

ZF Supplier Guide & FAQ on Green Electricity

Version 1.1



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Glossary

Term	Definition / Explanation
CHP	<p>Combined Heat and Electricity.</p> <p>The two most common CHP system are: (a) Combustion turbine with heat recovery unit (b) Steam boiler with steam turbine</p>
CDP	<p>Carbon Disclosure Project</p> <p>CDP is a non-profit organization that helps companies to disclosure their environmental impact.</p>
EAC	<p>Energy Attribute Certificate. Explanation in Introduction to Renewable Electricity Certificates</p>
EECS	<p>European Energy Certificate System</p> <p>EECS was developed to serve as the standardization of the European EAC market, i.e. for the European GoOs</p>
GE	<p>Green Electricity</p> <p>Synonym used for Green Power or Renewable Electricity form renewable sources</p>
GoO	<p>Guarantees of Origin</p> <p>Type of EAC. Mainly used in Europe.</p>
On grid / Off grid	<p>The source of electricity is connected (on grid) / not connected (off grid) to the electric grid.</p>
PPA (physical (sleeved), virtual, (synthetic))	<p>Electricity Purchasing Agreement</p> <p>A PPA refers to a long-term electricity supply agreement between two parties, usually between an electricity producer and a customer.</p> <p>The different types of PPAs are explained in Green Electricity Procurement Options.</p>
REC / I-REC	<p>Renewable Energy Certificate / International Renewable Energy Certificate</p> <p>Types of EAC. REC is mainly used in the US and Canada. I-REC is used in over 45 countries spread over Asia, Oceania, Africa, South America and Middle America.</p>
RE	<p>Renewable Energy</p>
RE100	<p>RE100 is a global initiative bringing together the world's most influential businesses committed to 100% RE</p>

1. Introduction

Today, sustainability is an integral part of the ZF's strategy. With "Next Generation Mobility," ZF is pursuing an agile and integrated approach to shaping the fundamentally changing mobility needs of tomorrow. Therefore, ZF has drawn up a climate strategy and aims to be climate neutral by 2040 for all three scopes of the Greenhouse Gas Protocol.

To meet the ambitious target of climate neutrality by 2040 along the entire value chain, the contribution of ZF's supply chain partners is key. Increasing energy efficiency at supplier facilities and transitioning suppliers to clean, renewable electricity are important levers to reduce product-related carbon emissions.

ZF Expectations

- By June 2022 we expect our suppliers to provide their roadmap to 100% green electricity [in % of your overall electricity demand] on a yearly basis for your manufacturing plants.
- To avoid disadvantages in future sourcing awards, 100% of green electricity in supplier manufacturing plants should be met in 2025 latest.

The purpose of this document is to support suppliers of ZF to meet Green Electricity (GE) requirements set by ZF. This guidance will explain shortly the general market mechanism of GE and ensure the credibility of possible activities by describing the minimum requirements regarding technology and contractual framework.

The Guide also addresses the following commonly asked questions and provide links / resources to further information:

- What is renewable energy and green electricity?
- What are the eligible technologies?
- What procurement options exist?
- What kind of verification is needed?
- How do I communicate my green electricity purchase to ZF?

2. ZF Definition of Green Electricity

The term Green Electricity (GE) can be defined in different ways. In this guide, GE refers specifically to electricity supplied from renewable sources that provide the highest environmental benefit. It is also defined as renewable electricity that replenish itself over short periods of time without being depleted.

Following types are eligible to be considered as renewable electricity.

Eligible Technologies:

- Wind, solar power, hydro, geothermal
- Solid, liquid and gaseous forms of biomass from fuels (see [Annex “Renewable Energy Technologies fuel requirements”](#))

Ocean-based energy resources captured through tidal and wave technologies.

Excluded Technologies

Electricity from nuclear power, natural gas (e.g. CHP) and from waste combustion are not regarded as renewable electricity.

3. Green Electricity Categories

Companies can achieve 100% GE by choosing options from the following main categories or a mix of them:

1. Self-generation
Production of renewable electricity from their own facilities. These can be grid-connected and onsite or offsite, or entirely off the grid.
2. Purchased green electricity
This may include direct purchases from specific generators (e.g. PPAs) or retail purchases from suppliers and utilities (e.g. green tariffs), and the purchase of stand-alone (“unbundled”) EACs.

