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What is an energy certificate?

An energy certificate is an electronic document which provides proof of the source of 1,000 kWh of electrical energy (an average European household would need between 3 and 5 certificates each year to prove where its electricity comes from).

Electricity comes from many generators and is transported to consumers across an electricity grid. This mixes energy from various sources, so it is not possible for consumer to know where their energy comes from. However, it is possible to contract with a plant to generate into the grid, and suppliers do this on behalf of their customers, using certificates as evidence that the energy has been generated. Nobody knows where the electricity flows, but certificates let us see where the money has gone.

Energy certificates can be used to support the claims of generators, suppliers and consumers as evidence of energy production or consumption, whether as proof of "green supply"; as a condition of receiving public support; or as proof of "environmental credentials".

Certificates can be bought by entering into contract of sale, either with another market party or with an Exchange. This contract may specify what they can be used for, particularly in the case of certificates that are associated with public support schemes. Note that energy suppliers represent their customer base, buying certificates on behalf of consumers.

Energy certificates are created by an independent "issuing body", which guarantees their quality and credibility by means of various checks and controls. They can then be transferred between accounts held on a central registration database (otherwise known as a "registry") by market participants. When the associated energy is sold to a final consumer, or perhaps used as evidence by a public body, then the certificate is made non-tradable and moved to a separate account from tradable certificates.

Energy certificates which are used as evidence of the use of renewable energy are also called:

- Guarantees of Origin (GO)
- Renewable Energy Certificates (RECs)
- Tradable Renewable Energy Certificates (TRECs)
- Tradable Renewable Certificates (TRCs)
- Green certificates.

What are the benefits of having a certificate market?

Certificates could be non-transferable, but then they would need to be used as evidence for contractual purposes, which suggests contract tracking would be necessary if you wanted to find the consumer to whom energy had been supplied. It is extremely difficult to follow the contractual path from generator to consumer, as this can involve many contracts, some of which will not distinguish between energy sources. If done properly, analysing contracts is expensive and prone to error.

Assuming certificates are transferable, and that there is differing demand for electricity from different sources, then this suggests that they will have a value, as they can be used to differentiate between the various energy sources.

The introduction of a market in certificates bring all of the usual market benefits, including improved customer choice, transparency, efficiency and so on.

What is the purpose of a certificate?

The purpose of a certificate is to provide evidence of the source, time and means of production of one megawatt hour of electrical energy. This can then be used to prove to consumers or to government such matters as the environmental impact of the energy.

What is disclosure

Electricity Disclosure is a requirement implemented in the revised Electricity Market Directive (2003/54/EC). Electricity suppliers must disclose to their customers:

1. the contribution of different energy sources to their supply portfolio in the preceding year; and
2. related environmental impact indicators, which must include the CO₂ emissions and nuclear waste that have been produced.

The objective of disclosure is to provide consumers with relevant information about power generation; so enabling consumers to make informed choices which are not solely based on electricity prices. In a liberalised market, disclosure requires the required attributes to be tracked from the generator to the supplier.

Member states have implemented national legislation on disclosure in different ways, sometimes allowing disclosure of differentiated product information (e.g. a green power product and a standard product).

Green power quality labelling is based on subjective quality criteria, which usually excludes a significant part of the electricity market from labelling. However, disclosure offers an objective information scheme for the entire electricity market, so providing consumers with information on which to base their buying decisions.

In order to accurately disclose their electricity mix, suppliers may account for the share of green electricity they sell by using Guarantees of Origin and/or other reliable tracking systems (such as statistics produced by feed-in support systems and ex-post contract-based tracking systems). They account for the rest of the electricity by the “residual mix”: a default set of statistic values for their country. The residual mix adjusts the production mix to reflect electricity that has already been tracked by Guarantees of Origin and/or other reliable tracking systems.

What is RECS International?

RECS International is a group of market participants that trade in renewable energy certificates throughout Europe. It started in 2001, as a voluntary initiative to create a uniform system for cross-border certificate trading, and there are now more than 250 members trading certificates in over 22 (mostly European) countries.

To protect its investment in a secure, workable and efficient market, RECS works closely with the Association of Issuing Bodies (AIB), holding quarterly international meetings and sponsoring workshops and open seminars.

