

INTERNATIONAL STANDARD

HORIZONTAL PUBLICATION

GROUP ENERGY EFFICIENCY PUBLICATION

**Energy efficiency - Customer energy management system -
Part 2-2: Data model and messaging - Interface between the customer energy
manager and resource managers**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2026 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

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

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search -

webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	8
Introduction.....	10
1 Scope	11
2 Normative references	11
3 Terms, definitions and abbreviated terms	11
3.1 Terms and definitions.....	11
3.2 Abbreviated terms.....	14
4 Energy management.....	14
4.1 Architectural overview.....	14
4.2 Description	15
4.3 Energy management roles	16
4.3.1 General	16
4.3.2 Energy producer role	17
4.3.3 Energy consumer role.....	17
4.3.4 Energy storage role	18
5 Resource manager	19
6 Customer energy manager (CEM).....	20
6.1 General.....	20
6.2 Local optimization	20
6.3 Implicit control	21
6.4 Explicit control	21
6.5 Summary	22
7 Energy management concepts.....	22
7.1 General.....	22
7.2 Design philosophy	22
7.3 Abnormal condition	23
7.4 Power measurements	23
7.5 Power forecasts	23
7.6 Control types	24
7.6.1 General	24
7.6.2 Power envelope based control.....	24
7.6.3 Power profile based control	29
7.6.4 Operation mode based control.....	30
7.6.5 Fill rate based control	33
7.6.6 Demand driven based control	35
8 Energy management data models.....	37
8.1 Basic data types	37
8.1.1 General	37
8.1.2 Common concepts related to time.....	37
8.1.3 Common concepts related to identifiers	38
8.1.4 Common concepts related to strings	38
8.1.5 Meaning of optionality.....	38
8.2 Resource manager.....	39
8.2.1 ResourceManagerDetails.....	39
8.2.2 PowerValue	39
8.2.3 PowerForecastValue.....	40

8.2.4	PowerRange.....	40
8.2.5	NumberRange	40
8.2.6	PowerMeasurement.....	41
8.2.7	Role	41
8.2.8	ReceptionStatus	41
8.2.9	Transition	41
8.2.10	Timer.....	42
8.2.11	InstructionStatusUpdate	42
8.3	Power forecast.....	42
8.3.1	Description	42
8.3.2	PowerForecast	43
8.3.3	PowerForecastElement.....	44
8.4	Control types	44
8.4.1	Power envelope based control.....	44
8.4.2	Power profile based control	47
8.4.3	Operation mode based control.....	50
8.4.4	Fill rate based control	52
8.4.5	Demand driven based control	57
8.5	Enumerations.....	60
8.5.1	RoleType	60
8.5.2	Commodity	60
8.5.3	CommodityQuantity	61
8.5.4	Currency.....	61
8.5.5	InstructionStatus.....	62
8.5.6	ControlType.....	63
8.5.7	PowerForecastType.....	63
8.5.8	PEBC.PowerEnvelopeLimitType	64
8.5.9	PEBC.PowerEnvelopeConsequenceType	64
8.5.10	ReceptionStatusValues.....	64
8.5.11	PPBC.PowerSequenceStatus	64
9	Communication.....	65
9.1	General.....	65
9.2	Generic tasks.....	66
9.2.1	Update resource manager details	66
9.2.2	Activate control type	66
9.2.3	Update active control type	67
9.2.4	Communicate power measurement.....	67
9.2.5	Update power forecast.....	67
9.2.6	Revoke power forecast	68
9.3	Power envelope based control tasks	68
9.3.1	Update power constraints	68
9.3.2	Revoke power constraints.....	69
9.3.3	Update power plan.....	69
9.3.4	Update energy constraints	70
9.3.5	Revoke energy constraints	70
9.3.6	Process instruction	71
9.3.7	Revoke instruction	72
9.4	Power profile based control tasks	72
9.4.1	Update power profile definition	72

