

Standards in support of the European Green Deal Commitments

Europe needs a Green Transformation – Standards can help¹

The EU Commission has set a global climate target of net zero by 2050. Many European governments, organizations, companies and citizens are determined to act towards achieving this goal, although a very challenging one. To reach this goal, all actors involved will have to rethink the way to produce and consume, the way our infrastructures work, the use of resources and the functioning of transportation systems.

Standards can help achieve these policy goals as they are meant to clarify commonly accepted definitions, provide methods for measuring and testing and open markets to the safe use of new technologies. This is needed, for example in the case of electricity grids with decentral power producing units, charging stations for electricity as well as for the implementation of sector integration (electricity, gas, building, industry), the use of natural gas grids for renewable and decarbonized gases or new kinds of alternative fuels as well as the safe recycling of materials.

The European Green Deal recognizes the importance of standards: *"As the world's largest single market, the EU can set standards that apply across global value chains. The Commission will continue to work on new standards for sustainable growth and use its economic weight to shape international standards that are in line with EU environmental and climate ambitions."*²

CEN and CENELEC are therefore recommending European policy makers to:

- Make use of European and international standards to support the European Green Deal actions and initiatives, thereby benefitting from the knowledge of industry

¹ See the official EC standardization policy ([Link](#))

² See Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal, page 22 ([Link](#)).

experts, SMEs as well as environment organizations and the will of the sectors involved (e.g. the gas sector) to decarbonization through the wide-spread use of standards in the market.

- Establish clear overarching principles to guide policy making, that prioritize reduced emissions and reuse of materials. Establish clear links between the sustainability performance and incentives. Request technical standards developed by the European Standardization Organizations for specifying the technical details for manufacturers and suppliers to meet legal requirements.
- Identify early on the type of standards needed to support the European Green Deal actions, which can be mapped against existing standards and identify gaps which need to be addressed through new standard developments.
- Request, on the basis of the Regulation (EU) No 1025/2012 on the European standardization and the New Legislative Framework, the development of new standards, or the revision of existing ones, by the European Standardization Organizations.
- Integrate standardization in European framework programs (e.g. Horizon 2020 or Horizon Europe) aiming to implement the European Green Deal in order to contribute to the dissemination and application of the results of research and innovation initiatives through standardization.

Standards support European policy and legislation

A standard is a formal, voluntary document that sets the specifications for a product, a system, a process or a service. Standards can help to make different parts of an infrastructure work together or to systemize processes, e.g. energy efficiency or waste reduction. Standards can lift barriers to the uptake of environmentally-friendly technologies and materials, by specifying tests, or provide robust definitions that avoid misleading environmental claims. Standards enable the development of sustainable finance integrating the materiality of technical requirements with due diligence and underwriting procedures of financial institutions and the disclosure of financial/non-financial requirements.

European standards are identical in all 34 Members of CEN and CENELEC and thus create an easy access to the European market. They can also have an impact at global level if they become international standards at ISO or IEC level, or are adopted in countries outside Europe. They are flexible tools that can improve safety, performances and climate resilience, protect consumers, workers and the environment. In some areas European legislation sets the general requirements and harmonized European Standards provide the technical details on how to meet these requirements.

The European Standardization Organizations are ready to contribute

CEN and CENELEC are eager to cooperate and contribute to achieving the ambitions of the European Green Deal. The Annex contains examples of established standards and preliminary specifications that can support of the European Green Deal.

ANNEX I

How standards can support the European Green Deal

Foreword

This document analyses how standardization can support the priority areas of the European Green Deal. It presents several existing standards but also identifies gaps and opportunities.

Standards have the potential to support a wealth of policy initiatives related to many sectors ranging from climate mitigation and circular economy, to biodiversity preservation and a toxic-free environment. In order to achieve EU's objectives of decarbonization and circular economy, the way we design and develop products, processes and services will need to be re-thought. Similarly, the content of standards might need to be adapted and further developed to support this endeavor.

Climate ambition:

Under this headline several aspects are covered by standards, either already existing or being developed, and oftentimes already used in support of EU policy (e.g. EU ETS Emissions Trading System, EU Climate Adaptation Strategy).

Many companies and banks already provide information on the CO₂ footprint of their products and investments. For the sake of transparency and comparability, it is important that standardized methodologies are used.

Standards on carbon quantification are specifications providing crucial guidance to public and private organizations on the quantification and reporting of greenhouse gas emissions and removals (at the organization level and project level) as well as verification and validation of greenhouse gas statements. Since 2018, EN ISO 14067 assists organizations to perform and report a carbon footprint for products³ and the EN 19694 series in the determination of greenhouse gas (GHG) emissions in energy-intensive industries.

Carbon footprint of buildings is part of the environmental performance assessment as covered by CEN/TC 350 'Sustainability of construction works' standards, EN 15804+A2 for construction products and EN 15978 for buildings, expressed as "Global Warming Potential" GWP-indicator, as defined in EN ISO 14067. Further work on the assessment of methane emissions in the gas transmission and distribution infrastructure is under its initial developments in CEN/TC 234 'Gas infrastructure'.

Many organizations are also assessing and reporting their 'water footprint'. This can improve the efficiency of water use and decisions on equitable water allocations to consumers and the environment and are important aspects of adapting to climate change. EN ISO 14046 specifies principles, requirements and guidelines related to

³ Using these standards, may serve to acquire and attach a monetary "value" and "determine the costs" for environmental impact or environmental damage, and to "determine the cost and benefit" in organizations for any action such as a trade-off situations of investments, product eco-design, policy development (i.e. green taxation, subsidy modification) they might face or generally to reduce their environmental impact or to adapt to any effect of the environment on the organization.

water footprint assessment of products, processes and organizations based on life cycle assessment (LCA).

A more general approach has been followed by development of standards, which focus on the cost of using or impacting the natural environment⁴ and ISO standards may also be of use in conjunction with the intended carbon border taxation.⁵

The ISO 14030 family of standards is being developed and will be relevant to stimulate climate-proof debt instruments.⁶ Moreover, standards are currently being developed defining a framework and principles for assessing and reporting investments and financing activities related to climate change, as well as assessing projects, assets and activities seeking green finance.

