



PROPOSAL for a NEW FIELD OF TECHNICAL ACTIVITY	
Date of circulation 2023-07-17	CEN/TC N (where appropriate)
Secretariat NEN	CENELEC/TC/ SC (Sec) (where appropriate)
Type of technical body proposed (TC / SC / BTTF)	Technical committee

IMPORTANT NOTE: Incomplete proposals risk rejection or referral to originator.

The proposer has considered the guidance given in Annexes 1 and 2 during the preparation

Proposal (to be completed by the proposer)

Title of the proposed new subject

(The title shall indicate clearly and unambiguously, yet concisely, the new field of technical activity which the proposal is intended to cover.)

CO₂ capture, transportation, utilization, storage and carbon accounting

Scope statement of the proposed new subject

(The scope shall precisely define the limits of the new field of technical activity. Scopes shall not repeat general aims and principles governing the work of the organization but shall indicate the specific area concerned.)

This technical committee will deal with standardization of activities in the field of carbon dioxide (CO₂) capture, transportation, utilization and storage (CCUS) as well as activities in the field of carbon accounting.

Standardization includes but is not limited to the full lifecycle of CCUS projects (e.g. design, construction, commissioning, operation / use, inspection and maintenance, abandonment / end of life) and will cover discipline specific (occupational) health, safety and environmental aspects, risk management, lifecycle assessment, CO₂ composition and measurement, quantification and verification, and monitoring.

Standardization also includes developing a harmonized carbon accounting system, building on established calculation methodologies, frameworks and chain-of-custody models to enable unambiguous, reliable and transparent business-to-business, business-to-government and business-to-consumer communication about the trade of CO₂ and possibly other greenhouse gases either physically (e.g. CO₂ as commodity / raw material) or administratively (e.g. carbon credits, carbon take back obligation).

Purpose and justification for the proposal.

According to the [International Energy Agency](#) (IEA), CO₂ capture, utilization and storage (CCUS) is an important emissions reduction technology that can be applied across the energy system. CCUS technologies involve the capture of CO₂ from fuel combustion or industrial processes, the transport of this CO₂ via ship or pipeline, and either its use as a resource to create valuable products or services or its permanent storage deep underground in geological formations. CCUS technologies also provide the foundation for carbon removal or "negative emissions" when the CO₂ comes from bio-based processes or directly from the atmosphere.

Highlights of IEA's '[A new era for CCUS](#)' as included in *CCUS in Clean Energy Transitions – Part of Energy Technology Perspectives* (flagship report, September 2020) are:

- CCUS so far has not lived up to its promise. Although its relevance for reaching climate goals has long been recognised, deployment has been slow: annual CCUS investment has consistently accounted for less than 0,5 % of global investment in clean energy and efficiency technologies.
- Stronger climate targets and investment incentives are injecting new momentum into CCUS. Plans for more than 30 new integrated CCUS facilities have been announced since 2017, mostly in the United States and **Europe**, although projects are also planned in Australia, China, Korea, the Middle East and New Zealand. Projects at advanced stages of planning represent a total estimated investment of more than USD 27 billion, almost double the investment in projects commissioned since 2010.

- CCUS technologies offer significant strategic value in the transition to net-zero:
 - CCUS can be retrofitted to existing power and industrial plants, which could otherwise still emit 8 billion tonnes (Gt) of carbon dioxide (CO₂) in 2050;
 - CCUS can tackle emissions in sectors where other technology options are limited, such as in the production of cement, iron and steel or chemicals, and to produce synthetic fuels for long-distance transport (notably aviation);
 - CCUS is an enabler of least-cost low-carbon hydrogen production;
 - CCUS can remove CO₂ from the atmosphere by combining it with bioenergy or direct air capture to balance emissions that are unavoidable or technically difficult to abate.
- The Covid-19 crisis represents both a threat and an opportunity for CCUS: the economic downturn will almost certainly impact investment plans and lower oil prices are undermining the attractiveness of using CO₂ for enhanced oil recovery. But CCUS is in a stronger position to contribute to economic recoveries than after the global financial crisis. A decade of experience in developing projects and the recent uptick in activity means that there are a number of “shovel-ready” projects with potential to double CCUS deployment by 2025.

