C.6 描繪〝先停車後關聯〞情況之序列

Figure C.6 − Sequence illustrating the situation “park then associate”

### C.6.3 與 WPT 一起使用之無線通訊

### C.6.3 Wireless communication used with WPT

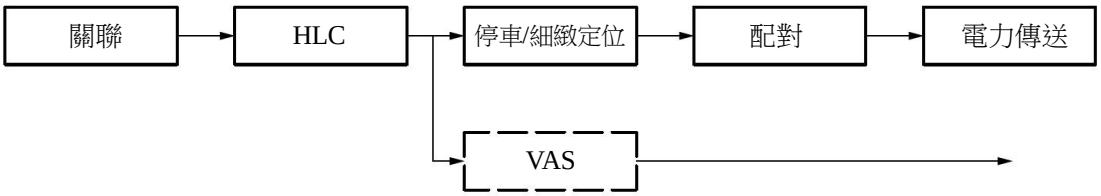
於無線電力傳送之情況下，插接動作不再相關，要求替代機制以確保 EV 停在適當位置以起動電力傳送。於下列圖解中，序列極相似，插接由精細定位序列所取代。

In case of wireless power transfer, the plug-in action is no longer relevant, and an alternative mechanism is required to make sure that the EV is parked at the appropriate place for the beginning of power transfer. In the following illustrations, the sequences are very similar, plug-in being replaced by the fine positioning sequence.

於圖 C.7 中，可獲取類似於圖 C.6 之情況，亦即駕駛者接近充電場所區域，然後 EV 關聯並起動精細定位(不屬本標準範圍內)，然後可起動配對並最終起動電力傳送。

In Figure C.7 we get the situation similar to Figure C.6 where the driver approaches the charging site area, then the EV associates and starts fine

positioning (out of scope of this standard), then pairing and finally power transfer may start.




| |
|---|
| Association　關聯 |
| Parking/Fine positioning　停車/精細定位 |
| Pairing　配對 |
| Power Transfer　電力傳送 |

圖 C.7　描繪 WPT 情況下〝先關聯後停車〞之序列

Figure C.7 − Sequence illustrating the situation “associate then park” in case of WPT

需注意，上述序列係僅於針對 EV 於 EV 供電設備處充電，可能發生的事件序列之例。序列隨 EV 及充電場所之實際實作而有所不同。

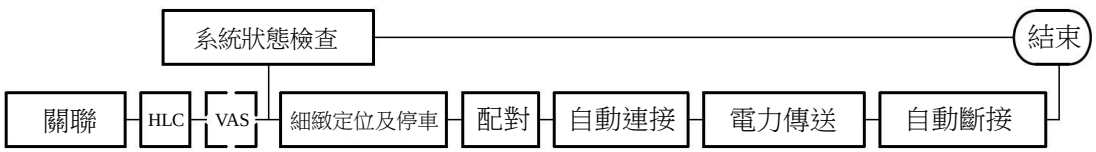
Note that the above sequences are only examples of sequences of events that might happen in order for an EV to be charged at an EV supply equipment. The sequence may vary depending on the actual implementation of the EV and charging site.

**C.6.4 ACD 之情況**

**C.6.4 In case of ACD**

於 ACD 之情況下，〝插接〞及〝拔出〞動作係通過 HLC 所控制。因此，儘管電力傳送方法通常為傳導式，但 ACD 序列極相似 7.2.3 中關於 WPT 案例所描述者。然而，針對 ACD 需額外之使用案例元件。

In case of ACD, the "plug-in" and "plug-out" action is controlled through HLC. Therefore, although the power transfer method is typically conductive, the ACD sequence follows closely to ones described in 7.2.3 on WPT cases. However, additional use case elements are needed for ACD.



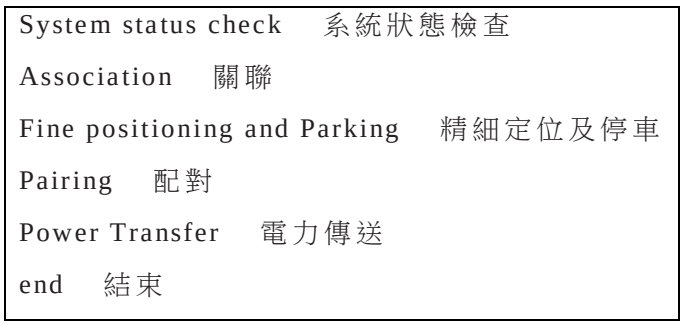



圖 C.8 描繪 ACD 電能傳送過程之序列例

Figure C.8 − Example sequence illustrating ACD energy transfer procedure

如圖 C.8 所示，相較於圖 C.7，新增 3 個元件。HLC 建立後，EV 需通過 EVCC 與 SECC 間之某些訊息互動，檢查 EV 供電設備的目前系統狀態，以確認 EV 供電設備針對駛入已備妥。

As shown in Figure C.8, as compared to Figure C.7, three new elements are added. After establishment of HLC, the EV needs to check the current system status of the EV supply equipment through some message exchanges between the EVCC and SECC to confirm that the EV supply equipment is ready for drive-in.

系統狀態檢查可於整個電能傳送過程中履行，且支援於電能傳送過程中可能發生之所有非可預期情況下對 ACD 的監測。如此一來，於 ACD 處於其原始位置之任何時候，EV 恆有能力離開 EV 供電設備。藉由自動斷接，EV 有能力請求 EV 供電設備解連 ACD 並將其帶回其原位置。

The system status check can be performed throughout the whole energy transfer process and supports the supervision of the ACD in all unexpected situation, which may occur during energy transfer. In that way the EV is always able to leave the EV supply equipment at any time the ACD is in its home position. By the AutoDisConnected the EV is able to request the EV supply equipment to disconnect the ACD and bring it back to its home position.

**C.6.5 無線實作一般使用案例之例**

**C.6.5.1 使用案例之名稱**

**C.6.5 Example of wireless implementation general use case**

**C.6.5.1 Name of the use case**

表 C.1 使用案例之名稱

Table C.1 − Name of the use case

| 使用案例識別<br>Use case identification | |
|---|---|
| 領域/區域 | 使用案例之名稱 |

| Domain(s)/Zone(s) | Name of the use case |
|---|---|
| ISO 15118-1 | General wireless communication interface use case (一般無線通訊介面使用案例) |

### C.6.5.2 使用案例之範圍及目標

### C.6.5.2 Scope and objectives of the use case

表 C.2　使用案例之範圍及目標

Table C.2 − Scope and objectives of the use case

| 使用案例之範圍及目標<br>Scope and objectives of use case | |
|---|---|
| 範圍<br>Scope | EV 接近充電場所並最終與特定之 EV 供電設備配對。<br>An EV approaches a charging site and eventually is paired to a particular EV supply equipment. |
| 目標<br>Objective(s) | 目標為描述 EV-SECC 關聯之場景，接著為 EV 與 EV 供電設備間的配對。該使用案例適用於 EV 及 EV 供電設備同時具無線通訊介面之情況。<br>The objective is to describe a scenario of an EV-SECC association followed by pairing between the EV and the EV supply equipment. The use case applies when both the EV and the EV supply equipment feature wireless communication interfaces. |

### C.6.5.3 使用案例之簡述

### C.6.5.3 Narrative of the use case

表 C.3　使用案例之簡述

Table C.3 − Narrative of the use case

| 使用案例之簡述<br>Narrative of use case |
|---|
| 簡短說明<br>Short description |
| 此使用案例描述使用無線通訊鏈路管理 EV 與 EV 供電設備間之電力傳送過程。其由產生自通訊鏈路之無線本質的層面，延伸本標準之使用案例。該使用案例亦描述對授權管理之支援，例：EV 供電設備預約。<br>This use case describes the managing of the power transfer process between the EV and the EV supply equipment using a wireless communication link. It extends the use cases of ISO 15118-1 by aspects resulting from the wireless nature of the communication link. The use case also describes the support of authorization management e.g. EV supply equipment reservation.<br>考量 3 個基本子使用案例：<br>－　支援傳導性電力傳送。 |

| |
|---|
| － 無線電力傳送。<br>－ 通過 ACD 之電力傳送。<br>Three basic sub use cases are considered:<br>－ support of conductive power transfer,<br>－ wireless power transfer,<br>－ power transfer through ACD.<br>針對傳導性電力傳輸及通過 ACD 之電力傳輸，無線通訊鏈路可與基於 IEC 61851-1 或本系列標準第 20 部的電力傳送控制結合使用。<br>For conductive power transfer and power transfer through ACD, the wireless communication link may be used in combination with power transfer control based on IEC 61851-1 or ISO 15118-20. |
| 完整說明<br>Complete description |
| 使用案例來源：<br>此使用案例將上述場景之一般結構延伸至無線通訊特定的情況。於無線電力傳送之情況下亦表現其他場景。<br>Source of the use case:<br>This use case extends the general structure of scenarios described above with wireless communication specific situations. Additional scenarios are also presented in the case of wireless power transfer.<br>EVCC 與 SECC 間之無線高層通訊介面係用作電力線路介面的替代品，用於本系列標準第 3 部或 WPT HLC 中所述之傳導式通訊。<br>Wireless high-level communication interfaces between the EVCC and the SECC are used as an alternative to the power line interface for conductive communication as described in ISO 15118-3 or for WPT HLC.<br>充電場所架構選項：<br>充電場所可由多個(自 1 起)由唯一 SECC 所控制之 EV 供電設備組成。於相同位置中多個 SECC 之情況下，視為其控制附近地區及 EV 無線介面範圍內的不同充電場所。<br>EV 未適當地停在與 SECC1 相關但與 SECC2 相關聯之位置，宜於配對過程期間導致錯誤。<br>Charging site architecture options:<br>The charging site may consist of a number (starting at 1) of EV supply equipment controlled by a unique SECC. In case of multiple SECCs in the same location it is considered that they control different charging sites in the same vicinity and in range of the EV wireless interface.<br>An EV inappropriately parked at a place related to SECC1 but associated to SECC2 should lead to an error during the pairing process.<br>於此使用案例中未詳述 SECC 與 EV 供電設備之通訊介面(唯一協定尚未標準化，其可使用任何適當的技術)。目前，其係由 CSO 以專用解決方案所組織。<br>SECC 係通過專屬或網際網路連接連接至 CSO 之上游後端設施。<br>SECC communication interfaces with the EV supply equipment are not detailed in this use case (a unique protocol is not standardised yet and it could use any appropriate technology). Presently, they are organised by the CSO with proprietary solutions. |

The SECC is connected to upstream backend facilities of the CSO through dedicated or internet connection.

針對情況描述之完整性，由於某些充電場所可能於相同區域內具不同的電力傳送模式，因此本使用案例亦描述模式 2 之情況。

For the completeness of situation description, as some charging sites may feature different power transfer mode in the same area, this use case describes also mode 2 situations.

初步情況：

EV 正接近充電場所區域。駕駛者可能已預約 EV 供電設備。

Preliminary conditions:

An EV is approaching a charging site area. The driver may have reserved an EV supply equipment.

若 EV 供電設備已預約，則駕駛者可能已收到有效之預約確認：EV 供電設備預約確認(EBC)。此 EBC 可包含預約編號加上 SECC ID 及通行碼，並允許駕駛者於關聯期間參引唯一之預約編號。藉由於 EV 特定應用中處置 EBC，可向駕駛者提供額外之加值服務(不屬本標準範圍內)。

In the case an EV supply equipment has been reserved, the driver may have received a valid reservation confirmation: the EV supply equipment booking confirmation (EBC). This EBC may contain the reservation number plus SECC ID and password and will allow the driver during association to refer to a unique reservation number. Additional value-added services (out of scope) may be provided to the driver by handling the EBC in EV specific applications.

此使用案例描述 3 種情況：

傳導式電力傳送：針對充電過程，EV 插接 EV 供電設備。EV 及 EV 供電設備同時遵循本系列標準第 20 部中所描述之高層通訊過程，以及 IEC 61851-1 中所描述的基本信令。

This use case describes three situations:

a) Conductive power transfer: the EV plugs into the EV supply equipment for the charging process. Both the EV and the EV supply equipment are complying with the communication process described in ISO 15118-20 for high level and IEC 61851-1 for basic signalling.

無線電力傳送：EV 停在主要裝置上。

自動連接裝置：EV 停在 EV 供電設備上，〝插接〞及〝拔出〞自動完成，無需使用者干預。於電能傳送過程中，EV 及 EV 供電設備同時遵循本系列標準第 20 部中所描述之高層通訊協定，以及 IEC 61851-1 中所描述的基本信令通訊協定。

b) Wireless power transfer: the EV is parked over a primary device.

c) Automatic connection device: The EV is parked at the EV supply equipment, and the "plug-in" and "plug-out" is done automatically without user intervention. During energy transfer, both the EV and the EV supply equipment are complying with the communication protocol described in ISO 15118-20 for high level and IEC 61851-1 for basic signalling.

各 SECC 可於必要時通過其無線通訊介面廣播其 ID，傳入之 EV 以啟動關聯。

關聯可能由駕駛者所觸發(例：當 EV 首次起動對 SECC 之通訊時)，或者可能為自動(例：若 SECC 之 ID 及通行碼已於 EVCC 或獨立的車載應用中註冊。

Each SECC may broadcast its ID through its wireless communication interface, when required, for incoming EVs to initiate association.

Association may be triggered by driver, e.g. when an EV starts communication with an SECC for the first time, or may be automatic, e.g. if the SECC's ID and password have already been registered in the EVCC or in an independent in-board application.

若已預約 EV 供電設備，則其他應用亦可使用 EBC 資料將 EV 自動連接至 SECC。

於下文中，指派予〝EVCC〞之角色可由 EVCC 或由獨立的車載應用(例：於智慧型手機或 GPS 介面上)所滿足。

If the EV supply equipment has been reserved, then additional applications may also use EBC data to connect automatically the EV to the SECC.

