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The Energy Authority: Instructions for certifying and disclosing the origin of electricity

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Version history (of the Energy Authority)

Version number	Date	Main changes
1.0	31 October 2022	First version
1.1	8 November 2022	Changes to sections 6 and 7.3

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These instructions were drawn up to explain the provisions imposed on electricity suppliers, electricity producers and other electricity users by the Act on Guarantees of Origin for Energy, applying to the obligation to certify and disclose the origin of electricity. The instructions are general in nature and do not contain legally-binding interpretation guidelines. Due to the ex-post nature of the Energy Authority's supervision, the Authority may take a formal position on the legality of a certain action by issuing an administrative decision applying to the individual matter.

The texts in italics are direct quotes from the Act on Guarantees of Origin for Energy.

1 Introduction

The Act on Guarantees of Origin for Energy (1050/2021) took effect on 3 December 2021, repealing the previous Act on the Certification and Disclosure of the Origin of Electricity (1129/2003). The new act expanded the scope of regulations on guarantees of origin to encompass gas and hydrogen produced from renewable energy in accordance with the Renewable Energy Directive in addition to electricity, as well as heating and cooling. Guarantees of origin are also issued for electricity produced by nuclear power and for waste heat and cold. The Act seeks to give customers more options to influence the origin of the energy they consume via a reliable system.

Guarantees of origin may be issued for electricity produced from renewable energy sources, nuclear power and high-efficiency cogeneration. If electricity is produced by high-efficiency cogeneration using renewable energy sources, only renewable energy guarantees of origin are issued for the electricity. In addition, guarantees of origin cannot be issued for electricity consumed by a power plant's auxiliaries.

The standard unit of guarantees of origin is one megawatt-hour, and guarantees are issued monthly upon request to production plants based on the volume of energy produced. If the volume of production in a calendar month is less than one megawatt-hour, guarantees of origin will be issued in the calendar month when the combined production is at least one megawatt-hour. Guarantees of origin of energy are issued by the administrator of the guarantee of origin register with overall system responsibility if the energy production method is verified in accordance with the law and the applicant for the guarantee of origin has disclosed the information required by the registry administrator for a guarantee of origin. Finextra Oy, owned by the transmission system operator Fingrid, administers the guarantee of origin register for electricity

2 Key definitions[1]

This chapter describes the concepts related to the issuing of guarantees of origin.

2.1 Guarantee of origin

Act on Guarantees of Origin for Energy, section 2: *Guarantee of origin means an electronic document which has the function of providing evidence that a given share or quantity of energy has been produced from renewable energy sources, nuclear power, high-efficiency cogeneration or waste heat or cold.*

2.2 Auxiliaries

Act on Guarantees of Origin for Energy, section 2: *Auxiliaries means devices and machinery that a power plant requires to produce electricity or electricity and heat, and to maintain production capacity or to eliminate or reduce adverse environmental effects resulting from the power plant, and provisions on which are laid down in provisions issued under section 2 of the Act on Excise Duty on Electricity and Certain Fuels (1260/1996).*

2.3 Residual mix of electricity

Act on Guarantees of Origin for Energy, section 2: *Residual mix for electricity means the total annual energy mix in electricity production for a Member State, excluding the share covered by cancelled guarantees of origin.*

2.4 High-efficiency cogeneration

Act on Guarantees of Origin for Energy, section 2: *High-efficiency cogeneration means cogeneration meeting the criteria laid down in Annex II of Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.*

2.5 Electricity from high-efficiency cogeneration

Act on Guarantees of Origin for Energy, section 2: *Electricity from high-efficiency cogeneration means electricity generated in a process linked to the production of useful heat and calculated in accordance with the methodology laid down in Annex I of the Energy Efficiency Directive.*

2.6 Renewable energy source

Act on Guarantees of Origin for Energy, section 2: *Renewable energy sources means energy from renewable non-fossil sources, namely wind and solar energy, geothermal energy, ambient energy, tide and wave energy and other ocean energy, hydroelectric power as well as biomass, landfill and sewage treatment plant gas, and biogas.*

[1] Act on Guarantees of Origin for Energy, sections 2 and 3

2.7 Electricity from renewable energy sources

Act on Guarantees of Origin for Energy, section 2: *Electricity from renewable energy sources means electricity produced by power plants using only renewable energy sources, as well as the share of electricity produced from renewable energy sources in power plants using renewable and non-renewable energy sources.*

2 Issuing guarantees of origin for electricity produced from waste

According to the definitions in the Act on Guarantees of Origin for Energy, renewable energy sources include biomass and gas and biogas from landfills and wastewater treatment plants.

