# SLOVENSKI STANDARD
# oSIST prEN IEC 62933-4-4:2023

**01-maj-2023**

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**Električne naprave za shranjevanje energije (EES) - 4-4. del: Standard o okoljskih vprašanjih na osnovi baterijskih sistemov za shranjevanje energije (BESS) s ponovno uporabljenimi baterijami - Zahteve**

Electrical energy storage (EES) systems- Part 4-4: Standard on environmental issues battery-based energy storage systems (BESS) with reused batteries - requirements



**Ta slovenski standard je istoveten z:** **prEN IEC 62933-4-4:2023**

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**ICS:**

| | | |
|---|---|---|
| 27.010 | Prenos energije in toplote na splošno | Energy and heat transfer engineering in general |

**oSIST prEN IEC 62933-4-4:2023** **en**

# 120/304/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

| PROJECT NUMBER: | |
|---|---|
| **IEC 62933-4-4 ED1** | |
| DATE OF CIRCULATION: | CLOSING DATE FOR VOTING: |
| **2023-02-03** | **2023-04-28** |
| SUPERSEDES DOCUMENTS: | |
| **120/272/CD, 120/277B/CC** | |

| IEC TC 120 : ELECTRICAL ENERGY STORAGE (EES) SYSTEMS | |
|---|---|
| SECRETARIAT:<br>Japan | SECRETARY:<br>Mr Hideki HAYASHI |
| OF INTEREST TO THE FOLLOWING COMMITTEES:<br>SC 8A,TC 21,SC 21A,TC 69,TC 77,TC 111 | PROPOSED HORIZONTAL STANDARD:<br>☐<br>Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary. |
| FUNCTIONS CONCERNED:<br>☐ EMC ☒ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY | |
| ☒ SUBMITTED FOR CENELEC PARALLEL VOTING<br>**Attention IEC-CENELEC parallel voting**<br>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.<br>The CENELEC members are invited to vote through the CENELEC online voting system. | ☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING |



This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of

- any relevant patent rights of which they are aware and to provide supporting documentation,
- any relevant “in some countries” clauses to be included should this proposal proceed. Recipients are reminded that the enquiry stage is the final stage for submitting "in some countries" clauses. See AC/22/2007.

TITLE:

**Electrical energy storage (EES) systems- Part 4-4: Standard on environmental issues battery-based energy storage systems (BESS) with reused batteries – requirements**

PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

This CDV has been revised based on observations made by 120/277B/CC. Also, the title of this standard has been changed below to reflect his CH4 and CH5 observations of 120/277B/CC.

New tile of 62933-4-4:

"Environmental issues on battery-based energy storage systems (BESS) with reused batteries – requirements"

# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# Electrical energy storage (EES) systems

# Part 4-4: Environmental issues on battery-based energy storage systems (BESS) with reused batteries – requirements

## FOREWORD

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IEC 62933-4-4 has been prepared by subcommittee WG4: Environment issues, of IEC technical committee TC120: Electrical Energy Storage (EES) System. It is an International Standard.

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

| Draft | Report on voting |
|---|---|
| XX/XX/FDIS | XX/XX/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.

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

# INTRODUCTION

The increased use of renewable energy is enhancing the decarbonization of energy production by reducing CO2 emissions caused by the use of fossil fuels. The production of renewable energy with solar and wind power is however associated with large temporal output fluctuations.

This causes increased voltage and frequency instabilities in the power grid. These irregularities can be advantageously counteracted with battery-based energy storage systems (BESS).

Such battery-based energy storage systems can be assembled with reuse batteries coming from other electric energy storage installations or electric vehicles.

The reuse of batteries enhances all facets of the life cycle thinking (LCT) by reducing premature product obsolescence.

Reuse cells, modules or battery assemblies require a particular attention toward the possible impact on the environment they will have due to their state of being a pre-aged component.

The impacts to the environment resulting from reuse batteries are reviewed and appropriate requirements are defined.

This document complements, when reuse batteries are involved, the information and guidance provided by IEC TS 62933-4-1.