In the following, the role assigned to "EVCC" may be fulfilled either by the EVCC, or by an independent in-board application, for example on a smartphone or GPS interface.

－ 作法及關聯：

駕駛者正接近充電場所區域。

- Approach and association

The driver is approaching the charging site area.

可發生 2 種情況：

若非：EVCC 及 SECC 同時以遵循本系列標準第 8 部之主動無線介面為特徵。

於範圍內時，適當之顯示器(可能為車載 EV 系統或如智慧型手機的獨立系統)顯示目前廣播其 ID 的所有本地 SECC 之列表。

Two situations may occur:

1. Either: both the EVCC and the SECC feature active wireless interfaces complying with ISO 15118-8.

When in range, the appropriate display (could be an on-board EV system or an independent system like a smartphone) shows the list of all local SECCs currently broadcasting their ID.

預約之情況下

駕駛者依 EBC 中所接收之資訊選擇正確的 SECC 之 ID。(若 SECC 之 ID 已儲存於應用記憶體中，則應用將自動代表駕駛者選擇正確之 SECC 的 ID。)

a. In case of reservation

The driver selects the right SECC’s ID according to the information received in the EBC. (If the SECC’s ID is already stored in the application memory, application automatically selects the right SECC’s ID on behalf of the driver.)

未預約

駕駛者選取與其充電站區域選擇相關之 1 個 SECC ID (若 SECC 的 ID 已儲存於應用記憶體中，應用會自動代表駕駛者選擇正確之 SECC ID)。假設若要求通行碼，則由 CSO 或 EMSP 於本地將其提供予駕駛者。

選擇 ID 後，將起動關聯過程。當 EVCC 與 SECC 間之無線關聯成功完成時，可起動高層通訊服務及下個使用案例步驟。

b. Without reservation

The driver selects one SECC ID in relation with its charging station area choice (if the SECC’s ID is already stored in the application memory, application automatically selects the right SECC’s ID on behalf of the driver). It is assumed that if a password is required, it is given to the driver locally by the CSO or by the EMSP.

Once the ID has been selected, the association process will be started. When the wireless association between the EVCC and the SECC is successfully done, high-level communication services and further use cases steps can start.

即為：EVCC 無線連接係關閉，此階段無關聯。

依循此關聯，CSO 可通知 SECC 充電場所內可用之 EV 供電設備及其所在位置。然後，SECC 可將此通知通知 EVCC。

2. Or: EVCC wireless connectivity is off, there is no association at this stage.

Following this association, the CSO may possibly notify the SECC an available EV supply equipment within the charging station and where it is located. The SECC may then inform the EVCC of this notification.

－ 鑑別及 EV 供電設備配置：

鑑別過程宜依本系列標準第 20 部中之描述進行。

- Authentication and EV supply equipment allocation

The authentication process should be carried out as described in ISO 15118-20.

預約之情況下

假設無線關聯已成功。

CSO 可能要求確認預約有效以持續下個步驟。此階段允許 CSO 驗證與第三方(特別是負責預約之 EMSP)之交易。

1. In case of reservation

We suppose that wireless association has been successful.

The CSO may require a confirmation that the reservation is valid to continue further steps. This phase allows the CSO to validate the transaction with third parties (in particular the EMSP responsible of the reservation).

CSO 後端檢查 EV 或 EV 使用者之預約及相關資料，以及其具涵蓋付款的 EMSP 的服務契約。若無法檢查，則宜於停車並配對後向駕駛者提出其他識別/付款方式(EIM 模式、預付款、信用卡...)。

a. The CSO backend checks the EV or EV user's reservation and related data, and the contract of service with its EMSP covering payment. If checking is not possible, other way of identification/ payment should be proposed to the driver (EIM mode, pre-payment, credit card…) after parking and pairing.

若預約已驗證，則 SECC 可向 EV 指示適當之 EV 供電設備所在的位置。〝適當之 EV 供電設備〞意指於預約過程期間所確認的適應 EV 要求事項的設備。

b. If the reservation is validated, the SECC may indicate to the EV where the appropriate EV supply equipment is located. “Appropriate EV supply equipment” means adapted to the EV requirements as confirmed during the reservation process.

若預約驗證未成功，則 SECC 將其通知予 EVCC，並於可能情況下為其配置 1 個可用之 EV 供電設備，因為未預約。

c. If reservation validation fails, the SECC notifies it to the EVCC and, if possible, assigns it an available EV supply equipment as without reservation.

SECC 上游通訊及 SECC 用於向 EVCC 指示預約之 EV 供電設備所在位置的方式不屬本系列標準範圍內。例：即時地圖、EV 供電設備上之閃光燈、駕駛者於接近 EV 供電設備時簡單可視的唯一編號。

SECC upstream communications and means used by the SECC to indicate to the EVCC where is located the reserved EV supply equipment are out of scope of the ISO 15118 series. For example: real-time maps, flashing light on the EV supply equipment, unique number that can simply be visualized by the driver when approaching the EV supply equipment.

未預約

駕駛者可於無線關聯後停在由 SECC 所指示之位置(參照上文)；或駕駛者可自行選擇可用的停車位。CSO 範圍外之信令系統(例：EV 供電設備上的綠/紅燈或資訊面板)可引導駕駛者自行選擇 EV 供電設備。

於此兩種情況下，駕駛者停車後，配對階段應確認 EV 供電設備的選擇/配置。

2. Without reservation

The driver may park either at the place indicated by the SECC after wireless association (see above); or the driver may select by himself an available place to park. Out of scope signalling system of the CSO (e.g. green/red light on EV supply equipment, or information panel) may guide the driver to select an EV supply equipment by him(her)self.

In both cases, after driver parks, the pairing phase shall confirm the EV supply equipment choice/allocation.

— 系統狀態檢查

於 ACD 之情況下，須使用系統狀態服務以檢查充電系統的狀態，用以進行自動連接。EV 於駛入充電槽前應通過系統狀態檢查檢查 EV 供電設備之狀態，以確保 EV 供電設備可用並針對電能傳送備妥。

- System status check

In case of ACD, the system status service has to be used to check the status of the charging system for automatic connection to be carried out. The EV shall check the status of the EV supply equipment through system status check before driving into the charging slot to ensure that the EV supply equipment is available and ready for energy transfer.

— 精細定位、停車、插拔及配對

精細定位係 IEC 61980-2 中所描述之程序，其中指引車輛，以便主要裝置與次要裝置正確對齊。

- Fine positioning, parking, plugging and pairing

Fine positioning is a procedure described in IEC 61980-2 where the vehicle is guided so the primary and secondary devices are properly aligned.

要求配對以確保 EV 插接或停在正確之 EV 供電設備的線圈上。

於具 PLC 介面之模式 3 的情況下，當駕駛者插入且使用案例元件 A1、A2 及 B 適用至啟動電力傳輸會話時，起動關聯。

Pairing is required to guarantee that the EV is plugged into or parked over the coil of the right EV supply equipment.

In case of mode 3 with PLC interface, association starts when the driver plugs in and use cases elements A1, A2 and B apply to start the power transfer session.

配對機制取決於電力傳送技術：

— 針對傳導式電力傳送，配對可使用既存之 IEC 61851 引導線以調變特定的狀態變異且觸 發配對之起動。

Pairing mechanism depends on the power transfer technology:

— For conductive power transfer the pairing may use the existing IEC 61851 pilot line to modulate specific state variations and to trigger the start of pairing.

— 針對 WPT，EV 觸發配對之起動係屬 IEC 61980 的責任。

— 針對 ACD，EV 一到達停車位置後立即觸發配對。可能通過定向天線對或其他方式達

成　配對。

－ For WPT, the EV triggers the start of the pairing which is under IEC 61980 responsibility.

－ For ACD, EV triggers the start of the pairing as soon as the parking position is reached. The pairing may be achieved through directional antenna pairs or other means.

錯誤位置係定義為：

－　未對應於由 SEC 或停車場管理者所配置之位置,或未對應於入口處交付票證的位置(無論是否預約)。

－　不可用之位置(例：該位置已被預約、目前正維護中或故障…)。

A wrong place is defined as:

－ A place that does not correspond to the place allocated by the SECC or the parking lot manager or the ticket delivered at the entry (with reservation or not).

－ A place that isn't available (e.g. the place has been reserved, is currently in maintenance, or is out of order …).

正確位置對應至：

－　已由 SECC (重新)配置之位置(預約與否)。

－　SECC 未配置但可用於電力傳送之位置。

A correct place corresponds to:

－ The place that has been (re)allocated by SECC (reserved or not).

－ A place that has not been allocated by the SECC but is available for power transfer.

－　配對成功後

一　旦停車位置由 EV 供電設備介面傳送至 SECC，SECC 有兩種選擇：

－　若非 EV 停在錯誤位置：

－　SECC 可能決定告訴駕駛者其係位於錯誤位置，並要求其前往正確位置並起動新配對序　列。

－　若目前之 EV 供電設備適應 EV 充電要求事項,則 SECC 可將 EV 重新配置於目前位置。

-After a successful pairing

Once the parking location is transmitted by the EV supply equipment interface to the SECC, the SECC has two choices:

－ Either the EV is parked at a wrong place:

－ the SECC may decide to tell the driver that he(she) is located at a wrong place and ask him(her) to go to the right place and start a new pairing sequence or

－ the SECC may reallocate the EV to the current place if the current EV supply equipment is adapted to the EV charge requirements.

－　即為 EV 停在正確位置，SECC 通知 EV 供電設備配對成功。

配對完成。

－ Or the EV is parked at the correct place and the SECC informs the EV supply equipment that the pairing is successful.

Pairing completed.

**C.6.5.4 一般備註**

**C.6.5.4 General remark**

配對對避免錯誤停車係屬必要，因無線通訊本身無法確保 EV 正確停放。此使用案例中所提出之配對機制描述於本系列標準第 20 部中。

Pairing is necessary to avoid wrong parking, as wireless communication cannot ensure by itself that EVs are correctly parked. The pairing mechanisms proposed in this use case are described in ISO 15118-20.

**C.6.5.5 觸發事件、先決條件、假設**

**C.6.5.5 Triggering event, preconditions, assumptions**

表 C.4　觸發事件、先決條件、假設

Table C.4 − Triggering event, preconditions, assumptions

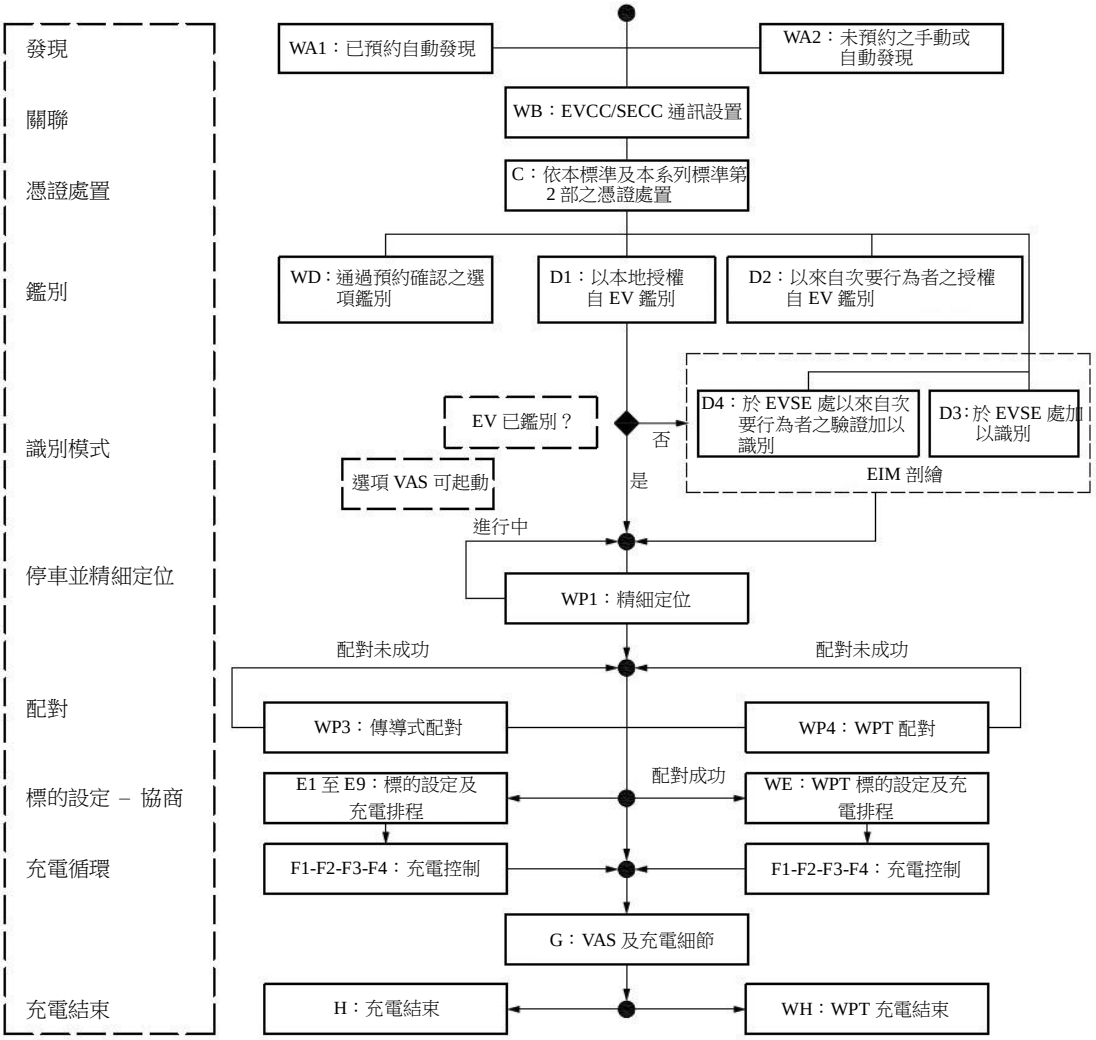
| 使用案例條件<br>Use case conditions | | | |
|---|---|---|---|
| 行為者/系統/資訊/契約<br>Actor/System/ Information/ Contract | 觸發事件<br>Triggering event | 先決條件<br>Pre-conditions | 假設<br>Assumption |
| 配對<br>Pairing | 當使用者插接時用於傳導性電力傳送。<br>針對無線電力傳送，來自 EVCC 之適當訊息可能觸發配對。<br>For conductive power transfer when the user plugs–in.<br>For wireless power transfer appropriate message from the EVCC may trigger pairing. | EV 已停車。<br>The EV is parked. | 應於配對起動前建立無線鏈路。<br>A wireless link shall be established before the pairing starts. |

