



SLOVENSKI STANDARD
oSIST prEN 16325:2023

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Potrdilo o izvoru energije - Potrdilo za električno energijo, plinaste ogljikovodike, vodik ter ogrevanje in hlajenje

Guarantees of Origin related to energy - Guarantees of Origin for Electricity, gaseous hydrocarbons, Hydrogen, and heating & cooling

Herkunftsnachweise im Energiebereich - Herkunftsnachweise für Elektrizität, gasförmige Kohlenwasserstoffe, Wasserstoff sowie Wärme und Kälte

Garanties d'origine liées à l'énergie - Garanties d'origine de l'électricité, des hydrocarbures gazeux, de l'hydrogène, du chauffage et du refroidissement

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

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/CLC/JTC 14.

If this draft becomes a European Standard, CEN and 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.

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

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation. Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European foreword

This document (prEN 16325:2022) has been prepared by Technical Committee CEN/CLC/JTC 14 “Energy management and energy efficiency in the framework of energy transition”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 16325:2013+A1:2015.

In comparison with the previous edition, the following technical modifications have been made:

- the scope of the document is extended to guarantees of origin of several gaseous energy carriers and heating and cooling.

This document will establish the relevant terminology and definitions, and requirements for the registration, issuance, transfer and cancellation of GOs in line with the following directives:

- Directive 2018/2001/EU on the promotion of the use of energy from renewable sources,
- Directive 2019/944/EU on common rules for the internal market for electricity,
- Directive 2012/27/EU on energy efficiency,

and other relevant European Union law.

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Introduction

General

This document sets out how Guarantees of Origin (GOs) are standardized in line with relevant European (EU) directives and existing voluntary schemes. The aim of the standard is, therefore, to create a standardized transferable GO that can be used to facilitate the disclosure of the origin of energy, the identification of particular energy sources, to its final customer, including by labelling schemes, like environmental/ecological labels. For the purpose of the Renewable Energy Directive (2018/2001/EU, often referred to as RED II), a GO means an electronic document which has the sole function of providing evidence to a final customer that a given share or quantity of energy was produced from renewable sources. A GO may serve other purposes where Member States have arranged to have GO's for other types of energy.

There is a growing demand from final customers for energy that can be reliably certified. Electricity suppliers are required to provide reliable disclosure information to final customers on the origin of the energy they supplied them. The EU GO system already meets many of the needs of these stakeholders and revising the EN 16325 standard on GOs can further strengthen the current system.

The EN 16325 standard on GOs is being revised to ensure that it fulfils the requirements of the recast Renewable Energy Directive (2018/2001/EU), the Directive on common rules for the internal market for electricity (2019/944/EU), the Directive on Energy Efficiency (2018/844/EU) and other relevant European laws. The revised standard will provide a basis for the further development of energy attribute tracking in the EU, to achieve greater harmonization between the national systems of EU Member States and EEA countries.

GOs are certificates which are tracked through a book and claim system and which thereby underpin the trading and disclosure of energy. The Renewable Energy Directive and Directive on Energy Efficiency require Member States to recognize a GO issued by another Member State unless it has “well-founded doubts about its accuracy, reliability, or veracity” (RED II - Art. 19.9). Further, the system should prevent double-counting and be resistant to fraud. Therefore, a European Standard for GOs for all member states is important. As per the revised Renewable Energy Directive, the content of the standard applies to energy from renewable sources, be it “electricity, or gas, including hydrogen, or heating or cooling” (RED II - Art. 19.7). The content of this standard can also be applied for energy from non-renewable sources.

The elaboration and publication of European Standards will allow certification bodies to develop their activities on consensual and recognized practices and this will increase the credibility of the certificates they deliver.

Description of the Guarantee of Origin system and its components

Basic description of the GO system and its components

The purpose of a guarantee of origin (GO) system is to track the attributes of a given megawatt-hour (MWh) of energy from generation/production to consumption. In doing so, the system allows final customers to know the origin of the energy supplied to them. For instance, this enables those final customers to choose to consume/use energy from renewable sources or to consume/use decarbonised and low-carbon energy. This is accomplished by energy producers or generators requesting the issuance of a GO for each MWh of energy they produce/generate. These GOs can then be traded until they are cancelled by/for a final customer. This cancellation allows the final customer to state that they have used this unit of energy. The underlying goal of GOs is to facilitate consumer choice, which indirectly could act as a market incentive for renewable production.

