EUROPEAN COMMISSION
ENTERPRISE AND INDUSTRY DIRECTORATE-GENERAL

New Approach Industries, Tourism and CSR
Construction

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PROGRAMMING MANDATE ADDRESSED TO CEN IN THE FIELD OF THE STRUCTURAL EUROCODES

1. OBJECTIVE

The overall objective of this mandate is to initiate the process of further evolution of the Eurocodes. Based on an extensive assessment process with wide consultations a set of ten priority actions are included in this mandate to facilitate implementation at national level and take on board market developments, innovation and research both through modifications/additions to existing standards as well as development of new standards.

2. BACKGROUND

This programming mandate is established in line with the agreement in the Eurocodes National Correspondents (ENC) meeting on 1 July 2009 following discussions on issues relevant for the evolution of the Eurocodes during several ENC meetings in 2008 and 2009. The development work was extensively supported by a working group with representatives from CEN, DG ENTR, DG JRC and EU MS.

2.1. Policy framework

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products supports the establishment and functioning of the internal market for construction products (the Construction Products Directive - CPD). This Directive indicates that the products must be suitable for the construction works where they are used and indicates a set of six Essential Requirements on the level of the works. An important part of the construction products market, with a central role regarding safety, is constituted by the "Structural construction products". The Eurocodes are developed to enable the design of structural construction works (building and civil engineering works) in order to comply with the Essential Requirement n°1 (mechanical resistance and stability) and partially Essential Requirement n°2 (safety in case of fire) and n°4 (safety in use) and to determine the performance of structural construction products. The Commission published a proposal for a Construction Products Regulation (CPR) in May 2008 which includes an additional Essential Requirement related to "the sustainable use of natural resources".
- Commission Recommendation (2003/887/EC), on the implementation and use of the Eurocodes for construction works and structural construction products, recommends the Member States to adopt the Eurocodes as a suitable tool for

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designing construction works and indicates that "continuous efforts to maintain the Eurocodes at the forefront of engineering knowledge and developments in structural design are needed, through further research at MS and at EU level facilitating uptake of the latest scientific knowledge and the development of the construction market, including new materials, products and construction methods". In addition, the Recommendation indicates the need to assess the variations of the Nationally Determined Parameters (NDPs) with the aim of further harmonisation.

- The ”Lead Market Initiative for Europe” (COM(2007) 860), adopted by the Commission in December 2007 indicates a coordinated and concerted action to facilitate the emergence of innovative products and services in six priority areas, including "Sustainable Construction"[1]. The "development of European Standards that allows taking into account sustainability aspects in construction design" is recognised as an important tool for the development and refinement of a "sustainable construction" market.
- Application of the Eurocodes in the EU Member States supports the Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market ("Services Directive"). Disparities in design/calculation methods of the national building regulations constitute impediments to the free circulation of engineering and architectural services within the Community. The implementation of the Eurocodes should facilitate the provision of services in the field of construction engineering and architecture by creating conditions for a harmonised system of general rules. To ensure their application over time, the Eurocodes need to be updated to take into account developments on the market (new materials, products, methods, etc).
- The application of the Eurocodes in the EU Member States supports Public Procurement Directives 2004/17/EC and 2004/18/EC entered into force on 31st January 2006. They state that contracting_authorities must allow the use of European Standards, like the Eurocodes, in tenders falling within the remit of these Directives. Common design/calculation rules for infrastructure and other construction works facilitate the circulation of goods and persons in the internal market. Thus, they contribute towards creating conditions for extended competition for public contracts.
- The White Paper of the European Commission ”Adapting to climate change : Towards a European framework for action” (COM (2009) 147 final), dated 1 April 2009, suggests assessing the feasibility of incorporating climate impacts into construction standards, such as Eurocodes.
- Mandate 420 in support of European accessibility requirements for public procurement in the built environment addresses inter alia building codes with an aim to develop a set of European accessibility requirements distinguishing between products and design.

2.2. Previous standardisation work

[1] Environmental, economic and social sustainability

All 10 of the EN Structural Eurocodes, in 58 parts, were published prior to June 2007, covering at present:

EN 1990	Eurocode:	Basis of Structural Design
EN 1991	Eurocode 1:	Actions on structures
EN 1992	Eurocode 2:	Design of concrete structures
EN 1993	Eurocode 3:	Design of steel structures
EN 1994	Eurocode 4:	Design of composite steel and concrete structures
EN 1995	Eurocode 5:	Design of timber structures
EN 1996	Eurocode 6:	Design of masonry structures
EN 1997	Eurocode 7:	Geotechnical design
EN 1998	Eurocode 8:	Design of structures for earthquake resistance
EN 1999	Eurocode 9:	Design of aluminium structures

Steady progress has been made in all Member States to meet the agreed date of March 2010 for implementation, when existing national codes, having the same scope as the Eurocodes, should be withdrawn. Development of National Annexes, including the defined Nationally Determined Parameters (NDPs) is well advanced.

The harmonisation of product standards under the Construction Products Directive is an ongoing process where a number of product standards rely on the Eurocodes for design and for demonstrating the product's characteristics.

2.3. Justification for further actions

The existing suite of structural Eurocodes will be implemented for use across the European Economic Area (EEA) which unites the 27 EU Member States and the three EEA/EFTA States (Iceland, Liechtenstein, and Norway) into an Internal Market using the same basic technical rules for construction design.

The Eurocodes will introduce a common technical language and a common technical culture in structural design, facilitating the creation of an effective Internal Market. These codes are also about to be implemented for use in a number of third countries (outside the EEA) where, in addition to the direct benefits for the countries themselves, their use is expected to contribute towards an improved competitiveness of the European construction industry.