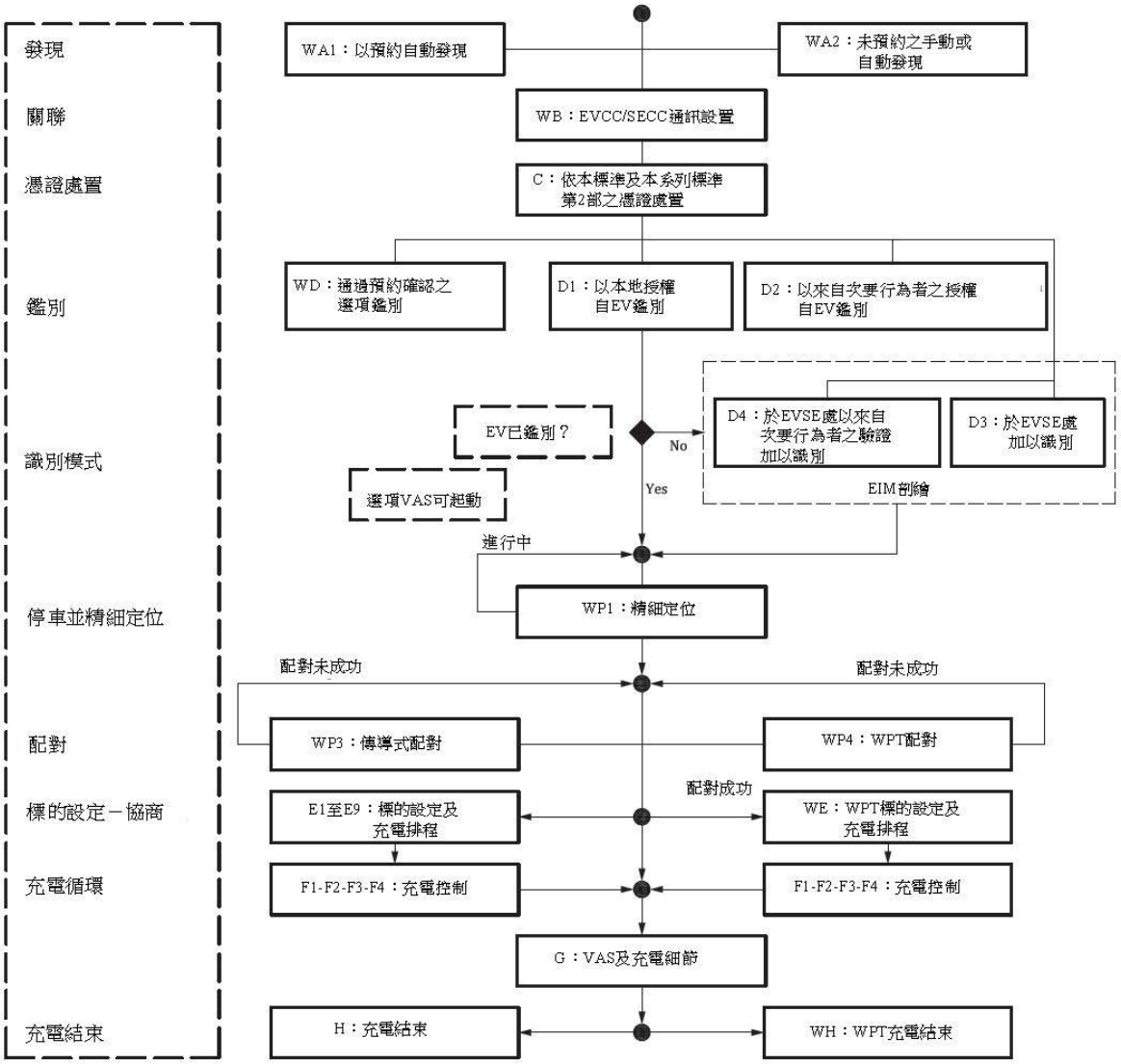
**C.6.5.6 使用無線通訊之流程圖例**

**C.6.5.6 Example of flow chart using wireless communication**

接近充電站 EVCC 及以無線介面為特徵之 SECC 的 EV

EV approaching a charging station EVCC and SECC feature wireless interface


發現
關聯
憑證處置
鑑別
識別模式
停車並精細定位
配對
標的設定 – 協商
充電循環
充電結束
WA1：已預約自動發現
WA2：未預約之手動或自動發現
WB：EVCC/SECC 通訊設置
C：依本標準及本系列標準第 2 部之憑證處置
WD：通過預約確認之選項鑑別
D1：以本地授權自 EV 鑑別
D2：以來自次要行為者之授權自 EV 鑑別
EV 已鑑別？
否
是
D4：於 EVSE 處以來自次要行為者之驗證加以識別
D3：於 EVSE 處加以識別
EIM 剖繪
選項 VAS 可起動
進行中
WP1：精細定位
配對未成功
配對未成功
WP3：傳導式配對
WP4：WPT 配對
配對成功
E1 至 E9：標的設定及充電排程
WE：WPT 標的設定及充電排程
F1-F2-F3-F4：充電控制
F1-F2-F3-F4：充電控制
G：VAS 及充電細節
H：充電結束
WH：WPT 充電結束




Discovery　發現

Association　關聯

Certificate handling　憑證處置

Authentication　鑑別

Identification mode　識別模式

Park and fine positioning　停車並精細定位

Pairing　配對

target setting-negotiation　標的設定－協商

Charging loop　充電循環

End of charge　充電結束

WA1: Automatic discovery with reservation　WA1：以預約自動發現

WA2: manual or automatic discovery without reservation　WA2：未預約之手動或自動發現

WB: EVCC/SECC communication setup　WB：EVCC/SECC 通訊設置

C: Certificate handling as described in 15118-1&2　C：依本標準及本系列標準第 2 部之憑證處置
WD: optional Authentication through reservation confirmation　WD：通過預約確認之選項鑑別
D1: Authentication from EV with local authorization　D1：以本地授權自 EV 鑑別
D2: Authentication from EV with authorization from secondary actor (DCH)　D2：以來自次要行為者之授權自 EV 鑑別
EV authenticated?　EV 已鑑別？
optional VAS may start　選項 VAS 可起動
ongoing　進行中
WP1: fine positioning　WP1：精細定位
D3: Identificaion at EVSE　D3：於 EVSE 處加以識別
D4: Identificaion at the EVSE with validation from secondary actor　D4：於 EVSE 處以來自次要行為者之驗證加以識別
EIM profile　EIM 剖繪
Pairing failed　配對未成功
Pairing successful　配對成功
WP3: Conductive paring　WP3：傳導式配對
E1 to E9: Target setting and charge scheduling　E1 至 E9：標的設定及充電排程
WP4: WPT paring　WP4：WPT 配對
WE: WPT Target setting and charge scheduling　WE：WPT 標的設定及充電排程
F1-F2-F3-F4: Charge control　F1-F2-F3-F4：充電控制
H: End of charge　H：充電結束
G: VAS and Charging details　G：VAS 及充電細節
WH: WPT End of charge　WH：WPT 充電結束

圖 C.9　使用案例應用序列

Figure C.9 − Use case application sequence

## C.7 行動 EV 供電設備使用案例之例

### C.7.1 一般說明

## C.7 Example of mobile EV supply equipment use case

### C.7.1 General description

下例係針對描繪目的所提供。

行動 EV 供電設備係電纜內控制及保護裝置(IC-CPD)，用於電動道路車輛之模式 2 充電，依與 SECC 一起使用之 IEC 62752 中所述。取決於實作，其能包括識別/授權、計費及加值服務等。

The following example is given for illustration purpose.

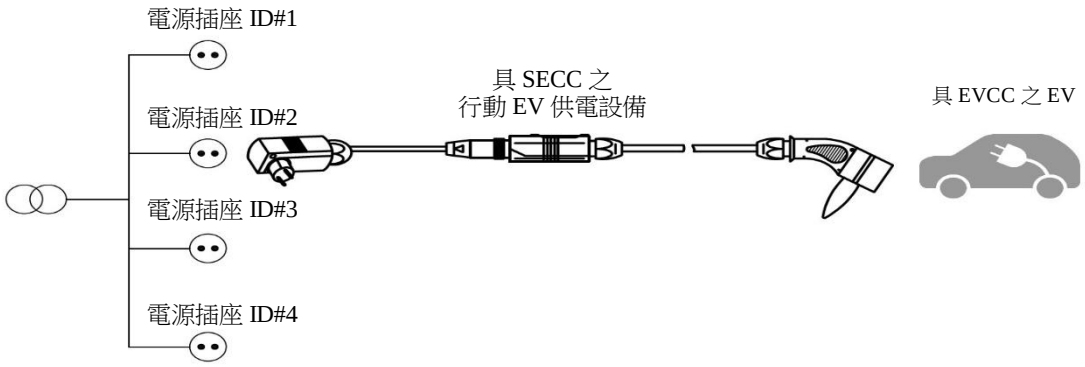
Mobile EV supply equipment is an in-cable control and protection device (IC-CPD) for mode 2 charging of electric road vehicles as described in IEC 62752 used with the SECC. Depending on implementation it can include identification/authorization, billing and VAS, etc.

針對具 SECC 之行動 EV 供電設備，SECC 使用連接的電源插座履行授權，以檢查其可用性。通常，若使用者提供經查驗之電源插座 ID 機制，則 SECC 允許充電。

In case of the mobile EV supply equipment with the SECC, the SECC performs authorization using the connected power outlet to check its availability. Typically, the SECC allows charging if the USER provides a verified power outlet ID mechanism.

圖 C.10 提供行動 EV 供電設備基礎設施之例。SECC 識別電源插座(例：RFID)並將其設定為 EVSEID。儘管本系列標準未規定電源插座識別方法之實作要求事項，但電源插座 ID 結構及 EVSEID 語法的規格描述於本系列標準第 2 部之附錄 H 中。

Figure C.10 gives an example of the mobile EV supply equipment infrastructure. The SECC identifies the power outlet (e.g. RFID) and set it as EVSEID. Although the ISO 15118 series does not specify requirements for the implementation of the power outlet identification methods, but the specifications of power outlet ID structure and EVSEID Syntax are described in ISO 15118-2:2014, Annex H.



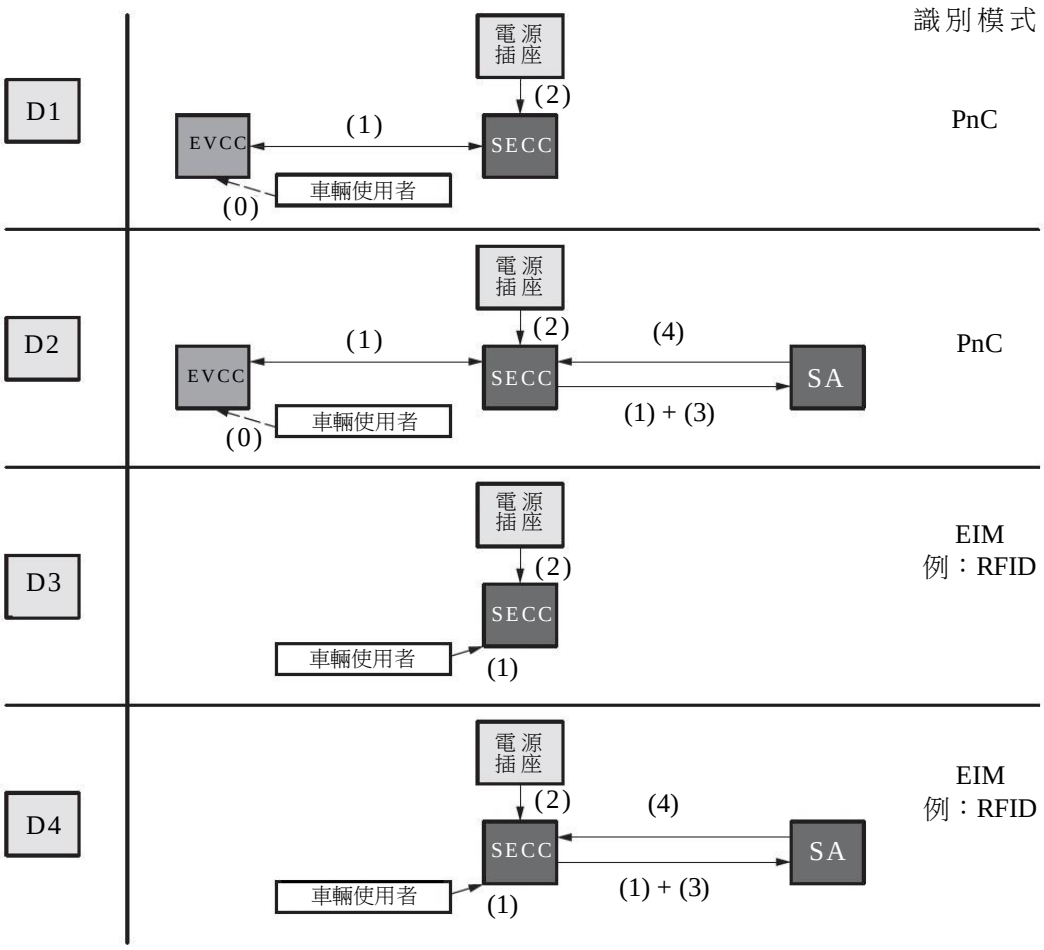

| |
|---|
| Power outlet ID# 1　電源插座 ID# 1 |
| Power outlet ID# 2　電源插座 ID# 2 |
| Power outlet ID# 3　電源插座 ID# 3 |
| Power outlet ID# 4　電源插座 ID# 4 |
| Mobile EV supply equipment with SECC　具 SECC 之行動 EV 供電設備 |
| EV with EVCC　具 EVCC 之 EV |