According to RED II Article 2(2)(24), biomass means the biodegradable fraction of products, waste and residues of 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. According to RED II Article 2(2)(28), biogas means gaseous fuels produced from biomass.

The biodegradable fraction is difficult to determine, especially for municipal and mixed waste. The Energy Authority's view is that the biodegradable fractions assumed in mixed fuels under Statistics Finland's fuel classification can be used when issuing guarantees of origin for electricity produced using mixed fuels if no more accurate information is available concerning the biodegradable fraction.

Mixed fuels are the fuels listed in group 31 (Mixed fuels) of Statistics Finland's fuel classification. The biodegradable fractions stated in the most recent Statistics Finland fuel classification should be used to determine the biodegradable fractions of fuels.

If a power plant burns mixed fuels and is within the scope of emissions trading, the biomass fraction of the fuel should be determined using the method required for the emissions permit when applying for guarantees of origin.

3 Obligation to certify the origin of electricity

Act on Guarantees of Origin for Energy, section 7:

An electricity supplier that sells to an electricity user electricity from renewable energy sources or from nuclear power shall certify the origin of the electricity from renewable energy sources and from nuclear power that it sells. The quantity or share of electricity from renewable sources and from nuclear power of the electricity sold shall be certified, no later than on the date determined by the supervisory authority, with a corresponding number of guarantees of origin cancelled in accordance with the provisions laid down in section 12.

An electricity producer that in its business activities other than those relating to electricity sales discloses to its customers information about the origin of electricity that it uses shall certify the origin of electricity from renewable energy sources and from nuclear power in accordance with subsection 1.

An electricity user that in its marketing discloses that the electricity it uses is from renewable energy sources or from nuclear power shall certify the origin of the electricity in accordance with subsection 1 or shall be otherwise able to demonstrate that it has used electricity certified in accordance with subsection 1. An electricity user that produces for its own use electricity from renewable energy sources in an electricity generating facility with a rated power below one megavolt-ampere or a power plant consisting of multiple generating facilities and that discloses in its marketing that the electricity it uses is from renewable energy sources need not certify the origin of the electricity used and produced by itself with a corresponding quantity of cancelled guarantees of origin if no guarantees of origin have been applied for relating to the electricity in question.

Electricity suppliers, electricity producers and electricity users should certify the origin of electricity that they declare to originate from renewable energy sources or nuclear power in their business activities. Certification occurs by cancelling guarantees of origin of electricity in a quantity corresponding to the amount of electricity that the entity declares to originate from renewable energy sources and nuclear power. Cancellation must take place without undue delay in writing or by another method approved by Fingrid (the registrar) for the purpose of use of the guarantee of origin in accordance with section 7 to the registrar or another party designated by the registrar. The aim of the obligations imposed by the Act on Guarantees of Origin for Energy is to ensure that electricity can only be sold as renewable or produced by nuclear power or included in the electricity supplier's disclosure of origin once.

The certification obligation applies firstly to electricity suppliers who have sold electricity to electricity users specifically on the basis of an agreement to supply electricity from renewable energy sources or nuclear power. The obligation does not limit the entitlement of electricity suppliers to sell products from sources other than renewable energy sources or nuclear power. However, when marketing their products and fulfilling their other disclosure obligations concerning products, electricity suppliers must take into account the provisions of the Act on Guarantees of Origin for Energy concerning the certification of renewable energy sources and nuclear power and ensure that electricity declared to originate from renewable energy sources or nuclear power is not sold twice. Operators should also consider the requirements of other legislation when declaring products from energy sources other than renewable energy and nuclear power in their marketing. Marketing aimed at consumers is subject to regulations such as the Consumer Protection Act in addition to the Act on Guarantees of Origin for Energy. When an electricity supplier sells electricity produced from renewable energy sources or nuclear

power to an electricity user, the electricity supplier must cancel guarantees of origin corresponding to the amount of energy it has sold as renewable or nuclear energy by 31 March of the following year in the register administered by Fingrid[2].

On the basis of section 22 of the Act on Guarantees of Origin for Energy, the registrar must arrange the issuing, transferring, cancelling and expiring of guarantees of origin in such a way that the guarantees of origin are accurate, reliable and fraud-resistant. Consequently, to ensure the reliability of the guarantees of origin system and effective oversight, the Energy Authority requires the electricity supplier to cancel guarantees of origin in the same amount as the volume of electricity sold to the end user in its own name (the beneficiary of the cancellation is the electricity supplier). The cancellation of guarantees of origin in the electricity supplier's name can be outsourced based on an agreement. Section 8 of these instructions contains examples of the allocation of cancellations.