The guarantee of origin system for electricity was first legislated for at European level in Article 5 of Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market. This article was later amended by Article 15 of the Renewable Energy Directive 2009/28/EC (often referred to as RED I). Article 15.1 states that “...Member States shall ensure

that the origin of electricity produced from renewable sources can be guaranteed... for the purpose of proving to final customers the share or quantity of energy from renewable sources in an energy supplier's energy mix". Renewable Energy Directive 2018/2001/EU, in Art. Nineteen extended the scope of GOs to cover gas (including hydrogen) as well as heating and cooling. The existing Energy Type Electricity is therefore extended to include the Energy Type Gas and Heating and Cooling:

- a) Electricity
- b) Gas
- c) Heating and Cooling

Article 14.10 of the Energy Efficiency Directive determines that upon request, a Member State shall issue a GO for Electricity produced from High-Efficiency Cogeneration, for the purpose of demonstrating that such production method leads to savings of primary energy used.

At the time of revision of this EN 16325 standard in 2020, the European energy market has adopted the GO system for electricity initiated by the first Renewable Energy Directive (2001/77/EC) and updated in the second and third one (2009/28/EC and 2018/2001/EC).

A guarantee of origin system consists of certain basic components, which relate to the verification of the underlying information, accurate generation of data, secure and electronic GO transfer as well as the use of GOs for cancellation and disclosure. These basic components ensure accurate attribute tracking and the avoidance of double disclosure, when the same unit of (renewable or decarbonised/low-carbon) energy is disclosed more than once. Table 1 describes how these basic components relate to the GO life-cycle.

Table 1 Main components of a GO system

Account Holder Registration	Prevent access of fraudulent actors	Competent body
	Ensure rule-compliance contractually	
Production Device Registration	Verify plant data	
	Ensure data maintenance and re-verification	
GO issuing	Base issuing on verified meter readings	
	Verify shares of energy origin in multi-fuel plants	
GO transfer	Secure and electronic transfer independently from the physical energy or energy trading	
	Non-mutability and uniqueness of certificate data	
GO cancellation	GO as the sole instrument to disclose renewable energy to consumers	
Disclosure	Disclosure of the energy origin sold/consumed	
	Where applicable, calculation of the residual mix and obligation to use it for untracked energy	

Account Holder registration

GOs are held in accounts of electronic registries which are managed by Issuing Bodies. Only legitimate companies (legal persons) with the intention of participating in the GO market (e.g. producers, traders and/or energy suppliers, end users of energy) are permitted to register as GO account holders. By setting a registration process and required documentation for account holders, the Competent Body or Bodies, Disclosure Authority of each country makes the necessary steps to block fraudulent actors accessing the market. Some countries may, at their discretion, limit access to the GO registry further to e.g. to energy

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market actors alone established in the national territory. After a successful registration process, an account holder gains secure access to its GO account(s).

Production Device registration

Issuing of GOs is based on measured energy output from registered Production Devices. For this purpose, all Production Devices, the owner/operator of which requests issuance of GOs, are registered in the GO registry. Prior to the approval of a registration, a Competent Body or its agent verifies the registered standing data (such as age, capacity, location, technology, energy medium) of the Production Device. Periodically, the registration information is re-verified to ensure the up-to-date accuracy of the data.

GO Issuing

Issuing of GOs is made periodically (typically every month) for measured energy output from registered Production Devices. In most countries, the energy output data are derived from Transmission or Distribution System Operator's data (e.g. imbalance settlement), which automatically portrays the accurate amount of energy production netted from auxiliary consumption. Where (rarely) this is not the case, the production data might come straight from the producer, in which case the Competent Body takes the necessary additional steps to ensure the accuracy of the data (e.g. by verification of the metering diagram).

For Production Devices producing energy from multiple energy sources (e.g. certain combined heat and power plants), the measured total energy output is distributed to each energy source through a verified declaration of the shares of different energy sources used in production. GOs are then issued for output from each energy source in proportion to their share so that each GO only records one energy source. The declaration process might cause a time lag of several months for the issuance of GOs from multi fuel plants.

Issued GOs are deposited on the GO Account(s) of registered Account Holders. Each GO represents a value of 1 MWh of energy and the information content of a GO, the attributes of the unit of energy, consists of the standing information of the Production Device as well as information specific to the production such as the energy source, production time, received support). Once the GO is issued, the information contained on a GO is immutable (apart from possible error correction). The Competent Body ensures through contractual and other means that the same energy origin is not tracked by any other means (e.g. contractually or through another tracking system).