9.4.2	Revoke power profile definition	73
9.4.3	Update power profile status	73
9.4.4	Process schedule instruction	73
9.4.5	Revoke schedule instruction	74
9.4.6	Process start interruption instruction	75
9.4.7	Revoke start interruption instruction	75
9.4.8	Process end interruption instruction	76
9.4.9	Revoke end interruption instruction	76
9.5	Operation mode based control tasks	77
9.5.1	Update system description	77
9.5.2	Revoke system description	77
9.5.3	Update status	78
9.5.4	Update timer status	78
9.5.5	Process instruction	79
9.5.6	Revoke instruction	79
9.6	Fill rate based control tasks	80
9.6.1	Update system description	80
9.6.2	Revoke system description	80
9.6.3	Update actuator status	81
9.6.4	Update storage status	81
9.6.5	Update timer status	81
9.6.6	Update leakage behaviour	82
9.6.7	Revoke leakage behaviour	82
9.6.8	Update usage forecast	83
9.6.9	Revoke usage forecast	83
9.6.10	Update fill level target profile	84
9.6.11	Revoke fill level target profile	84
9.6.12	Process instruction	85
9.6.13	Revoke instruction	85
9.7	Demand driven based control tasks	86
9.7.1	Update system description	86
9.7.2	Revoke system description	86
9.7.3	Update actuator status	87
9.7.4	Update timer status	87
9.7.5	Update average demand rate forecast	87
9.7.6	Revoke average demand rate forecast	88
9.7.7	Process instruction	88
9.7.8	Revoke instruction	89
Annex A (informative)	Use cases	90
A.1	Overview	90
A.2	Organizing	91
A.2.1	UC_EM_O100: Configuring CEM in network	91
A.2.2	UC_EM_O101: Configuring master CEM with smart grid operator credentials	91
A.3	Scheduling	92
A.4	Management	92
A.4.1	UC_EM_M300: CEM selects alternative energy sequences by energy costs	92
A.4.2	UC_EM_M301 CEM modifies start time of energy sequence	93

A.4.3	UC_EM_M302: CEM changes an energy profile to make temporary use of stored energy	93
A.4.4	UC_EM_M303: Demanded power cannot be delivered by domestic grid	94
A.4.5	UC_EM_M304: Two electric vehicles conflicting in their power load	94
A.4.6	UC_EM_M305: EMG requests temporarily energy saving	95
A.4.7	UC_EM_M306: Energy storage requests high priority	96
A.5	Case studies	97
A.5.1	UC_EM_M307 Charging an EV in the context of Power Limitation PV with the dynamic control mode of ISO 15118-20	97
A.5.2	UC_EM_M308: Charging an EV in the context of Power Limitation PV with the scheduled control mode of ISO 15118 (series) [10] and monetary incentives	98
	Bibliography	100
	Figure 1 – Architectural overview of Premises smart grid system	15
	Figure 2 – Example of how different power profiles can achieve the same target state	16
	Figure 3 – Example resource manager and HBES or BACS or smart appliance or device combinations, or any combinations of these	19
	Figure 4 – Example of a PEBC. Instruction from the CEM containing a PowerEnvelope	25
	Figure 5 – Example of how a PowerEnvelope and a PowerForecast of type GENUINE result in a PowerForecast of type CEM_INFLUENCED	26
	Figure 6 – Power constrain examples	26
	Figure 7 – Example of the PowerConstraints based on Figure 6 b)	27
	Figure 8 – Example which illustrates the effect of the minimal power envelope element duration	28
	Figure 9 – Example of a power profile definition	29
	Figure 10 – Example system description for the operation mode based control type	31
	Figure 11 – Visual example of how the factor maps to power values	32
	Figure 12 – Example for fill rate based control	33
	Figure 13 – Example of the actuator details of fill rate based control	34
	Figure 14 – Example of an operation mode for fill rate based control	35
	Figure 15 – Schematic overview of the data the resource manager send to the CEM	36
	Figure 16 – Example of the operation modes in Demand Driven Based Control	37
	Figure 17 – PowerForecast	43
	Figure 18 – PowerForecastElement	44
	Figure 19 – State diagram for instruction status	63
	Figure 20 – Interaction pattern for 'update resource manager details' task	66
	Figure 21 – Interaction pattern for 'activate control type' task	66
	Figure 22 – Interaction pattern for the 'update active control type' task	67
	Figure 23 – Interaction pattern for the 'communicate power measurement' task	67
	Figure 24 – Interaction pattern for the 'update power forecast' task	68
	Figure 25 – Interaction pattern for the 'revoke power forecast' task	68
	Figure 26 – Interaction pattern for the 'update power constraints' task	69
	Figure 27 – Interaction pattern for the 'revoke power constraints' task	69
	Figure 28 – Interaction pattern for the 'update energy constraints' task	70
	Figure 29 – Interaction pattern for the 'revoke energy constraints' task	71