Electricity producers who use the electricity they produce from renewable energy sources or nuclear power in their other business activities and wish to commercially exploit such information should also certify the origin of the electricity they declare to originate from renewable energy sources or nuclear power. This obligation, therefore, applies to electricity producers' business activities other than electricity production. For example, the obligation applies to forest industry units that use the electricity they produce from renewable energy sources to manufacture paper and wish to exploit such information when marketing the paper.[3]

In addition, the certification obligation applies to electricity users who issue marketing material declaring that the electricity used to manufacture their products or provide their services originates from renewable energy sources or nuclear power. The electricity user must certify the origin of electricity by cancelling electricity guarantees of origin itself, or it must be able to prove that the electricity is certified with guarantees of origin in a different way. For example, one way of proving the origin of electricity other than using guarantees of origin is to sign an electricity supply agreement requiring the electricity to be produced from renewable energy sources or nuclear power[4]. In such a situation, an electricity supplier who has sold electricity produced from renewable energy sources or nuclear power to an electricity user cancels electricity guarantees of origin in an amount corresponding to the electricity consumed by the electricity user in its own name.

An electricity user that declares the electricity it uses to originate from renewable energy sources does not need to certify the origin of the electricity it uses and produces itself if it produces electricity for its own use using renewable energy sources with a rated output of less than one megavolt-ampere in an electricity production system or a power plant consisting of several production systems. Proving the amounts of own production and usage thereof is based on the network operator's measurements and imbalance settlement data. In such a situation, the electricity user could, for example, produce electricity as part of an energy community of which the electricity user is a member or shareholder[5].

[2] Energy Authority's definition of the deadlines to observe when allocating used guarantees of origin to a certain calendar year and reporting the allocation information to the Energy Authority, doc. no. 58/000002/2022.
[3] Government Bill HE 87/2021 p. 43.
[4] Government Bill HE 87/2021 p.44.
[5] Government Bill HE 87/2021 p. 44.

4 Electricity supplier's obligation to disclose the origin of electricity

4.1 Disclosure of the origin of electricity purchased by an end-consumer under an electricity supply agreement

Act on Guarantees of Origin for Energy, section 19:

An electricity supplier shall disclose at least once a year in electricity bills delivered to a final electricity customer the share of each energy source of the electricity purchased by the final customer in accordance with the electricity supply contract. This information shall otherwise be kept easily available to the final electricity customer on the website of the electricity supplier or by other similar means indicated clearly to the final consumer in or with bills.

In other words, the electricity supplier must indicate the share of each energy source in the electricity purchased by the final customer under the electricity supply agreement at the product level. The information must be included in the final customer's electricity bill once per year. In addition, suppliers must keep the relevant information readily accessible to electricity users, for example, on the electricity supplier's website or mobile app. The final customer's bill or an appendix to the bill should clearly indicate where the information is available. Instructions for finding the information do not need to be included in every bill – it is sufficient to include, for example, a link and supplementary instructions in a bill once per year. Electricity suppliers must ensure that the reliability of the information they provide can be verified for at least six years from the end of the calendar year to which the information applies.

4.2 Disclosure of the origin of the overall mix of energy sources used by an electricity supplier for electricity sold in Finland

Act on Guarantees of Origin for Energy, section 19:

Information shall be provided in or with bills on the contribution of each energy source to the overall energy mix of the electricity sold in Finland by the electricity supplier over the preceding year in a comprehensible and clearly comparable manner. This information may also be provided on the electricity supplier's website or by other similar means in a manner that is easily available to the final electricity customer if this is indicated clearly in or with bills. This information shall be provided also concerning electricity sold in the European Union if the electricity supplier operates in more than one Member State.

The electricity supplier must indicate the share of each energy source in the overall mix of energy sources for the electricity sold by the electricity supplier in Finland over the preceding year. This information may be provided in or with bills or on the electricity supplier's website or in another similar manner that is easily accessible to the final user of electricity, provided that the bills or their appendices clearly indicate where the information is available. Instructions for finding the information do not need to be included in every bill – it is sufficient to include, for example, a link and supplementary instructions in a bill once per year. Information about the share of each energy source in the overall mix of energy sources for the electricity sold by the electricity supplier should also be provided for electricity sold in the European Union if the electricity supplier operates in several Member States.