According to the [European Commission’s website](#), CCS has significant potential to help mitigate climate change both in Europe and internationally, particularly in countries with large reserves of fossil fuels and a fast-increasing energy demand. They highlight the following aspects:

- Ensuring safe and environmentally sound CCS: The environmental integrity of CCS is the Commission's overriding concern. This is partly a matter of ensuring that the CO₂ captured and stored remains isolated from the atmosphere in the long term; and partly about ensuring that the capture, transport and storage elements do not present other risks to human health or ecosystems. Although the components of CCS are all known and deployed at commercial scale, integrated systems are new. A clear regulatory framework is thus required, and the EU's [CCS Directive](#) provides this.
- High cost a barrier to uptake: The cost of capture and storage remains an important barrier to the take-up of CCS. The capture component in particular is an expensive part of the process. As flue gas from coal or gas-fired power plants contains relatively low concentrations of CO₂ (10 % - 12 % for coal and around 3 % - 6 % for gas), the amount of energy needed to capture the gas makes the process costly.
- CCS under 2030 policy framework for climate and energy: The Commission's proposal for a [2030 climate and energy policy framework](#) acknowledges the role of CCS in reaching the EU's long-term emissions reduction goal. Significant emissions cuts are needed in the EU's energy and carbon-intensive industries. As theoretical limits of efficiency are being reached and process-related emissions are unavoidable in some sectors, CCS may be the only option available to reduce direct emissions from industrial processes on the scale needed in the longer term. In the power sector, CCS could be a key technology for fossil fuel-based generation. It could help balance an electricity system with increasing shares of variable renewable energy. To ensure that CCS can be deployed in the 2030 timeframe, increased R&D efforts and commercial demonstration are essential over the next decade. A supportive EU framework will be necessary through continued and strengthened use of auctioning revenues.

In the [Net-Zero Industry Act](#), a key part of the European Green Deal Industrial Plan, the European Commission proposes a framework of measures to accelerate Europe’s green transition. The Act addresses the relevance of facilitating and enabling CCS projects, including enhancing the availability of CO₂ storage sites. In addition, the Act states:

- Carbon capture and storage require a cross-border, single market approach to be an effective solution for industries in all Member States, including in those Member States with no CO₂ storage capacity, and is therefore best addressed in a coordinated way at EU level.
- To scale up the technology and expand its leading manufacturing capacities, the EU needs to develop a forward-looking supply of permanent geological CO₂ storage sites permitted in accordance with Directive 2009/31/EU 36 . By defining a Union target of 50 million tonnes of annual operational CO₂ injection capacity by 2030, in line with the expected capacities needed in 2030, the relevant sectors can coordinate their investments towards a European Net-Zero CO₂ transport and storage value chain that industries can use to decarbonise their operations. This initial deployment will also support further CO₂ storage in a 2050 perspective. According to the Commission’s estimates, the Union could need to capture up to 550 million tonnes of CO₂ annually by 2050 to meet the net zero objective 37 , including for

carbon removals. Such a first industrial-scale storage capacity will de-risk investments into the capturing of CO₂ emissions as important tool to reach climate neutrality.

Considering IEA's report, European Commission's policy, and also the many 'decarbonization / low-carbon emissions' plans presented by several industries and companies, it is now the right moment to intensify standardization activities. To date, standardization activities take place at international level with a focus on CCS, managed by ISO/TC 265 'Carbon dioxide capture, transportation, and geological storage'. In addition, ISO/TC 207 'Environmental management' addresses greenhouse gas emission related activities, especially subcommittees SC 5 'Life cycle assessment' and SC 7 'Greenhouse gas management and related activities'.

