CertifHy

CertifHy Scheme

Subsidiary Document

CertifHy-SD Hydrogen Criteria

Dissemination level: public

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Contents

Status of this document

This document, CertifHy-SD Hydrogen Criteria, is a subsidiary document to the 'CertifHy Scheme' of CertifHy.

In the event of conflict between the text of the CertifHy Scheme and the text of this document, the CertifHy Scheme shall always take precedence.

The CertifHy-SD Hydrogen Criteria document was formally approved by the CertifHy Stakeholder Platform on 28 April 2022.

The effective date of this CertifHy Scheme subsidiary document is 29 April 2022.

Change history

Version	Date	Description
0.1	2019-01-15	Initial draft
0.2	2019-01-26	CertifHy consortium feedback taken into account
0.3	2019-02-14	CertifHy WG1, WG2 feedback taken into account
0.4	2019-02-21	CertifHy WG1 endorsed
1.0	2019-03-11	CertifHy Steering Group endorsed with one comment (request for CertifHy consortium to adjust)
1.1	2019-03-13 2019-03-25	CertifHy consortium adjusted as requested by Steering Group CertifHy Stakeholder Platform endorsed
1.2	2021-10-29	Adjustment to EECS requirements
1.3	2022-03-23	CertifHy WG1 endorsed
1.4	2022-04-19	Further adjustments to EECS and ISO 14067; CertifHy WG1 endorsed
1.5	2022-04-27	CertifHy Steering Group endorsed
2.0	2022-04-28	CertifHy Stakeholder Platform endorsed

1 Introduction

1.1 General

CertifHy's mission is to advance and facilitate the production, procurement, and use of Hydrogen fulfilling ambitious environmental criteria in order to protect the climate and improve the living conditions of humankind.

CertifHy wants to contribute to and promote an environmentally, socially and economically sustainable production of Hydrogen in all uses including energy, mobility, chemical conversion, etc.

1.2 CertifHy

CertifHy is a high-quality European Certification scheme that sets out statements and principles regarding the operation of the scheme. It covers the entire upstream supply chain to the production device exit gate at defined quality. The scheme is continuously reviewed and improved by means of a multi-stakeholder dialogue.

The core features of the scheme are openness, reliability, integrity, quality and transparency. Those values are the fundamentals of CertifHy's relationship with its Stakeholders.

The scheme is complemented by criteria Hydrogen needs to fulfil.

1.3 Purpose

Hydrogen must fulfil certain criteria in order to be labelled "CertifHy green Hydrogen" or "CertifHy low-carbon Hydrogen". The purpose of this document is to specify these criteria.

This Document "CertifHy-SD Hydrogen Criteria" is a subsidiary document to the CertifHy Scheme.

2 Normative References

CertifHy makes reference to other standards and their definitions in its documents. For this document ‘H2-criteria definition’, as well as for its subsidiary documents, CertifHy refers to ISO Standard 14044and 14067 and their definitions of basic terms. ISO Standard 14064 is referred to in terms of definitions of “materiality” and “level of assurance”, but not for other aspects or issues.

3 Definition of terms

For a common understanding of the terminology used in the CertifHy documents, definitions and terms are outlined and explained in the CertifHy Scheme section 5.

In case this document uses further terminologies not specified in section 5 of the scheme, they are explained in the table below.

Term	Definition
Energy Source	Primary source of energy from which the energy content of a Core Energy Input derives.
Product System	Collection of unit processes with elementary flows and product flows, performing one or more defined functions and which models the life cycle of a product.

4 Criteria

Core Energy Input

Core Energy Input includes all energy Input that is required to generate the hydrogen molecules. This includes the following:

- For material inputs that enter into the molecular structure of the hydrogen this is the lower heating value of the material inputs.
- For energy inputs that are needed according to the hydrogen production reaction this is energy content of the energy inputs; for material energy inputs this is the lower heating value.
- Core Energy Input is actual energy Input, not the theoretical input according to the chemical equation.

CertifHy Green Hydrogen and *CertifHy Low-carbon Hydrogen* definition

CertifHy Green Hydrogen is Hydrogen from renewable energy that additionally fulfils the criteria of *CertifHy Low-carbon Hydrogen*.

Hydrogen produced from renewable energy is Hydrogen produced from renewable sources as defined in the Renewable Energy Directive recast of 2018[1].

