



IEC SRD 63199

Edition 1.0 2020-07

SYSTEMS REFERENCE DELIVERABLE



Top priority standards development status in the domain of smart energy

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.240

ISBN 978-2-8322-8649-4

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

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
0.1 General.....	6
0.2 Summary of development plan process.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions and abbreviated terms.....	7
3.1 Terms and definitions.....	7
3.2 Abbreviated terms.....	8
4 SyC Smart Energy development plan: development process.....	9
4.1 Purpose.....	9
4.2 Collection of standardization cases.....	10
4.3 Ranking process and results.....	10
4.3.1 General.....	10
4.3.2 Ranking criteria.....	10
4.3.3 X-axis = Smart energy deployment standardization case impact.....	11
4.3.4 Y-axis = Standardization case resolution likelihood.....	11
4.3.5 Evaluation of the degree of consensus.....	11
4.3.6 Who were involved for prioritizing?.....	12
4.3.7 Ranking result.....	12
4.4 From advantages and disadvantages of paths to the resolution of standardization cases.....	13
4.5 Facilitation of standardization case activities by SyC SE.....	15
5 Assessment of each standardization case.....	16
5.1 S-INT-1: Increase profiling support.....	16
5.1.1 Purpose of IEC effort.....	16
5.1.2 Description of current standardization efforts.....	17
5.1.3 Description of remaining standardization efforts.....	17
5.2 S-CNC-2: Connecting and managing DER standards.....	17
5.2.1 Purpose of IEC effort.....	17
5.2.2 Description of current standardization efforts.....	18
5.2.3 Description of remaining standardization efforts.....	18
5.3 S-CNC-4: Installations with multiple power sources.....	18
5.3.1 Purpose of IEC effort.....	18
5.3.2 Description of current standardization efforts.....	19
5.3.3 Description of remaining standardization efforts.....	19
5.4 S-SA-10: Extensions to support dynamic system management.....	19
5.4.1 Purpose of IEC effort.....	19
5.4.2 Description of current standardization efforts.....	20
5.4.3 Description of remaining standardization efforts.....	20
5.5 S-SA-11: Guidance for IEC 61850 extensions.....	20
5.5.1 Purpose of IEC effort.....	20
5.5.2 Description of current standardization efforts.....	21
5.5.3 Description of remaining standardization efforts.....	21
5.6 S-DER-1: Promotion and expansion of IEC 61850-7-420.....	21
5.6.1 Purpose of IEC effort.....	21

5.6.2	Description of current standardization efforts	21
5.6.3	Description of remaining standardization efforts	22
5.7	S-HBES/BACS-1: Cooperation of cross TCs for DR applying to smart home and building automation systems	22
5.7.1	Purpose of IEC effort	22
5.7.2	Description of current standardization efforts	22
5.7.3	Description of remaining standardization efforts	23
5.8	S-ES-1: Standardization for interconnection and interoperability of large and distributed energy storage	23
5.8.1	Purpose of IEC effort	23
5.8.2	Description of current standardization efforts	24
5.8.3	Description of remaining standardization efforts	25
5.9	G-C-7: Support for the long-term interoperability of IPv4 and IPv6	25
5.9.1	Purpose of IEC effort	25
5.9.2	Description of current standardization efforts	25
5.9.3	Description of remaining standardization efforts	25
5.10	G-S-5: Guidelines of smart energy cyber security requirements	26
5.10.1	Purpose of IEC effort	26
5.10.2	Description of current standardization efforts	26
5.10.3	Description of remaining standardization efforts	26
5.11	S-AM-1&New Extension of SGAM smart energy grid reference architecture	27
5.11.1	Purpose of IEC effort	27
5.11.2	Description of current standardization efforts	27
5.11.3	Description of remaining standardization efforts	29
6	Synchronized process with gap analysis <review process>	29
Annex A (informative) Electrical energy storage systems (EESS)		30
Bibliography		31
Documents referred to in this document		31
Other documents for reference		32
Figure 1 – Development plan overall process		9
Figure 2 – Typical graphical output and conclusions		11
Figure 3 – Classification of electrical energy storage systems according to energy form		24
Figure 4 – Key cyber security standards and guidelines		26
Figure 5 – The SGAM framework		28
Figure 6 – The interaction model of three energies' component layer		29
Figure A.1 – Large EES data model		30
Table 1 – List of selected items in the development plan version 1.3		10
Table 2 – Ranking results: selected 11 items		12
Table 3 – Example of scenarios comparison (S-DER-1)		14
Table 4 – Development plan V1.3		14
Table 5 – International Standards related to S-HBES/BACS-1		23