Finally, standards on Sustainable Finance are being developed that include terms and definitions and a framework with principles and guidelines for implementation (ISO/TC 322 'Sustainable finance'). A small number of financial institutions are already calculating their impact on biodiversity, including the potential impact on biodiversity of the ways in which water systems are managed, or their social impact and want to assess how their investments can contribute to biodiversity. Here too a standardized methodology might be beneficial.

At EU-wide level, CEN is involved in the Environmental Footprint initiative, and closely follows the applicability of the EU Eco-Management and Audit Scheme (EMAS) of verification, reporting and validation of energy efficiency and carbon footprint. The EMAS Regulation, reproducing sections of EN ISO 14001, helps organizations to publish their carbon footprint in a transparent, verifiable and third party verified manner and thus provides the prerequisite for demonstrating compliance with policies and strategies at corporate and societal level.

CEN members also influence international standards in ISO on adaptation to climate change, sustainability criteria for bioenergy and with regards to carbon footprint (EN ISO 14064), and related verification standards (EN ISO 14001, ISO/IEC 17029) as well as energy efficiency and energy management (ISO 50001) and energy auditing (ISO 50002/EN 16247).

EN ISO 14090 series provide guidance and technical specification including for climate adaptation planning and vulnerability assessment. This includes the integration of adaptation within or across organizations, understanding impacts and uncertainties and how these can be used to inform solutions to enhance resilience in any organizational unit or sector e.g in cities, infrastructure systems like transport, agriculture and health. The EN ISO 14090 suggests looking at the 'organization' as a system of systems, with interdependencies stretching past the usual management chain and, for example, suggests thinking about the future resilience of supply chains.

Standards focusing on "Resilience" also include climate factors and provide standards on integrated management and resilience indicators (ISO/TC 268 'Sustainable cities and communities', CEN/TC 465 'Sustainable and Smart Cities and Communities').

⁴ ISO 14007 and 14008

⁵ ISO 14064 part 1, 2, 3 in combination. The ISO 14064 standard provides governments, businesses, regions and other organizations with a complimentary set of tools for programs to quantify, monitor, report and verify greenhouse gas emissions

⁶ Consisting of part 1: Process for green bonds; part 2: Process for green loans; part 3: Taxonomy and part 4: Verification.

European Standards play a vital role in increasing society's resilience to climate change. A key element (action #7 out of 8) in the present EU Strategy on Adaptation to Climate Change is ensuring a more resilient infrastructure. The work of the CEN CENELEC Coordination Group on Climate Change Adaptation (ACC CG) and related TCs in the energy, construction and transport sectors aim at revising infrastructural standards and play a key role in realizing this element of the EU Strategy. Recently, new activities have been added. The ACC-CG will support in standardizing adaptation measures (e.g.: green roofs) which will help in accelerating the performance and use of these measures. Furthermore, action start towards inclusion on future climatic information in construction standards, helping to make constructions across Europe more resilient to climate change.

Clean, affordable, resilient and secure energy:

Companies in Europe want to contribute to the green transformation while improving their business. Standards on **management of energy use** or **management of carbon emissions** can be used as a tool for companies to gradually improve their performance. Several international standards about energy management and about reducing emissions already exist and are used.

Standardization in the field of **wind energy** generation systems including wind turbines, wind power plants onshore and offshore and interaction with the electrical system(s) to which energy is supplied. These standards address site suitability and resource assessment, design requirements, engineering integrity, modelling requirements, measurement techniques, test procedures, operation and maintenance. Their purpose is to provide a basis for design, quality assurance and technical aspects for certification (IEC/CENELEC TC 88 'Wind turbines').

Standards for **liquid and gaseous fuels** have been produced for methods of sampling, analysis, field quality monitoring and specifications for fuels, that origin from mineral oil, synthetic processes and biomass. Purposes are both transport and stationary applications. The standardization work focus for instance on preventing issues in the market with regards to biofuels and synthetic fuels (CEN TC 19 'Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin' and CEN/TC 408 'Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid').

The European standards on "Sustainably produced biomass for energy applications" are being revised and it is important that revised standards support the objectives of the Renewable Energy Directive II and promote biofuels that can be proven to be sustainable or with so-called "low-ILUC" risks ("low indirect land use change" risks).

It is important that The European standards on "Sustainably produced biomass for energy applications" support the objectives of the Renewable Energy Directive II and promote biofuels that can be proven to be sustainable or with so-called "low-ILUC" risks ("low indirect land use change" risks) as well as assist in the implementation of harmonized sustainability criteria applying to forest biomass (CEN/TC 383 'Sustainably produced biomass for energy applications')."

Regarding **hydrogen** standardization: there is a need for a clear CO₂ emission criteria throughout the production process, backed by a robust system of guarantees of origins for hydrogen, the industry hence needs coherent set of standards, starting with a standard for Guarantees of Origin as a tool to evidence the environmental benefits of hydrogen (see also box on Mobility). International and European standards (CEN/ CENELEC Sector Forum Energy Management Working Group 'Hydrogen', CEN/ CENELEC JTC6 'Hydrogen in energy systems', CEN TC 234 Gas infrastructure and other related TCs) can support the increased uptake of hydrogen in the energy systems and as feedstock that is sustainably produced (with and without fossil energy sources or blending with natural gas or creating additional base load), focusing the production and use of fully sustainable produced hydrogen as soon as possible. The existing standard on "Guarantees of Origin for Electricity" (EN 16235) is being revised with the extended scope to include hydrogen and with recommendation to also include biomethane, and other gases, heating and cooling in this standard (CEN/CENELEC JTC 14 'Energy management and energy efficiency in the framework of energy transition').

To be able to reach ambitious climate targets by 2030 and climate neutrality by 2050, all carbon-neutral energy sources should be supported, fully integrated and interconnected. Transforming energy production also calls for the need to manage **decentralized power and thermal grids**.