圖 C.10－－行動 EV 供電設備基礎設施示例

Figure C.10 − Example of mobile EV supply equipment infrastructure

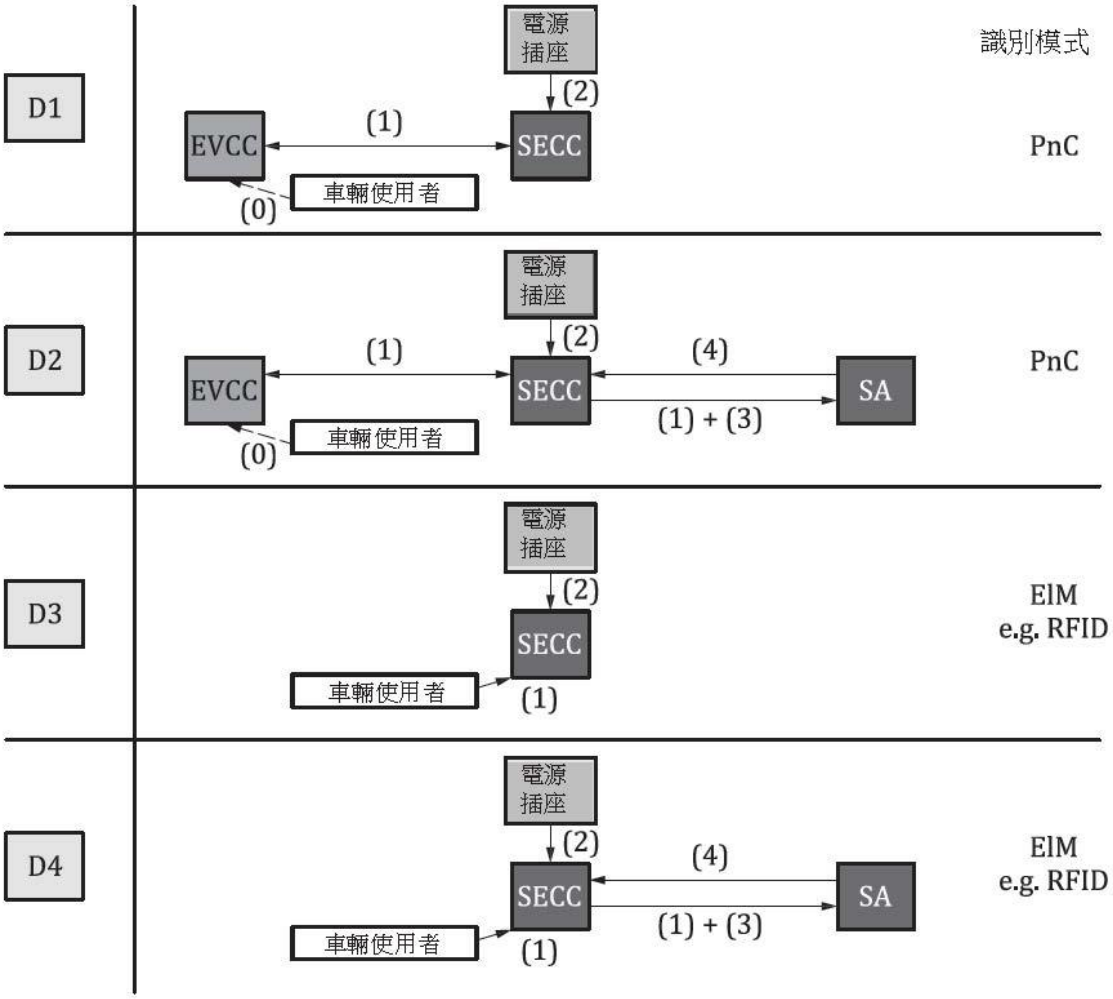
圖 C.11 顯示可能之電源插座識別/授權方式及其位置的圖形概觀。SECC 履行授權以檢查電源插座是否有效。使用者授權之方法隨行動 EV 供電設備基礎設施而有所不同。SECC 可使用具 EVSEID 之自我授權(D1、D3)以識別及授權電源插座，或藉由將 EVSEID 發送至次要行為者使用外部授權(D2、D4)以識別並授權電源插座。

Figure C.11 shows the graphical overview of the possible power outlet identification/authorization means and their location. The SECC performs authorization to check if the power outlet is valid. The method of user authorization varies depending on the mobile EV supply equipment infrastructure. The SECC can identify and authorize the power outlet using Self-Authorization (D1, D3) with the EVSEID, or identify and authorize the power outlet using External-Authorization (D2, D4) by sending the EVSEID to the secondary actors.




圖例：

| | |
|---|---|
| (0) | 啟動 |
| (1) | 信符(例：EMAID) |
| (2) | 例：EVSEID |
| (3) | 例：授權 |
| (4) | 例：授權 |




圖例

啟動

信符(例：RFID)

例：電源插座 ID

例：具電源插座 ID 之 EVSEID

例：授權

| |
|---|
| Power outlet　電源插座 |
| vehicle user　車輛使用者 |
| Identification mode　識別模式 |
| Key　圖例 |
| activation　啟動 |
| credential (e.g., RFID)　信符(例：RFID) |
| e.g., power outlet ID　例：電源插座 ID |
| e.g., EVSEID with power outlet ID　例：具電源插座 ID 之 EVSEID |
| e.g., authorization　例：授權 |

圖 C.11　針對電源插座識別情境之圖形概觀

Figure C.11 − Graphical overview of scenarios for power outlet identification

**C.7.2 使用案例之名稱**

**C.7.2 Name of the use case**

表 C.5　使用案例之名稱

Table C.5 − Name of the use case

| 使用案例之名稱<br>Name of the use case |
| --- |
| Start of the charging process with forced high-level communication at public charging spot using the mobile EV supply equipment (使用行動 EV 供電設備於公共充電場點處具強制高層通訊之充電過程的起動) |

**C.7.3 使用案例之範圍及目標**

**C.7.3 Scope and objectives of the use case**

表 C.6　使用案例之範圍及目標

Table C.6 − Scope and objectives of the use case

| 使用案例之範圍及目標<br><br>Scope and objectives of the use case |
| --- |
| 此使用案例之範圍為使用行動 EV 供電設備於公共充電場所處進行 EV 充電。目標為描述駕駛者強制行動 EV 供電設備之場景。<br><br>This scope of this use case is EV charging at public charging station using the mobile EV supply equipment. The objective is to describe a scenario were the driver forces the mobile EV supply equipment. |

### C.7.4 使用案例之全景

### C.7.4 Context of the use case

表 C.7　使用案例之全景

Table C.7 − Context of the use case

| 使用案例之全景<br><br>Context of the use case |
| --- |
| 開發該使用案例係為顯示於什麼情況下行動 EV 供電設備可於 1 個簡單使用案例中取代固定設備。其源自本標準中之 A1 使用案例。<br><br>The use case is developed to show in what condition a mobile EV supply equipment can replace fixed one in a simple use case. It is derived from A1 use case in this document. |

### C.7.5 使用案例之簡述

### C.7.5 Narrative of the use case

表 C.8　使用案例之簡述

Table C.8 − Narrative of the use case

| 簡短說明(至多 3 行)<br><br>Short description (maximum 3 sentences) |
| --- |
| 使用行動 EV 供電設備於公共充電場點處具強制高層通訊(遵循 IEC 61851-1 之本系列標準)的充電過程之動<br><br>Start of charging process with forced high-level communication (the ISO 15118 series in compliance with IEC 61851-1) at public charging spot using the mobile EV supply equipment. |
| Complete description |
| 駕駛者抵達具行動 EV 供電設備之公共充電點處。駕駛者連接行動 EV 供電設備與電源插座間之電纜。然後其類似於路邊之公共充電，並新增電源插座驗證。<br><br>The driver arrives at a public charging spot with the mobile EV supply equipment. The driver connects the cable between the mobile EV supply equipment and the power outlet. Then it is similar to the public charging at kerb side and adds the power outlet verification. |

情境說明如下：

－ 連接行動 EV 供電設備與電源插座間之電纜。

The scenario description is as follows:

－ Connect the cable between the mobile EV supply equipment and the power outlet.

－ 以選項所要求之本系列標準(A1)抑或 IEC 61851-1 與本系列標準(A2)並行啟動充電過程。

－ (B1) SECC 識別電源插座(例：RFID)並將其設定為 EVSEID。要求關聯並繫結。

－ Start of the charging process with optional either required ISO 15118 (A1) or concurrent IEC 61851-1 and ISO 15118 (A2).

－ (B1) The SECC identifies the power outlet (e.g. RFID) and set it as EVSEID. Association and binding is required.

－ 若憑證係用於鑑別過程(D1、D2)，則亦宜支援憑證元件(C1、C2)以實作平穩運作。

－ 應選定識別、鑑別及授權使用案例元件(D1-D4)之一。

－ If certificates are used for the authentication process (D1, D2) the certificate elements (C1, C2) should be supported as well for smooth operation.

－ One of the identification, authentication and authorization use case elements (D1-D4) shall be chosen.

若用戶需針對電能之使用付費，則除基本的充電循環元件(F0)外，亦需支援對應之元件(F1)。

If the customer is billed for the usage of the energy the according element (F1) needs to be supported in addition to the basic charging loop element (F0).

備考： SECC 履行授權過程(D1-D4)以檢查電源插座是否有效。SECC 可使用具 EVSEID 之自我授權(D1、D3)以識別及授權電源插座，或藉由將 EVSEID 發送至次要行為者使用外部授權(D2、D4)，以識別及授權電源插座。取決於電源插座 ID 型式，SECC 可能無法鑑別 ID，因此可能將無授權服務。

NOTE The SECC performs the authorization process (D1-D4) to check if the power outlet is valid. The SECC can identify and authorize the power outlet using Self-Authorization (D1, D3) with the EVSEID, or identify and authorize the power outlet using External-Authorization (D2, D4) by sending the EVSEID to the secondary actors. Depending on the power outlet ID type, the SECC may not have the possibility to authenticate the IDs and therefore might not authorize the service.

－ 取決於所選定之負載平衡方式(本地設施 1419/遵守電網條件)，使用案例元件(E1：本地)或(E2：電網條件)適用。衍生自此決定，需整合中斷條件(F2)及 (F3)。

－ Depending on the chosen way ofload levelling (local installation 1419/respecting grid conditions) use case elements (E1; local) or (E2; grid conditions) apply. Derived from this decision the interrupt conditions (F2) and (F3) need to be integrated.

－ 若啟用，則可能整合寬帶服務(G1)。

－ 最後，應使用(H1)完成充電過程之結束。

－ If enabled, broadband services (G1) might be integrated.

－ Finally, the ending of the charging process should be done by using (H1).

### C.7.6 行為者：人員、系統、應用、資料庫、電力系統及其他利害相關者－行為者之例

### C.7.6 Actors: people, systems, applications, databases, the power system and other stakeholders − Example of actors

表 C.9　行為者：人員、系統、應用、資料庫、電力系統及其他利害相關者－行為者之例

Table C.9 − Actors: people, systems, applications, databases, the power system and other stakeholders − Example of actors

| 行為者名稱<br>Actor name | 特定於此使用案例之進一步資訊<br>Further information specific to this use case |
|---|---|
| 駕駛者(Driver) | 連接行動 EV 供電設備與電源插座間之電纜。<br>Connect the cable between the mobile EV supply equipment and the power outlet. |
| EV | |
| 行動 EV 供電設備(Mobile EV supply equipment) | 提供電源插座 ID 之識別方法(例：RFID)。<br>Provide identification methods (e.g. RFID) of the power outlet ID. |
| EVCC | |
| SECC | SECC 識別電源插座(例：RFID)並將其設定為 EVSEID。要求關聯並繫結。<br>SECC 履行授權過程(D1-D4)以檢查電源插座是否有效。SECC 可使用具 EVSEID 之自我授權(D1、D3)以識別及授權電源插座，或藉由將 EVSEID 發送至次要行為者使用外部授權(D2、D4)，以識別及授權電源插座。取決於電源插座 ID 型式，SECC 可能無法鑑別 ID，因此可能將無授權服務。<br>The SECC identifies the power outlet (e.g. RFID) and sets it as the EVSEID. Association and binding is required.<br>The SECC performs the authorization process (D1-D4) to check if the power outlet is valid. The SECC can identify and authorize the power outlet using Self-Authorization (D1, D3) with the EVSEID, or identify and authorize the power outlet using External-Authorization (D2, D4) by sending the EVSEID to the secondary actors. Depending on the power outlet ID type, the SECC may not have the possibility to authenticate the IDs and therefore might not authorize the service. |
| SA | 檢查電源插座是否有效。<br>Check if the power outlet is valid. |

### C.7.7 議題：法律契約、法律監理、約束及其他－議題之例

### C.7.7 Issues: legal contracts, legal regulations, constraints and others − Example of issues

表 C.10　議題：法律契約、法律監理、約束及其他－議題之例

Table C.10 − Issues: legal contracts, legal regulations, constraints and others − Example of issues

| 議題－此處特定者<br>Issue - here specific ones | 議題對使用案例之影響<br>Impact of the issue on the use case | 參引－法律、標準、其他<br>Reference – law, standard, others |
|---|---|---|
| 行動 EV 供電設備提供電源插座 ID 之識別方法(例：RFID)。<br>The mobile EV supply equipment provides identification methods (e.g. RFID) of the power outlet ID. | | |