When calculating its overall mix of energy sources, the electricity supplier may include all the sales of renewable electricity in which the electricity supplier has sold to its customers both a physical supply of electricity and the renewable origin of electricity. Sales may be based on an electricity sales agreement specifying that the electricity is of renewable origin. Sales may also be based on separate agreements, in which case guarantees of origin are delivered under a different agreement than the one for physical electricity. For example, long-term power purchase agreements and the associated ancillary agreements may constitute such a situation. However, in the following cases, an electricity supplier cannot take into account the cancellations of guarantees of origin in its own declaration of origin:

- The electricity supplier has sold only the origin of electricity to its customer, and the customer has purchased electricity from a different electricity supplier.
- The electricity supplier has sold its customer electricity of unspecified origin, which the customer has then certified by cancelling guarantees of origin itself. The electricity supplier should take responsibility for certifying the origin of electricity by cancelling guarantees of origin – the certification obligation cannot be passed on to the customer by contractual means, for example.

The shares of energy sources described above and in subsections 1 and 2 of the Act must be broken down into at least the following categories:

Act on Guarantees of

1) Renewable energy sources

2) Nuclear

3) Fossil fuels

Act on Guarantees of Origin for Energy, section 19:

The breakdown of energy sources disclosed by the electricity supplier to final customers shall include all of the sources of electricity sold to electricity users as well as to electricity suppliers, excluding imbalance power supplied by the balancing power unit.

The share of electricity certified with guarantees of origin as produced from renewable energy sources or from nuclear power shall be disclosed correspondingly in the breakdown of energy sources as produced from renewable energy sources or from nuclear power. Electricity from non-renewable or non-nuclear sources the origin of which is known may be disclosed in the breakdown either using the actual production method or the residual mix published by the Energy Authority. The shares of electricity from renewable sources or from nuclear power not certified with guarantees of origin and the shares of electricity of unknown origin shall be disclosed using the residual mix published by the Energy Authority.

The shares of energy sources must be disclosed in at least three categories: renewable energy sources, nuclear power, or fossil fuels. The breakdown of energy sources

disclosed by the electricity supplier to final customers shall include all of the sources of electricity sold to electricity users as well as to electricity suppliers, excluding imbalance power supplied by the balancing power unit.

The share of electricity certified with guarantees of origin as produced from renewable energy or nuclear power should be disclosed in the breakdown of energy sources as produced from renewable energy or nuclear power. Electricity produced from non-renewable or non-nuclear sources where the origin is known may be disclosed in the breakdown either using the actual production method or the residual mix published by the Energy Authority. Electricity that is not certified by guarantees of origin – i.e., electricity produced from renewable energy sources or nuclear power but not certified by guarantees of origin – and electricity of unknown origin should also be disclosed in the breakdown using the residual mix. Consequently, only electricity produced from fossil energy sources can be disclosed on the basis of the actual production method.

5 Use of the residual mix

Act on Guarantees of Origin for Energy, section 6:

The supervisory authority shall calculate the residual mix for electricity for the period of a calendar year and shall publish it annually by the end of the June of the following year. When calculating the residual mix, it shall be ensured that an energy unit from renewable energy sources as well as an energy unit from nuclear power is taken into account only once.

An electricity supplier, producer and user shall in circumstances provided in section 7 and an electricity supplier shall in circumstances provided in sections 19 and 20 use the most recent residual mix no later than three months after its publication.

Further provisions on the calculation of the residual mix for electricity may be laid down by government decree.

Electricity suppliers, producers and users should disclose the origin of electricity using the residual mix calculated by the Energy Authority if the origin of electricity is not certified by guarantees of origin and the exceptions to the certification obligation provided for in section 7 of the Act on Guarantees of Origin for Energy do not apply. In addition, electricity suppliers should use the residual mix when fulfilling their notification obligation in accordance with section 19 and 20 if the origin of electricity is not certified by guarantees of origin or if the electricity was not produced from fossil energy sources that the electricity supplier declares according to the actual production method.

Information on the origin of electricity according to the residual mix should be used unaltered; it is not permissible to "cherry-pick" the share of electricity produced from renewable energy sources or nuclear power from the residual mix, for example.

The residual mix is calculated for one calendar year at a time (1 January–31 December). The Energy Authority calculates the mix annually and publishes it by the end of June. The residual mix is published on the Authority's website.

Electricity suppliers, producers and users are obliged to use the residual mix published by the Energy Authority no later than three months after it is published.

6 Disclosure of the quantities of carbon dioxide emissions and radioactive waste

Act on Guarantees of Origin for Energy, section 20:

An electricity supplier shall disclose at least once a year in or with electricity bills information on the quantity of carbon dioxide emissions and radioactive waste resulting from the energy sources used to produce the electricity sold by the electricity supplier over the preceding year. This information may also be provided on the electricity supplier's website or by other similar means in a manner that is easily available to the final electricity customer if it is indicated clearly in or with bills where the information is available.