System aspects of electrical and thermal energy supply and demand are addressed at a European level as well as the international level (CENELEC TC 8X 'System aspects of electrical energy supply').

There are standardization developments related to Smart Energy Grid and Smart Meter, including home and buildings. It is necessary to improve the system and component interoperability within the smart home. The "Customer Energy Manager" standard (under development) supports demand-side flexibility in smart buildings.

To further decarbonize the energy system, energy efficiency at all levels must be prioritized (CEN/CENELEC JTC 14 'Energy management and energy efficiency in the framework of energy transition'), as well as the development of tools in support of related sustainable finance.

The efficient management of the energy systems with a large share of renewables is another priority to ensure high quality and performance of the energy grids (CEN/CLC Sector Forum Energy Management). This includes energy storage and conversion to other energy carriers (i.e. hydrogen) as enablers. Standardization can support the management of these challenges. It could provide tools to improve sustainability to policy makers, efficient and sustainable financing schemes to investors and concerned organizations, as well as efficient and affordable energy to all citizens.

Hand in hand with **decarbonization** is the long-term **resilience** of the sector. Again, the ISO 14090 series of adaptation standards may be used to assess and improve the long-term resilience of the power sector – whether in the generation, transmission, distribution or across its supply chains.

Moreover standards promote the:

- *digitalization* along the value chain of the energy systems enabling the implementation the new services for consumers while reducing the operational costs of grid management via tools such as digital twin, which allows manufacturers to predict different outcomes and avoid potential failure based on data thus saving time and reducing costs;
- *innovation* through the holistic view of integrating the energy system of new decarbonizing technologies, new fuel sources (hydrogen, biofuels) with energy efficiency, renewables and financeability.

Industrial strategy for a clean and circular economy:

Following the European Green Deal, the EC published the Circular Economy Action Plan 2 (CEAP2) which pays more attention to prevention and reuse. This has to be reflected in all the sectoral standards.

Energy related products

European standards complement EU legislation, supporting the Ecodesign and the Energy Labelling Regulations in providing standards for methods to measure and assess whether products comply with regulatory requirements.

More than twenty CEN and CENELEC Committees are developing standards in support of Ecodesign and Ecolabelling product regulation and about 150 standards have already been published (covering products such as: vacuum cleaners, external power supplies, power transformers, washing machines, etc.).

It is important that these standards are appropriately updated in order to reflect technological progress, represent real-life use as much as possible and discourage circumvention attempts, so that the requirements that are set and the information provided on the Energy Label are accurate and can genuinely drive reductions in energy demand.

The European Green Deal and CEAP2 intend to make priority products such as smartphones and computers, more durable and easier to repair. Standards are important to achieve this (e.g. EN 45554 'General methods for the assessment of the ability to repair, reuse and upgrade energy-related products').

More progressive measures might be needed to improve product durability, repairability, toxicity, and recyclability at design stage, and make sure these are replicated to all products regulated by eco-design and beyond.

For energy related products criteria defining reusability, recyclability and recoverability to improve material efficiency have been developed through standards. This includes the ability to access or remove certain components, consumables or assemblies from products to facilitate repair or remanufacture or reuse (CEN/CLC JTC 10 'Energy-related products - Material Efficiency Aspects for Ecodesign').

Standards also exist to formulate the technical requirements for the collection and treatment of WEEE, preventing the release of hazardous chemicals while optimizing material-efficient recycling (EN 50625 series on 'Collection, logistics & treatment requirements for WEEE').

Follow up is needed on the Standardisation Request (M/555) on natural refrigerants to further stimulate the alternatives to HFCs, which have a high Global Warming Potential (GWP), especially to improve the environmental performance of the heating and cooling sector.

Plastics

A major milestone in the Plastics Strategy is the revision of the essential requirements for packaging. ISO/TC 61 'Plastics' and CEN/TC 249 at CEN level are responsible for the standards in this area. There is a lot more potential for standards to facilitate reuse systems through common formats and typing. Reliable standards are needed to verify biodegradability claims.

Furthermore, standards are crucial when it comes to harmonized data collection and analytical methods to assess microplastics from various sources, including tyres (CEN/TC 366 'Materials obtained from End-of-Life Tyres'), plastic pellet loss, and synthetic fiber wear-off. At end of life, there are many standards that ensure the quality of recycling.⁷ The European Plastics Strategy therefore explicitly refers to European quality standards to increase confidence that recycled plastics meet manufacturer needs. There are also standards to calculate recycling rates (EN 13440) and plastics recycling traceability (EN 15343). Future work could be: Development of a reliable standard to determine recycled content in a scientifically sound way and which will cover mechanically as well as chemically recycled plastics. Recently a standard has been developed for closed-loop recycling of un-plasticized PVC for windows and doors.

Construction sector

To fit within a low-carbon and circular economy the **construction and real estate sectors** have to transform in a more sustainable direction. European standards have been developed to support the Construction Products Regulation in a number of product categories.

In the context of the Green Deal, minimizing CO₂ emissions ought to become the driver for the renovation effort. Makeover and rehabilitation programs and incentives should be guided by the systematic targeting of the most carbon-intensive buildings. Standards can help promote the renovation wave by giving guidelines to predict the effect of measures and compare possible renovation strategies in terms of environmental output and climate resilience.

In order to enable the assessments of the environmental performance of buildings and other construction works standards for Environmental product declaration (EPD) of construction products, EN 15804+A2, has been developed by CEN/TC 350 'Sustainability of construction works'. This is a tool to quantify and communicate the environmental impacts of a product based on Life Cycle Assessment (LCA) (EN ISO 14040) and other quantified environmental information. The coherent LCA rules for buildings are defined in EN 15978 and for Civil Engineering Works in prEN 17472, developed by CEN/TC 350. These standards can stimulate a market demand for more sustainable construction renovation and materials.