Thereof, ZF accepts the following seven categories as green:

ZF Green Electricity Categories	
Self-Generation	
1	<p>Production and use of GE from supplier’s own facilities that meet the eligible renewables definition are eligible sources.</p> <p>On-site/Off-site: Self-generation facility can be located on-site where the power is consumed (behind the meter or generation located on supplier’s premises and used on site), or it can be located off-site</p> <p>On-grid (EACs generated) / Off-grid (no EACs generated)</p>
Purchase Options – Prove via EACs *)	

2	PPA / sleeved PPA
3	Virtual PPA
4	Green Electricity Tariff / Green Electricity Product (Electricity supplied by an electricity provider where the provider takes over the responsibility to provide the electricity either directly from renewable sources, for example through PPAs, or procures and deletes unbundled EACs for the supplied electricity)
5	Unbundled EACs / GoOs
6	Unbundled RECs, I-RECs
7	Exceptions for unregulated markets: If I-RECs or other EACs are not applicable as proof of a renewable electricity delivery in the country the carbon emission occurs, an alternative type of proof has to be chosen which is locally an accepted method during the time of production for example a local governmental system.

The different procurement options are explained in the Chapter [Green Electricity Procurement Options](#) in more detail.

Not acceptable as GE is for example electricity from nuclear electricity or natural gas fired CHPs.

4. Introduction to Renewable Electricity Certificates

When a company wants to procure GE, this is done via Energy Attribute Certificates (EACs). All generated energy, whether renewable or fossil fuel based, is being fed into one common grid. As it is not possible to physically trace renewable electricity from producer to consumer, EACs play an essential role as they solve the problem of identification, allocation and ownership of renewable electricity across a shared electric grid.

An EAC is the “ID-badge” for Electricity



- Electricity cannot physically be tracked between producer and consumer.
- Therefore, EAC book & claim accounting systems were established worldwide.
- EAC is a generic term for the different types of certificates of the different tracking systems which exist worldwide (REC, I-REC, GoO, etc.)
- EACs track the production and use of 1 MWh of electricity, along with its attributes:
 - Date of production
 - Location of generation device
 - Generation technology (wind, solar, hydro, etc.)
 - Age of production device

No claiming of green electricity without an EAC!

EACs have been established in a book and claim system to track the attributes of a given megawatt-hour (MWh) of electricity from a producer to a consumer. EACs also exist for nuclear- and fossil-based electricity and can be seen as an “ID badge” for electricity. In the case of renewable EACs, they provide proof of the unique attributes of each MWh of produced renewable electricity, such as:

- time and date of production
- location of the generation device
- generation technology (e.g., wind, solar, hydro, biomass, geothermal)
- age of the production device

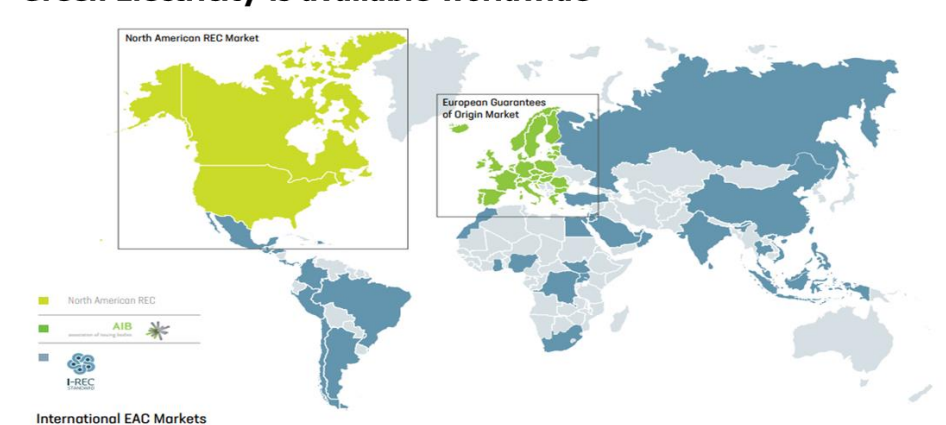
In addition to being essential to substantiate environmental claims, EACs help avoid double counting and claiming of the same generation attributes by more than one party. EACs must include all relevant information on the generation of their underlying GE including location, fuel type and month or quarter of generation. They must be tied to 1 MWh of actual GE generation no matter how large or small the facility is or where the facility is located relative to the consumer.

