SLOVENSKI STANDARD
SIST EN IEC 62934:2021

01-september-2021

Integracija omrežja proizvodnje energije iz obnovljivih virov - Izrazi in definicije

Grid integration of renewable energy generation - Terms and definitions

Netzintegration erneuerbarer Energieerzeugung - Begriffe, Definitionen und Symbole

Intégration de la production d'énergie renouvelable aux réseaux électriques - Termes et définitions

Ta slovenski standard je istoveten z: **EN IEC 62934:2021**

ICS:

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

SIST EN IEC 62934:2021 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62934

June 2021

ICS 27.010; 29.020

English Version

Grid integration of renewable energy generation - Terms and definitions (IEC 62934:2021)

Intégration de la production d'énergie renouvelable aux réseaux électriques - Termes et définitions (IEC 62934:2021)

Netzintegration erneuerbarer Energieerzeugung - Begriffe, Definitionen und Symbole (IEC 62934:2021)

This European Standard was approved by CENELEC on 2021-05-31. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62934:2021 E

European foreword

The text of document 8A/75/FDIS, future edition 1 of IEC 62934, prepared by SC 8A "Grid Integration of Renewable Energy Generation" of IEC/TC 8 "System aspects of electrical energy supply" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62934:2021.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2022-02-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2024-05-31

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62934:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61400-21-1:2019	NOTE	Harmonized as EN IEC 61400-21-1:2019 (not modified)
IEC 61400-27-1:2020	NOTE	Harmonized as EN IEC 61400-27-1:2020 (not modified)
IEC 61400-27-2:2020	NOTE	Harmonized as EN IEC 61400-27-2:2020 (not modified)

IEC 62934

Edition 1.0 2021-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Grid integration of renewable energy generation – Terms and definitions

Intégration de la production d'énergie renouvelable aux réseaux électriques – Termes et définitions

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 27.010; 29.020

ISBN 978-2-8322-9621-9

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

GRID INTEGRATION OF RENEWABLE ENERGY GENERATION – TERMS AND DEFINITIONS

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 62934 has been prepared by subcommittee 8A: Grid Integration of Renewable Energy Generation, of IEC technical committee 8: System aspects of electrical energy supply. It is an International Standard.

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

Draft	Report on voting
8A/75/FDIS	8A/79/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/standardsdev/publications.

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 document 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

The purpose of this terminology document is to provide terms and definitions for all publications under the responsibility of SC 8A. In this document, renewable energy generation is the electric power generation which uses renewable energy as its primary source for the conversion into electricity.

All SC 8A normative documents to be published should keep consistency with this International Standard (IS). This IS will be revised together with other SC 8A publications in order to avoid mismatches when necessary.

From the technical point of view, grid integration of renewable energy generation is a interdisciplinary complex technical field which is concerned with basic equipment, system integration, control and protection, operation and dispatch, market and trade and so on. Without a strong standardization of terminology, focal terms can have a different understanding by different countries, parties, and technical areas. Harmonised vocabulary is critical also from the market point of view. It impacts economics and this can become a barrier to commerce. The correct comparison among different options is fundamental, therefore basic terms and definitions impact economic decisions.

Several IEC product standards give definitions of certain terms which are necessary for the understanding of how to design, manufacture and use of those products. The International Electrotechnical Vocabulary (IEV, IEC 60050, http://www.electropedia.org) and the IEC Glossary (http://std.iec.ch/glossary) allow on-line access to this information.

Terms and definitions of this document have been harmonized with the IEV, the IEC Glossary and other IEC documents as far as possible. Definitions not included in this terminology standard may be found elsewhere in other IEC documents.

The use of abbreviations has been optimized, on the one hand to avoid tedious repetition and, on the other hand, to avoid confusion. A minimum set of abbreviations is identified in Clause 4 of this document; the other terms are written out in full spelling when needed.

GRID INTEGRATION OF RENEWABLE ENERGY GENERATION – TERMS AND DEFINITIONS

1 Scope

This terminology document provides terms and definitions in the subject area of grid integration of renewable energy generation. The technical issues of grid integration mainly focus on the issues caused by renewable energy generation with variable sources and/or converter based technology, such as wind power and photovoltaic power generation. Some renewable energy generations such as hydro power and biomass power with a relatively continuously available primary energy source and a rotating generator are conventional sources of generation, and are therefore not covered in this document.

The intention of this document is to answer the question "what do the words mean" and not "under what conditions do the terms apply".

2 Normative references

There are no normative references in this document.

3 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 Terms and definitions for renewable energy generation

3.1.1
renewable energy
RE
primary energy, the source of which is constantly replenished and will not become depleted

Note 1 to entry: Examples of renewable energy are: wind, solar, geothermal, hydropower, etc.

Note 2 to entry: Fossil fuels are non renewable.

[SOURCE: IEC 60050-617:2009, 617-04-11 modified, examples of renewable energy are added in Note 1 to entry."]

3.1.2
variable renewable energy
VRE
subset of renewable energy, the source of which is not continuously available and cannot be stored or controlled

EXAMPLE Wind energy, solar energy, wave energy.