'Energy from renewable sources' is defined in the Renewable Energy Directive recast of 2018 in article 2[1] as:

> *"(1) 'energy from renewable sources' or 'renewable energy' means energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas;"*

where

> *"(2) 'ambient energy' means naturally occurring thermal energy and energy accumulated in the environment with constrained boundaries, which can be stored in the ambient air, excluding in exhaust air, or in surface or sewage water;*
>
> *(3) 'geothermal energy' means energy stored in the form of heat beneath the surface of solid earth;*
>
> *(24) 'biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin;*

[1] DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the promotion of the use of energy from renewable sources (recast); OJ L 328/82, 21.12.2018.

(28) 'biogas' means gaseous fuels produced from biomass;"

In multi-fuel plants using renewable and non-renewable sources for Hydrogen production, only the part of Hydrogen produced from renewable sources shall be taken into account for the calculation of the quantity of *CertifHy green Hydrogen*. For the purposes of that calculation, the contribution of each Energy Source shall be calculated on the basis of its energy content using the lower heating value[2]. *CertifHy Low-carbon Hydrogen* is Hydrogen from a production batch or sub-batch having a Carbon Footprint equal to or lower than a specified limit. Until the time that these requirements have been clearly established, the specified limit is 36.4 gCO_{2eq}/MJ[3] which represents a reduction of 60% compared to the benchmark process.

A production batch is the Hydrogen produced by a Hydrogen Production Device between any two points in time selected by the Operator Account Holder of this production device for which the quantity of Certificates that may be issued is calculated.

A sub-batch is the part of a production batch defined in accordance with production process specific calculation procedures defined in a subsidiary document to this document.

Eligibility of Hydrogen production device

If the Carbon Footprint of the Hydrogen produced by the production device since registration with CertifHy or during the latest period of 12 months where data is available, but with a starting date not longer than 24 months ago, which is neither qualified as *CertifHy Green Hydrogen* nor as *CertifHy Low-carbon Hydrogen* is below the benchmark value, the production device is eligible to produce *CertifHy Green Hydrogen* or *CertifHy Low-carbon Hydrogen*; otherwise it is not.

The benchmark process is state-of-the art steam reforming of natural gas in large installations. The Carbon Footprint of the H2 produced by the benchmark process is 91 gCO_{2eq}/MJ[3].

The threshold for data materiality has been defined taking into account that information is material if the outcome of the assessment could be changed by omitting, misstating or misreporting that information. Accordingly, CertifHy defines the threshold for materiality of energy inputs as a total of 5% based on the amount of energy sold or, for non-energy inputs, based on total GHG emissions.

The level of assurance to be applied in CertifHy audits is set as reasonable assurance.

[2] Values regarding the energy content of fuels, as set out in the Renewable Energy Directive recast of 2018 in Annex III, shall be used. For the determination of the energy content of fuels not included in Annex III, the relevant European Standards Organisation (ESO) standards shall be used in order to determine the heating values of fuels. Where no ESO standard has been adopted for that purpose, the relevant International Organization for Standardisation (ISO) standards shall be used.
[3] MJ of Hydrogen using the lower heating value.

Well-to-gate Carbon Footprint of Hydrogen

The calculation of the Carbon Footprint of a production batch shall follow the methodology defined by the International Organization for Standardisation (ISO) standards ISO 14044 and 14067.

The system boundary considered for determining the greenhouse gas impact of the Hydrogen produced shall include all its life-cycle stages "from well to gate", i.e. from extraction and processing of raw materials up to production of a marketable product.

The emissions from the following activities are not considered:

- Building of the capital goods (including Hydrogen production device, etc.),
- Transport and supply of the Hydrogen to the consumers,
- Use of the Hydrogen, and
- Product end of life.

The system boundary shall include all the production stages needed to reach a Hydrogen purity of at least 99.9%$_{vol}$ and a gauge pressure of at least 3 MPa.

If the Hydrogen at the production device's boundary limit is lower than 3 MPa, the system boundary may be set at this boundary limit if an additional electricity consumption that would be required to reach a pressure of 3 MPa assuming an isentropic efficiency of 60% and a single compression stage is taken into account. This additional electricity consumption is assumed to have the same Carbon Footprint as that of the electricity consumed for Hydrogen production. In case GOs are cancelled for the electricity used for Hydrogen production, then GOs also need to be cancelled for the additional amount of electricity for compression.

The greenhouse gas impact of electricity used for Hydrogen production shall be considered to be equal to zero for electricity from wind, solar photovoltaic, and hydropower.

Greenhouse gas emissions allocation methods will be defined in a subsidiary document to this document.

Renewable origin of the energy consumed

The renewable origin of energy consumed in the form of electricity, gas or heat from the grid or a district heating network shall be established by cancelling Guarantees of Origin.