Figure 30 – Interaction pattern for 'process instruction' task.....	71
Figure 31 – Interaction pattern for the 'revoke instruction' task.....	72
Figure 32 – Interaction pattern for the 'update power profile definition' task	72
Figure 33 – Interaction pattern for the 'revoke power profile definition' task	73
Figure 34 – Interaction pattern for 'update power profile status' task.....	73
Figure 35 – Interaction pattern for 'process schedule instruction' task.....	74
Figure 36 – Interaction pattern for the 'revoke schedule instruction' task.....	74
Figure 37 – Interaction pattern for 'process start interruption instruction' task	75
Figure 38 – Interaction pattern for the 'revoke start interruption instruction' task	75
Figure 39 – Interaction pattern for 'process end interruption instruction' task	76
Figure 40 – Interaction pattern for the 'revoke end interruption instruction' task	76
Figure 41 – Interaction pattern for the 'update system description' task.....	77
Figure 42 – Interaction pattern for the 'revoke system description' task.....	78
Figure 43 – Interaction pattern for 'update status' task	78
Figure 44 – Interaction pattern for 'update timer status' task	78
Figure 45 – Interaction pattern for the 'process instruction' task.....	79
Figure 46 – Interaction pattern for the 'revoke instruction' task.....	79
Figure 47 – Interaction pattern for the 'update system description' task.....	80
Figure 48 – Interaction pattern for the 'revoke system description' task.....	80
Figure 49 – Interaction pattern for 'update actuator status' task	81
Figure 50 – Interaction pattern for 'update storage status' task	81
Figure 51 – Interaction pattern for 'update timer status' task	82
Figure 52 – Interaction pattern for the 'update leakage behaviour' task.....	82
Figure 53 – Interaction pattern for the 'revoke leakage behaviour' task	82
Figure 54 – Interaction pattern for the 'update usage forecast' task.....	83
Figure 55 – Interaction pattern for the 'revoke usage forecast' task.....	83
Figure 56 – Interaction pattern for the 'update fill level target profile' task	84
Figure 57 – Interaction pattern for the 'revoke fill level target profile' task	84
Figure 58 – Interaction pattern for 'process instruction' task.....	85
Figure 59 – Interaction pattern for the 'revoke instruction' task.....	85
Figure 60 – Interaction pattern for the 'update demand driven system description' task.....	86
Figure 61 – Interaction pattern for the 'revoke demand driven system description' task.....	86
Figure 62 – Interaction pattern for 'update actuator status' task	87
Figure 63 – Interaction pattern for 'update timer status' task	87
Figure 64 – Interaction pattern for the 'update average demand rate forecast' task	88
Figure 65 – Interaction pattern for the 'revoke average demand rate forecast' task	88
Figure 66 – Interaction pattern for 'process instruction' task.....	89
Figure 67 – Interaction pattern for the 'revoke instruction' task.....	89
Figure A.1 – Solving conflicting power load.....	95
Figure A.2 – Charging an EV	97
Figure A.3 – Charging an EV	98
Table 1 – Data types.....	37

Table 2 – ResourceManagerDetails	39
Table 3 – PowerValue	40
Table 4 – PowerForecastValue	40
Table 5 – PowerRange	40
Table 6 – NumberRange	41
Table 7 – PowerMeasurement	41
Table 8 – Role	41
Table 9 – ReceptionStatus	41
Table 10 – Transition	41
Table 11 – Timer	42
Table 12 – InstructionStatusUpdate	42
Table 13 – PowerForecast	43
Table 14 – PowerForecastElement	44
Table 15 – PEBC.PowerConstraints	44
Table 16 – PEBC.AllowedLimitRange	45
Table 17 – PEBC.EnergyConstraint	45
Table 18 – PEBC.PowerEnvelope	46
Table 19 – PEBC.PowerEnvelopeElement	46
Table 20 – PEBC.Instruction	46
Table 21 – PPBC.PowerProfileDefinition	47
Table 22 – PPBC.PowerSequenceContainer	47
Table 23 – PPBC.PowerSequence	48
Table 24 – PPBC.PowerSequenceElement	48
Table 25 – PPBC.PowerProfileStatus	48
Table 26 – PPBC.PowerSequenceContainerStatus	48
Table 27 – PPBC.ScheduleInstruction	49
Table 28 – PPBC.StartInterruptionInstruction	49
Table 29 – PPBC.EndInterruptionInstruction	50
Table 30 – OMBC.SystemDescription	50
Table 31 – OMBC.Status	50
Table 32 – OMBC.TimerStatus	51
Table 33 – OMBC.OperationMode	51
Table 34 – OMBC.Instruction	52
Table 35 – FRBC.SystemDescription	52
Table 36 – FRBC.ActuatorDescription	52
Table 37 – FRBC.ActuatorStatus	53
Table 38 – FRBC.TimerStatus	53
Table 39 – FRBC.OperationMode	53
Table 40 – FRBC.OperationModeElement	54
Table 41 – FRBC.StorageDescription	54
Table 42 – FRBC.StorageStatus	55
Table 43 – FRBC.LeakageBehaviour	55
Table 44 – FRBC.LeakageBehaviourElement	55