A key principle of book and claim systems is that the attributes of a given product are separated from the underlying product itself. This means that an EAC can be sold either together with the underlying electricity (= bundled), or separately from it (= unbundled).

Multiple EAC products had been developed being traded on different market worldwide. The most common EAC products are:

- RECs – North America
- Guarantees of Origin (GoOs) – Europe
- International RECs (I-RECs) – many regions
- Tradable Instruments for Global Renewables (TIGRs) – many regions
- J-Credits – Japan
- Large-Scale Generation Certificates (LGCs) – Australia
- NZECs – New Zealand.

Green Electricity is available worldwide



EACs need to be produced and claimed within the same market

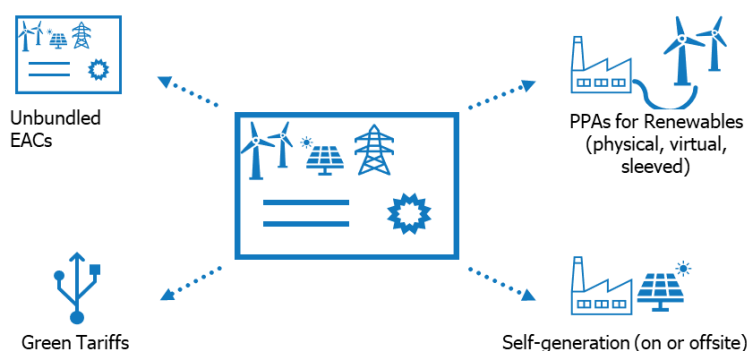
It is important to understand that EACs can only be produced and consumed within the same EAC market. It is not possible, for example to claim a REC produced in the US for a plant in Europe. Wherever possible, ZF recommends suppliers to use RECs, GoOs and I-RECs, because those are the most established products.

5. Green Electricity Procurement Options

GE can be procured in several different ways. **However, all forms GE supply and consumption include EACs.** If a company chooses to purchase GE they may procure it from a local distribution utility, from competitive power suppliers, or directly from a renewable electricity generator. Even in countries where there are no GE suppliers and the utilities do not offer a GE option, any organization can buy EACs/I-RECs as a stand-alone product, “unbundled” from the organization’s electricity purchases.

Another option is the self-generation of electricity either by owning or leasing green power generation facilities (e.g., solar, wind, biomass). Self-generation can be done on-site opportunities (e.g. with a photovoltaic on the plant’s roof) or off-site.

EACs are the key instrument for tracking green electricity



All procurement options for green electricity are based on EACs

1. Self-generation (on-site / off-site)

If a GE system is physically located at the location and is directly connected to company’s electrical circuits, it is considered on-site. If the system needs to be connected to utility-owned transmission or distribution infrastructure before providing GE to the consuming location, it is considered off-site. A company may own the equipment and be responsible for maintenance and operation, but it can also be contracted to an external service provider. Since self-generation usually requires an up-front capital investment and the power generation facilities need space accordingly, this option is not applicable for all organizations.

2. Purchasing Power Agreements (PPAs)

A Power Purchase Agreement (PPA) is a long-term agreement between a power producer and a customer (a consumer or trader of electricity). The PPA defines the terms of the agreement, such as the amount of electricity to be supplied and the price to be negotiated. For the buying companies PPAs offer a long-term supply of GE with stability in prices, often at or below current market prices. PPAs are mainly used by large-scale electricity consumers. There are different types of PPAs available:

a. Physical PPA

Characteristic: The power producer (directly) ensures the customer's supply.

I. Onsite-PPA

The generation plant is located behind the meter of the consumer, i.e. on-site at a consuming company. For example, a company opts to outsource the installation and operation of a photovoltaic on the plant's roof to an electricity producer. For this purpose, the company enters an on-site PPA with the producer, who now installs the photovoltaic system on the roof and sells the electricity generated directly to the company.