3.1.3
renewable energy generation
generation of electrical energy, which uses renewable energy as the primary energy source for the conversion into electricity

3.1.4
variable renewable energy generation
subset of renewable energy generation, which uses variable renewable energy as the primary energy source for the conversion into electricity

EXAMPLE Wind power generation, photovoltaic power generation, concentrated solar power generation, wave power generation.

Note 1 to entry: The primary energy from variable renewable energy sources is in most cases not able to be stored and therefore the electricity generated is constrained by the availability of the energy source.

3.1.5
renewable energy generating unit
REGU
smallest set of equipment which can generate electricity from renewable energy and can feed the electricity into an electric power network

Note 1 to entry: Several typical forms of renewable energy generating unit are shown in Annex A.

3.1.6
renewable energy power plant
collection of renewable energy generating units connected to an electric power network through one or more points of connection, including auxiliaries and connection equipment

Note 1 to entry: Two typical forms of renewable energy power plant are shown in Annex A.

3.1.7
power collection system
<renewable energy power plant> electrical system that collects the electricity from at least one renewable energy generating unit and feeds this electricity into an electric power network, usually comprising transformers and overhead lines or cables

3.1.8
substation
plant substation
<renewable energy power plant> transformer substation or switching substation of a renewable energy power plant through which the output power of all generating units is transmitted to the electric power network

3.1.9
point of generating unit connection
PGUC
point that is part of the generating unit and identified by the manufacturer as a reference point at which the generating unit is connected to the power collection system

3.1.10
point of connection
POC
reference point on the electric power network where the user's electrical facility is connected

[SOURCE: IEC 60050-617:2009, 617-04-01]

3.1.11
point of common coupling
PCC
point in an electric power system, electrically nearest to a particular load or the POC of a power plant, at which other loads/power plants are, or may be, connected

Note 1 to entry: These loads can be either devices, equipment or systems, or distinct customer's installations.

[SOURCE: IEC 60050-614:2016, 614-01-12, modified – "or the POC of a power plant" is added and "network users' installations" is changed to "customer's installations"]

3.1.12
cluster
<renewable energy power plant> two or more neighboring renewable energy power plants which are connected to the electric power network via a common substation

Note 1 to entry: Typical form of cluster is shown in Annex A.

3.1.13
distributed energy resources
DER
generators (with their auxiliaries, protection and connection equipment), including loads having a generating mode (such as electrical energy storage systems), connected to a low-voltage or a medium-voltage network

[SOURCE: IEC 60050-617:2017,617-04-20]

3.1.14
distributed generation
DG
generation of electric energy by multiple sources which are connected to the power distribution system

[SOURCE: IEC-60050-617:2009, 617-04-09]

3.1.15
virtual power plant
VPP
group of distributed energy resources and controllable loads which combine to function as a dispatchable unit

Note 1 to entry: A virtual power plant can be used for the purpose of participating in the electricity market or aggregating ancillary services.

[SOURCE: IEC 60050-617:2017, 617-04-27, modified − controllable loads are included in the definition since they form an essential part of virtual power plant]

3.2 Terms and definitions for grid aspects and requirements

3.2.1
power system

3.2.1.1
electric power system
electricity supply system
< broad sense> all installations and plant provided for the purpose of generating, transmitting and distributing electricity

[SOURCE: IEC 60050-601:1985, 601-01-01]

3.2.1.2
electric power network
particular installations, substations, lines or cables for the transmission and distribution of electricity

Note 1 to entry: The boundaries of the different parts of this network are defined by appropriate criteria, such as geographical situation, ownership, voltage, etc.

[SOURCE: IEC 60050-601:1985, 601-01-02]

3.2.1.3
bulk power system
BPS
bulk electricity system
portion of the electric power system comprising the facilities used for the generation and transmission of electric energy

Note 1 to entry: The extent of the bulk power system is usually limited to the means for production and transmission of electric energy to major industrial and distribution centers.

Note 2 to entry: In English, the term "composite system" is also used for this concept.

[SOURCE: IEC 60050-601:1985, 601-01-33]

3.2.2
electrical quantities

3.2.2.1
nominal voltage
U_n
<power plant> value of the voltage (line to line) by which a power plant is designated and identified, usually defined at the POC

[SOURCE: IEC 60050-826:2004, 826-11-01, modified − supplementary information is added to indicate that the nominal voltage of a power plant is usually defined at the point of connection]

3.2.2.2
rated power
rated active power
maximum continuous power output which a renewable energy generating unit or plant is designed to achieve under normal operating conditions

Note 1 to entry: In some standards and grid codes this term is referred as "rated capacity".

[SOURCE: IEC 60050-415:1999, 415-04-03, modified – "wind turbine" is changed to "renewable energy generating unit or plant" to adapt the scope of this standard]

3.2.2.3
nominal active power
P_n
nominal value of the active power generation of a renewable energy generating unit or power plant, which must be stated by the manufacturer or the designer

Note 1 to entry: It is used as a base for calculating quantities in relation to that generating unit or power plant.

3.2.2.4
nominal apparent power
S_n
apparent power from a renewable energy generating unit or power plant while operating at nominal current and nominal voltage and frequency within the maximum permissible reactive power