**C.7.8 先決條件、假設、後續條件及事件－條件之例**

**C.7.8 Preconditions, assumptions, post condition and events − Example of conditions**

表 C.11　先決條件、假設、後續條件及事件－條件之例

Table C.11 − Preconditions, assumptions, post condition and events − Example of conditions

| 行為者/系統/資訊/契約<br>Actor/System/Information/ Contract | 先決條件<br>Pre-conditions | 假設<br>Assumption |
|---|---|---|
| EV、行動 EV 供電設備<br>EV, Mobile EV supply equipment | 行動 EV 供電設備應於連接至 EV 之前，實體連接至電源插座。<br>The mobile EV supply equipment shall connect physically to the power outlet before connecting to the EV. | |
| EV、行動 EV 供電設備<br>EV, Mobile EV supply equipment | EV 應實體連接至行動 EV 供電設備。<br>The EV shall be connected physically to the mobile EV supply equipment. | |
| EV、行動 EV 供電設備<br>EV, Mobile EV supply equipment | EV 及行動 EV 供電設備要求依 IEC 61851-1 之引導功能及基本信令。<br>The EV and mobile EV supply equipment require pilot function and basic signalling in accordance with IEC 61851-1. | 初始化過程之時序應依本系列標準第 3 部。<br>Timing for the initialisation process shall be according to ISO 15118-3. |
| EV、行動 EV 供電設備<br>EV, Mobile EV supply equipment | SECC 識別電源插座(例：RFID)並將其設定為 EVSEID。<br>The SECC identifies the power outlet (e.g. RFID) and set it as | SECC 可使用具 EVSEID 之自我鑑別以識別並授權電源插座，或藉由將 EVSEID 發送至次要行為者使用外部件別，以識別並授 |

| | | |
|---|---|---|
| | EVSEID. | 權電源插座。<br>SECC can identify and authorize the power outlet using Self-Authorization with the EVSEID, or identify and authorize the power outlet using External-Authorization by sending the EVSEID to the secondary actors. |
| EV、行動 EV 供電設備<br>EV, Mobile EV supply equipment | EV 及行動 EV 供電設備應具依本系列標準第 2 部、第 3 部、第 8 部及第 20 部之 HLC 裝置。<br>The EV and mobile EV supply equipment shall have a HLC device in accordance with ISO 15118-2, ISO 15118-3 and ISO 15118-8 and ISO 15118-20. | |

**C.7.9 所參引標準及/或標準化委員會(若可用)**

**C.7.9 Referenced standards and/or standardization committees (if available)**

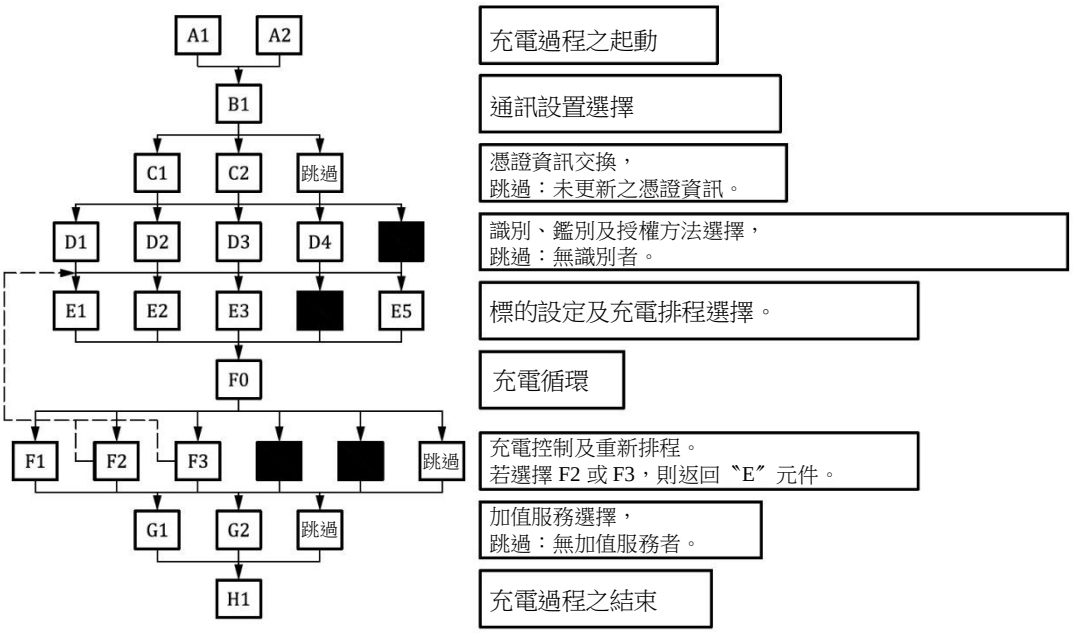
表 C.12　所參引標準及/或標準化委員會(若可用)

Table C.12 − Referenced standards and/or standardization committees (if available)

| 相關標準化委員會<br>Relevant standardization committees | 支援使用案例之標準<br>Standards supporting the use case | 標準狀態<br>Standard status |
|---|---|---|
| IEC 61851-1 | | |

**C.7.10 使用案例之圖表**

**C.7.10 Diagram of the use case**




備考：所有塗黑項目似乎不適用於此情景。

NOTE All blacked out items do not seem to be applicable within this scenario.

Start of charging process　充電過程之起動。

Communication set-up selection　通訊設置選擇。

Certification info. exchange Skip: No certification info. Update　憑證資訊交換，跳過：未更新之憑證資訊。

Identification, authentication and auyhorisation method selection Skip: No Identification　識別、鑑別及授權方法選擇，跳過：無識別者。

Target setting and charging scheduling selection　標的設定及充電排程選擇。

Charging loop　充電循環

Charging controlling and re-schedulling selection. If F2 or F3 selected, back to “E” elements.　充電控制及重新排程。若選擇 F2 或 F3，則返回〝E〞元件。

Value-added service selection, Skip: No value-added service　加值服務選擇，跳過：無加值服務者。

End of charging process　充電過程之結束。

圖 C.12　使用行動 EV 供電設備進行公用充電之圖形概觀

Figure C.12 − Graphical overview of public charging using the mobile EV supply equipment

# 附錄 D
# (參考)
# 典型 RPT 系統

Annex D
(informative)
Typical RPT system

本附錄提供 RPT 系統之某些代表性示例。可實作其他重要變異。

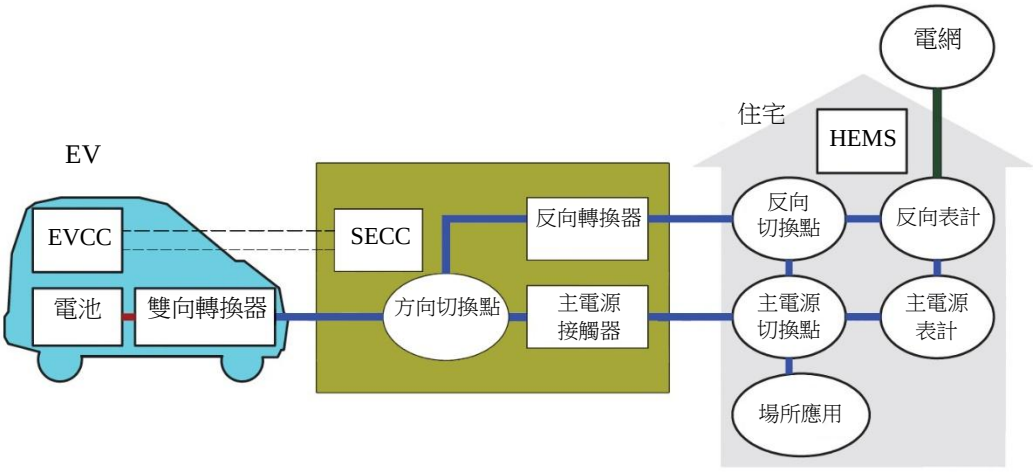
圖 D.1 顯示典型之 AC 正向及反向電力傳送系統。其僅提供功能塊位置，未顯示實作細節。具內部電池作為電力資源之 EV，若其亦具向場所電氣設備或電網輸出電力的功能，則可適用此系統。

This annex provides some representative examples of the RPT system. Other important variations could be possible to be implemented.

Figure D.1 shows a typical AC forward and reverse power transfer system. It gives only functional block location and doesn't show the details of implementation. Electric vehicles that have internal battery for propulsion energy resource, in case it also has the function to output electricity power to premises appliances or the grid, this system could be applied.

右側所示之 EV 連接至 EV 電力系統，顯示為中心正方形。由於此係 AC 充電及放電系統之例，雙向轉換器安裝於 EV 中並控制正向及反向電力傳送。電力傳送通道為 AC 傳導電纜與 EV 電力系統之 AC 內部連接。藉由 3 個開關點適當地切換對電網或場所電氣設備之連接，由 SECC 或 HEMS 所控制。此等開關點及分離之主表計及反向表計功能僅為示例，但其針對量測本地供電網路的反向電力，以及汲取場所電氣設備使用之正向電力係屬必要。此等架構要求不屬本標準範圍內，但訊息應涵蓋此典型示例。

The electric vehicle, shown in the right side, is connected to the electric vehicle power system, shown as centred square. As this is an AC charge and discharge system example, bidirectional converter is installed in the EV and controls forward and reverse power transfer. The power transfer channel is AC conductive cable and AC internal connection of the EV power system. Connection to the grid or premises appliances is switched appropriately by three switch points, controlled by the SECC or HEMS. These switch points and separated main meter and reverse meter functions are only of examples, but they are necessary to measure the amount of reverse electricity power to the local supply network with drawing forward electricity power used by premises appliances. These architecture requirements are out of scope of this document, but messages shall cover this typical example.




圖例

高層通訊

基本信令

DC 導體

AC 導體

低壓供電網路

| |
|---|
| Battery　電池 |
| Bidirectional converter　雙向轉換器 |
| Reverse contactor　反向接觸器 |
| Direction SW point　方向切換點 |
| Main contactor　主電源接觸器 |
| Home　住宅 |
| Grid　電網 |
| Reverse SW point　反向切換點 |
| Main SW point　主電源切換點 |
| Reverse meter　反向表計 |
| Main meter　主電源表計 |
| Premises application　場所應用 |
| high level communication　高層通訊 |
| basic signaling　基本信令 |
| DC conductor　DC 導體 |
| AC conductor　AC 導體 |
| low voltage supply network　低壓供電網路 |

圖 D.1　典型 AC 正向及反向電力傳送系統

Figure D.1 − Typical AC forward and reverse power transfer system

接觸器分別安裝正向及反向電力傳送，並依開關點及雙向轉換器適當工作。

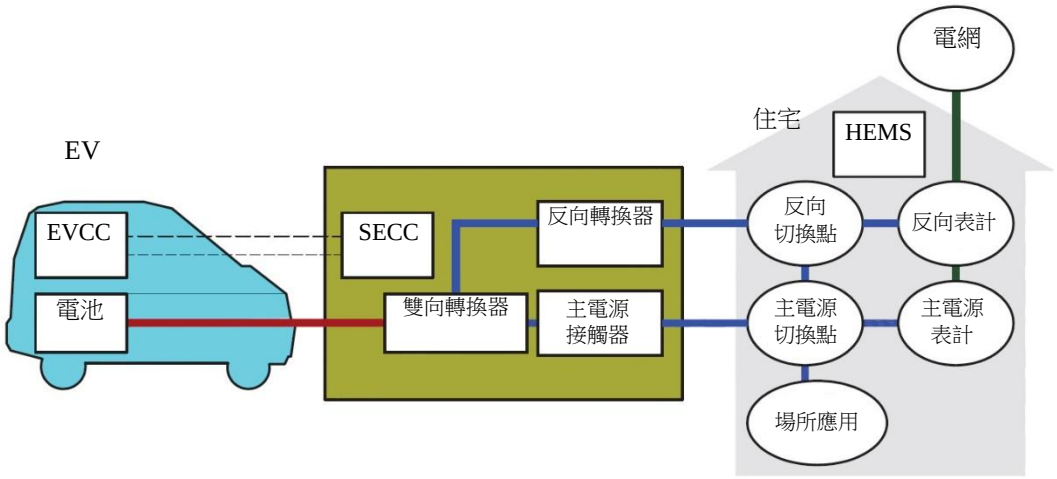
EVCC 及 SECC 安裝於 EV 及 EV 電力系統中，藉由基本信令及 HLC 之 2 個通訊通道連接。

Contactors are installed for forward and reverse power transfer separately and work appropriately according to the switching points and bidirectional converter.

EVCC and SECC are installed in EV and EV power system and connected by two communication channels of basic signalling and HLC.

圖 D.2 顯示典型 DC 正向及反向電力傳送系統。其極相似 AC 系統；不同者為雙向轉換器功能係位於 EV 電力系統中，而 AC 系統則位於 EV 中。依此變更，電力傳送通道變更為 DC 導體電纜組合。EV 電力系統中之方向開關點整合至雙向轉換器功能塊中。

Figure D.2 shows a typical DC forward and reverse power transfer system. It is very similar to the AC system; the difference is that the bidirectional converter function is located in the EV power system, which is in the EV for the AC system. According to this change, the power transfer channel is changed to the DC conductor cable assembly. The directional switch point in the EV power system is integrated into the bidirectional converter function block.