Following a consultation among European experts participating in ISO/TC 265/WG 4 'Quantification and verification', communications with several associations and a poll among participants in research projects, European stakeholders expressed the need for (increased) European coordination and cooperation in the field of CCUS standardization activities as well as that of carbon accounting. It was acknowledged that CCUS and carbon accounting are global issues in which international standards should be preferred over home-grown European standards. However, it was also recognized that there might be topics that serve a particular European need or for which European stakeholders could first agree with a European standard to be offered to ISO for transforming into an international standard. A dedicated CEN technical committee offers several opportunities for European stakeholders, including but not limited to:

- adoption of published ISO standards as European standards; all CEN members (representing 34 countries) are obliged to adopt European standards as their national standards and to withdraw possible conflicting home-grown national standards;
- parallel development of new EN-ISO standards (under so-called Vienna Agreement) to assess if these standards also satisfy the needs and expectation of European stakeholders while not conflicting European regulations;
- coordinated input, or at least exchange of views, with respect to ISO related activities as committee's business plans, new work item proposals, and draft international standards;
- development of home-grown European standards for topics that serve particular European needs (which might be expressed via a standardization request from the European Commission) or for topics that could not yet reach consensus at a global level (and for which a European standard can serve as starting point).

European standardization has also proven to be an effective tool to support European legislation and policy. Standards can be developed either as alternative for legislation (i.e. self-regulation) or to support legislation (e.g. presumption of conformity). A new CEN technical committee for CO₂ capture, transportation, utilization, storage and carbon accounting would fulfil this role in this emerging field of activities.

Is the proposed new subject actively, or probably, in support of European legislation or established public policy?

Yes No

If Yes, indicate if the proposal is

▪ **in relation to EC mandate(s):**

N/A | A standardization request might be considered in future

▪ **in relation to EC Directive(s)/Regulation(s):**

[Directive 2009/29/EC](#) of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community

[Directive 2009/31/EC](#) of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006

[Proposal](#) for a regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act)

▪ **in relation to other legislation or established public policy:**

The [European Green Deal](#) – an ambitious package of measures ranging from ambitiously cutting greenhouse gas emissions, to investing in cutting-edge research and innovation, to preserving Europe's natural environment. First climate action initiatives under the Green Deal include:

- [European Climate Law](#) to enshrine the 2050 climate-neutrality objective into EU law
- [European Climate Pact](#) to engage citizens and all parts of society in climate action
- [2030 Climate Target Plan](#) to further reduce net greenhouse gas emissions by at least 55% by 2030

Proposed initial programme of work

The proposed programme of work shall correspond to and clearly reflect the aims of the standardization activities and shall therefore show the relationship between the subject proposed.

Each item on the programme of work shall be defined by both the subject aspect(s) to be standardized (for products, for example, the items would be the types of products, terminology, characteristics, other requirements, data to be supplied, test methods, performance requirements, etc.). Supplementary justification may be combined with particular items in the programme of work (e.g. output from a research project).

The proposed programme of work shall also suggest priorities, target dates and the most appropriate type of deliverable (e.g. EN, TS) for each item

The initial work programme will consist of (non-exhaustive list and subject to changes following stakeholders needs and priorities):

- European adoption of several standards published by [ISO/TC 265](#) 'Carbon dioxide capture, transportation, and geological storage' through the Vienna Agreement on a case-by-case basis;
- standard(s) on CO₂ composition specifying different grades of purity and determination methods, and where needed, developing standards for determination methods of newly identified elements / impurities;
- standard(s) on CO₂ quantification and verification applicable to the entire or parts of the CCS/CCU value chain (*NB. a similar project has been cancelled in ISO/TC 265 due to lack of consensus within given timeframe*);
- standard(s) to facilitate (cross-border) transportation of CO₂ by pipeline or shipping, including safety, integrity, interoperability and environmental aspects; compression and liquefaction; CO₂ transfer systems (loading / unloading); temporary storage;
- standard(s) related to well governance during full lifecycle of geological storage of CO₂;
- standard(s) related to risk management [related to the European context, e.g. legislation, and building on ISO deliverables]
- standard(s) for harmonized approach for lifecycle assessments (LCA) in the field of CCU, building on several LCA methodologies developed by different research programmes;
- standard(s) to build a framework / tools box in the field of carbon accounting (e.g. guarantees of origin, carbon take back obligation, carbon removal mechanisms, chain-of-custody models, conformity assessment activities, business-to-business / business-to-government / business-to-consumer communication).

