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SYSTEMS REFERENCE DELIVERABLE

colour inside

Top priority standards development status in the domain of smart energy

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FOREWORD

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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- withdrawn,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.

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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.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1.1
actor
entity that communicates and interacts

Note 1 to entry: These actors can include people, software applications, systems, databases, and even the power system itself.

Note 2 to entry: In IEC SRD 62913 (all parts) [2], this term includes the concepts of Business Role and System Role involved in Use Cases.

[SOURCE: IEC 62559-2:2015, 3.2 [3]]

3.1.2
architecture model
generic tool intended to support the modelling activities for use cases, functions, architectures, in order to analyse and visualize them with respect to interoperability, domains and zones

3.1.3
cyber security
protection against unauthorized access, theft, and damage to hardware, software or electronic data (whether stationary or transported), detection of such deliberate or inadvertent events, and coping during such a deliberate or inadvertent event

3.1.4
demand response
action resulting from management of the electricity demand in response to supply conditions

[SOURCE: IEC 60050-617:2011, 617-04-16]

3.1.5
grid code
<electric power system> collection of rules concerning rights and duties of the parties involved in a certain part of the electric power system

[SOURCE: IEC 60050-617:2009, 617-03-03, modified – The term "code" has been replaced by "grid code".]

3.1.6
microgrid
group of interconnected loads and distributed energy resources with defined electrical boundaries forming a local electric power system at distribution voltage levels, that acts as a single controllable entity and is able to operate in either grid-connected or island mode

Note 1 to entry: This definition covers both (utility) distribution microgrids and (customer owned) facility microgrids.

[SOURCE: IEC 60050-617:2017, 617-04-22]

3.1.7
protocol
defined set of procedures adopted to ensure communication between sets of processes which exist within the same layer of a hierarchy of layers

[SOURCE: IEC 60050-716:1995, 716-01-17]

3.1.8
role based access
policy-neutral access control mechanism defined around roles and privileges

3.1.9
smart energy grid
means to generate, store and distribute energy using electricity as an energy vector connecting energies, thus comprising also energy transformation between electricity and the other energies, and vice versa

3.1.10
standardization case
case where additional standardization could improve smart energy technology, interoperability and market support

3.2 Abbreviated terms

BACS	building automation and control system
CIM	common information model
DA	distribution automation
DER	distributed energy resources
DERMS	distributed energy resource management system
e-vehicle	electric vehicle
HBES	home and building electric system
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
LV	low voltage
PV	photovoltaic system
SGAM	(1) smart grid architecture model (2) smart energy grid architecture model
SyC SE	systems committee Smart Energy

4 SyC Smart Energy development plan: development process

4.1 Purpose

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 over time. There are many new reasons for having new entries, such as (but not limited to):

- new market trends (which may create new entries but also delete entries because no longer of high priority);
- new technology;
- new organization of IEC or external entities, which may trigger some re-arrangement of works.

In order to address this, a process needs to be set formally. It has the goal to formalize:

– a way to collect new standardization cases;

– a way to rank these standardization cases (from the highest priority to the lowest) – a necessary step in order to allocate the effort of IEC SyC SE 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 1) to 4) and in Figure 1.

1) A set of recommendations [4] is obtained from the smart grid roadmap [1].
2) These recommendations are assessed and ranked by NCs and TCs in order to select key standardization cases.
3) Multiple scenarios are developed aiming at resolving these standardization cases and are checked considering advantages and disadvantages.
4) Final scenarios are selected and further refined in the development plan. These procedures are described in 4.2 to 4.4.