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TOP PRIORITY STANDARDS DEVELOPMENT STATUS
IN THE DOMAIN OF SMART ENERGY**
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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC SRD 63199, which is a Systems Reference Deliverable, has been prepared by IEC systems committee Smart Energy.

The text of this Systems Reference Deliverable is based on the following documents:

Draft SRD	Report on voting
SyCSmartEnergy/129/DTS	SyCSmartEnergy/139/RVDTS

Full information on the voting for the approval of this Systems Reference Deliverable can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

0.1 General

IEC systems committee Smart Energy (SyC SE) addresses standardization issues in the field of smart energy with the purpose of identifying systems level requirements for standardization, coordination and guidance in the areas of smart grid and smart energy, including interaction in the areas of heat and gas.

To realize this, SyC SE has accepted the idea that *"One concrete approach consists of collectively elaborating on a master development plan to visualize new ideas under consideration by the TCs/SCs consistently with the ongoing program of work"* [SOURCE: IEC SyC SE, WG2 IEC Smart Energy Development Plan].

To achieve this goal, SyC SE determined that it was essential to consult widely within the IEC community and the broader stakeholder community to provide overall systems level value, support and guidance to technical committees (TCs) and other standards development groups, both inside and outside the IEC. From this consultation effort, SyC SE was able to select important cases that would benefit from standardization. After identifying and assessing the importance of these standardization cases, SyC SE has worked with the affected TCs to promote these efforts and periodically updates their progress in an SRD report (called the SyC SE development plan).

The purpose of the SyC SE development plan is to assist TCs in coordinating and recognizing standardizing action needed for as well to raise awareness of the ongoing standardization efforts.

In order to develop new standards and amendments of existing standards for smart energy, it is important to analyse gaps, resolve each gap's standardization cases (milestones, timelines, dependencies, etc.), progress the development process in accordance with a timetable, and manage the development status by tracking the processes.

The ultimate goal is to boost, facilitate and monitor standardization work where needed, in order to get the most comprehensive and consistent set of standards in the given time scale, needed for a seamless deployment of smart energy domain worldwide.

0.2 Summary of development plan process

The development plan is in essence a living tool, not only because of the progressive resolution of standardization cases included in the development plan, but also because the list of entries will evolve during time.

In order to address this, a formal process was developed with the goal to formalize:

- a way to collect new standardization cases (cases where additional standardization could improve smart energy technology, interoperability and market support);
- a way to rank these standardization cases (from the highest priority to the lowest) – a necessary step in order to allocate the IEC SyC SE effort to the highest priorities only;
- a way to elaborate and select a resolution path;
- a way to engage, monitor and report on each standardization case resolution process.

This overall process is summarized in 4.1.

The review process of the development plan should be synchronized with updates of the smart grid roadmap [1], which consists of revision update and version update. Discussion with related TCs is very important for these updates. In principle, update of this document is expected to be synchronized with version update of the development plan.

TOP PRIORITY STANDARDS DEVELOPMENT STATUS IN THE DOMAIN OF SMART ENERGY

1 Scope

This document presents the current status of the IEC systems committee Smart Energy (SyC SE) development plan for readers (not limited to IEC smart energy related members). The document identifies items that require standardization, their current status and work required, possibly by multiple technical committees or working groups, to address any issues.

Since the content of this document represents a snapshot of the dynamic/living standardization processes to be updated, it is subject to future changes.

Users' perspectives are considered. For example, the analysis of influences of each item (development impact and chance to fill gaps) are stated.

2 Normative references

There are no normative references in this document.