There are more ways in which standards can support circular construction and sustainable construction products. Discussions to produce standards – on resource-mapping of buildings, deconstruction and selective demolition of buildings, and for the reuse of construction products as well as construction waste management – are important in this regard, thus developing a common approach across the value chain to integrate principles of circularity in all phases from design to deconstruction and future lifecycles. Standards for Sustainable Renovation and Refurbishment will also be important to support practices for improved sustainability of existing buildings supported by relevant product standards. The identification of the new standardization needs will be done after analyzing the existing relevant European protocols and guidelines and consultation with stakeholders.

⁷ There are generic standards such as ISO 15270, formulating guidelines for the recovery and recycling of plastic waste, but also specific standards to characterise the input/outputs of sorting and recycling processes. These standards define (minimum) quality requirements and test methods for sorted plastics waste and recyclate, to minimise contamination by (hazardous) substances. Standards also help to monitor the quantity of recycled plastics in the market by detailing the methodology to measure collected and sorted plastics waste as well as recyclers and converters inputs and outputs.

Bio-based products

For bio-based products a set of standards have been developed that address the sustainability (biomass used, production and end-use), the life-cycle analysis of the products as well as the amount of non-mineral components used (CEN/TC 411 'Bio-based products'). A new committee has initiated work to test regulated chemicals in products intended for consumers (CEN/TC 462 'Regulated chemicals in products').

Material flow cost accounting

Material flow cost accounting (MFCA) can also be calculated based on international standards. Under MFCA, the flows and stocks of materials within an organization are traced and quantified in physical units (e.g. mass, volume) and the costs associated with those material flows are also evaluated. The resulting information can be used as a motivation for organizations and managers to seek opportunities to simultaneously reduce adverse environmental impacts and generate financial benefits.

Textiles

Standards can help make textile products circular, durable and produced in a sustainable way, without hazardous chemicals. For instance, standards can be developed for circular design, methods to determine recycled content, high-quality textile-to-textile recycling and labelling on durability and recyclability. The EC is encouraged to issue standardisation requests to CEN and CENELEC after the publication of the dedicated EC action plan.

Smart and Sustainable Cities and Communities

Circularity in cities and communities (including territories) is of strategic importance, thanks to their capacity to engage in circular economy priorities, from promotion to decision making as well as through innovative governance schemes. Standardization (CEN/CENELEC/ETSI 'Sector Forum Smart and Sustainable Cities and Communities', as well as CEN/TC 465 'Sustainable and Smart Cities and Communities') has a major role in paving the way to further development through trust and guidance.

Welding

The energy and resource consumption of welding equipment could be reduced by applying existing non-proprietary techniques without an increase in the combined costs of purchasing and operation. Commission Regulation (EU) 2019/1784 laying down ecodesign requirements for welding equipment pursuant to Directive 2009/125/EC. This Regulation establishes ecodesign requirements for the placing on the market or the putting into service of electrical mains-operated welding equipment. The timing for the introduction of ecodesign requirements allows manufacturers to redesign the products covered by this Regulation. It takes account of the impact on costs for manufacturers, in particular the large proportion of small and medium-sized enterprises in the welding equipment manufacturing sector in Europe, while ensuring the timely achievement of the objectives of this Regulation. The preparatory study has concluded that the proposed ecodesign requirements do not affect the functionality or affordability of welding equipment from the end-user's perspective and do not negatively affect health, safety or the environment. To consider the aspects of Commission Regulation (EU) 2019/1784, CEN/TC 121 for welding and allied processes starts the revision of EN ISO 14717:2005, Welding and allied processes - Environmental check list. This document provides check lists for the assessment of the environmental aspects of welding fabrication of metallic materials including site and repair work. Informative annexes indicate recommended actions for avoiding and reducing the possible environmental impacts outside the workshop. Further projects are under preparation within CEN/TC 121."

Sustainable and smart mobility:

European standards contribute actively to sustainable and smart mobility through three different tracks:

1. the standardization of ITS (Intelligent Transport Systems) and Electric Road Systems
2. the standardization related to the deployment of alternative fuels vehicles and infrastructure.
3. the intramodality and the shift to public transport, through the standardization in the rail sector.

European standardization successfully addressed the challenge of the interoperability of electronic road toll systems and of co-operative systems for Intelligent Transport in the field of information and communication technologies. The standardization work will now meet new challenges as automated vehicles are deployed and cybersecurity becomes an issue.

The necessity of improving the sustainability of transport requires a transition to alternative fuels vehicle beyond the traditional combustion model. In this sense CEN and CENELEC have produced major standards in the framework of Directive 2014/94/EU (CEN/TC 268 'Cryogenic vessels and specific hydrogen technologies applications', CEN/TC 326 'Natural gas vehicles - Fuelling and operation', TC 286 'Natural gas vehicles - Fuelling and operation', CEN/TC 301 'Road vehicles' and CENELEC/TC 69X 'Electrical systems for electric road vehicles').

For electric vehicles, a complementary set of standards dedicated to smart charging, customer information standards, standards on "real-time" information on charging point and standards for interoperable energy services constitutes the next milestones in this field. Regarding liquefied natural gas (LNG) and compressed natural gas (CNG), most of the identified standards on connectors and fueling stations have been adopted as EN standards. Nevertheless, there are still important standardization needs and opportunity in this field, notably the integration of bio methane in CNG and LNG, the transport of (bio) LNG and the transport of LNG in tank containers via rail.

Furthermore, sustainability criteria and standards are needed for (electric vehicle) battery design, enabling second life for batteries through reuse for energy storage.

Standards play a crucial role for a future shift to rail and to ensure greater intramodality. New topics still to be addressed are: connections to other transport sectors, cybersecurity, autonomous operation and optimized interfaces between the subsystems of the railway system. Also, the use of simulation instead of physical testing for all kinds of requirements need to be supported by proper standardization in order to further strengthen the sector (CEN/TC 256 'Metallic tanks for the storage of liquids' and CLC/TC 9X 'Electrical and electronic applications for railways')

From farm to fork:

The European Farm to Fork Strategy will strengthen the efforts of farmers and fishermen to tackle climate change, protect the environment and preserve biodiversity. Imported food products from third countries must comply with the EU's environmental standards. European standardization in the field of food and agriculture focuses mostly on food safety, rather than environment and sustainability. However, considering that water resources have to be protected from the potential negative impact of the agricultural activities, CEN/TC 230 'Water analysis' standards provide a wide range of methods to assess water quality.