Table 45 – FRBC.Instruction	55
Table 46 – FRBC.UsageForecast.....	56
Table 47 – FRBC.UsageForecastElement	56
Table 48 – FRBC.FillLevelTargetProfile	57
Table 49 – FRBC.FillLevelTargetProfileElement.....	57
Table 50 – DDBC.SystemDescription	57
Table 51 – DDBC.ActuatorDescription	58
Table 52 – DDBC.ActuatorStatus	58
Table 53 – DDBC.TimerStatus	58
Table 54 – DDBC.OperationMode	59
Table 55 – DDBC.Instruction.....	59
Table 56 – DDBC.AverageDemandRateForecast	60
Table 57 – DDBC.AverageDemandRateForecastElement.....	60
Table 58 – Enumeration of RoleType types	60
Table 59 – Enumeration of commodity types	61
Table 60 – Enumeration of CommodityQuantity types	61
Table 61 – Examples of enumeration of currency types according to ISO 4217	61
Table 62 – Enumeration of InstructionStatus types	62
Table 63 – Enumeration of ControlType types.....	63
Table 64 – Enumeration of PowerForecastType types.....	63
Table 65 – Enumeration of PowerEnvelopeLimitType types	64
Table 66 – Enumeration of PowerEnvelopeConsequenceType types.....	64
Table 67 – Enumeration of ReceptionStatusValues types	64
Table 68 – Enumeration of PPBC.PowerSequenceStatus types	64
Table A.1 – Use cases mainly describe energy management	90
Table A.2 – Use cases overview	90

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Energy efficiency - Customer energy management system -
Part 2-2: Data model and messaging - Interface between the customer
energy manager and resource managers**

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 63402-2-2 has been prepared by subcommittee 23K: Electrical energy efficiency products, of IEC technical committee 23: Electrical accessories. It is an International Standard.

It has the status of a group energy efficiency publication in accordance with IEC Guide 118, *Preparation of basic and group energy efficiency publications including energy efficiency aspects*.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23K/134/FDIS	23K/138/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 63402 series, published under the general title *Energy efficiency - Customer energy management systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

Introduction

Over recent decades, energy production and its consumption patterns have changed dramatically. Although central energy production is still dominant, the trend for distributed production is distinctive following an increasing number of renewables. Alternative energy sources are highly fluctuating in their production capabilities, which can result in the grid operators having difficulty to keep a balance between energy production and consumption. The complexity of keeping the grid reliable is further increased by the change in the electric energy consumption and production of the customer itself, e.g., the use of electric vehicles and personal generation facilities.

A Smart Grid allows the grid operator to be flexible and reactive. Such reactivity uses communication between energy consuming and producing entities, from single family houses to large factories.

This document describes aspects of the smart grid that relate specifically to the premises (home or building) part of the smart grid and describes the common interface between equipment in the premises and the smart grid. This document defines the fundamental aspects of semantic interoperability for the S2 interface and the related data exchange between a **CEM** and the Resource Managers within the premises.

Different use cases are explained in **Annex A**, which help to understand the philosophy of this document.

This document is based on **EN 50491-12-2 [1]** which also served as a basis for ETSI TS 103 410-1 SAREF4ENER **[2]**.

Sample Document

get full document from standards.iteh.ai

1 Scope

This document specifies the fundamental aspects of semantic interoperability for the S2 interface and the related data exchange between a CEM and the resource managers within the premises. It provides a technology independent set of data models and interaction patterns in order to enable applications for energy management within the premises. This document does not include:

- mappings to concrete data representations (XML, JSON and similar);
- mappings to application protocols for the message passing;
- security related aspects.

