



# SLOVENSKI STANDARD

## oSIST prEN ISO 19870-1:2025

01-junij-2025

---

**[Not translated]**

Hydrogen technologies - Methodology for determining the greenhouse gas emissions associated with the hydrogen supply chain - Part 1: Emissions associated with the production of hydrogen to production gate (ISO/DIS 19870-1:2025)

Technologies de l'hydrogène - Méthodologie pour déterminer les émissions de gaz à effet de serre associées à la chaîne d'approvisionnement en hydrogène - Partie 1: Émissions associées à la production d'hydrogène jusqu'au point de production (ISO/DIS 19870-1:2025)

**Ta slovenski standard je istoveten z: prEN ISO 19870-1**

<https://standards.iteh.ai/catalog/standards/sist/b994856a-7ba4-49b1-8bbe-d83238174b6d/osist-pren-iso-19870-1-2025>

---

**ICS:**

13.020.40	Onesnaževanje, nadzor nad onesnaževanjem in ohranjanje	Pollution, pollution control and conservation
27.075	Tehnologija vodika	Hydrogen technologies

**oSIST prEN ISO 19870-1:2025**

**en,fr,de**





# DRAFT International Standard

## ISO/DIS 19870-1

### Hydrogen technologies — Methodology for determining the greenhouse gas emissions associated with the hydrogen supply chain —

#### Part 1: Emissions associated with the production of hydrogen to production gate

ICS: 27.075; 13.020.40

ISO/TC 197/SC 1

Secretariat: **SCC**

Voting begins on:  
**2025-05-05**

Voting terminates on:  
**2025-07-28**

This document is circulated as received from the committee secretariat.

**ISO/CEN PARALLEL PROCESSING**

Reference number  
ISO/DIS 19870-1:2025(en)

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENTS AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

© ISO 2025

## ISO/DIS 19870-1:2025(en)

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[oSIST prEN ISO 19870-1:2025](https://standards.iteh.ai/catalog/standards/sist/b994856a-7ba4-49b1-8bbe-d83238174b6d/osist-pren-iso-19870-1-2025)

<https://standards.iteh.ai/catalog/standards/sist/b994856a-7ba4-49b1-8bbe-d83238174b6d/osist-pren-iso-19870-1-2025>



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## ISO/DIS 19870-1:2025(en)

## Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms, definitions and abbreviated terms</b>	<b>2</b>
3.1 Quantification of the Carbon Footprint of a Product	2
3.2 Products, product systems and processes	4
3.3 Life Cycle Assessment	8
3.4 Organizations	11
3.5 Data and Data Quality	11
3.6 Abbreviated Terms	12
<b>4 Evaluation Methods</b>	<b>12</b>
4.1 Evaluation Basis	12
4.1.1 General Principles	12
4.1.2 Attributional approach	13
4.1.3 Consequential approach	13
4.2 Product reporting	14
4.2.1 Product System Boundary	14
4.2.2 Selected Cut-Off Criteria	15
4.2.3 Evaluation Elements	15
4.2.4 Evaluation cycle	16
4.3 Quantification of GHG emissions	16
4.3.1 Process description and data quality	16
4.3.2 Emissions inventory	17
4.3.3 Emissions allocation	22
4.4 CFP study report	26
<b>5 Critical review</b>	<b>26</b>
<b>Annex A (Normative) Hydrogen Purity</b>	<b>27</b>
<b>Annex B (informative) Consequential Approach—Examples for Hydrogen Production</b>	<b>31</b>
<b>Annex C Feedstocks for Hydrogen Production</b>	<b>35</b>
<b>Annex D Hydrogen Production Pathway – Methane Reforming (with or without Carbon Capture and Storage)</b>	<b>42</b>
<b>Annex E Hydrogen Production Pathway – Water Electrolysis</b>	<b>58</b>
<b>Annex F Hydrogen Production Pathway – Chlor-alkali</b>	<b>63</b>
<b>Annex G Hydrogen Production Pathway – <u>Steam cracking</u></b>	<b>70</b>
<b>Annex H Hydrogen Production Pathway – Gasification with or without carbon capture</b>	<b>77</b>
<b>Annex I Hydrogen Production Pathway – Methane pyrolysis</b>	<b>85</b>
<b>Annex J Hydrogen Production Pathway – Chemical Looping Water Splitting with or without carbon capture</b>	<b>93</b>
<b>Annex K Hydrogen Production Pathway – Geologic Hydrogen Production</b>	<b>100</b>
<b>Annex L Hydrogen Production Pathway – Catalytic Naphtha Reforming</b>	<b>110</b>
<b>Bibliography</b>	<b>116</b>

## ISO/DIS 19870-1:2025(en)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 197, *Hydrogen technologies*, Subcommittee SC 1, *Hydrogen at scale and horizontal energy systems*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

oSIST prEN ISO 19870-1:2025

<https://standards.iteh.ai/catalog/standards/sist/b994856a-7ba4-49b1-8bbe-d83238174b6d/osist-pren-iso-19870-1-2025>