The transition from mineral to organic fertilizing products is important to close the loop in the agricultural system. The safe and sustainable use of organic (waste) streams meeting quality requirements has to be ensured before being used as compost or digestate on land. Harmonized standards are being developed to recover organic (waste) streams, define criteria for the quality of composts and supports the development of biostimulants (CEN/TC 455 'Plant Biostimulants', CEN/TC 260 'Fertilizers', CEN/TC 223 "Soil improvers and growing medi harmonized standards" and CEN/TC 444 "Environmental characterization of solid matrices").

Preserving and protecting biodiversity:

The European Green Deal supports the implementation of forthcoming biodiversity ambitions as included in the Post-2020 Global Biodiversity Framework. The EU Biodiversity Strategy outlines key actions in the EU context, including measures that would help Member States improve and restore damaged ecosystems and also proposals to green European cities and increase biodiversity in urban spaces. Standards can help to measure and assess the state of biodiversity but also the impact of practices (business) on biodiversity.

New standards on the following issues would be helpful: data collection, reporting, data assessment and validation for Natura 2000, evaluation and validation for online mapping and citizen science data. Standards can also support green infrastructures and nature-based solutions (for example for climate change adaptation) including guidelines for biodiversity impact assessment, water resources resilience, air quality, health, or urban regeneration. Currently, a proposal for a new ISO committee on Biodiversity is being considered.

The international transport of soil containing non-endemic plants, animals and organisms creates a massive risk for ecosystems (as invasive species are spread and cause a threat to native species). Standards and regulations can prevent this. A fitting process quality assurance system (conformity assessment) could be put in place. This can support Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species. European and international committees produce standards related to this issue (CEN/TC 444 'Environmental characterization of solid matrices' and ISO/TC 190 'Soil quality').

Standards are also produced with regards to fisheries and aquaculture, providing methods to be used by the fishing industry to obtain sustainability, including prevention of pollution, protection of biodiversity, mitigation of climate change, reduction of littering from the fishing fleet and traceability of fish products and related sustainability information through the value chain (CEN/WS 76 'Batch-based Calculation of Sustainability Impact for Captured White Fish Products', CEN/WS 'Recommendations for making Climate Adaptation Plans for marine capture fisheries, marine aquaculture and freshwater lake and pond production (ClimeFish)', ISO/TC 234 'Fisheries and aquaculture').

The greatest risk of biodiversity outside Europe is deforestation due to production of commodities, such as palm oil and cocoa. The EN ISO 34010 series on sustainable and traceable cocoa deals with the possible impact of cocoa production on people, planet and profit. It contains criteria on ecosystem conservation and on protecting freshwater bodies, minimizing the use of agrochemicals etc. The EN ISO 34101 series can be an example for other commodities that have a high negative impact on biodiversity.

At international level a new project has just started to develop standards on sustainable processes for wood and wood-based products. It could be relevant for European companies to influence this work (ISO/TC 287 'Sustainable processes for wood and wood-based products').

Towards a zero-pollution ambition for a toxic free environment:

"Zero pollution" covers production, use, and end-of-life of products. Many standards exist, or are under development, with respect to all three life-cycle phases, covering a wide variety of product groups.

Standards play an important role to identify, eliminate or minimize the use of (potentially) harmful chemical substances in (consumer) products, such as flame retardants and endocrine disruptors, with a view to protect human health and the environment. Standards will have to ensure the development of strict requirements on problematic substances in product standards, including the safe and sustainable use of nanomaterials. It will take years, if not decades, for legacy chemicals to be completely phased out from plastic products that were placed on the market in the past.

The CEN Workshop proposal on "Mitigation of Urban Heat Island effects with cool materials" (Cool materials in built environment) aims at on boosting the appropriation by cities of cool materials to mitigate the Urban Heat Island effects. By facilitating the use of cool material, the local actors are made able to reach

their objectives in term of carbon emission while ensuring the comfort of their users.

International standards are crucial to accurately define measurement and detection methodologies that are needed to characterise physical properties and control possible contamination. In CEN and corresponding ISO TCs, measurement/quality standards for pollution of air, water and soil are developed and maintained (e.g., CEN/TC 230 'Water analysis', CEN/TC 264 'Air quality', CEN/TC 444 'Test methods for environmental characterization of solid matrices', ISO/TC 147 'Water quality', ISO/TC 146 'Air quality', CEN/TC 190 'Soil quality' etc.). To improve air quality, standards define measurement methods in the context of the Industrial Emissions Directive, e.g. for particulate matter pollution, especially PM10, PM2.5."

Standards also define measurements and limits for the toxic emissions caused by specific products for instance toys and plastics, secondary raw materials for instance fertilizing products and emissions from waste (e.g. CEN/TC 52 'Safety of toys', CEN/TC 223 'Soil improvers and growing media', TC 260 'Fertilizers and liming materials', CEN/TC 444 'Environmental characterization of solid matrices matrices', CEN/TC 455 'Plant Biostimulants').