This group EE publication is primarily intended to be used as an EE standard for the products mentioned in the scope, but is also intended to be used by TCs in the preparation of publications for products which are included in the boundary mentioned in the scope of this document.

2 Normative references

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.

IEC TR 62746-2:2015, *Systems interface between customer energy management system and the power management system - Part 2: Use cases and requirements*

IEC 63402-1, *Energy Efficiency - Customer Energy Management Systems -- Part 1: General Requirements and Architecture*

ISO 4217, *Codes for the representation of currencies*

ISO 15118-20, *Road vehicles - Vehicle to grid communication interface - Part 20: Network and application protocol requirements*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 63402-1, and the following apply.

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1

customer energy manager

CEM

internal automation function for optimizing the energy consumption, production and storage within the premises according to the preferences of the customer using internal flexibilities and typically based on external information received through the energy management gateway and possibly other data sources

[SOURCE: IEC 63402-1:2025 [3], 3.1.1]

3.1.2

power envelope based control

coordination of the CEM based on limitations to the device

Note 1 to entry: The CEM can set minimum and maximum values for the power that shall not be exceeded by the device.

3.1.3

power profile based control

control type where coordination from the CEM is based on profile modification, including concepts of sequence shifting, sequence selection

3.1.4

operation mode based control

control type where the resource manager offers the CEM multiple operation modes that the CEM could choose from

Note 1 to entry: The behaviour of the device will be modified by selecting operation modes.

3.1.5

fill rate based control

control type based on measurements indicating the fill level and the fill rate

3.1.6

demand driven based control

control type where the CEM can decide how a given demand should be fulfilled

3.1.7

resource manager

RM

function that exclusively represents a logical group of devices or a single smart device, and is responsible for sending unambiguous instructions to the logical group of devices or to a single device, typically using a device-specific protocol

Note 1 to entry: In the context of this document the resource manager manages the energy flexibility of a logical group of devices or a single smart device.

[SOURCE: IEC 63402-1:2025 [3], 3.1.9]

3.1.8

role

categorization of the behaviour of a participant by its capabilities related to energy management, each participant at least supporting one

3.1.9

S1 communication

interface between CEM and energy management gateway

3.1.10

S2 communication

interface between CEM and resource manager

3.1.11

smart grid

electric power system that utilizes information exchange and control technologies, distributed computing and associated sensors and actuators, for purposes such as:

- to integrate the behaviour and actions of the network users and other stakeholders,
- to efficiently deliver sustainable, economic and secure electricity supplies

3.1.12

smart grid operator

instance requesting energy profiles from the [CEM](#) in order to keep the grid stable and reliable

3.1.13

time slot

fixed period of time with a specific duration

3.1.14

use case

case that describes interactions between an actor and another actor or a system to achieve a specific goal, either very abstract or very detailed

Note 1 to entry: The use case can be nested.

3.1.15

user

either a person (e.g. installer or resident) or a surrogate service

3.1.16

prosumer

household or device that produces and consumes energy of the same commodity

[SOURCE: [IEC 60050-617:2009](#) [4], 617-02-16, modified - Replacement of "network user" with "household or device"; addition of "of the same commodity".]

3.1.17

single application smart system

SASS

group of devices having a communication interface for a single application such as heating or lighting, that consume, produce or store energy (or a combination thereof) and that can be controlled by a resource manager for the purpose of energy management

[SOURCE: [IEC 63402-1:2025](#) [3], 3.1.13]

3.1.18

home and building electronic system

building automation control system

HBES

BACS

logical group of devices which uses a multi-application communication system where the functions are distributed and linked through a common communication process

EXAMPLE Management of lighting, heating, energy, water, fire alarms, blinds, different forms of security, etc.

Note 1 to entry: HBES and BACS is used in homes and buildings plus their surroundings. Functions of the system are, for example: switching, open loop controlling, closed loop controlling, monitoring and supervising.

Note 2 to entry: In literature, HBES or BACS can be referred also as "home control system or network", "home electronic systems", "building automation systems", etc.

[SOURCE: [IEC 63402-1:2025](#) [3], 3.1.6]

3.1.19

abnormal condition

situation in which a Resource Manager is sacrificing user comfort when requested by the [CEM](#)