## ISO/DIS 19870-1:2025(en)

## Introduction

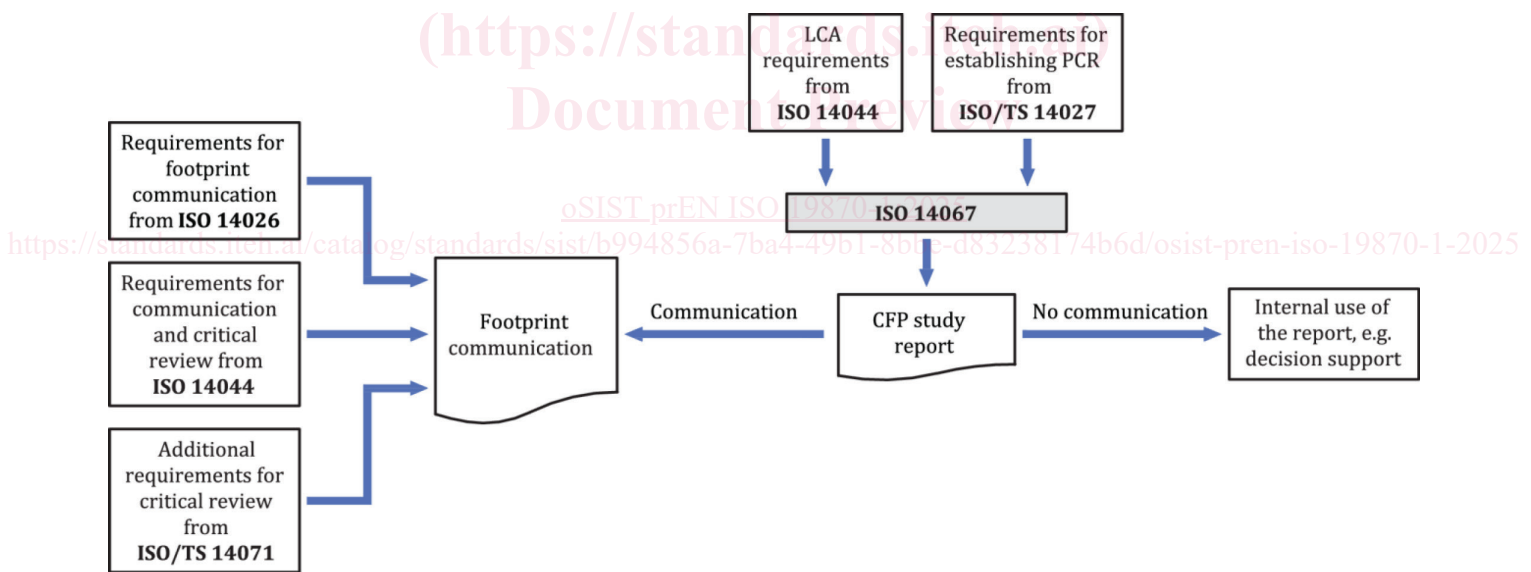
The Paris Agreement was adopted at the UN Climate Change conference (COP21) with the aims of: strengthening the global response to the threat of climate change, restricting global temperature rise to below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1,5 °C above pre-industrial levels. To meet these goals, greenhouse gas (GHG) emissions need to be reduced by about 45 % from 2010 levels by 2030, reaching net zero in 2050 (IPCC, 2018; UNFCCC, 2021).

GHG initiatives on mitigation rely on the quantification, monitoring, reporting and verification of GHG emissions and/or removals. International Standards that support the transformation of scientific knowledge into tools can help in reaching the targets of the Paris Agreement to address climate change.

ISO 14044 defines the requirements and guidelines identified in existing International Standards on life cycle assessment (LCA). The ISO 14060 series provides clarity and consistency for quantifying, monitoring, reporting and validating or verifying GHG emissions and removals to support sustainable development through a low-carbon economy. It also benefits organizations, project proponents and stakeholders worldwide by providing clarity and consistency on quantifying, monitoring, reporting and validating or verifying GHG emissions and removals.

ISO 14067 is based on the requirements and guidelines on LCA identified in ISO 14044 and aims to set specific requirements for the quantification of a carbon footprint (CFP) and a partial CFP. ISO 14067 defines the principles, requirements and guidelines for the quantification of the carbon footprint of products. Its aim is to quantify GHG emissions associated with the lifecycle stages of a product, beginning with resource extraction and raw material sourcing and extending through the production, use and end-of-life stages of the product.

[Figure 1](#) illustrates the relationship between ISO 14067 and other ISO documents on LCA.



PCR: Product category rule

**Figure 1 — Relationship between standards beyond the GHG management family of standards (source ISO 14067:2018)**

Hydrogen can be produced from diverse sources including renewables, nuclear and fossil fuels, with or without carbon capture, utilization and storage (CCUS). Hydrogen can be used to decarbonize numerous sectors.

A particular challenge is that identical hydrogen molecules can be produced and combined from sources that have different GHG intensities. Similarly, hydrogen-based fuels and derivatives will be indistinguishable and can be produced from hydrogen combined with a range of fossil and low-carbon inputs. Indeed,