ANNEX II

detailed mapping of technical work against green deal headings

GREEN DEAL ACTIONS	TIMETABLE	STANDARDISATION SUPPORT	TECHNICAL WORK examples
CLIMATE AMBITION			
Proposal on a European 'Climate Law' enshrining the 2050 climate neutrality objective	March 2020	<p>Standards can help in the</p> <ul style="list-style-type: none"> • enforcement of the new climate law and implementation of the new adaptation strategy: <ul style="list-style-type: none"> - climate mitigation (Determination of greenhouse gas (GHG) emissions in energy-intensive industries) - climate adaptation – revision of infrastructure-related standards. Current priorities are the energy, transport and construction sector; European standards for adaptation measures and standards on future climatic information for the construction sector. • EED and RED Directives <ul style="list-style-type: none"> - energy efficiency and transition: <ul style="list-style-type: none"> o Biofuels – feasibility of use of higher fuel blends and their associated environmental benefits o Hydrogen - the uptake of hydrogen as a more common source of energy (energy carrier and/or storage medium, with great potential for clean and transport applications) <ul style="list-style-type: none"> - energy storage and batteries (<i>see also in industrial policy</i>) - biomethane - recycling of waste to produce locally energy replacing imported fossil energy o Measurement standards are expected for battery performance and lifetime requirements, contribution to the Battery Alliance <ul style="list-style-type: none"> - SFEM activities related to energy directives (<i>see clean, affordable, and secure energy</i>) o CEN-CENELEC Sector Forum on Energy Management and Energy Transition (SFEM) is in charge of advising on and coordinating the strategic matters regarding energy management and energy efficiency in standardization. Relevant actions: <ul style="list-style-type: none"> - the standardization needs for the energy transition and the financing tools for the energy efficiency. - the report on energy management in airports and a report on energy storage and batteries. - - report on Hydrogen in the energy systems (updated 2019) - SFEM will start the development of a standardization strategy regarding the application of Blockchain and DLT in the energy sector. - screening of GD for identification of how to support the implementation - Joint Group of Sector For a Energy management WG Hydrogen, Gas infrastructure and Gas utilization aims at coordinating the provision of - coherent H2 related standards for the gas sector. 	<ul style="list-style-type: none"> • CEN/TC 12 (Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries) mirror committee of ISO/TC 67, ISO/TC 67 establishes an ad-hoc group on 'green manufacturing', which addresses low carbon emission and circularity aspects. The work of this ad-hoc group will also have impact on CEN/TC 12 • CEN/TC 234 (Gas infrastructure) launches work on the assessment of methane emission in gas infrastructure (onshore) • CEN/TC350 Carbon footprint of buildings is part of the environmental performance assessment as defined in EN 15978, expressed as "Global Warming Potential" -indicator. Climate adaptation is part of the social performance assessment as defined in EN 16309 for buildings and prEN 17472 for Civil Engineering Works • EN 61010 (Safety requirements for electrical equipment) provides requirements for transition to climate friendly refrigerants. • EN ISO 25745 (series)-1/2/3 (Energy performance of lifts) with the objective to improve the energy efficiency for those products. These standards also facilitate inclusion of lifts in the implementation of the Energy Performance for Building Directive. • EN 16723-1 and EN 16723-2 for biomethane for injection or use as fuel • Guidelines for Measuring and Managing CO2 Emission from Freight Transport Operations • EN ISO 14090 series provide guidance and technical specification including for climate adaptation planning and vulnerability assessment. • EN 16258 provides a methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers) • Coordination Group ACC (mandated work): inclusion of CCA into standards for infrastructures (energy, transport, buildings) (CEN/TC 234, CEN/TC 282).
Comprehensive plan to increase the EU 2030 climate target to at least 50% and towards 55% in a responsible way	Summer 2020		
Proposals for revisions of relevant legislative measures to deliver on the increased climate ambition, following the review of Emissions Trading System Directive; Effort Sharing Regulation; Land use, land use change and forestry Regulation; Energy Efficiency Directive; Renewable Energy Directive; CO ₂ emissions performance standards for cars and vans	June 2021		
Proposal for a revision of the Energy Taxation Directive	June 2021		
Proposal for a carbon border adjustment mechanism for selected sectors	2021		
New EU Strategy on Adaptation to Climate Change	2020/2021		

CLEAN, AFFORDABLE AND SECURE ENERGY

Assessment of the final National Energy and Climate Plans	June 2020	Smart grids, Smart house,	<ul style="list-style-type: none"> • CEN/TC 12 (Standardization of the materials, equipment and offshore structures used in the drilling/pipelines) has various standards addressing asset integrity that support security of energy supply and prevent loss of containment. Effects of climate change and climate adaptation / resilience are taken into account in the maintenance of the standards portfolio • CEN TC 234 evaluates consequences of H2 in natural gas infrastructure (CEN/TR) and starts revision of standards to enable use of hydrogen as a blend or in converted infrastructure • CEN/TC 237 (Gas meters) • prEN 81-44 (lifting appliances for wind turbines). This standard helps in building safer and higher wind turbines for clean energy production • EN 17038 standard series (1/2/3/4) (Pumps - Methods of qualification and verification) provides EnergyEfficiency Index for rotodynamic pump units. Will soon be harmonized under Regulation 547/2012 with regard to ecodesign requirements for water pumps. • EN 16798-1:2019 on how to assess the energy performance of buildings • CEN/TC 408 will take under Vienna Agreement standards from ISO/TC 255 on domestic and industrial methanisation of wet biomass and gasification of dry biomass. • CLC/TC 82 'Solar photovoltaic energy systems', CLC/TC 88 'Wind turbines' and CEN/TC 312 'Thermal solar systems and components' • EN-ISO 52000-1:2019 on how to assess the energy performance of buildings, EN-ISO 52003:2017 on how to set national requirements and EN 16798-1:2019 on how to set the environmental input parameters for the building. • JTC 14: Energy management and energy efficiency and energy in the framework of energy transition is working of the following standards: <ul style="list-style-type: none"> ◦ EN 16247 revision (series) 1/2/3/4/5 "Energy Audit" for building, processes, transportation. ◦ EN 16325 revision "Guarantee of origin related to energy" ◦ prEN 17463 "Valuation of energy related investments) ◦ prEN xxxxxx "Energy Performance Contracting" development phase • CEN-CENELEC Sector Forum on Energy Management and Energy Transition (SFEM) is in charge of advising on and
'Renovation wave' initiative for the building sector	2020	Smart metering https://www.cenelec.eu/standards/Topics/Smartgrid/Pages/default.aspx	
Evaluation and review of the Trans-European Network – Energy Regulation	2020	Standards for Wind turbines and Solar photovoltaic systems	
Strategy for smart sector integration	2020	Buildings/Construction: the coordination of the EPB (Energy Performance of Buildings) standardization activities are carried by CEN/TC 371.	
Strategy on offshore wind	2020	Energy Management and Energy Transition: Relevant actions: standardization needs for the energy transition and the financing tools for the energy efficiency. report on energy management in airports and a report on energy storage and batteries. - - report on Hydrogen in the energy systems (updated 2019) start of the development of a standardization strategy regarding the application of Blockchain and DLT in the energy sector. screening of GD for identification of how to support its implementation Wind turbines standards Biogas production standards	