GO Transfer

Account Holders may access their GO Accounts to perform transactions such as the transfer of a GO to another Account Holder's account. GOs may be transferred independently from the transfer of the energy to which they relate (2018/2001/EC, preamble 55).

GO Cancellation

The Cancellation (use) of a GO enables a claim on the origin of the energy supplied to a final customer. Cancellation hence means the realization of the value of the GO for the Disclosure of energy origin to a final customer. An Account Holder who performs a Cancellation unambiguously designates the sold/consumed energy to which the Cancellation relates. This may imply a certain (renewable or decarbonised/low-carbon) energy product or the generic mix of a supplier in a given year.

GO transfers between Account Holder's in countries

between which no communication interface exists are handled usually through a process called ex-domain cancellation, where a GO is cancelled in one country for disclosure of the energy origin of the energy sold or consumed in another country.

Energy disclosure and residual mix

Each electricity supplier is obliged to disclose to its customers the energy origin of electricity sold (2018/2001/EU, Article 19.8). This process, called "Disclosure", is the purpose of GOs. GOs are used by energy suppliers, and, in some countries, by consumers to self "green" the "regular" energy supplied to

them by a supplier or directly purchased from e.g. an energy exchange. Sale of energy from renewable energy origin shall take place accompanied by the cancellation of a GO¹.

The legal basis for a similar disclosure obligation exists to some extent for district heating and cooling (see 2018/2001/EU, Article 24.1) and can be found for other types of energy in 2018/2001/EU, Article 19.8 paragraph 2. In order to avoid double claims on the origin of the same amount of energy, a disclosure scheme linked to the cancellation of guarantees of origin is needed for all energy carriers for which a GO system is introduced. No requirement exists for disclosure of the energy origin of gas at the time of drafting this revised standard.

Residual Mix is the energy source mix excluding tracked energy generation attributes from the generation mix. The concept of residual mix is an integral part of any energy origin disclosure system based on the book-and-claim principle. The introduction of a GO (= book-and-claim) system provides a way to supply energy with specified attributes, but also impacts the remaining attributes of energy supplied without a GO. A residual mix is a logical consequence of implementing energy attribute tracking as it ensures that the attributes represented by GOs are not double disclosed to other consumers through an implicit mix. The use of uncorrected generation statistics for purposes of disclosure should be avoided. For the time being a residual mix is only mandatory for electricity, but the same methodology should be extended for other energy carriers as GO and disclosure systems for other energy carriers develop.

Electricity disclosure information provided by energy suppliers to their customers is verified by a Disclosure Supervisory Body to ensure a) that a sufficient amount of GOs has been cancelled corresponding to the suppliers' disclosure statements and b) that for the remaining part of disclosure the residual mix² is correctly applied.

Complementing EN 16325 for agile response in changing circumstances

This standard covers the essential building blocks for a reliable system of guarantees of origin, and a basis for reliable disclosure of the origin of energy. For efficiency of operation and deeper quality assurance, harmonization of detailed processes is recommended, although such details may require frequent updates e.g. to keep pace with developments in the market, and national policies.

There is need for a trade-off between the stability of a formalized standard and the more flexible additional agreements that can be made between issuing bodies.

Ideally, this is done in a single platform where issuing bodies share experiences and concerns, and jointly make decisions on the updates. A clear process for such decision-making between GO issuing bodies, enables agile response to changing circumstances for GO system management.

¹ Only exceptions include governmental support schemes and remaining shares of renewable energy attributes in the residual mix.

² or possible contractual tracking for non-renewable attributes.

1 Scope

This document specifies requirements for Guarantees of Origin (GOs) of Electricity several gaseous Energy Carriers, and Heating and Cooling. This document will establish the relevant terminology and definitions, and requirements for the registration, issuance, transfer and cancellation of GOs in line with the following directives: Renewable Energy Directive (2018/2001/EU), the Directive on common rules for the internal market for electricity (2019/944/EU), the Directive on Energy Efficiency (2012/27/EU) and other relevant European Union law. This document will also cover measuring methods and auditing procedures.

Out of scope of this document is GO recognition by Member States.

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.