In addition, RECS International effectively lobbies national and European governments for harmonisation of the pan-European market for certificate trading

What is EECS?

The acronym "EECS" stands for the "European Energy Certificate System".

EECS provides harmonised rules for the operation of public and commercial certificate systems. These rules are set out in a document known as "the Principles and Rules of Operation of the European Energy Certificate System" – the PRO.

The rules of EECS allow certificates to be transferred securely between countries and regions across Europe.

What is an EECS Certificate?

EECS certificates have standard contents. They contain information about:

- the issuer
- the time and date of production
- the source of the energy and the technology used to convert it into its current form
- the identity, capacity, commissioning date and location of the generation plant
- units of energy (e.g. megawatt hours)
- the purpose and eligibility of the certificate under various schemes and Directives, and whether other certificates have been issued for this unit of energy
- whether public support has been received by the plant (investment support) or the owner of the associated energy (production support).

In addition, for Disclosure and CHP certificates, carbon dioxide emissions information is carried.

This information is presented in a standard way, using agreed codes, data formats and rules. EECS certificates also have quality criteria: the certificate issuers are bound by a code of conduct prohibiting such matters as issuing several certificates for the same energy, and forbidding them to take a position in the market.

EECS certificates may be transferred to accounts registered in databases managed by other certificate issuers by means of the EECS network.

What information does a certificate contain?

EECS certificates are uniquely identifiable, tradable and relate to a standard unit of energy – 1 megawatt hour (1MWh). Each contains standard information relating to how and when the associated energy was generated and of its environmental impact:

- The "energy medium" – electricity, fuel or heat
- A unique certificate number
- The date on which the installation became operational
- The first and last days on which the associated energy was produced
- The type of installation – its environment (e.g. land, sea ...), energy source (e.g. fossil, renewable ...), type (e.g. solar, wind ...) and fuel (e.g. geothermal, natural gas ...)
- The identity of the installation
- The country of issue

- The location of the installation
- The capacity of the installation
- The face value of the certificate (e.g. 1 megawatt hour)
- The issuer of the certificate
- The date of issue
- The identity of any label schemes under which it is eligible
- The identity of any EU Directives under which it is eligible
- The purpose of the certificate (either disclosure or support)
- An indication of whether other certificates have been (or can be) issued, associated with the same unit of energy, for other purposes
- An indication of whether or not public support has been received, and the form of such support.

In addition, CHP-GO certificates contain:

- Use of heat (category)
- Lower Calorific value (MJ/kg)
- CO₂ emitted
- Primary Energy savings (%)
- Actual amount of primary energy savings (MJ)
- CO₂ savings (%) .

Are there certificates for all types of electricity?

EECS now supports the following:

- Renewable energy is supported by EECS-GO (obligatory Guarantees of Origin under Directives 2001/77/EC and 2009/28/EC) and RECS (voluntary) certificates;
- Fossil and nuclear energy are supported by EECS Disclosure certificates (these support the Internal Markets in Electricity Directives 2003/54/EC and 2009/72/EC); and
- High efficiency CHP is supported by CHP-GO (obligatory Guarantees of Origin for CHP, under Directive 2004/8/EC).

What is the difference between a label and a certificate?

A certificate provides evidence of the quality of a single megawatt hour of electrical energy.

A label provides the consumer with proof of the quality of supplied energy, according to an agreed set of criteria. The claims made by such labels may be supported by the supplier, by proving that it owns a certificate for each megawatt hour of supplied energy during the period of supply.

Why should certificates be electronic?

Certificates must be electronic in order to:

- provide guarantees against fraud;
- provide a manageable environment for administering many, many certificates (currently over 60 million certificates are issued each year);

- enforce the rules; and
- make international trade easier.

But in particular, making certificates electronic makes it much, much easier to prevent duplication.

Why are certificates reliable?

Internationally standardised certificates offer a more reliable form of evidence of the environmental impact of production than contracts and statistics: statistics are by their nature not accurate, and so they will always misrepresent the energy blend to the consumer; and it is extremely difficult to follow the contractual path from generator to consumer: this can involve many contracts, some of which will not distinguish between energy sources. For this reason, analysing contracts is expensive and prone to error.

