

Organisation Volvo Car Corporation	Owner 50130 Global Sustainability	Document type Position Paper	Version 4
Document name Volvo Cars position on Energy Attribute Certificates (EACs) for electricity	Valid from 2026-04-30	Security class Public	

Volvo Cars position on Energy Attribute Certificates (EACs) for electricity

Purpose of this document

This document outlines Volvo Cars position on Energy Attribute Certificates (EACs) and provides guidance on which certificates we allow when procuring and reporting climate neutral electricity. EACs are used to claim Scope 2 emission reductions in line with the Greenhouse Gas Protocol by providing proof of climate neutral energy generation. We consider sources of energy that do not emit GHG emissions in their generation as climate neutral. Although EACs cover both electricity and energy (including heating), this document is focused on electricity. Volvo Cars sees a need to define our position on EACs due to the complexity of the different renewable (RE) markets and to show how we are aligned with international carbon accounting standards, i.e. the GHG Protocol.

Background and challenge

- The current global energy crisis has accelerated the energy transition and once again highlighted the key role of renewable energy.¹
- Volvo Cars' ambition is to reach net zero greenhouse gas emissions by 2040. As a tangible step forward, we intend to reduce carbon emissions by 65 to 75 per cent per car by 2030 (compared to 2018 levels).²
- Securing access to climate neutral energy, both for heating and electricity use, is critical to reach our 2030 and 2040 ambitions. We aim to have climate neutral energy in our own operations, both for heating and electricity. We are also supporting our value chain in transitioning to climate neutral energy sources.
- When shifting from fossil-fuel to climate neutral energy different options are available:
 - Investment in additional (on- or offsite) climate neutral energy production for own energy consumption.
 - Use of different types of power purchase agreements (PPAs). In particular, long-term PPAs for new renewable electricity capacity help to support the development of additional renewable energy generation.
 - Buy climate neutral energy using EACs.
- Organisations may have contracts, i.e. PPAs, to purchase electricity from a specified generating facility³ to enable long-term sourcing of RE with or without the potential to achieve a high degree of additionality.

¹ <https://www.iea.org/reports/renewable-energy-market-update-may-2022>

² Please see the Volvo Cars [Global Newsroom](#) for further explanations.

³ <https://www.epa.gov/sites/default/files/2020-12/documents/electricityemissions.pdf>

- Physical PPAs represent an energy delivery contract between end-user and generator for the supply of electricity and the associated EACs, that may offer a high degree of additionality⁴.
- Virtual PPAs are financial contracts between the RE generator and the end-user without the physical delivery of electricity, but with the transfer of asset specific EACs. The agreement can be cross border, however, generator and end-user should be within the same EAC market boundaries. Virtual PPAs and unbundled EACs have lower transparency, do not enable 24/7 tracking, nor support the build up of local RE production.
- As the GHG emission claims are related to our own electricity usage and footprint, they are not equivalent to carbon offset⁵ claims.

What are Energy Attribute Certificates?

- EACs are certificates representing the environmental attributes (e.g. technology, location, GHG emission rates and facility age) of a generated MWh from a specific RE asset. EACs⁶ are purchased, traded and cancelled to claim the usage of that specific MWh of electricity.⁷
- An EAC allows a company to claim the usage of climate neutral electricity to reduce its carbon footprint associated with purchased electricity.⁸
- EAC procurement can be either contractually bundled (EAC and underlying energy traded in a single contract) or unbundled (EAC and underlying energy traded in separate contracts).

Description of EAC⁹ standard attributes:

Type	REC Renewable Energy Certificates	GO Guarantee of Origin	GEC Green Electricity Certificate ¹⁰	I-REC International Renewable Energy Certificates	TIGR Tradable Instrument for Global Renewables	Japanese EACs (see separate table below)
Location	Used in North America (USA and Canada).	Used in majority of Europe	National certification system in China.	International certification system. Used in any country or region.	International certification system. Used in any country or region.	National certification systems in Japan.
Expiration time frame	12-36 months after generation.	12 months after generation, no later than March 31 the following year.	24 months after generation	Not clearly defined.	Not clearly defined.	
Subsidies	Generally possible to issue RECs and receive state subsidy.	Depending on registry, GOs issued from RE assets receiving state subsidy.	Subsidy allowed, but, if GECs sold the producer can no longer receive subsidy.	No explicit exemptions.	Generally not allowed to issue TIGRs if receiving subsidies.	