II. Offsite-PPA

In contrast to on-site PPAs, the producer delivers the electricity to the consumer through the public grid. The power generation system does not need to be located close to the consumer. This provides additional flexibility, as the plant operator can now choose locations with optimal conditions or a plant that already exists.

b. Sleeved-PPA

Characteristic: Between the power producer and the consuming customer, an energy service provider acts as intermediary and ensures the customer's supply.

The service provider might offer different services, e.g. balancing group management, preparing feed-in forecasts, marketing green certificates, or assuming various risks.

c. Virtual PPA (a.k.a. synthetic PPA)

Characteristic: Producer and customer agree to a Contract for Difference (CfD)

GE project developers sometimes enter into virtual PPAs with energy consumers to get financing. By entering into a virtual PPA the customer guarantees the owner of the GE project a certain fixed price for the electricity they sell to the electric grid. When the GE project is complete, the developer of the renewable project sells the electricity to the grid. Now two situations can occur:

I. If the electricity sells to the grid for less than the guaranteed fixed price, the customer will pay the difference.

II. If the electricity sells to the grid for more than the fixed price, the customer will make money.

Benefits: The developer has the price security it needs to get financing for the project, and the customer has both price stability and the opportunity to make money.

3. Green Tariffs

A green tariff is a contract between the electricity supplier (a utility, or other power developer or market entity) and the consuming customer through a special utility tariff rate. The supplier matches the electricity consumed by the customer and delivered through the grid with renewable electricity produced or purchased from a variety of sources and/or projects. The electricity supplier shall purchase and retire or retain certificates on behalf of the consuming company making the claims.

4. Unbundled EACs

As described in the Chapter [Introduction to Renewable Electricity Certificates](#), EACs can either be sold “bundled” with the underlying physical electricity (e.g. PPA/Green Tariff), or “unbundled” from it. Thus, the consuming company may choose to buy both power and attributes from the same power producer or buy both from separate suppliers. With either procurement choice, the fundamental principles remain the same. If customers are buying EACs for renewable electricity – no matter bundled or unbundled – they are providing an income stream to renewable electricity producers, thus accelerating the energy transition. Companies may purchase unbundled certificates like RECs, GoOs and I-RECs separately from electricity to match with their electricity consumption from non-renewable sources.

6. Verification & Auditing

Double Counting

Double Counting must be avoided. Eligible EACs or renewable electricity can be used once and only once. Renewable electricity or EACs (or the renewable or environmental attributes incorporated in that EAC) that can be legitimately claimed by another party may not be used. Examples of prohibited double uses include, but are not limited to:

- a. When the same EAC is sold by one party to more than one party, or any case where another party has a conflicting contract for the EACs or the renewable electricity.
- b. When the same EAC is claimed by more than one party, including any expressed or implied environmental claims made pursuant to electricity coming from a renewable energy resource, environmental labeling or disclosure requirements. This includes representing the energy from which EACs are derived as renewable in calculating another entity’s product or portfolio mix for the purposes of marketing or disclosure.
- c. When the same EAC is used by an electricity provider or utility to meet an environmental mandate, such as an RPS, and is also used to satisfy customer sales or
- d. Use of one or more attributes of the renewable energy or EAC by another party. This includes when an EAC is simultaneously sold to represent “renewable electricity” to one party, and one or more attributes associated with the same MWh of generation (such as CO2 reduction) are also sold, to another party.

Verification & Auditing

At SOP and upon request of ZF only the seller shall provide a proof of origin of the GE that is dedicated to ZF. We recommend setting your whole plant to 100% GE. It will make the proof of GE easier. In the

case you are only buying a share of GE especially for ZF, you must proof that the share of GE is really used for ZF products only and not for other customers or double counted. The approach needs to be approved by an external auditor, i.e. it needs to be proofed that GE is used for ZF only.


A combination of the different [Green Electricity Categories](#) is allowed. Please refer to [Annex “Proof of Fulfillment and possible Combinations”](#). It is recommended to request the usage of GE from your power supplier with [Annex “Confirmation Request for purchased green electricity”](#).