The disclosure specified in subsection 1 above shall state the following quantities resulting from the energy sources used to produce the electricity sold by the electricity supplier over the preceding calendar year:

1) The specific emissions of carbon dioxide in grams per kilowatt-hour

2) The quantity of spent nuclear fuel relative to the total quantity of electricity sold in milligrams per kilowatt-hour

A disclosure concerning the specific carbon dioxide emissions of electricity certified by guarantees of origin shall specify the emission factors specific to the energy source and production method used in the calculation of the specific emissions, as well as the emission allocation methodology used for cogeneration of heat and power. The data on the quantity of spent nuclear fuel may be based either on the electricity sourcing of the electricity supplier or on the data the supervisory authority used and published for the calculation of the most recent residual mix. As regards electricity of uncertified origin, data from the residual mix calculated by the supervisory authority shall be used in the disclosure of the quantities of carbon dioxide emissions and spent nuclear fuel. The specific carbon dioxide emissions of electricity from fossil energy sources of known origin may, however, be disclosed using either the actual specific emissions of carbon dioxide or the residual mix.

At least once per calendar year, electricity suppliers must disclose information on the quantity of carbon dioxide emissions and radioactive waste resulting from the energy sources used to produce the electricity sold by the electricity supplier over the preceding calendar year. This information may be provided in or with bills or on the electricity supplier's website or in another similar manner that is easily accessible to the final user of electricity, provided that the bills or their appendices clearly indicate where the information is available.

Public information sources shall present the specific CO2 emissions (g/kWh) from the production of the electricity sold by the supplier. The specific emissions shall be calculated as the average of the specific emissions arising from the production of all the electricity sold by the supplier. The disclosure shall specify the emission factors specific to the energy source and production method used in the calculation of the specific emissions, as well as the emission allocation methodology used for cogeneration of heat and power.

As regards radioactive waste, the amount of spent nuclear fuel arising from the production of electricity sold by the supplier over the previous calendar year shall be presented in relation to the total amount of electricity sold (mg/kWh). The data on the quantity of spent nuclear fuel may be based either

on the electricity sourcing of the electricity supplier or on the data the Energy Authority used and published for the calculation of the most recent residual mix. As regards electricity that is not certified by guarantees of origin, information from the residual mix published by the Energy Authority should be used in the disclosure of the specific carbon dioxide emissions and quantity of spent nuclear fuel.

7 Examples of the use of the residual mix

Note: The examples use indicative values for the residual mix and the emission and nuclear waste factors from the residual mix. The applicable residual mix and the emission and nuclear waste factors should be checked by referring to the Energy Authority's most recent decision on the residual mix. The residual mix is published on the Authority's website.

Abbreviations and terms used:

RES	Electricity produced from renewable energy sources
FOS	Electricity produced from fossil energy sources and peat
NUC	Electricity produced by nuclear power
Disclosure	A disclosure of the origin of electricity sold, required for electricity suppliers under section 19 of the Act on Guarantees of Origin for Energy
Uncertified electricity	Electricity whose origin is not certified by guarantees of origin
Certified RES	Electricity produced from renewable energy sources and certified by guarantees of origin
Certified NUC	Electricity produced at a nuclear power plant and certified by guarantees of origin
Residual mix	Finland's residual mix published by the Energy Authority. Residual mix used in the examples: FOS 40% RES 10% NUC 50%

7.1 Example 1: Own production taken into account

In this example, the electricity supplier has its own production, which is taken into account in full in the disclosure of the origin of electricity sold. The units used in this example are energy units (e.g., GWh).

Electricity supplier's total sales:

Certified RES	6
Certified NUC	2
Uncertified electricity	8
Total [units]	16

Sourcing of guarantees of origin: The electricity supplier must purchase guarantees of origin in an amount corresponding to the energy sold as RES products (6 units) and NUC products (2 units).

Electricity supplier's own production:

RES	6
NUC	2
FOS	2
Total [units]	10

Example calculation:

Line	Explanation	RES	NUC	FOS	Total
1	Own production [units]	6	2	2	10
2	Finland's residual mix [%]	10%	50%	40%	100%
3	Sales [units]	Certified RES 6 Certified NUC 2 Uncertified electricity 8			16
4	Consideration of own production [units]	-	-	2	2
5	Other sourcing (with residual mix) [units]	0.6	3	2.4	6
6	Mix of uncertified electricity [units]	0.6	3	4.4	8
7	Overall mix of sales [units]	6.6	5	4.4	16
8	Overall energy source mix [%]	**41%**	**31%**	**28%**	**100%**

Line-by-line calculation:

1. Electricity supplier's own production
2. Most recent residual mix for Finland published by the Energy Authority
3. Electricity supplier's total sales: 6 units of certified RES, 2 units of certified NUC, and 8 units of uncertified electricity. Total sales: 16 units.