The reliability of certificates depends on the presence of a standardised and reliable framework for certificate administration. This is provided by EECS, which addresses all of the administrative aspects and has been developed by an international group of practitioners over several years of practical experience, and is guaranteed by an organisation independent of the market and of any particular certificate system administrator.

Can you copy an EECS certificate?

The most important core principle of the Principles and Rules of Operation of the European Energy Certificate System (the PRO) is the prevention of EECS certificates being created or used more than once for the same energy; and of their being created where other certificates have been (or can be) created. This principle states that:

"The arrangements for issuing, transferring and cancelling EECS Certificates should be such as to eliminate the possibility of EECS Certificates of the same type being issued, registered or cancelled in respect of the same energy.

The arrangements for issuing EECS Certificates should be such as to eliminate the possibility of EECS Certificates being Issued in respect of the same energy and attributes for which other tradable Certificates (other than EECS Certificates of a different type where specifically permitted by the PRO) have or will be issued."

In short, the answer is most emphatically "no" – nobody may copy an EECS certificate!

Can you print EECS certificates?

No. This would make it far too easy for certificates simply to be photocopied and sold twice. There are similar reasons in the world of currency exchange, where electronic funds transfer is fast overtaking the use of banknotes, in order to reduce opportunities for forgery and other forms of fraud.

Some certificate issuers will provide written proof that a certificate has been "cancelled" (cashed in). However, this reduces the value of the guarantee provided by a certificate. While this practice is not banned by AIB, it is discouraged.

What is an Issuing Body?

An Issuing Body is the body that is appointed by government or by industry to take responsibility for ensuring that certificates provide unique and reliable evidence of the source of energy, enabling them to be transferred between market parties, and regulating the way in which they are used.

They do this by:

1. Ensuring the technology used by participating plant are properly identified and recorded, along with any changes, and that only properly registered plant are permitted to participate.
2. Recording the amount of fuel consumed and energy generated by participating plant, and confirming that this is both accurate and reasonable.
3. Recording details of plant and certificates in a registry.
4. Transferring certificates between accounts on instruction from certificate-holders, including transferring them into cancellation accounts as proof that the associated energy has been consumed.
5. Preventing the transfer of certificates that have been placed into cancellation accounts.

They may also administer the provision of public support to the holders of cancelled certificates.

Guarantees of Origin are issued according to national regulations, so what are the benefits and role of the AIB?

The AIB offers a standardised solution – the European Energy Certificate System, or “EECS”. This passes on the years of experience and support of members who have already implemented systems, and identifies and overcomes solutions to many common problems. It guarantees collaborative and effective operation of certificate schemes across Europe; providing a structured environment for the harmonisation of such matters as: registration of production devices; coding schemes; definition of certificates and so on.

Furthermore, the AIB offers an electronic Hub, providing a single point of contact for certificate registries. This enables risk to be reduced by means of simple interfacing with other registries and sharing of common information. The Hub will eventually provide a central repository for information relating to market activity (although note that there are no plans for the prices of trades to be captured).

While the AIB cannot change national legislation, by working closely with the issuing bodies for Guarantees of Origin, it can help them to implement national schemes in a way which will be acceptable across Europe, thus promoting the effective operation of the EU RES Directive (2001/77/EC and its successor, 2009/28/EC), CHP Directive (2004/8/EC) and Internal Electricity Markets Directive (2003/54/EC).

What is the difference between a Guarantee of Origin and a RECS certificate?

Guarantees of Origin and RECS certificates fulfil the same function, and are of the same quality. Where they differ is that a Guarantee of Origin is required under the EU "RES Directive" (201/77/EC and its successor, 2009/28/EC), which are obligatory on all Member States of the European Union; whereas RECS certificates are issued as a voluntary initiative by energy companies.

Although it is possible for Guarantees of Origin to be printed, the EECS standard does not support this: all EECS Guarantees of Origin and RECS certificates are electronic. The reasons for this are given elsewhere in these FAQ ("[Why should certificates be electronic?](#)" and "[Can you print EECS certificate?](#)").