⁴ Additionality refers to the degree to which additional renewable energy capacity is added to the grid with the selected RE sourcing option.

⁵ Offsets and EACs are fundamentally different contracts. Offsets address direct and indirect GHG emissions by removal and/or reduction through external projects used to reduce an organisations' scope 1, 2, or 3 emissions, as a net adjustment. EACs address indirect GHG emissions associated with purchased energy by verifying the use of renewable sources of energy, associated with scope 2 emissions.

⁶ To prevent double counting, EAC systems provide tracking to ensure that the same environmental attributes are not claimed more than once.

⁷ All electricity production has an GHG emission factor, expressed in metric tons of CO₂-equivalent per MWh of generation (tCO₂e/MWh) used for Scope 2 calculations and claims.

⁸ Standard by: GHG Protocol, World Resource Institute (WRI) and World Business Council for Sustainable Development (WBCSD): <https://ghgprotocol.org/corporate-standard> and the RE100 Making Credible Claims document.

⁹ EACs specified herein are delimited to the ones that Volvo Cars has a position on. (There are other EACs available as well.)

¹⁰ GEC is China's national system for EACs, launched to reduce governmental subsidies by a market-based mechanism (to mitigate risk of RE investment). RE producers receiving government subsidy can still issue GECs, but once they sell it, they can no longer receive the subsidy.

V O L V O

Framework compliant	GHGP ¹¹ , SBTi ¹² , RE100 ¹³ and CDP ¹⁴ .	GHGP, SBTi, RE100 and CDP.	Conditionally accepted.	GHGP, SBTi, RE100 and CDP. Market boundary needs to be considered.	GHGP, SBTi, RE100 and CDP. Market boundary needs to be considered.	
---------------------	---	----------------------------	-------------------------	--	--	--

Japanese EACs

Type	Non-Fossil Certificates (NFCs)			GEC Japan	J-Credits
	Feed-in-Tariff (FIT) ¹⁵ NFCs	Non-FIT NFCs (incl. Feed-in-Premium (FIP))			
		Renewable (Solar, wind, hydro, geothermal, bioenergy)	Non-Renewable (Nuclear, plastic incineration)		
Bundling	Bundled and unbundled.	Bundled and unbundled.		Unbundled	
Expiration time frame	Same FY as generation.	Same FY as generation.		No expiration.	
Subsidies	Subsidised	Can be subsidised. ¹⁶		No explicit exemptions.	
Framework compliant	GHGP, RE100 and CDP.	GHGP, conditionally RE100 (only renewable sources) and CDP.		GHGP, SBTi, RE100 and CDP.	

Volvo Cars position

We accept the following EACs:

Type	REC	GO	GEC	I-REC	TIGR	Japanese EACs
Position	Accepted as EAC.	Accepted as EAC.	Conditionally accepted as EAC.	Conditionally accepted as EAC.	Conditionally accepted as EAC.	Conditionally accepted as EAC if renewable. Non-FIT Non-Renewable NFCs are generally not accepted. ¹⁷

However, to align with the GHG Protocol scope 2 accounting, EACs shall meet the following criteria:

Criteria	Explanation
1. Credible generation data and convey GHG emission rate claims	The contract must specify the GHG emission rate ¹⁸ associated with the electricity produced. Accurate generation data is critical for the climate neutral usage claim - both static (e.g. location, date of first operation) and dynamic data (quantity of generation and source of energy).
2. Unique claims and exclusive ownership (no double counting)	To make a credible electricity usage claim and avoid double counting, the contract must be the sole owner of the GHG emission claim and ensure no attributes have been sold off, transferred, or claimed elsewhere. Therefore, Volvo Cars will only buy unsubsidised certificates ¹⁹ .
3. Retirement of claims	Contracts shall be redeemed to enable a GHG emission claim. Certificates must be tracked and redeemed, retired, or cancelled when the electricity is consumed.
4. Vintage	<u>Vintage reflects the date of energy generation from which the contractual instrument is derived.</u> Certificates shall be redeemed as close as possible to the period of energy consumption to which it is applied, and consistent with existing market standards, ensuring a timely cancellation (retirement) of EACs. Volvo Cars employs a 12-month validity period between renewable energy generation (vintage) and the period of energy consumption to ensure temporal alignment.
5. Market boundaries	The certificate must be valid for the same market as where the electricity is produced. A market is a geographical area with a common system for trading and cancellation. E.g. the US and China can be seen as markets dependent on boundaries set by the issuing body of the certificate.
6. Residual mix	The residual mix represent emission intensity from remaining energy generation after EACs are delivered. Utility specific emission factors are therefore claimed and deducted from the calculation. The residual mix shall be disclosed for consumer scope 2 calculations and if no EAC is available. ²⁰

¹¹ The GHG Protocol outlines that electricity should be sourced from the same market as the electricity usage occur.

¹² The Science Based Targets initiative (SBTi).

¹³ RE100 is the global corporate renewable energy initiative bringing together hundreds of large and ambitious businesses committed to 100% renewable electricity.

¹⁴ Carbon Disclosure Project (CDP).

¹⁵ Enacted in July 2012. End-users pays for the RE surcharge.

¹⁶ Electricity under FIP is subsidized, enacted in April 2022. The Government pays the RE surcharge.

¹⁷ Nuclear may be conditionally accepted if the nuclear waste treatment method is disclosed.

¹⁸ Refers to the GHG generated during the RE production.

¹⁹ In some markets (e.g. Japan) when only subsidised EACs are available, exemptions are allowed.

²⁰ If a residual mix is not currently available, companies shall disclose that an adjusted emissions factor is not available or has not been estimated to account for voluntary purchases and this may result in double counting between electricity consumers.

- Volvo Cars prefer bundled EACs. Allowing for unbundled ones may be needed when other options are not viable.
- Regardless of the standard and framework we always take Volvo Cars' sustainability requirements into account in case standard requirements are lower than ours.

Regarding I-RECs, TIGRs, GECs and Japanese EACs (RE²¹), Volvo Cars accepts these under the following conditions:

- The certificate must be valid for the same market as where the electricity is produced. China can be considered as one market (dependent on boundary set by the issuing body of the certificate according to the GHG protocol).
- Abides by 12-month validity period between renewable energy generation (vintage) and the period of energy consumption to which it is applied. A timely cancellation of EACs is required.
- .²²The contract must specify the GHG emission rate for the generated electricity.
- There must not be any double accounting (e.g. by issuing other types of certificates or contracts for the same MWh of electricity) of such CO2 emissions on behalf of the producer or the utility company (i.e. all contracts must have the same owner). We should only buy unsubsidised certificates, but under certain conditions exemptions²³ may be necessary.
- Bundled EACs are preferred over unbundled. Allowing for unbundled ones may be needed when other options are not viable.
- The certificate must be tracked and redeemed, retired, or cancelled when the electricity is consumed to claim the climate neutral energy usage.

Future direction

- We expect the sustainability requirements on EACs to increase in the next 5-10 years. Additional criteria may include requirements on RE, additionality, shorter expiration of EACs (e.g. monthly, 24/7 matching) and stricter definitions of electricity markets (e.g. physically interconnected grid, same electricity pricing area). We aim to demonstrate leadership through gradually applying additional temporal- and spatial-matching criteria.

²¹ Nuclear may be conditionally accepted if the nuclear waste treatment method is disclosed.

²² As the expiration dates for GEC and TIGRs is not clearly defined, Volvo Cars set this standard to comply with applicable frameworks.

²³ In some markets (e.g. Japan) when only subsidised EACs are available, exemptions are allowed.