4. In this example, the electricity supplier's own production is taken into account in full by certifying the RES production and NUC production with guarantees of origin (line 7) and taking FOS into account as actual production.
5. Other sourcing is supplemented using the residual mix. Other sourcing could be, for example, electricity purchases from the power exchange. In this example, the missing 6 units are multiplied by the ratios in the residual mix (line 2).
6. The mix of uncertified electricity is calculated as the sum of lines 4 and 5.
7. Six units of renewables and two units of nuclear power are added to the mix, corresponding to the guarantees of origin cancelled by the supplier. This gives the overall mix of sales (including sales of certified RES, certified NUC and uncertified electricity)
8. The percentages of the overall energy source mix are calculated

7.2 Example 2: Own production not taken into account in the disclosure

In this example, the electricity supplier has its own production, but the supplier does not take into account the information on the origin of its own production. Instead, the supplier discloses the origin of electricity using the residual mix and sales certified by guarantees of origin. The units used in this example are energy units (e.g., GWh).

Electricity supplier's total sales:

Certified RES	6
Certified NUC	2
Uncertified electricity	8
Total [units]	16

Sourcing of guarantees of origin:

The electricity supplier must purchase guarantees of origin in an amount corresponding to the energy sold as RES products (6 units) and NUC products (2 units).

Electricity supplier's own production:

RES	6
NUC	2
FOS	2
Total [units]	10

Example calculation:

Line	Explanation	RES	NUC	FOS	Total
1	Own production [units]	6	2	2	10
2	Finland's residual mix [%]	10%	50%	40%	100%
3	Sales [units]	Certified RES 6 Certified NUC 2 Uncertified electricity 8			16
4	Consideration of own production [units]	-	-	-	-
5	Other sourcing (with residual mix) [units]	0.8	4	3.2	8
6	Mix of uncertified electricity [units]	0.8	4	3.2	8
7	Overall mix of sales [units]	6.8	6	3.2	16
8	Overall energy source mix [%]	**42%**	**38%**	**20%**	**100%**

Line-by-line calculation:

1. Electricity supplier's own production
2. Most recent residual mix for Finland published by the Energy Authority
3. Electricity supplier's total sales: 6 units of certified RES, 2 units of certified NUC, and 8 units of uncertified electricity. Total sales: 16 units.
4. In this example, the information on the origin of the electricity supplier's own production is not taken into account at all.
5. The residual mix (line 2) is used for sales of uncertified electricity (8 units). Multiply 8 units by the ratios in the residual mix.
6. The mix of uncertified electricity is calculated as the sum of lines 4 and 5.
7. Six units of renewables and two units of nuclear power are added to the mix, corresponding to the guarantees of origin cancelled by the supplier. This gives the overall mix of sales (including sales of certified RES, certified NUC and uncertified electricity).
8. The percentages of the overall energy source mix are calculated

7.3 Example 3: Some own production taken into account

In this example, the electricity supplier has its own production, of which certain parts are taken into account in the disclosure of the origin of electricity sold. The units used in this example are energy units (e.g., GWh).

Electricity supplier's total sales:

Certified RES	6
Certified NUC	2
Uncertified electricity	8

Total [units]	16

Sourcing of guarantees of origin:

The electricity supplier must purchase guarantees of origin in an amount corresponding to the energy sold as RES products (6 units) and NUC products (2 units).

Electricity supplier's own production:

RES	2
NUC	9
FOS	5
Total [units]	16

Example calculation:

Line	Explanation	RES	NUC	FOS	Total
1	Own production [units]	2	9	5	16
2	Finland's residual mix [%]	10%	50%	40%	100%
3	Sales [units]	Certified RES 6 Certified NUC 2 Uncertified electricity 8			16
4	Consideration of own production [units]	-	-	5	5
5	Other sourcing (with residual mix) [units]	0.3	1.5	1.2	3
6	Mix of uncertified electricity [units]	0.3	1.5	6.2	8
7	Overall mix of sales [units]	6.3	3.5	6.2	16
8	Overall energy source mix [%]	**39%**	**22%**	**39%**	**100%**

Line-by-line calculation:

1. Electricity supplier's own production
2. Most recent residual mix for Finland published by the Energy Authority
3. Electricity supplier's total sales: 6 units of certified RES, 2 units of certified NUC, and 8 units of uncertified electricity. Total sales: 16 units.
4. In this example, only the fossil (FOS) fraction of the electricity supplier's own production is taken into account. The RES and NUC production is certified by guarantees of origin (line 7).
5. The supplier's own physical production is sufficient to cover sales, so it is not necessary to supplement sourcing with the residual mix. As the supplier's own nuclear power cannot be utilised without guarantees of origin, the nuclear power is also added to the supplier's mix using the residual mix insofar as the supplier's own production is not certified by guarantees. Multiply 3 units by the ratios in the residual mix.
6. The mix of uncertified electricity is calculated as the sum of lines 4 and 5.