圖例

| | |
|---|---|
| ————————— | 高層通訊 |
| - - - - - - - - - - - - | 基本信令 |
| | DC 導體 |
| | AC 導體 |
| | 低壓供電網路 |

Battery　電池
EV power system　EV 電力系統
Bidirectional converter　雙向轉換器
Reverse contactor　反向接觸器
Direction SW point　方向切換點
Main contactor　主電源接觸器
Home　家庭
Grid　電網
Reverse SW point　反向切換點
Main SW point　主電源切換點
Reverse meter　反向表計
Main meter　主電源表計
Premises application　場所應用
high level communication　高層通訊
basic signaling　基本信令
DC conductor　DC 導體
AC conductor　AC 導體

low voltage supply network　低壓供電網路

圖 D.2　典型 DC 正向及反向電力傳送系統

Figure D.2 − Typical DC forward and reverse power transfer system

此 2 個示例代表電力傳送方向與電網連接之各種組合。其他可能之重要示例定義為此 2 個示例的子集合。

These two examples are representatives of various combinations of directions of power transfer and connections to the grid. Other possible important examples are defined as subsets of these two examples.

# 附錄 E
# (規定)
# 要求事項表列
# Annex E
# (normative)
# Requirement list

表 E.1　要求事項表列

Table E.1 − Requirement table

| ID | 要求說明<br>Requirement description | 對使用案例之鏈結<br>Link to use cases | 型式<br>Type | 參引<br>Reference |
|---|---|---|---|---|
| V2G1-ED2-1 | 於 AC 電能傳送之情況下，位於 EV 中的充電器應履行電能傳送控制。於 DC 電能傳送之情況下，位於 EV 供電設備中的充電器應履行電能傳送控制。<br>In case of AC energy transfer, the charger located in the EV shall perform the energy transfer control. In case of DC energy transfer, the charger located in the EV supply equipment shall perform the energy transfer control. | 所有使用案例<br>All use cases | 電能(Energy) | 5.2 |
| V2G1-ED2-2 | 若 EV 及 EV 供電設備同時配備 HLC 裝置，則應僅發生以 HLC 交換資訊。<br>Information exchange with HLC shall only occur if both the EV and the EV supply equipment are equipped with a HLC device. | 所有使用案例 | 通訊(Communication) | 5.2 |
| V2G1-ED2-3 | 本系列標準第 3 部或第 8 部中所定義之機制，應用以建立 EVCC 與 SECC 間的通訊。<br>The mechanisms defined in ISO 15118-3 or ISO 15118-8 shall be used to establish the communication between the EVCC and the SECC. | 所有使用案例 | 一般(General) | 5.2 |
| V2G1-ED2-4 | 任何使用者視為機密之資料，應使用適當的加密方法加以保護。<br>Any data considered as confidential by the user shall be protected with the appropriate cryptography methods. | 所有使用案例 | Cybersecurity (網路安全) | 5.3.2 |
| V2G1-ED2-5 | 應保護通訊資料免遭修改或模仿(駭客攻擊)。<br>Communication data shall be protected | 所有使用案例 | 網路安全(Cybersecurity) | 5.3.2 |

| | | | | |
|---|---|---|---|---|
| | against modification or imitation (hacking). | | | |
| V2G1-ED2-6 | 若要求分離計費，則應於 EV 供電設備中量測所傳送之電能。<br>If separate billing is required electric energy transferred shall be measured in the EV supply equipment. | F、H | 電能(Energy) | 5.2 |
| V2G1-ED2-7 | 電能傳送應於預定時間點完成。<br>The energy transfer shall be completed by a predetermined point in time. | E、F、H | 電能(Energy) | 5.3.1 |
| V2G1-ED2-8 | 於任何特殊情況下，亦即若電能傳送排程無法滿足，且若於所宣布的時間點之前無法傳送總電能，則宜盡快觸發所規定的錯誤報告程序通知使用者。<br>In the case of any exceptional circumstances, i.e. if the energy transfer schedule cannot be met and if the total energy amount can't be transferred by the announced point in time, a specified error reporting procedure to inform the user should be triggered as soon as possible. | F、H | 電能(Energy)<br>錯誤處置(Error handling) | 5.3.1 |
| V2G1-ED2-9 | 若有電能傳送排程之協商過程，例：由於電網的負載平衡所需，協定應實作方法以指示是否可滿足標的設定值。<br>If there is a negotiation process for the energy transfer schedule e.g. because of the load levelling needs of the electrical grid, the protocol shall implement methods to indicate whether the target setting values could be fulfilled or not. | E | 電能(Energy) | 5.3.1 |
| V2G1-ED2-10 | 若所請求之電能傳送排程無法滿足，則應針對替代方案啟動電能傳送排程的重新協商。<br>In the event that the requested energy transfer schedule can't be fulfilled, a re-negotiation of the energy transfer schedule shall be initiated for alternatives. | E | 電能(Energy) | 5.3.1 |
| V2G1-ED2-11 | EV 製造者或 EMSP 能選擇合適之方法，以告知其用戶與所協商的電能傳送排程之非可預期差異。<br>EV manufacturers or EMSPs can choose suitable methods to inform their customers about unexpected differences from the negotiated energy | F、H | 電能(Energy)<br>錯誤處置(Error Handling) | 5.3.1 |

| | | | | |
|---|---|---|---|---|
| | transfer schedule. | | | |
| V2G1-ED2-12 | 任何通訊錯誤應由 EV 供電設備或 EV 檢測及控制。<br>Any communication error shall be detected and controlled either by the EV supply equipment or the EV. | 所有使用案例 | 錯誤處置 (Error Handling) | 5.3.1 |
| V2G1-ED2-13 | 私人資訊及使用者資料僅能由所預期之接收者讀取。<br>Private information and user data shall only be readable by the intended addressees. | 所有使用案例 | 網路安全 (Cybersecurity)<br>隱私(Privacy) | 5.3.2 |
| V2G1-ED2-14 | 私人資訊僅於必要時傳送予第三方。<br>Private information shall be transferred to third parties only when necessary. | 所有使用案例 | 網路安全 (Cybersecurity)<br>隱私(Privacy) | 5.3.2 |
| V2G1-ED2-15 | 應告知使用者誰有權存取其私人資料。<br>Users shall be informed about who has access to their private data. | 所有使用案例 | 網路安全 (Cybersecurity)<br>隱私(Privacy) | 5.3.2 |
| V2G1-ED2-16 | 使用者應有能力將儲存於其 EV 中之個人資料，傳送予另一 EV，而不被其 EV 所阻止。<br>User shall be able to transfer his personal data stored from his EV to another EV without being prevented from doing so by his EV. | 所有使用案例 | 隱私(Privacy) | 5.3.2 |
| V2G1-ED2-17 | 針對歐盟流通之 EV，應考量通用資料保護機制 (General Data Protection Regulation, GDPR) (Regulation (EU) 2016/679)。其他大陸及國家亦應考量類似約束。<br>For EV circulating in European Union, the General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) shall be taken into account. Similar restrictions shall be taken into account in other continent and country. | 所有使用案例 | 隱私(Privacy) | 5.3.2 |
| V2G1-ED2-18 | 為確保其參與，解決方案應以清晰簡單之方式表現予使用者。<br>In order to ensure their involvement, solutions shall be presented in a clear and simple manner to the users. | 所有使用案例 | 一般 (General) | 5.3.3 |
| V2G1-ED2-19 | HMI 應盡可能易於使用。然而，此易用性不應妨礙使用者於 V2G 會談之前、期間或之後，存取與其電氣行動機制需要相關的資訊，如標的及目前 SOC、電能傳送目前狀態及效率。 | 所有使用案例 | 一般 (General) | 5.3.3 |

| | | | | |
|---|---|---|---|---|
| | HMI shall be as easy to use as possible. However, this ease of use shall not prevent the user to access before, during or after the V2G session, to information related to his e-mobility needs like target and current SOC, energy transfer current state and efficiency. | | | |
| V2G1-ED2-20 | 使用者應有權存取儲存於 EV 中之所有私人資訊，而無需第三方干預。<br>The user shall have access to all private information stored in the EV without third parties' intervention. | 所有使用案例 | 隱私(Privacy) | 5.3.2<br>5.3.3 |
| V2G1-ED2-21 | 使用者應有能力於無第三方干預之情況下，移除儲存於 EV 中之所有私人資訊。<br>The user shall be able to remove all private information stored in the EV without third parties' intervention. | 所有使用案例 | 隱私(Privacy) | 5.3.2<br>5.3.3 |
| V2G1-ED2-22 | 由次要行為者、EV 供電設備或 EV 依使用者、充電場所及電能電網行為者之資訊所計算的電能傳送排程，應傳回電網行為者，以允許對其他 EV 進行規劃。<br>The energy transfer schedule, calculated either by a secondary actor, the EV supply equipment or the EV, based on information from the user, charging site and energy grid actors, shall be transferred back to the grid actors to allow the planning of other EVs. | E2、E5、E8、E9 | 電能(Energy) | 5.4 |
| V2G1-ED2-23 | 若要求，EVCC 及 SECC 應提供自任一方調適電能傳送排程之的可能性。<br>The EVCC and the SECC shall provide the possibility to adapt the energy transfer schedule from either side if required. | E2、E5、E8、E9 | 電能(Energy) | 5.4 |
| V2G1-ED2-24 | 於下列情況下，於 EV 之整個生命期內變更用戶特定資訊係屬可能：<br>－ 於 EV 生產中。<br>－ 於 EV 分別交付予用戶時起動使用 EV。<br>－ 當用戶變更電能契約時。<br>It shall be possible over the lifetime of the EV to change customer-specific information under the following circumstances: | C | OEM 特定(OEM specific) | 5.4 |

| | | | | |
|---|---|---|---|---|
| | − at EV production;<br>− at EV delivery to customer resp. start of EV usage;<br>− when energy contract is changed by the customer;<br>− 憑證逾期時。<br>− 若 EVCC 或儲存使用者/用戶特定 資料之組件將於維修廠更換。<br>− 當車輛報廢時。<br>− 當車輛遭竊時。<br>− when certificate expires;<br>− if the EVCC or the component which stores the user-/customer-specific data will be replaced in a workshop;<br>− when vehicle is discarded;<br>− when vehicle is stolen. | | | |
| V2G1-ED2-25 | 任何型式之用戶相關資料，應適用下列要求事項及過程邊界條件：<br>− 用於 EV 特定資料或憑證之控制單 元的儲存及處置能力有限。<br>− 由於 EV 之生產可能於交付予用戶 前數個月發生，因此不應於生產時寫入未來用戶或契約特定的資料。<br>Any type of customer-related data shall apply the following requirements and process boundary conditions:<br>− Limited storage and processing capacity available at a control unit for EV-specific data or certificates.<br>− Since the production of the EV may happen months before delivery to a customer, no data specific to the future customer nor contract shall be written at production time.<br>− OEM 供應憑證可於生產時安裝。<br>− OEM 供應憑證可能於 EV 生命期內變更，例：使用更長金鑰或由新 OEM 根憑證籤署。<br>− The OEM provisioning certificate may be installed at production time.<br>− The OEM provisioning certificate | C | OEM 特定 (OEM specific) | 5.4 |

| | | | | |
|---|---|---|---|---|
| | may be changed during EV life time, e.g. with longer key or signed by a new OEM root certificate.<br>備考： 於 EV 中為多個 OEM 供應憑證及多個 EMAID 憑證提供安全資料儲存可能有所幫助。<br>— 儲存於 EV 中之用戶相關資料可能 使用 20 年以上。<br>— 應可於獨立維修廠維護 EV。<br>NOTE It could be helpful to offer secure data storage in the EV for more than one OEM provisioning certificate and several EMAID certificates.<br>— Customer-related data stored in EVs may be used for more than 20 years.<br>— Maintenance of an EV at independent workshops should be possible. | | | |
| V2G1-ED2-26 | 由電能 SA 通知電能約束之 EV 供電設備，應準備並向 EVCC 傳達建立標的設定所必要的元件。<br>The EV supply equipment, being informed of the energy constraints by the energy SA, shall prepare and communicate to the EVCC the elements necessary to establish the target setting. | F | 電能(Energy) | 5.5.1 |
| V2G1-ED2-27 | 標的設定應取決於所選擇的控制模式。<br>Target setting shall depend on the control mode selected. | F | 電能(Energy) | 5.5.1 |
| V2G1-ED2-28 | SECC 應通知 EVCC 最大可用功率位準，以最佳化本地電網電能使用。<br>The SECC shall inform the EVCC of the maximum available power level to optimize local grid energy usage. | E2、E5、E8、E9 | 電能(Energy) | 5.5.1 |
| V2G1-ED2-29 | 於電能傳送期間之任何時間，EVCC 或 SECC 可能觸發控制模式或功率排程的變更。<br>Anytime during the energy transfer, the EVCC or the SECC may trigger a change of control mode or of the power schedule. | F | 電能(Energy) | 5.5.1 |
| V2G1-ED2-30 | EV 對本系列標準之支援，不應妨礙於充電場所未支援 HLC 之情況下使用基本信令。 | E | 通訊(Communication) | 5.5.1 |

| | | | | |
|---|---|---|---|---|
| | The support of the ISO 15118 series by EVs shall not prevent the usage of basic signalling in case the charging site does not support HLC. | | | |
| V2G1-ED2-31 | 於EV供電設備與EV之間流通之最大標稱電流，不應超過供電額定裝置的額定值及所附接電纜組合之額定值。<br>The maximum nominal current circulating between the EV supply equipment and EV shall not exceed the ratings of the supply rating installation and the ratings of the attached cable assembly. | F | 電能(Energy)<br>設備人身安全(Safety) | 5.5.2 |
| V2G1-ED2-32 | 電纜任何導線間之最大標稱電壓，不應超過電纜組合的額定值。<br>The maximum nominal voltage between any wire of the cable shall not exceed the rating of the cable assembly. | F | 電能(Energy)<br>設備人身安全(Safety) | 5.5.2 |
| V2G1-ED2-33 | SECC 應向 EVCC 指示能於 EV 與 EV 供電設備間流通的最大標稱電流。電流指示應對應於不使本地裝置過載之情況下可流通的電流。<br>The SECC shall indicate to the EVCC the maximum nominal current that can circulate between the EV and the EV supply equipment. The current indication shall correspond to the current that can circulate without overloading the local installation. | E | 電能(Energy)<br>設備人身安全(Safety) | 5.5.2 |
| V2G1-ED2-34 | SECC 應向 EVCC 指示電纜組合之額定電壓。<br>The SECC shall indicate to the EVCC the voltage rating of the cable assembly | E | 電能(Energy)<br>設備人身安全(Safety) | 5.5.2 |
| V2G1-ED2-35 | 若於電能傳送過程中電流或電壓超過EV供電設備或EV所指示之限制，則EV供電設備或EV可使用本系列標準第2部或第20部的預先定義例行工作中斷電能傳送過程，於緊急情況下，則為基本信令例行工作。<br>If the current or the voltage exceed the limits indicated by the EV supply equipment or the EV during the energy transfer process, the EV supply equipment or the EV may interrupt the energy transfer process using predefined routines of ISO 15118-2 or ISO 15118-20 and, in case of an emergency, basic signalling routines. | F | 電能(Energy)<br>設備人身安全(Safety)<br>錯誤處置(Error Handling) | 5.5.2 |
| V2G1-ED2-36 | 於使用 EMAID 授權之情況下，協定 | D | 通訊 | 5.5.3 |