A statement from the proposer as to how the proposed work may relate to or impact on existing work, especially existing CEN, CENELEC, ISO and IEC deliverables.

The proposer should explain how the work differs from apparently similar work, or explain how duplication and conflict will be minimized. If seemingly similar or related work is already in the scope of other committees of the organization, or in other organizations, the proposed scope shall distinguish between the proposed work and the other work. The proposer shall indicate whether his or her proposal could be dealt with by widening the scope of an existing committee or by establishing a new committee.)

The proposed work will, wherever possible, build on existing ISO standards (see next section) by adopting them, supplementing them to address discipline, sector or region (Europe) specific needs, or referring to them. The CEN deliverables intended to be developed and published might be input for revision of existing CEN and ISO deliverables. Through establishing liaisons with the relevant CEN and ISO technical committees, the standardization activities will be coordinated and collaboration will be encouraged to avoid duplication of work or conflicting requirements.

A listing of relevant existing documents at the international, regional and national levels.

Any known relevant documents (such as standards and regulations) shall be listed, regardless of their source, and should be accompanied by an indication of their significance.

- EN ISO 14040:2006, Environmental management — Life cycle assessment — Principles and framework
- EN ISO 14044:2006, Environmental management — Life cycle assessment — Requirements and guidelines
- EN ISO 14045:2012, Environmental management — Eco-efficiency assessment of product systems — Principles, requirements and guidelines
- ISO/TR 14047:2012, Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to impact assessment situations
- ISO/TS 14048:2002, Environmental management — Life cycle assessment — Data documentation format
- ISO/TR 14049:2012, Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis
- EN ISO 14064-1:2018, Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- EN ISO 14064-2:2019, Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- EN ISO 14064-3:2019, Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements
- EN ISO 14065:2020, General principles and requirements for bodies validating and verifying environmental information
- EN ISO 14066:2011, Greenhouse gases — Competence requirements for greenhouse gas validation teams and verification teams
- EN ISO 14067:2018, Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- ISO 14068: —, Greenhouse gas management and related activities — Carbon neutrality
- ISO/TR 14069:2013, Greenhouse gases — Quantification and reporting of greenhouse gas emissions for organizations — Guidance for the application of ISO 14064-1
- ISO/TS 14071:2014, Environmental management — Life cycle assessment — Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006
- ISO/TS 14072:2014, Environmental management — Life cycle assessment — Requirements and guidelines for organizational life cycle assessment
- ISO 14080:2018, Greenhouse gas management and related activities — Framework and principles for methodologies on climate actions
- EN ISO 14083: —, Greenhouse gases — Quantification and reporting of greenhouse gas emissions arising from operations of transport chains
- ISO 14097: —, Framework including principles and requirements for assessing and reporting investments and financing activities related to climate change
- EN 19694-1: —, Stationary source emissions — Determination of greenhouse gas (GHG) emissions in energy-intensive industries — Part 1: General aspects
- ISO 22095:2020, Chain of custody — General terminology and models
- ISO/TR 27912:2016, Carbon dioxide capture — Carbon dioxide capture systems, technologies and processes
- ISO 27913:2016, Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems
- ISO 27914:2017, Carbon dioxide capture, transportation and geological storage — Geological storage
- ISO/TR 27915:2017, Carbon dioxide capture, transportation and geological storage — Quantification and verification
- ISO 27916:2019, Carbon dioxide capture, transportation and geological storage — Carbon dioxide storage using enhanced oil recovery (CO₂-EOR)
- ISO 27917:2017, Carbon dioxide capture, transportation and geological storage — Vocabulary — Cross cutting terms
- ISO/TR 27918:2018, Lifecycle risk management for integrated CCS projects