ISO 13443, *Natural gas – standard Reference conditions*

ISO 20675, *Biogas - Biogas production, conditioning, upgrading and utilization - Terms, definitions and classification scheme*

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:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

account

record on a *registration database* (3.54) relating to a particular *account holder* (3.2) in which *GOs* (3.33) are held

3.2

account holder

person or organisation in respect of whom an *account* (3.1) is maintained on a *registration database* (3.54)

3.3

affiliate

stakeholder assigned by the expression “related undertaking” by the IEMD (in relation to the electricity market) and directive (EU) 2009/73 (in relation to the gas market)

3.4

alteration

correction by the *competent body* (3.12) of any data of a *GO* (3.33) where an error has been introduced upon issuing the *GO* (3.33) or during the processing the *GO* (3.33)

3.5 auxiliary

item of the *production device* (3.50) that is required for the functional operation of that *production device* (3.50) that consumes energy

Note 1 to entry: An auxiliary can consume output produced by that production device.

Note 2 to entry: An auxiliary can consume energy in the form of any energy carrier.

Note 3 to entry: Energy consumed by an auxiliary used to facilitate the process is other energy than input and is thus not converted into the output.

3.6 authorised measurement body

person or organization responsible for collecting and determining (on behalf of the *registrant* (3.53)) measured values of the *import meter(s)* (3.36) and *export meter(s)* (3.29) of a *production device* (3.50), and which has been either:

- appointed under a *domain GO scheme* (3.20); or
- appointed by a competent body (3.12) as its *agent* (3.13);

for the purpose of measuring energy

3.7 attribute

data field specifying the characteristics of an energy unit produced by a *production device* (3.50) in terms of the *input(s)* (3.37) used and/or the details (standing data) of that *production device* (3.50) and production process

3.8 biomass

biodegradable fraction of products, waste, and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin

3.9 cancel

mark, at the request of the holder of the account on which it is held, a *GO* (3.33) as having been used for the purpose of *disclosure* (3.16) of consumed energy, and to prevent it from subsequently being:

- transferred to another account; or
- marked again in this way

3.10 cancellation statement

electronic, non-transferrable receipt which provides evidence of the cancellation of one or more *GOs* (3.33) for the purpose of *disclosure* (3.16) of the *attributes* (3.7) of those *GOs* (3.33) for the beneficiary or beneficiaries of the cancellation

3.11 cogeneration

simultaneous generation of thermal energy and electrical and/or mechanical energy in a single process

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3.12

competent body

body duly authorised under the laws and regulations of any state (and, as the case may be, region) to exercise or discharge any legislative, governmental, regulatory, administrative or supervisory function associated with the administration of a *domain GO scheme* (3.20)

3.13

competent body's agent agent

person or organisation engaged by a *competent body* (3.12) to perform on its behalf any of its functions associated with the administration of a *domain GO scheme* (3.20)

3.14

consumption declaration

declaration with respect to the *inputs* (3.37) of a *production device* (3.50), including energy used in storing energy to be used by that *production device* (3.50)

3.15

conversion issuance

issuance of a *GO* (3.33) for *output* (3.46) resulted from *energy carrier conversion* (3.23), and for which *GOs* (3.33) representing the *attributes* (3.7) of the *input* (3.37) to that *production device* (3.50) have been cancelled

3.16

disclosure

provision of information to a final customer on the share or quantity of the energy supplied to them as having specific *attributes* (3.7)

3.17

disclosure authority

competent body (3.12) charged with supervision of origin disclosure in its *domain* (3.19), comprising tasks like e.g.:

- verifying the accuracy and veracity of *disclosure statements* (3.18); and
- applying corrective measures with regard to *disclosure statements* (3.18) that do not conform to the requirements of the relevant *domain GO scheme* (3.20), and
- calculating the *residual mix* (3.61) and possibly other fuel mixes, where applicable

3.18

disclosure statement

information provided as a result of *disclosure* (3.16)

3.19

domain

geographic area containing *production devices* (3.50) with respect to which an *issuing body* (3.39) is responsible for issuing *GOs* (3.33) for the relevant *energy carrier* (3.22)

3.20

domain GO scheme GO scheme

legislative, regulatory, administrative, supervisory, and contractual framework, in relation to any *domain* (3.19), establishing a system for issuing, registration, and cancellation of *GOs* (3.33) and for *disclosure* (3.16) in that *domain* (3.19)

3.21**domain GO scheme participant
GO scheme participant**

registrant (3.53) and/or an *account holder* (3.2)

3.22**energy carrier**

substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes and the means by which it is conveyed

3.23**energy carrier conversion
conversion**

production of an *energy carrier* (3.22) in a *production device* (3.50) from one or more *inputs* (3.37) including at least one other *energy carrier* (3.22)

3.24**energy efficiency directive
EED**

directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC

3.25**energy input factor**

proportion (relating to the energy content and expressed as a factor of not more than one) of the *output* (3.46) of a *production device* (3.50) which is from a single type of *input* (3.37)

3.26**energy storage
storage**

device or system that is used to store energy, where the *energy carrier* (3.22) injected into that device or system is the same as the *energy carrier* (3.22) that flows out of it

Note 1 to entry: For the purpose of this standard, energy carrier conversion is not to be understood as energy storage.