7. Six units of renewables and two units of nuclear power are added to the mix, corresponding to the guarantees of origin cancelled by the supplier. This gives the overall mix of sales (including sales of certified RES, certified NUC and uncertified electricity)
8. The percentages of the overall energy source mix are calculated

7.4 Example 4: Calculating the specific emissions of carbon dioxide and quantity of spent nuclear fuel

Electricity suppliers must calculate and disclose the specific carbon dioxide emissions (grams/kilowatt-hour) from the energy sources used to produce the electricity sold in the previous calendar year and the amount of spent nuclear fuel in relation to the total quantity of electricity sold (milligrams/kilowatt-hour).

The specific emissions shall be calculated as the weighted average of the specific emissions arising from the production of all the electricity sold by the electricity supplier. The disclosure of specific carbon dioxide emissions shall specify the emission factors specific to the energy source and production method used in the calculation of the specific emissions, as well as the emission allocation methodology used for cogeneration of heat and power. The proportional method can be used to divide the emissions of cogeneration plants between electricity and heat. Also other methods can be used to divide the emissions. However, the method must always be indicated in the disclosure of specific carbon dioxide emissions.

Information on the amount of spent nuclear fuel can be based either on the electricity supplier's electricity sourcing or statistical data from the Radiation and Nuclear Safety Authority.

The calculation of emissions and the amount of spent nuclear fuel must use the same breakdown as the disclosure of the origin of electricity. If the residual mix is used to disclose the origin, the emission and nuclear fuel quantities in the residual mix must also be used for the fraction in question. Correspondingly, if the electricity supplier's own production is taken into account in the disclosure, the emissions and nuclear fuel data for the supplier's own production must be used for this fraction. The specific emission and nuclear fuel quantities are published in connection with the residual mix.

Formulae for calculating emission information:

CO2 emissions/year [tCO2/TJ] = energy content of spent fuel [TJ] / year * emission factor * oxidation factor
CO2 emissions/kWh [g/kWh] = (CO2 emissions/year) / amount of electricity produced per year

The emission and oxidation factors for specific fuels, published in connection with Statistics Finland's fuel classification, can be used in the calculation. The fuel classification is available at http://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html

8 Examples of the allocation of cancellations

8.1 Case 1

Electricity supplier A sells to its customer X (electricity end user) electricity defined as having been produced from renewable energy sources.