INDUSTRIAL STRATEGY FOR A CLEAN AND CIRCULAR ECONOMY

EU Industrial strategy	March 2020	<ul style="list-style-type: none"> • Textile industry initiatives – initiative on plastics • Construction standards– 'Sustainability of construction works' –standardized approach for the delivery of environmental information on construction products, the assessment of the environmental, social and economic performance of buildings and civil engineering works, and more generally the sustainability performance of 	<ul style="list-style-type: none"> • EN ISO 17989-1:2015 (Tractors and machinery for agriculture and forestry) Enhance the sustainability in agriculture. • CEN/TC350 EN 15804+A2 (Sustainability of construction works - Environmental product declarations - Core rules for the product category of
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Circular Economy Action Plan, including a sustainable products initiative and particular focus on resource intense sectors such as textiles, construction, electronics	March 2020	<p>construction works.</p> <ul style="list-style-type: none"> Recycling and design of electronics (WEEE and Eco-design, material efficiency) 	<p>construction products)</p> <ul style="list-style-type: none"> EN 15978 (Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method)
Initiatives to stimulate lead markets for climate neutral and circular products in energy intensive industrial sectors	From 2020	<p>Plastics – plastics strategy under development; standardization initiatives related to microplastics in the environment; standards on packaging and biodegradability</p>	<ul style="list-style-type: none"> CLC/TC 82 'Solar photovoltaic energy systems', CLC/TC 88 'Wind turbines' and CEN/TC 312 'Thermal solar systems and components'
Proposal to support zero carbon steel-making processes by 2030	2020	<ul style="list-style-type: none"> Energy intensive industrial sectors Standards for the definition, classification, testing, and technical delivery requirements of the products of the chemical, cement, lime and non-ferrous metals industry: 	<ul style="list-style-type: none"> EN 16309 (Sustainability of construction works - Assessment of social performance of buildings - Calculation methodology)
Legislation on batteries in support of the Strategic Action Plan on Batteries and the circular economy	October 2020	<ul style="list-style-type: none"> Batteries Alliance – CEN-CENELEC participation (<i>see also in section Climate ambition</i>) – new mandate expected 	<ul style="list-style-type: none"> EN 16627 (Sustainability of construction works - Assessment of economic performance of buildings - Calculation methods)
Propose legislative waste reforms	From 2020	<ul style="list-style-type: none"> Waste management (circular economy), <ul style="list-style-type: none"> EE waste, waste batteries packaging and waste – requirements for the reuse, recoverability, recyclability; biodegradability and efficient design digestate from biogas production used as fertilizer 	<ul style="list-style-type: none"> prEN 17472 (Sustainability of construction works - Sustainability assessment of civil engineering works – Calculation methods) CEN/TC 12 (Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries) see above. Regulation 2019/1009 (Fertilizing products) Is part of the Circular Economy package and will therefore facilitate the green-deal by implementing harmonized standards for the recovery of organic products and the development of bio stimulants to make the food chain more economical in Phyto and mineral fertilizers -> CEN/TC 455 Plant Bio stimulants CEN/TC 248 (Standardization of the following aspects of textiles, textile products and textile components of products) Recently launched a ballot for the creation of two related to Microplastics from textile sources: New work Item Proposal (NWIP) for Textiles and textile products - Microplastics from textile sources. CEN/TC 249 'Plastics' deals with plastics and microplastic recycling CEN TC/366 'End of Life Tyres' Standardization of the materials produced from end-of-life tyre treatment. future ISO 14009 "Environmental management systems - Guidelines for incorporating material circulation in design and development"- will define the criteria for "strengthening" an EMS ISO 14001 with a view to eco-design oriented towards the circular economy and integrating the existing framework set by the different standards. CEN TC 465 'Smart and Sustainable Cities and Communities' Life Cycle Assessment (LCA)- related standards such as EN 50693:2019 – 'Product category rules for life cycle assessments of electronic and electrical products and systems'