| | | | | |
|---|---|---|---|---|
| | 應允許 EVCC 與 SECC 間交換與契約相關的資訊。<br><br>In case of authorization using EMAID, the protocol shall allow the exchange of contract-relevant information between the EVCC and the SECC. | | (Communication) | |
| V2G1-ED2-37 | 契約相關資訊之驗證，應藉由車輛、EV 供電設備與(若要求)使用者間接受或不接受指示而達成。應以防止濫用之方式對其管理。<br><br>The validation of the contract-relevant information shall be achieved by an indication of acceptance or non-acceptance between the vehicle, the EV supply equipment and, if needed, the user. It shall be managed in a way that misuses are prevented. | D | 通訊(Communication) | 5.5.3 |
| V2G1-ED2-38 | 僅當經驗證之 SA 或使用者要求時，EV 供電設備方允許自 EV 傳送電能。<br><br>The EV supply equipment shall allow energy transfer from the EV only if mandated by a validated SA or by the user. | D、F | 電能(Energy) | 5.5.4 |
| V2G1-ED2-39 | 於允許自 EV 傳送電能之前，EV 供電設備應檢查強制電能傳送之 SA 的有效性。<br><br>Before allowing energy transfer from the EV, the EV supply equipment shall check the validity of the SA mandating the energy transfer. | D | 電能(Energy) | 5.5.4 |
| V2G1-ED2-40 | 於 EIM 識別模式之情況下，SA 有效性檢查程序應藉由使用者接受或不接受來自 EV 之電能傳送的明確指示而達成。應以防止誤用之方式管理該指示。<br><br>In case of EIM identification mode the SA validity checking procedure shall be achieved by an explicit indication of acceptance or non-acceptance by the user of the energy transfer from the EV. This indication shall be managed in a way that misuses are prevented. | D | 通訊(Communication) | 5.5.4 |
| V2G1-ED2-41 | 於使用 EMAID 授權之情況下，協定應允許 SECC 與 SA 之間交換契約相關資訊，以強制自 EV 傳送電能。<br><br>In case of authorization using EMAID, the protocol shall allow the exchange of contract-relevant information between the SECC and the SA mandating the energy transfer from the | D | 通訊(Communication) | 5.5.4 |

| | | | | |
|---|---|---|---|---|
| | EV. | | | |
| V2G1-ED2-42 | 於使用 EMAID 授權之情況下，應藉由檢查 SA 憑證的有效性，以驗證 SA 強制自 EV 傳送電能。<br>In case of authorization using EMAID, the validation of the SA mandating energy transfer from the EV shall be achieved by checking the validity of the SA certificate. | D | 通訊 (Communication) | 5.5.4 |
| V2G1-ED2-43 | 於使用 EMAID 授權之情況下，若 EV 供電設備無法檢查 SA 憑證的有效性，則不允許自 EV 傳送電能。<br>In case of authorization using EMAID, and if the EV supply equipment is not able to check the SA certificate validity then energy transfer from EV shall not be allowed. | D | 通訊 (Communication) | 5.5.4 |
| V2G1-ED2-44 | 經驗證之 SA 之識別應於 SDR 中指示。<br>Identification of validated SA shall be indicated in the SDR. | H | 通訊 (Communication) | 5.5.4 |
| V2G1-ED2-45 | 為允許藉由新增組件以升級既存充電場所(EV 供電設備)，HLC 系統之定義應使既存基礎設施升級遵循本系列標準成為可能。<br>In order to allow the upgrading of existing charging sites (EV supply equipment) by adding a component, the HLC systems shall be defined in a way that an upgrade of existing infrastructure in compliance with the ISO 15118 series is possible. | 所有使用案例 | 一般 (General) | 5.5.5 |
| V2G1-ED2-46 | 此外，若新組件未將既存組件完全整合至 EV 供電設備中(分離控制先導/SECC 架構)，則新安裝之 SECC 亦應瞭解並處置 EV 供電設備的實體限制。<br>Furthermore, in case the new component does not fully integrate the existing components in the EV supply equipment (separated control pilot/SECC architecture), the newly installed SECC shall know and process the physical limits of the EV supply equipment as well. | 所有使用案例 | 一般 (General) | 5.5.5 |
| V2G1-ED2-47 | 針對發現及關聯，SECC 可廣播其識別及必要之資訊(例：唯一 ID…)。<br>SECCs may broadcast their identification and necessary information for discovery and association (e.g. unique id…). | 所有使用案例 | 通訊 (Communication) | 5.6.2 |

| | | | | |
|---|---|---|---|---|
| V2G1-ED2-48 | 各 SECC 可控制 1 或多個 EV 供電設備。此通訊鏈路之規格不屬本標準範圍內，但其資料速率不應降低整體系統的效能。<br>Each SECC may control one or many EV supply equipment. The specification of this communication link is out of scope of this document however its data rate shall not degrade the overall system performance. | 所有使用案例 | 通訊(Communication) | 5.6.2 |
| V2G1-ED2-49 | 各 EV 供電設備應具僅對 1 個 SECC 之通訊鏈路。<br>Each EV supply equipment shall have a communication link with one SECC only. | 所有使用案例 | 通訊(Communication) | 5.6.2 |
| V2G1-ED2-50 | 無需任何駕駛者動作即可發現及關聯。<br>discovery and association shall be possible without any driver action. | WA、WB | 通訊(Communication) | 5.6.2 |
| V2G1-ED2-51 | 設計為有能力通過 EV 供電設備釋放電能之 EV，應遵循電流來源或電壓來源及 DER 之所有相關電氣安全要求事項。<br>An EV designed to be able to discharge energy through an EV supply equipment shall comply with all relevant electrical safety requirements applicable to electrical current or voltage source and DER. | 所有使用案例 | 電能(Energy)<br>設備人身安全(Safety) | 5.7.2 |
| V2G1-ED2-52 | EV 與 EV 電力系統應藉由電力傳送通道安全地連接。例：電力傳送通道係由 EV 與 EV 電力系統間之電纜組合所提供。<br>The EV and the EV power system shall be safely connected by the power transfer channel. Example: the power transfer channel is provided by cable assembly between the EV and the EV power system. | 所有使用案例 | 電能(Energy)<br>設備人身安全(Safety) | 5.7.2 |
| V2G1-ED2-53 | 於電能傳送循環中，EV 供電設備應量測(以本地法規所要求之精確度)流出及流入電網的有效電能及無效電能(有效充電、無效充電、有效放電、無效放電)。<br>During the energy transfer loop, the EV supply equipment shall measure (with the precision required by local regulation) active and reactive energy flowing from and to the grid (active charging, reactive charging, active | F | 可追蹤性(Traceability) | 5.8 |

| | | | | |
|---|---|---|---|---|
| | discharging, reactive discharging). | | | |
| V2G1-ED2-54 | 於電能傳送循環期間(使用案例 F0 至 F4)，SECC 及 EVCC 應有能力請求關於有效電能及無效電能表計指標之資訊以供核可。若合理性檢查未成功，EVCC 或 SECC 將回傳錯誤代碼，指示未成功之檢查導致終止 V2G 會談。<br>During the energy transfer loop (use cases F0 to F4) The SECC and the EVCC shall have the possibility to request information about the active and reactive energy meter indexes for approval. In case of failing plausibility check, the EVCC or the SECC shall return an error code indicating a failing check leading to terminating the V2G session. | F | 可追蹤性 (Traceability) | 5.8 |
| V2G1-ED2-55 | 於電能傳送循環結束時，EV 供電設備可能產生服務詳細紀錄，其中包含與其他適當電氣行動機制相關之資訊，以及下列資訊塊：<br>電能傳送循環起動之時戳<br>所使用之控制模式(動態或排程)<br>充電型式 AC 或 DC，單相或 3 相。<br>識別：EVID、EVSEID、電網供電點識別。<br>At the end of the energy transfer loop, the EV supply equipment may produce a service detail record containing, among other appropriate e-mobility related information, the following block of information:<br>1. Timestamp of the beginning of the energy transfer loop<br>2.Control modes used (dynamic or scheduled)<br>3. Type of charge AC or DC, single phase or 3 phases<br>4. Identification: EVID, EVSEID, Grid Delivery Point identification<br>傳送至 EV 之總有效電能及無效電能。<br>傳送自 EV 之總有效電能及無效電能。<br>電能傳送循環結束時之時戳。<br>所涉及之 EMAID 及行為者 ID (若有)。<br>V2G 會談中斷旗標，指示於電能傳送循環期間發生負合理性檢查。 | H | 可追蹤性 (Traceability) | 5.8 |

| | | | | |
|---|---|---|---|---|
| | 5. Total active and reactive energy transferred to EV<br>6. Total active and reactive energy transferred from the EV<br>7. Timestamp at the end of the energy transfer loop<br>8. EMAIDs and actors Ids involved if any<br>9. V2G session interruption flag indicating that a negative plausibility check occurred during the energy transfer loop | | | |
| V2G1-ED2-56 | 保留。<br>reserved | | | |
| V2G1-ED2-57 | 保留。<br>reserved | | | |
| V2G1-ED2-58 | EVCC 與 SECC 應交換關於所支援之本系列標準第 2 部或第 20 部及第 8 部協定版本之資訊，並使用最新的通用協定版本。<br>The EVCC and the SECC shall exchange information about the supported ISO 15118-2 or ISO 15118-20 and ISO 15118-8 protocol versions and use the latest common protocol version. | B | 通訊 (Communication) | 7.4 |
| V2G1-ED2-59 | SECC 與 EVCC 應有能力 1 對 1 關聯。<br>The SECC and the EVCC shall be capable of being associated one-to-one. | B | 通訊 (Communication) | 7.4 |
| V2G1-ED2-60 | EVCC 應支援憑證更新過程。<br>The EVCC shall support the certificate update process. | C | 網路安全 (Cybersecurity) | 7.5.1 |
| V2G1-ED2-61 | EVCC 應支援憑證安裝過程。<br>The EVCC shall support the certificate installation process. | C | 網路安全 (Cybersecurity) | 7.5.2 |
| V2G1-ED2-62 | SECC 應啟用對次要行為者之通訊鏈接，或提供安裝中之 EMAID 作為本地複本。<br>The SECC shall enable a communication link to the secondary actor or provide the EMAID being installed as local copy. | C | 網路安全 (Cybersecurity) | 7.5.2 |
| V2G1-ED2-63 | 若授權未自動發起，使用者應於將 EV 連接至 EV 供電設備後之特定時間內 | D1、D2 | 通訊 (Communication) | 7.6 |

| | | | | |
|---|---|---|---|---|
| | 通過人機界面(車內)啟動授權。<br>If the authorization is not automatically launched, the USER shall activate the authorization through the HMI (in the car) within a specific time after connecting the EV to the EV supply equipment. | | | |
| V2G1-ED2-64 | SECC 應對 EVCC 交換其 ID (EV 供電設備 ID)。<br>The SECC shall exchange its IDs (EV supply equipment ID) to the EVCC. | D1、D2 | 通訊 (Communication) | 7.6 |
| V2G1-ED2-65 | EVCC 應對 SECC 交換其 ID (EMAID)。<br>The EVCC shall exchange its IDs (EMAID) to the SECC. | D1、D2 | 通訊 (Communication) | 7.6 |
| V2G1-ED2-66 | SECC 應將 ID (來自 EVCC 之 EMAID 結合其自有 ID (EV 供電設備 ID))轉發予次要行為者。<br>The SECC shall forward the IDs (EMAID from the EVCC associating its own IDs (EV supply equipment ID) to the secondary actors. | D2 | 通訊 (Communication) | 7.6.3 |
| V2G1-ED2-67 | SECC 應評估授權，若接受，則持續通訊流程。<br>The SECC shall evaluate the authorization and, if accepted, proceed with the communication flow. | D3 | 通訊 (Communication) | 7.6.4 |
| V2G1-ED2-68 | 例：使用者應使用 HMI 輸入識別碼或 EV 供電設備所提供之任何其他授權方法。<br>The USER shall, for example, use an HMI to type in the identification code or any other authorization method offered at the EV supply equipment. | D3 | 通訊 (Communication) | 7.6.4 |
| V2G1-ED2-69 | 使用者應於將 EV 連接至 EV 供電設備後之特定時間內啟動授權，或 EV 供電設備應具人機界面或任何其他方式，以授權重新起動授權過程。<br>The USER shall activate the authorization within a specific time after connecting the EV to the EV supply equipment or the EV supply equipment shall have an HMI or any other method to authorize the restart of the authorization process. | D3 | 通訊 (Communication) | 7.6.4 |
| V2G1-ED2-70 | 於預約之情況下，SECC 可配置適當的 EV 供電設備。 | D4 | 通訊 (Communication) | 7.6.6 |