# ELECTRICAL ENERGY STORAGE (EES) SYSTEMS

# Part 4-4: ENVIRONMENTAL ISSUES ON BATTERY-BASED ENERGY STORAGE SYSTEMS (BESS) WITH REUSE BATTERIES - REQUIREMENTS

## 1 Scope

This part of the IEC 62933 series describes environmental issues when reuse batteries are considered for a BESS.

It provides details and requirements for identifying and preventing environmental issues in each life cycle stage i.e., from the design to the disassembly of such reuse batteries in a BESS.

## 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 TS 62933-4-1: Electric Energy Storage System – Part 4-1: Guidance On Environmental Issues.



## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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**
**battery energy storage system**
BESS
electrical energy storage system with an accumulation subsystem based on batteries with secondary cells

Note 1 to entry: Battery energy storage systems include flow battery energy systems.

[SOURCE: IEC 60050-631 :2021]

**3.2**
**reuse**
operations by which secondary batteries that are not waste and are used again in an application

Note 1 to entry: Reuse can be distinguished between refurbishing and repurposing.

**3.3**
**life-cycle thinking**
LCT
consideration of all relevant environmental aspects during the entire (product) life-cycle

[SOURCE: IEC Guide 109: definition 3.10 with modifications]

**3.4**
**life-cycle assessment**
LCA
compilation and evaluation of the inputs, outputs and the potential environmental impacts product system throughout its life cycle

[SOURCE: ISO 14040:2006, definition 3.2]

**3.5**
**environment**
surroundings in which a product or system exists, including air, water, land, natural resources, flora, fauna, humans and their interrelation



[SOURCE: IEC Guide 109:2012, 3.3]

**3.6**
**environmental aspect**
element of an organization's activities or products that can interact with the environment



Note 1 to entry: A significant environmental aspect has or can have a significant environmental impact.

[SOURCE: IEC Guide 109:2012, 3.4]

**3.7**
**environment impact**
change to the environment, whether adverse or beneficial, wholly or partly resulting from environmental aspects

[SOURCE: IEC Guide 109: 2012, 3.5, modified-The expression "an organization's" has been omitted]

**3.8**
**life cycle**
consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to the final disposal

[SOURCE: IEC Guide 109:2012, 3.8]

**3.9**
**installation**
One apparatus or set of devices and/or apparatuses associated in a given location to fulfil specified purposes, including all means for their satisfactory operation.

[SOURCE: IEC 60050-151: 151-11-26]

**3.10**
**service life**
total period of useful life of a cell or battery in operation

[SOURCE: IEC 60050-482: 482-03-46 – modified with - notes deleted]

**3.11**
**customer**
organization or person that receives a product or service

Note 1 to entry: The customer will be the user or a distributor.

[SOURCE: ISO 9000 with modification]

# 4 General

Batteries of the BESS accumulation subsystem can be derived from installations and systems where they have been operated with specific user profiles and environmental conditions for sizable periods of time. Details of these use conditions can be fragmentary or unknown, complicating the reuse of the batteries.

The following clauses provide guidance and requirements to properly select and use reuse batteries for a BESS and thus prevent premature failures and unwanted negative impacts on the environment.



# 5 Identifying environmental issues of EES systems



## 5.1 General

The guidance on general environmental aspects and their impacts caused by EES systems is given in IEC TS 62933-4-1.

Environmental aspects and requirements specific for the use of reuse batteries in the accumulation subsystem of a BESS, are addressed in the present document.

## 5.2 Guide for addressing environmental issues

ISO Guide 64 is addressing environmental issues in product standards and outlines the relationship between provisions in product standards and the environmental aspects and impacts of the product.

It recommends the use of life-cycle thinking when defining environmental provisions for a product for which a standard is drafted.

The following clauses in ISO Guide 64 are referred in this document.

- Clause 3. Basic principles and approaches
- Clause 4. Environmental aspects to be considered for systematically addressing in product standards
- Clause 5. Identifying product environmental aspects using a systematic approach.