Countries where the certificate issuer does not provide electronic and transferable Guarantees of Origin may adopt voluntary RECS certificates. Alternatively, they can contract with a service organisation to use Guarantees of Origin as a basis for issuing EECS Guarantees of Origin, while preventing the original Guarantees of Origin from being reused.

If this sounds a little confusing, think of it this way. Gold assures the value of a currency in a similar way that Guarantees of Origin assures the value of an EECS Guarantee of Origin. You keep the gold (and the Guarantee of Origin) in the bank vault; and you trade the currency (and the EECS Guarantee of Origin).

Why do we have many types of certificates, instead of just Guarantees of Origin?

RECS certificates were in place before Guarantees of Origin, and not all countries have yet joined the AIB in order to benefit from the European Energy Certificate System (EECS). For this reason, renewable energy is represented by both RECS certificates and renewable energy Guarantees of Origin.

Guarantees of Origin are obligatory in all countries within the European Union under EU Directive 2001/77/EC and its successor, 2009/28/EC (renewable energy); and EU Directive 2004/8/EC (high efficiency CHP).

There is no requirement for Guarantees of Origin for fossil and nuclear energy, or for lower efficiency CHP. However, it is useful to have certificates for all types of energy, as it enables anyone selling energy to consumers to let them know where all of the supplied energy comes from, rather than having to use a statistically-based "residual mix". For this reason, EECS provides certificates for fossil and nuclear energy.

Further, not all countries have implemented the Directive(s) in the same way: for instance, code "x" may be "wind" in one country, and code "y" in another. Also, the information on certificates is not always collected in the same way. This hinders the international transfer of Guarantees of Origin, and leads to market participants in some countries using the voluntary RECS scheme instead.

What is the difference between an EECS certificate and a TUV certificate?

A TUV certificate is the product of a single organisation, while EECS certificates are harmonised across many market parties and certificate administrators throughout Europe.

Also, EECS certificates have been developed in cooperation with the European Commission (the RECS test phase was sponsored by the Commission; and CHP-GO were developed in close cooperation with the Commission).

What are “voluntary certificates”?

Voluntary certificates are those issued as the result of a voluntary initiative, and not because of a requirement under national law or regulation. These currently include EECS fossil and nuclear certificates, and RECS certificates.

Can you get financial support from the Government and have voluntary certificates too?

In certain circumstances this is possible, but it must be recorded on the voluntary certificate as an “earmark”. This is because some purchasers of certificates do not want to buy supported certificates. In other circumstances this is not possible: either certificates are not awarded to supported plant, or else they are immediately cancelled.

Voluntary certificates and Guarantees of Origin are given a value by the market, which benefits all parties in the supply chain. Within national support schemes that use them (for instance, Certificati Verdi in Italy, ROCs and LECs in the UK and Elcerts in Sweden), certificates have a value which has been conferred on them by government. To date, these have been managed in systems which are not integrated with EECS. However, EECS will support such certificates should this be required by government.

Where can you use a certificate?

Certificates are principally used to disclose to consumers the source of energy, and thus the environmental impact of energy production, to consumers; and can be used to demonstrate to government the achievement of national targets.

They can also be used to enable many types of support schemes, whether voluntary (green energy and green label schemes); or obligatory (such as supply obligations, portfolio standards and feed-in systems). They do so by enabling source of the energy to be guaranteed, and can be traded internationally.

Is there a market within Europe for certificates from outside Europe?

Yes, but it is extremely small at the moment

Is anyone allowed to buy a certificate? To whom can certificates be sold?

In order to buy an EECS certificate, you must have an account with an Issuing Body that is a member of AIB.

EECS certificates can be sold to anybody who has an account with an Issuing Body that is a member of AIB, provided they are transferred into the account of the purchaser. Where they are used as evidence of the nature of supply to a consumer, then they must first be cancelled by the supplier.

What is the price of a certificate? Do different types of certificates have different prices?

The price of a certificate varies depending upon the type of certificate.

The price of RECS certificates and Guarantees of Origin is set by the market, and influenced by such factors as when the energy was produced, the source of the energy and the type of production device. It is also influenced by the size of the transaction, large trades attracting lower prices than small trades.

Currently, EECS does not support those certificates put in place by governments specifically to support national support schemes: the price of these being set (or influenced) by government.