Upon request of ZF, internal or external auditors shall be allowed by the supplier in order to verify the compliance of the supplier’s and/ or sub-suppliers electricity consumption for the relevant ZF production with this ZF requirement. Seller shall tolerate the audits and cooperate, for example by providing information, to the extent such is necessary for the audits. Buyer is authorized to have the audits conducted by a qualified external company bound by confidentiality regarding third parties, unless such a company is a Competitor of Seller.

7. Frequently Asked Questions (FAQs)


Topic	Question	Answer
Definition of ZF Green Electricity	My grid mix shows a huge share of nuclear power. Is this considered green? If not, what can I do?	No. Nuclear is not considered green. To claim GE, apply one of the procurement options for GE, for example change to a green tariff or buy EACs.
Grid mix / EACs	My energy supplier’s normal grid mix shows 50% RE. Thus, can I claim 50% green electricity?	No claiming of GE without an EAC. You need to get EACs from your energy supplier.
Grid mix / EACs	How can I claim the share of RE in my normal grid mix at my energy supplier?	You can't. You need to choose one of the procurement options for GE, e.g. green tariffs.
Grid mix / EACs	I bought a green tariff at my power supplier. Is this automatically considered GE?	No claiming of GE without an EAC. Provide evidence that according EACs had been decommissioned.
Offsetting programs	Can I buy carbon offsets and claim them as GE?	No. This is not an option that ZF accepts as GE.
Share of Green Electricity	Our plant produces 25% for ZF and 75% for other customers not requiring GE. Do I need to switch my plant to 100% GE anyway?	No. But it would be easier for the supplier to proof it, if the plant is 100% on GE. In the case you are only buying a share of GE especially for ZF, you must proof that the share is really used for ZF products only and not for other customers or double counted. Proof by an external auditor is required, i.e. approval that GE is used for ZF only.
Purchasing Options	I am a small/medium sized enterprise (SME). Can you give me a recommendation which purchasing options I should prefer?	As an SME with a consumption <30 GWh per year, you will have troubles to purchase PPAs because most of the providers will require a minimum of energy consumption. You might also struggle with investments into on-site generation. Thus, the two options are potentially best for SMEs: <ol style="list-style-type: none"> 1. Green tariffs 2. Unbundled EACs

Topic	Question	Answer
Purchasing Options	I often hear that GE is not available worldwide, for example in China. Is that correct?	No. GE is available in all developed countries. In China the GE production reached more than 2300 TWh in 2021 (e.g. see https://energypost.eu/china-should-comfortably-meet-its-2030-renewables-target-but-its-emissions). And GE production is constantly increasing (e.g. see https://www.iea.org/reports/global-energy-review-2021/renewables).
On-site generation	Is a CHP considered green?	It depends on how the CHP is fueled. If it runs with natural gas it's not green. If bio-based fuels are used, e.g. woody waste it's considered green. If renewable fuels of non-biological origin (RFNBO), e.g. renewable hydrogen are used, it is considered green, too.
On-site generation	I have installed an off-grid solar panel on my roof. It covers 10% of my overall power consumption. Can I automatically claim it as renewable energy (RE)? Can I assign those 10% all to ZF products although they only make 25% of my overall production volume?	No. Even for an on-site off-grid electricity production, the verification of the attributes of the RE is required. You need to proof the yearly production of your solar panel. Then you need to proof what the energy consumption for the ZF products in your plant is. The share of energy consumption covered by the solar panel energy production you can claim green. In this case the 10% is not enough to cover the total electricity consumed for ZF products. An additional instrument shall be used to cover the remaining 15%, e.g. by purchasing unbundled EACs. This "mass-balance" approach as well as the usage of the produced electricity for ZF only, needs to be approved by an external auditor.
EAC markets	Can I transfer an EAC from one market to the other, for example buy a REC in the US and account it for my plant in China?	No. Green electricity/EACs needs to be sourced from the same EAC market as the consuming company.
EAC markets	Can I apply an EAC for one country to another country of the same EAC market, for example buy a GoO in Spain and account it for my plant in Germany?	Yes. Germany and Spain belong to the same EAC market (EECS – Guarantees of Origin), so a GoO is valid for all countries belonging to that market.
EAC markets	In which country do I have to claim the green electricity?	There are regulatory restrictions. The cancellation of EACs (= GE claim) needs to be carried out in the country of electricity consumption.