SUSTAINABLE AND SMART MOBILITY			
Strategy for sustainable and smart mobility	2020	Transport sector (<i>see also smart mobility</i>) <ul style="list-style-type: none"> Standardization in the field of electric vehicles. The need for clean energy and the support provided by smart grids and infrastructures to recharge batteries, Standards for Intelligent Transport Systems, Alternative fuels – <i>see above</i> European Standards support the creation and expansion of the European market for biofuels also used in transportation <ul style="list-style-type: none"> Sector Forum Gas infrastructure (WG 'Multi-fuelling stations) identifies needs/possibilities for alignment of requirements and terminology for multi-fuelling station, with the involvement of TCs from different mobility sectors. 	<ul style="list-style-type: none"> CEN/TC 278 (Intelligent transport systems (ITS)) Identifies the optimal use of road, traffic and travel data as a priority area. To achieve the EC's ambition in this area. CEN/TC 268 (hydrogen for vehicles) Enhances preparation of standards for hydrogen refuelling points. CEN/TC 256 (Standardization of applications in the field of railways) and CLC/TC 9X (Standardization of electrical and electronic systems, equipment and associated software) produced a considerable set of standards enhancing interoperability which is a fundamental step to reach a greater shift towards rail. <p>In support of Directive 2014/94/EU (on the deployment of alternative fuels infrastructure):</p> <ul style="list-style-type: none"> CEN/TC 326 (Natural gas for vehicles), CEN/TC 286 (LPG) and the eMCG (gathering CEN/TC 301 and CLC/TC 69X working on Electric Vehicles standards) have produced major standards in the framework of Directive 2014/94/EU. CEN/TC 286 (LPG) and the eMCG (gathering CEN/TC 301 and CLC/TC 69X working on Electric Vehicles standards) <p>In the fuels sector, specifications for alternative fuels are developed by several TCs: CEN/TC 19 'Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin.' CEN/TC 383 – 'Sustainably produced biomass for energy applications', CEN/TC 408 – Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid, CEN/TC 441 fuel labelling</p>
Funding call to support the deployment of public recharging and refuelling points as part of alternative fuel infrastructure	From 2020		
Assessment of legislative options to boost the production and supply of sustainable alternative fuels for the different transport modes	From 2020		
Revised proposal for a Directive on Combined Transport	2021		
Review of the Alternative Fuels Infrastructure Directive and the Trans European Network – Transport Regulation	2021		
Initiatives to increase and better manage the capacity of railways and inland waterways	From 2021		
Proposal for more stringent air pollutant emissions standards for combustion-engine vehicles	2021		
GREENING THE COMMON AGRICULTURAL POLICY / 'FARM TO FORK' STRATEGY			
Examination of the draft national strategic plans, with reference to the ambitions of the European Green Deal and the Farm to Fork Strategy	2020-2021	<ul style="list-style-type: none"> European standardization work in agriculture focus primarily on test methods for food and animal feed products Fertilizers - standards for the recovery of organic products will implement harmonized standards for the recovery of organic products Water conservation – protecting water resources from potential harmful impacts of agriculture - analytical methods for water quality 	<ul style="list-style-type: none"> CEN/TC 260 'Fertilizers and liming material' CEN/TC 455 The verification of product claims for plant biostimulants CEN/TC 223 – Soil improvers and growing media CEN/TC 415 Sustainable and Traceable Cocoa CWA 'Batch-based Calculation of Sustainability Impact for Captured White Fish products'
'Farm to Fork' Strategy Measures, including legislative, to significantly reduce the use and risk of chemical pesticides, as well as the use of fertilizers and antibiotics	Spring 2020 2021		
PRESERVING AND PROTECTING BIODIVERSITY			
EU Biodiversity Strategy for 2030	March 2020	<ul style="list-style-type: none"> biodiversity Mapping of the standards that support the biodiversity strategy and green infrastructure is ongoing	<ul style="list-style-type: none"> CEN/TC 12 (see above) has also adopted all ISO standards as well in the field of Arctic operations (EN ISO 3510X series). These will help ensure that operations in the Arctic are safe for both humans and the environment, supporting the EU Arctic policy that focuses on international cooperation and sustainable development. Especially EN ISO 35103, Arctic operations – <i>Environmental monitoring</i> and (future) EN ISO 35104, <i>Arctic operations</i> – <i>Ice management</i> are directly linked to biodiversity CEN/TC 144 provides standards for reliable and safer gardening tools, i.e.: <ul style="list-style-type: none"> EN 13683 Garden equipment - Integrally powered shredders/chippers and EN 13684 Garden equipment - Pedestrian controlled lawn aerators.
Measures to address the main drivers of biodiversity loss	From 2021		

New EU Forest Strategy	2020		<ul style="list-style-type: none"> ● EN 13406 (Agricultural machinery - Slurry tankers and spreading devices - Environmental protection) – Provides requirements and test methods for the spreading precision.
Measures to support deforestation-free value chains	From 2020		<p>On the same topic:</p> <ul style="list-style-type: none"> ● EN ISO 16119 series Environmental requirements for sprayers ● EN ISO 19932-1 Equipment for crop protection - Knapsack sprayers - Part 1: Safety and environmental requirements
TOWARDS A ZERO-POLLUTION AMBITION FOR A TOXIC FREE ENVIRONMENT			
Chemicals strategy for sustainability	Summer 2020	<ul style="list-style-type: none"> • CEN/TC 462 'Regulated chemicals in products', Starting on 2020-02-25, 	
Zero pollution action plan for water, air and soil	2021	<ul style="list-style-type: none"> • CEN Guide 16 Guide for addressing chemicals in standards for consumer-relevant products' 	
Revision of measures to address pollution from large industrial installations	2021	<ul style="list-style-type: none"> • Standards for water, air and soil 	
MAINSTREAMING SUSTAINABILITY IN ALL EU POLICIES			
Proposal for a Just Transition Mechanism, including a Just Transition Fund, and a Sustainable Europe Investment Plan	January 2020	<ul style="list-style-type: none"> • Sustainable finance-related standardization initiatives (mainly ISO standards) • Reporting on sustainability and energy • Promotion of innovation 	
Renewed sustainable finance strategy	Autumn 2020		
Review of the Non-Financial Reporting Directive	2020		
Initiatives to screen and benchmark green budgeting practices of the Member States and of the EU	From 2020		
Review of the relevant State aid guidelines, including the environment and energy State aid guidelines	2021		
Align all new Commission initiatives in line with the objectives of the Green Deal and promote innovation	From 2020		
Stakeholders to identify and remedy incoherent legislation that reduces the effectiveness in delivering the European Green Deal	From 2020		
THE EU AS A GLOBAL LEADER			
EU to continue to lead the international climate and biodiversity negotiations, further strengthening the international policy framework	From 2019	<ul style="list-style-type: none"> • ENs become international standards, strong international cooperation 	
Strengthen the EU's Green Deal Diplomacy in cooperation with Member States	From 2020		
Bilateral efforts to induce partners to act and to ensure comparability of action and policies	From 2020		
Green Agenda for the Western Balkans	From 2020		
WORKING TOGETHER – A EUROPEAN CLIMATE PACT			
Launch of the European Climate Pact	March 2020	<ul style="list-style-type: none"> • The Strategic Advisory Body on Environment (SABE) and the 	Infrastructure standards are under revision in the sectors impacted by climate change (energy, transport, construction and

<p>Proposal for an 8th Environmental Action Programme</p>	<p>2020</p>	<p>Adaptation to Climate Change Coordination Group (ACCCG) set the strategic goals and lead the standardization work in this area.</p>	<p>related ICT) EN 61010 series (see above) will also facilitate the transition to climate friendly refrigerants by providing requirements for their safe use.</p>
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