- ISO 27919-1:2018, Carbon dioxide capture — Part 1: Performance evaluation methods for post-combustion CO₂ capture integrated with a power plant
- ISO 27919-2: —, Carbon dioxide capture — Part 2: Evaluation procedure to assure and maintain stable performance of post-combustion CO₂ capture plant integrated with a power plant
- ISO/TR 27921:2020, Carbon dioxide capture, transportation, and geological storage — Cross cutting issues — CO₂ stream composition
- ISO/TR 27922: —, Carbon dioxide capture — Overview of carbon dioxide capture technologies in the cement industry
- ISO/TS 27924: —, Risk management for integrated CCS projects
- Greenhouse Gas Protocol standards, guidance and calculation tools
- Implementation of the CCS Directive Guidance documents (four parts)
- Intergovernmental Panel on Climate Change (IPCC) Guidelines

Known patented items

Yes No If "Yes", see CEN-CENELEC Guide 8 and provide full information in an annex

A simple and concise statement identifying and describing relevant affected stakeholder categories (including small and medium sized enterprises) in particular those who are immediately affected from the proposal (see Annexes 1 and 2) and how they will each benefit from or be impacted by the proposed deliverable(s)

- **Economic operators:** These organizations are (or intend to become) part of the CCUS value chain or other value chains in cases of CO₂ trading. Economic operators include, but are not limited to, organizations that apply CO₂ capture technologies like the energy-intensive industry (e.g. cement, hydrocarbons, lime, steel) and energy production sector, organizations that operate the physical infrastructure for transporting (e.g. pipeline, vessel) and temporarily storing (liquefied) CO₂, organizations that valorise the (recycled) CO₂ in their production process(es), organizations that operate storage facilities (e.g. wells, caverns) in which the CO₂ is permanently stored, and organizations that buy or sell CO₂ credits to meet mandatory or voluntary goals.
- **Government:** (Inter)governmental bodies can have several roles in the CCUS and carbon accounting developments, including policy making, drafting laws and regulations, granting permits and supervising operations (market surveillance), participating in projects (i.e. state interest), and granting (financial) support. The intent of standards is that they are also recognized by governments and authorities as a reference to apply best practices to demonstrate compliance with the requirements set by the bodies concerned. Their involvement in standardization activities will strongly enhance this intent, in which it is important to identify for which role(s) each standard is developed.
- **Research and knowledge institutes:** Good understanding of (the performance of) the various CO₂ capture technologies, the behaviour of CO₂ under different (environmental) circumstances, the asset integrity across entire value chain and lifecycle, the assessment and comparability of different CO₂ valorisation options, the metrology related aspects, et cetera, is key to manage the risks and opportunities of CCUS activities. This requires specific knowhow and experience that is available at particular universities, research and metrology institutes. In addition, research and knowledge institutes contribute to innovations in supporting the activities by economic operators, also through spin-offs and start-ups.
- **Civil society:** The civil society consists of citizens, either or not organized in civil platforms, and of non-governmental organisations (e.g. nature and environmental organizations, labour organizations). They have certain views on CCUS activities and carbon accounting. They are also a major information source for (social) media. These individuals and organizations should be involved, both to make use of their (local) knowhow and expertise and to enhance acceptance of the agreements.
- **Financial sector:** CCUS related activities also require investments for which often loans or other financial means are needed to close them (in addition to possible governmental funding). Furthermore, activities require insurances in cases of unplanned events. Banks and insurance companies require particular certainties to finance projects (i.e. real chance on pay-back) or insure projects (i.e. safe operations) for which standards can be used as reference. Also in the field of carbon accounting the financial sector can play a role, for example linked to sustainable finance and green recovery investments.