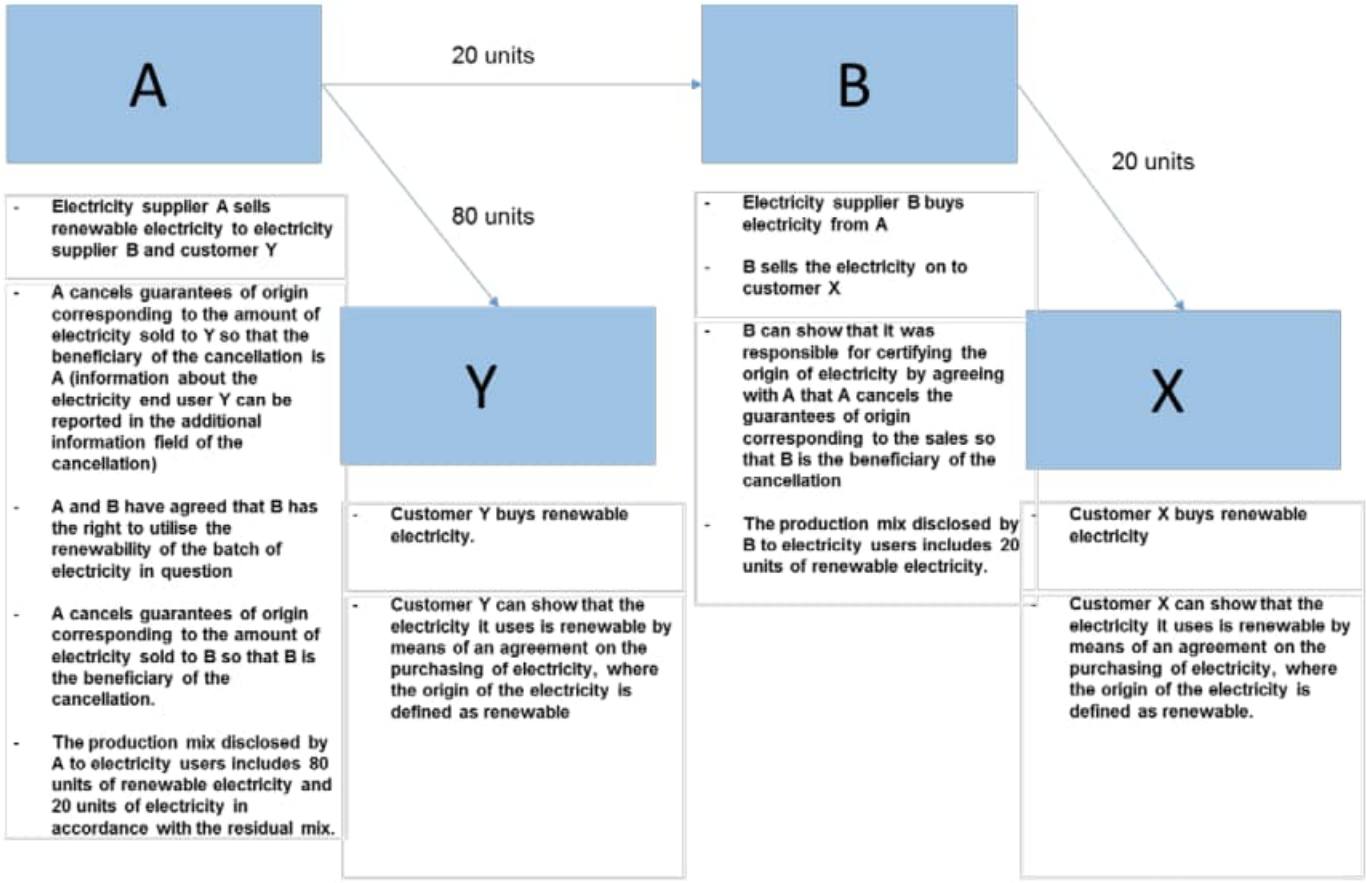
- Electricity supplier A sells renewable electricity to customer B
- Electricity supplier A cancels an amount of guarantees of origin corresponding to the sales so that the beneficiary of the cancellation is electricity supplier A (information about the electricity end user X can be reported in the additional information field of the cancellation)

- Customer X buys renewable electricity
- Customer X can verify that the electricity it uses is renewable by means of an agreement on the purchasing of electricity, where the origin of the electricity is defined as renewable.

The electricity supplier is responsible for certifying the origin of electricity by cancelling guarantees of origin. The cancellation of guarantees of origin in the electricity supplier's name can be outsourced based on a contract. The obligation to certify set out in the Guarantee of Origin Act applies to electricity suppliers selling electricity defined as renewable in origin to electricity users. The division of energy sources disclosed by the electricity supplier to the electricity user must include all the procurement sources of electricity sold to both electricity users and electricity suppliers, with the exception of imbalance power delivered by the imbalance power unit. The aim of the obligations set out in the Guarantee of Origin Act is to ensure that the renewability of electricity can be sold or included in the electricity supplier's disclosure of origin only once.

8.2 Case 2

Electricity supplier A sells electricity that is renewable in origin to both electricity supplier B and its own customer Y (electricity end user). A sells a total of 100 units of electricity. A sells 80 units of renewable electricity to Y and 20 units of electricity to B. Electricity supplier B sells on the electricity as renewable in origin to its customer X (electricity end user).



The electricity supplier can include in its production mix all of its sales of renewable electricity where the electricity supplier has sold to its customer both the physical delivery of electricity and the renewable origin of electricity. The sales can be based on an electricity sales agreement, where the origin of the electricity is defined as renewable. The sales can also be based on separate agreements, where the sales of physical electricity on one hand and the sales of the origin of the electricity on the other have been agreed with the same customer (for example, so-called portfolio agreements). For example, in the following cases the electricity supplier cannot take the cancellation of the guarantees of origin in question into account in its own disclosure of origin:

- The electricity supplier has sold only the origin of the electricity to its customer, and the customer has bought the electricity from another electricity supplier.

- The electricity supplier has sold electricity of unknown origin to its customer, and the customer has certified the electricity itself by cancelling guarantees of origin. The electricity supplier is responsible for certifying the origin of electricity by cancelling guarantees of origin, and the fulfilment of the obligation to certify cannot be transferred to the customer, for

example, by means of an agreement.