| | | | | |
|---|---|---|---|---|
| | In case of reservation the SECC may allocate an appropriate EV supply equipment. | | | |
| V2G1-ED2-71 | 於預約之情況下，SECC 應將預約的拒絕或接受通知 EVCC。<br>In case of reservation the SECC shall notify the rejection or acceptance of the reservation to the EVCC. | D4 | 通訊 (Communication) | 7.6.6 |
| V2G1-ED2-72 | 於預約之情況下，EVCC 應向 SECC 指示 EBC 中所指示之預約編號。<br>In case of reservation the EVCC shall indicate to the SECC the reservation number indicated in the EBC. | D4 | 通訊 (Communication) | 7.6.6 |
| V2G1-ED2-73 | 於預約之情況下，SECC 應向 EVCC 詢問預約編號碼。<br>In case of reservation the SECC shall ask the EVCC the reservation number. | D4 | 通訊 (Communication) | 7.6.6 |
| V2G1-ED2-74 | 應於無線通訊(WB)建立後立即檢查關於精細定位技術之相容性。<br>The compatibility with respect to the fine positioning technologies shall be checked just after the establishment of the wireless communication (WB). | WP1 | WPT | 7.7.1 |
| V2G1-ED2-75 | SECC 每次僅能接受 1 個傳導配對。<br>The SECC may accept only one conductive pairing at a time. | WP3 | 通訊 (Communication) | 7.7.3 |
| V2G1-ED2-76 | SECC 及 SA 應優先考量使用者行動性需要，而非系統及電網服務。<br>The SECC and SAs shall give preference to user mobility needs over system and grid services. | E8 | 一般 (General) | 7.8.8 |
| V2G1-ED2-77 | SECC 及 SA 應遵循使用者或 EV 所定義之電能最小/最大範圍。<br>The SECC and SAs shall comply with the energy minimum/maximum range defined by the user or EV. | E8 | 一般 (General) | 7.8.8 |
| V2G1-ED2-78 | 若於識別階段提及與彈性營運者之契約，則該契約應於電能傳送起動前由彈性營運者加以驗證。<br>If a contract with a flexibility operator has been mentioned during identification phases then the contract shall be validated by the flexibility operator before the energy transfer starts. | E8 | 一般 (General) | 7.8.8 |

| | | | | |
|---|---|---|---|---|
| V2G1-ED2-79 | 於雙向電力傳送過程中，EV 供電設備應量測有效傳送至電網之電能，同時考量本地電網規格及彈性契約量測要求事項。<br>During bidirectional power transfer, the EV supply equipment shall measure the energy effectively transferred to the grid, taking into account local grid codes and flexibility contract measurement requirements. | E9 | 電能(Energy) | 7.8.9 |
| V2G1-ED2-80 | 於雙向電力傳送過程中，EV 可檢查 EV 供電設備量測之電能。<br>During bidirectional power transfer, EVs may check the energy measured by the EV supply equipment. | E9 | 電能(Energy) | 7.8.9 |
| V2G1-ED2-81 | 若要求，EV 供電設備應產生 SDR，指示日期、持續時間、傳送自及傳送至電池之電能，以及彈性契約要求的所有其他量測值(例：負載曲線、有效及/或無效電能、電流品質、頻率…)。<br>If required, the EV supply equipment shall produce an SDR indicating the date, duration, energy transferred, from and to the battery, and all other measurements required by the flexibility contract (e.g. load curves, active and/or reactive energy, quality of current, frequency…). | E9 | 電能(Energy) | 7.8.9 |
| V2G1-ED2-82 | SDR 應發送至 EMSP 及 EMS。SDR 應由 EV 供電設備簽署並加密。可由 EV 加以檢查。<br>The SDRs shall be sent to the EMSP and to the EMS. The SDR shall be signed and encrypted by the EV supply equipment. It may be checked by EV. | E9 | 電能(Energy) | 7.8.9 |
| V2G1-ED2-83 | EVCC 及 SECC 應遵循可追蹤性要求事項。<br>The EVCC and the SECC shall comply with traceability requirements. | F0、F1、WF1、F2、F3、F4、G2 | 可追蹤性(Traceability) | 7.9 |
| V2G1-ED2-84 | SECC 應向 EVCC 發送表計讀數以供簽署。<br>The SECC shall send a meter readout to the EVCC for signing. | F1 | 電能(Energy)<br>網路安全(Cybersecurity) | 7.9.2 |
| V2G1-ED2-85 | 動態控制模式下雙向電力傳送循還訊息之履行時間及逾時應參數化，以確保快速回應服務。<br>Performance time and timeouts for bidirectional power transfer loop | F4 | 通訊(Communication) | 7.9.6 |

| | | | | |
|---|---|---|---|---|
| | messages in dynamic control mode shall be parameterized in order to ensure fast responding services. | | | |
| V2G1-ED2-86 | 於控制循環中，EV 及 EV 供電設備應考量所有相關之本地電網規格，若適用，則應符合 EN 50549-1。<br>During the control loop the EV and the EV supply equipment shall take into account all relevant local grid codes and if applicable, shall conform to EN 50549-1. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-87 | 於三相電能傳送之情況下，EV 應盡最大努力平衡三相間之功率。<br>In case of three-phase energy transfer the EV shall make it best efforts to balance the power among the three phases. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-88 | 於 AC 之情況下，若使用雙通道架構，則 EVCC 應向 SECC 指示電力潮流方向。然後，SECC 有能力藉由 HLC 履行相關之接觸器控制。<br>In case of AC and if a dual channel architecture is used, the EVCC shall indicate the power flow direction to the SECC. The SECC is then able to perform the relevant contactor control by HLC. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-89 | 於 DC 之情況下，SECC 應向 EVCC 指示目前之電流及電壓值。<br>In case of DC, the SECC should indicate to the EVCC the present current and voltage value. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-90 | 於 AC 之情況下，SECC 應向 EVCC 指示有效及無效功率之標的設定點。<br>In case of AC, the SECC should indicate to the EVCC target set point of active and reactive power. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-91 | SECC 應發送元件通知 EV 通道配置(雙通道或單通道)變更進行中或已完成。<br>The SECC shall send an element to inform the EV that channel configuration (dual or single channel) change is ongoing or finished. | F4 | 通訊 (Communication) | 7.9.6 |
| V2G1-ED2-92 | 若選擇，EVCC 應於整個電能傳送過程中支援系統狀態服務。<br>If selected, the EVCC shall support the system status service throughout the | WG1 | 通訊 (Communication) | 7.10.2 |

| | | | | |
|---|---|---|---|---|
| | whole energy transfer process. | | | |
| V2G1-ED2-93 | EVCC 與 SECC 間交換訊息以查詢並報告其系統狀態。若於檢查系統狀態期間發生錯誤，則應中止電能傳送過程。<br><br>Messages are exchanged between the EVCC and the SECC to query and report on its system status. If an error occurs during checking of the system status, the energy transfer process shall be aborted. | WG1 | 通訊 (Communication)<br>錯誤處置 (Error Handling) | 7.10.2 |
| V2G1-ED2-94 | SDR 應依可追蹤性要求事項產生並發送予經授權之次要行為者。<br><br>SDR shall be generated according to traceability requirements and sent to authorized secondary actors. | H1、WH1 | 可追蹤性 (Traceability) | 7.11.2 |

## 參考資料

[1] ISO 7498 (all parts), Information technology − Open Systems Interconnection − Basic Reference Model

[2] ISO/IEC 15408-1, Information technology − Security techniques − Evaluation criteria for IT security − Part 1: Introduction and general model

[3] ISO 15118-4, Road vehicles − Vehicle to grid communication interface − Part 4: Network and application protocol conformance test

[4] ISO 15118-5, Road vehicles − Vehicle to grid communication interface − Part 5: Physical layer and data link layer conformance test

[5] ISO/IEC 19501, Information technology − Open Distributed Processing − Unified Modeling Language (UML) Version 1.4.2

[6] ISO 19363, Electrically propelled vehicles − Magnetic field wireless power transfer − Safety and interoperability requirements

[7] IEC 60050, International electrotechnical vocabulary

[8] IEC 60309-1, Plugs, socket-outlets and couplers for industrial purposes − Part 1: General requirements

[9] IEC 61851-23, Electric vehicle conductive charging system − Part 23: DC electric vehicle charging station

[10] IEC 61851-24, Electric vehicle conductive charging system − Part 24: Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging

[11] IEC 61980-1, Electric vehicle wireless power transfer (WPT) systems − Part 1 General Requirements

[12] IEC 61980-3, Electric vehicle wireless power transfer (WPT) systems − Part 3: Specific requirements for the magnetic field wireless power transfer systems

[13] IEC 62052-11, Electricity metering equipment (AC) − General requirements, tests and test conditions − Part 11: Metering equipment

[14] IEC 62053-21, Electricity metering equipment (a.c.) − Particular requirements − Part 21: Static meters for active energy (classes 1 and 2)

[15] IEC 62053-52, Electricity metering equipment (AC) − Particular requirements − Part 52: Symbols

[16] IEC 62196-1:2011, Plugs, socket-outlets, vehicle couplers and vehicle inlets - Conductive charging of electric vehicles - Part 1: Charging of electric vehicles up to 250 A a.c. and 400 A d.c

[17] IEC 62196-2, Plugs, Socket-Outlet and vehicle coupler

[18] IEC/PAS 62559:2008, IntelliGrid Methodology for Developing Requirements for Energy Systems

[19] SAE J1772, Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler

[20] SAE 2836, Instructions for Using Plug-In Electric Vehicle (PEV) Communications,

Interoperability and Security Documents
[21] SAE 2847, Between Plug-In Vehicles and Off-Board DC Chargers
[22] SAE 2931, Signaling Communication for Wirelessly Charged Electric Vehicles
[23] ETSI TS 101 556-3, Intelligent Transport Systems (ITS); Infrastructure to Vehicle Communications; Part 3: Communications system for the planning and reservation of EV energy supply using wireless networks V1.1.1 (2014-10)
[24] Handbook of Applied Cryptography, by A. Menezes, P. van Oorschot, and S. Vanstone. CRC Press, 1996

**相對應國際標準**

ISO 15118-1:2019 Road vehicles − Vehicle to grid communication interface − Part 1: General information and use-case definition

## 名詞對照

| | |
|---|---|
| A | |
| actor | 行為者 |
| ales tariff table | 銷售費率表 |
| ancillary service | 輔助服務 |
| authentication | 鑑別 |
| authorization | 授權 |
| automatic connection device, ACD | 自動連接裝置 |
| B | |
| basic signalling | 基本信令 |
| battery management system, BMS | 電池管理系統 |
| B | |
| certificate | 憑證 |
| charging station operator, CSO | 充電站營運者 |
| communication session | 通訊會談 |
| conductive communication | 傳導式通訊 |
| contactor | 接觸器 |
| credential | 信符 |
| customer contract | 用戶契約 |
| D | |
| demand clearing house, DCH | 需量結算所 |
| departure time | 離場時間 |
| distributed energy resources, DER | 分散式能源 |
| distribution system operator, DSO | 配電系統營運者 |
| E | |
| electric energy meter, EEM | 電能表計 |
| electric vehicle communication controller, EVCC | 電動車輛通訊控制器 |
| electric vehicle power supply, EVPS | 電動車輛電力供應 |
| electric vehicle supply equipment identifier, EVSEID | 電動車輛供電設備識別符 |
| electric vehicle, EV | 電動車輛 |
| electricity provider, EP | 電力提供者 |
| electronic control unit, ECU | 電子控制單元 |

| | |
|---|---|
| element | 元件 |
| e-mobility authentication identifier, EMAID | 電氣行動機制鑑別識別符 |
| e-mobility operator clearing house, EMOCH | 電氣行動機制營運者結算所 |
| e-mobility service provider, EMSP | 電氣行動機制服務提供者 |
| energy demand | 電能需量 |
| energy management system, EMS | 能源管理系統 |
| energy transfer | 電能傳送 |
| EV supply equipment booking confirmation, EBC | EV 供電設備預約確認 |
| external identification means, EIM | 外部識別方式 |
| F | |
| fast responding service | 快速回應服務 |
| fleet operator, FO | 車隊營運者 |
| forward power transfer, FPT | 正向電力傳送 |
| G | |
| grid schedule | 電網排程 |
| H | |
| high level communication, HLC | 高層通訊 |
| home area network, HAN | 家庭區域網路 |
| home energy management system, HEMS | 家庭能源管理系統 |
| human machine interface, HMI | 人機介面 |
| L | |
| level selector | 位準選擇器 |
| M | |
| meter operator, MO | 表計營運者 |
| micro-payment | 小額支付 |
| mobility | 行動性 |
| mobility operator | 行動機制營運者 |
| O | |
| original equipment manufacturer, OEM | 原始設備製造者 |
| P | |
| park and charge, PnC | 停車充電 |

| | |
|---|---|
| paying unit, PU | 付費單元 |
| payment | 付費 |
| pilot function | 引導功能 |
| plug and charge, PnC | 即插即充 |
| plug-in | 插電式；插接 |
| power limit | 功率限制 |
| power line communication, PLC | 電力線通訊 |
| power transfer | 電力傳送 |
| private network energy management system, PNEMS | 私用網路能源管理系統 |
| pulse width modulation, PWM | 脈寬調變 |
| R | |
| requirements | 要求事項 |
| residual current device, RCD | 剩餘電流裝置 |
| reverse power transfer, RPT | 反向電力傳送 |
| S | |
| scheduled mode | 排程模式 |
| secondary actor, SA | 次要行為者 |
| service detail record, SDR | 服務明節紀錄 |
| spot operator | 現場操作者 |
| supply equipment | 供電設備 |
| supply equipment communication controller, SECC | 供電設備通訊控制器 |
| T | |
| target setting | 標的設定 |
| trigger | 觸發者 |
| V | |
| value-added service, VAS | 加值服務 |
| W | |
| wireless power transfer, WPT | 無線電力傳送 |