3.27**expiry**

cessation of a *GO* (3.33) being eligible for transfer or cancellation, as a consequence of the passage of a given period of time since the production of the associated energy, in accordance with subclause 4.9.4

3.28**fuel index**

minimum mole fraction of a certain compound in a gas mix

Note 1 to entry: The index is determined by subtracting the total of all other gases expressed in mole percent, from 100 mol percent.

3.29**export meter**

one or more device(s) and supporting arrangements for determining (in whole or in part) the quantity of *output* (3.46) flowing from a *production device* (3.50) to the point where the *output* (3.46) is to be made available

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3.30

GO issuing request

request by the authorised representative of a *production device* (3.50) to an *issuing body* (3.39) for the *issue* (3.38) of *GOs* (3.33) in respect of that *production device* (3.50) and a specific period of time

3.31

energy type

the energy to which a *GO* (3.33) relates, being *electricity* (3.31.1), *gas* (3.31.2) or *heating and cooling* (3.31.3)

3.31.1

electrical energy**electricity**

energy made available by the flow of electric charge through a conductor

3.31.2

gas

energy type (3.31) comprising all gaseous *energy carriers* (3.22) that consist of a chemical compound being in a gaseous state at 15°C and atmospheric pressure (101,325 kPa)

Note 1 to entry: In the context of this standard gaseous energy carriers are hydrogen, methane, ethane, propane, butane, ammonia, dimethylether (DME) and unspecified gas.

3.31.2.1

unspecified gas

energy carrier (3.22) or mix of *energy carriers* (3.22) for which the *fuel index* (3.28) is not specified

3.31.2.2

hydrogen

energy carrier (3.22) of which the energy content is derived from the chemical compound H_2

3.31.2.3

methane

energy carrier (3.22) of which the energy content is derived from the chemical compound CH_4

3.31.2.4

ethane

energy carrier (3.22) of which the energy content is derived from the chemical compound C_2H_6

3.31.2.5

propane

energy carrier (3.22) of which the energy content is derived from the chemical compound C_3H_8

3.31.2.6

butane

energy carrier (3.22) of which the energy content is derived from the chemical compound C_4H_{10}

3.31.2.7

ammonia

energy carrier (3.22) of which the energy content is derived from the chemical compound NH_3

3.31.2.8

dimethylether**DME**

energy carrier (3.22) of which the energy content is derived from the chemical compound C_2H_6O

3.31.3**heating and cooling**

energy type (3.31) which has the purpose of adding or deducting thermal energy

3.32**gross energy production**

total energy production of a *production device* (3.50)

3.33**guarantee of origin****GO**

electronic document relating to the *attributes* (3.7) for a specific amount of energy issued by an *issuing body* (3.39) under a *domain GO scheme* (3.20) with the purpose of disclosure (3.16)

3.34**high-efficiency cogeneration**

cogeneration which meets the criteria of Annex II of the *energy efficiency directive* (3.24)

3.35**Internal Market in Electricity Directive****IEMD**

directive 2003/54/EC of the European Parliament and the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC

Note 1 to entry: Directive 2003/54/EC has been replaced by directive 2009/72/EC and then by directive (EU) 2019/994 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU

3.36**import meter**

one or more device(s) and supporting arrangements for determining (in whole or in part) the quantity of total *input* (3.37) per *energy carrier* (3.22) flowing into a *production device* (3.50)

3.37**input**

amount of energy from a specific energy source or material goods consumed by a *production device* (3.50) for the production of *output* (3.46)

3.38**issue**

process of creating (as a *GO* (3.33)) an *account* (3.1), i.e. a record in a *registration database* (3.54)

3.39**issuing body**

competent body (3.12) or *competent body's agent* (3.13) responsible for:

- registering *production devices* (3.50) and *account holders* (3.2) in a *registration database* (3.54);
- collecting measured values from *authorized measurement bodies* (3.6);
- issuing *GOs* (3.33) ; and
- enabling and registering transfers and cancellation of *GOs* (3.33)