- **Product and service providers:** Deploying CCUS and carbon accounting activities also involve a broad variety of suppliers along the several actors in the value chain and during the different lifecycle stages of an activity (as also illustrated by large variety of economic operators). Suppliers include, but are not limited to, consultancy and engineering firms, companies that supply technologies, products or materials for specific applications, (sub)contractors that execute certain activities, and warehouses that administer CO₂ credits.
- **Customers:** The CCUS and carbon accounting activities result in products and services (e.g. CO₂ as raw material, CO₂ credits), that are delivered to a wide range of customers, either other organizations in the supply chain or individuals (e.g. carbon compensation).

Liaisons:

A listing of relevant external European or international organizations or internal parties (other CEN, CENELEC, ETSI, ISO and/or IEC committees) to which a liaison should be established (in the case of ISO and IEC committees via the Vienna or Dresden Agreements).

- A.SPIRE – European Association for Sustainable Process Industry through Resource and Energy efficiency
- CEFIC – European Chemical Industry Council
- CemBureau – European Cement Association
- CEN/CLC/JTC 14 ‘Energy management and energy efficiency in the framework of energy transition’
- CEN/TC 12 ‘Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries’
- CEN/TC 234 ‘Gas infrastructure’
- CEN/TC 264 ‘Air quality’
- CEN/TC 459 ‘ECISS – European Committee for Iron and Steel Standardization’
- CEN/TC 467 ‘Climate change’
- CO2 Value Europe
- ECOS – European Environmental Citizen’s Organisation for Standardisation
- EPRA – European Petroleum Refiners Association
- ESTEP – European Steel Technology Platform
- Eurelectric
- Eurogas
- GasNaturally
- Global CCS Institute
- Greenhouse Gas Protocol (partnership between World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD))
- IEA – International Energy Agency
- IOGP – International Association of Oil & Gas Producers
- ISO/TC 207 ‘Environmental management’ including sub-committees
- ISO/TC 265 ‘Carbon dioxide capture, transportation, and geological storage’
- ISO/TC 308 ‘Chain of custody’
- ISO/TC 323 ‘Circular economy’
- EC JRC – Joint Research Centre of European Commission
- ZEP – Zero Emission Platform

Joint/parallel work:

Possible joint/parallel work with:

- CEN (please specify committee ID)
- CENELEC (please specify committee ID)
- ISO (please specify committee ID) ISO/TC 265
- IEC (please specify committee ID)
- Other (please specify)

Name of the Proposer

(include contact details)

Koen Kobes | NEN | koen.kobes@nen.nl | +31 6 21 377 662

An expression of commitment from the proposer to provide the committee secretariat if the proposal succeeds.

Signature of the proposer


Annex(es) are included with this proposal (give details)

Position paper

Informative Annex 1 "Principal categories of market needs"

- Consumer protection and welfare
- Environment
- Innovation
- Support to:
 - public policy
 - European legislation/regulation
- Market access/barriers to trade, i.e. enhancing the free movement of:
 - services
 - goods
 - people
- Interoperability
- Health/Safety
- Terminology

Informative Annex 2 "Principal categories of stakeholders"

- Industry and commerce,
 - where particularly appropriate, to be identified separately as
 - Large enterprises (those employing 250 staff or more)
 - Small and medium sized enterprises (SME), (those employing 250 staff or fewer)
- Government
- Consumers
 - including those organizations representing interests of specific societal groups, e.g. people with disabilities or those needing other particular consideration)
- Labour
- Academic and research bodies
- Non-governmental organisations (NGO),
 - including organizations representing broad or specific environmental interests
- Standards application business (e.g. testing laboratories, certification bodies)

Sometimes it is valuable also identify the immediate affected stakeholders from industry and commerce in terms of their position in a product value chain, as follows:

- Supplier
- Manufacturer
- Intermediary (e.g. warehousing, transport, sales)
- Service provider
- User of the product or service
- Maintenance / disposal

NOTE: 'Immediately affected stakeholders' are considered to be those who, within the context of the proposal, would be in a position to implement the provisions of the intended standard(s) into their products, services or management practices.