	<p>Cancelled Guarantees of Origin</p> <p>Issued (expiry/due) 13.2020</p> <p>Technology 7030000 Hydro electric hand installations; Run-of-river hand installations; Unspecified</p>	<p>Support type No support</p> <p>Energy source 9030000 Renewable: Mechanical stress or other: Hydro & marine; Unspecified</p>
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Examples of Cancellation Statements

EXAMPLE GoO-Europe:



Digitally signed by REN - Rede Eléctrica Nacional, S.A.
Date: 2021.05.26 13:48:26 BST
Reason: Guarantees of Origin Cancellation
Location: Portugal



Cancellation Statement - Guarantees of Origin

This cancellation statement certifies that the Guarantees of Origin listed hereunder have been cancelled. Onward sale of this Cancellation Statement is prohibited. The environmental qualities of the associated energy have been consumed and that this Cancellation Statement and these Certificates may not be transferred to any party other than the energy supplier or end-consumer.

Origin Account Holder (cancelled by)	
Account Number	19X1000081
Name	EDP Comercial - Comercialização de Energia, S.A.
VAT Number	PT503504564
Address	Avenida 24 de Julho, nº12 1249-300 Lisboa Portugal

Beneficiary (cancelled in favour of)	
Type	Energy supplier
Country of Consumption	Portugal
AIB Domain	19 - REN
Account Number	Non-Registered
Name	TRW Automotive Portugal, Lda
VAT Number	PT500333831
Address	Centro empresarial Talaide, Estrada Octavio Pato 2785-723 S. Domingos de Rana – Cascais Portugal
Delivery Point Codes	


Certificate Cancellation Information	
Cancellation Number	180471
Document Issue	26-05-2021 - v1
Total Cancelled Certificates	14
Cancellation date	26-05-2021
Registry Cancelled From	PT19 REN
Consumption Period	01-04-2021 - 30-04-2021
Remarks	Cancelamento Abr21 Cliente: TRW Automotive Portugal, Lda. NIF: 500333831 Morada: Centro empresarial Talaide, Estrada Octavio Pato, 2785-723 S. Domingos de Rana – Cascais


Cancelled Guarantees of Origin		
Guarantees Details:	From guarantee ID: 5406090000000000000000050122415	Production Period: 01-04-2021 - 30-04-2021
	To guarantee ID: 5406090000000000000000050122418	Issuing Date: 01-05-2021
	Trading Scheme: GO	Quantity: 14
	Issue Domain: PT	Purpose: Disclosure
Installation Details:	Energy Carrier: Electricity	
	Installation Code: 560609000000000002299	Commissioning Date: 01-01-1999
	Installation name: Central Hidroelétrica do Desterro	Equipment: G1

EEGO - Entidade Emissora de Garantias de Origem
Av. Estados Unidos da América, 55
1749-061 Lisboa - Portugal

Tel.: (+351) 210 013 500
Email: eeego@ren.pt
www.ren.pt | <https://eeego.ren.pt>

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Cancelled Guarantees of Origin

	<p>Installed Capacity(MW): 13.200</p> <p>Technology: T030100 Hydro-electric head installations; Run-of-river head installation; Unspecified</p>	<p>Support Type: No support</p> <p>Energy Source: F01050200 Renewable; Mechanical source or other; Hydro & marine; Unspecified</p>
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The correctness of the above information is confirmed by EEGO - the competent issuer of GOs for the domain Portugal.

EXAMPLE I-REC :

 **THE INTERNATIONAL
REC STANDARD**

This Redemption Statement has been produced for

by

confirming the Redemption of

19 936

I-REC Certificates, representing 19 936 MWh of
electricity generated from renewable sources

This Statement relates to electricity consumption located at or in

in respect of the reporting period

2021-01-01 to 2021-12-31

The stated Redemption Purpose is

Retired for the benefit of**- 2021**

Evident



QR Code Verification

Verify the status of this Redemption Statement by scanning the QR code on the
left and entering in the Verification Key below

Verification Key

<https://evidentapp/public/certificates/en//344C3559y1/HQTqNJm/COAbf1NdxOUK3mUL/Vor0=>