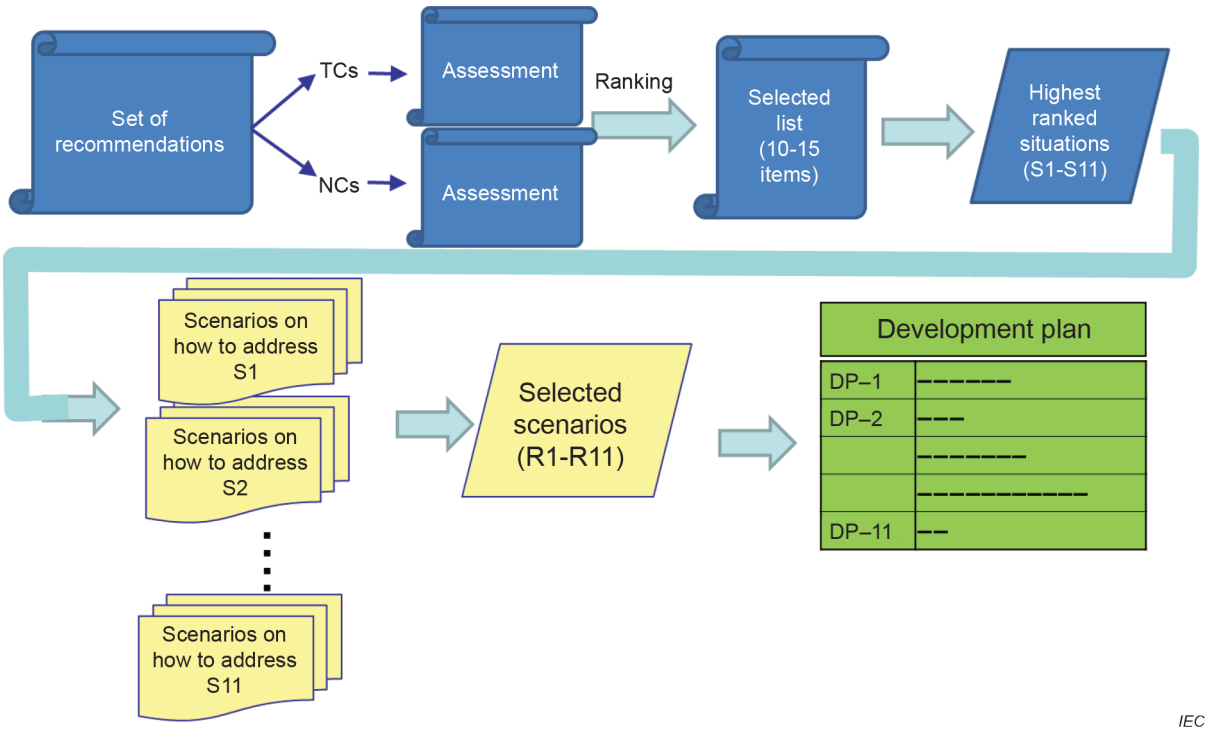

Figure 1 – Development plan overall process

By way of this iterative resolution process, the development plan version 1.3 was determined, as shown in Table 1.

Table 1 – List of selected items in the development plan version 1.3

No.	Selected items [a]
1	Increase profiling support
2	Connecting and managing DER standards
3	Installations with multiple power sources
4	Extensions to support dynamic system management
5	Guidance for IEC 61850 extensions
6	Promotion and expansion of IEC 61850-7-420
7	Cooperation of cross TCs for demand response applying to smart home and building automation systems
8	Standardization for interconnection and interoperability of large and distributed energy storage
9	Support for the long-term interoperability of IPv4 and IPv6
10	Guidelines of smart energy cyber security requirements
11	Extension of SGAM smart energy grid reference architecture

[a] Details of these items are given in SyCSmartEnergy/39e/INF [5].

4.2 Collection of standardization cases

There are many ways to collect inputs as "potential standardization cases", i.e. by identifying gaps or overlaps, or by recognizing other kinds of standardization needs potentially affecting the relevance of the IEC set of standards to fulfil the smart energy requirements.

Initially, the inputs mostly came from a former assessment performed by the IEC SG3 Smart Grids, formalized under its report "Release 1.0 of the IEC smart grid roadmap" [1], produced by IEC SG3 and then assessed in "IEC SyC1 Draft Set of Recommendations V3 0" [4]. At the end, more than 100 potential standardization cases were identified through this process.

4.3 Ranking process and results

4.3.1 General

The ranking process was published in "SyCSmartEnergy/37e/DC" [6].

4.3.2 Ranking criteria

Two main criteria for ranking the standardization were selected in order to ensure

- a quick answer from stakeholders, and
- a simple sorting and decision-making process.

At the end of the survey, a third criterion was used to evaluate the degree of consensus of the stakeholders.

As illustrated in Figure 2, the two criteria form the X and Y axes of a graph of each standardization case, while the size of the area indicates the degree of consensus.