A sustained development of the Eurocodes programme is necessary to preserve the user's confidence in the codes and continue to strive towards meeting the overall objectives regarding safety and Internal Market. This development process should:

- encourage/accompany innovation (related to materials and products, construction techniques and research on design methods), ensuring that the Eurocodes reflect and incorporate sustained market developments,
- take into account new societal demands and needs[2],

[2] Accessibility for persons with disabilities and older persons is an essential component of social sustainability given the demographic change.

- facilitate the harmonisation of national technical initiatives on new topics of interest for the construction sector.

To gain the maximum benefit from the structural Eurocodes, effective implementation in the participating EEA countries is important. Such an effective implementation can only be based on a continuing confidence regarding reliability, usability and safety in the market place. Furthermore, long-term confidence in the codes is also based on the ability of the structural Eurocodes to evolve in an appropriate manner in order to address the variety of new methods, new materials, new regulatory requirements and new societal needs developing. It is therefore particularly important at this key stage, when the codes are put in use, to ensure that developments that have occurred since they were drafted are integrated as appropriate.

Thus, it is considered necessary for the structural Eurocodes to be appraised so as to identify improvements to the existing suite to reflect the state of the art, and extend harmonisation by, for example, reducing the need for Nationally Determined Parameters and exploring the need to assist new entrants to the market and small and medium sized enterprises.

Based on feed-back received from market operators and initial assessments of feasibility/relevance, it is foreseen that additional structural Eurocodes or substantial additions to the existing codes, should be developed as part of the action at European level. They should at least cover:

- assessment, re-use and retrofitting of existing structures,
- strengthening of the requirements for robustness,
- new materials/new use of materials (e.g. glass, FRP and very high performance concrete),
- new types of structures (e.g. tensile surface structures),
- incorporation of ISO Standards in the Eurocodes family, such as atmospheric icing of structures and actions from waves and currents on coastal structures.

The existing structural Eurocodes need to be reviewed in order to determine the need and format of possible revisions that would enable designers to take into account sustainable development aspects directly affecting structural design of buildings and civil engineering structures.

In the following, the work to be carried out in relation to the development of the EUROCODES is called "EUROCODE work".

3. DESCRIPTION OF THE MANDATED WORK

The aim of this programming mandate from the European Commission to CEN is to provide an overall framework for the planning of the "EUROCODE work", allowing for the identification and definition by CEN of all specific tasks and steps needed in order to successfully finalize this work.

CEN is invited to develop a detailed standardisation work programme based on the existing Eurocode standards. The future tasks should support and strengthen the development of an Internal Market in the design and construction sector while taking into account market and research developments in the sector as well as new societal needs and demands as linked to structural design of buildings and structures.

This mandate does not include maintenance related to existing clauses in the Eurocode standards; such work is covered by the previous mandates for the development of the Eurocodes. The preparation and implementation of the standardisation work resulting from this mandate should not be allowed to delay high-priority maintenance tasks related to the existing Eurocodes.

3.1. Execution of the Mandate

CEN is requested to provide a programme of standardisation for the EUROCODE work covering:

- the development of **new standards or new parts of existing standards** looking in-depth at, for example, a new construction material and corresponding design methods or a new calculation procedure **(vertical approach);** or,
- **the incorporation of new performance requirements and design methods, in more than one of the existing standards.** These are efforts to achieve further harmonisation of the implementation of the existing standards, implying extensive technical work and often including concerted actions between several CEN Technical Committees **(horizontal approach).**

CEN is requested to provide a response to each of the projects indicated under Section 3.2. The responses from CEN to the individual projects should be based on adequate consultation with relevant public and private stakeholders. An analysis should also be performed in order to demonstrate the need and the possibilities for the use of the new standards or parts of standards. Such work may include the organisation of meetings/events with the objectives to i) explain the nature and potential benefits of the proposed steps of European standardisation and ii) eradicate possible misunderstandings.

3.2. List of projects to be included

The projects listed below were identified following extensive and focussed consultations involving private and public market operators (including Member States administrations) and relevant entities in CEN, notably TC 250 and its subcommittees. In some cases, initial assessments regarding the topic's relevance to standardisation and overall feasibility were undertaken by the JRC. Such assessments should be duly taken into account in the reply presented by CEN.

CEN is expected to reply to the mandate with a standardisation progamme related to the following projects of the EUROCODE work:

3.2.1. New Eurocodes or Eurocode parts

a. Extension of existing rules for the assessment of existing buildings and structures and their strengthening;

b. Design of structures that include structural glass members;

c. Design of structures that include structural members made of fibre reinforced polymers;

d. Design of membrane structures;

e. Extension of existing rules for robustness.

3.2.2. Further development of the existing Eurocodes EN 1990 to EN 1999

a. Assessment of all existing Eurocodes concerning the potential to significantly reduce the number of Nationally Determined Parameters (NDPs). This work should be done in close collaboration with the JRC and be based on the NDPs as defined on national level and uploaded in the specific NDP database;

b. Incorporation of recent results of international studies from scientific and technical associations and results from research programmes relevant to innovation (including the performance-based and sustainability concepts in design and construction);

c. Incorporation of recent results of international studies from scientific and technical associations and results from research programmes relevant to contribution of structural design to sustainability;

d. Adoption, where relevant, of ISO standards to supplement the Eurocode family (currently identified potential issues are atmospheric icing of structures and actions from waves and currents on coastal structures);

e. The potential for simplification of rules, where relevant, for limited and well identified fields of application;

f. The potential for auxiliary guidance documents to facilitate feedback from stakeholders and the practical local implementation.

g. Consideration of on going work and results of Mandate 420, CEN/CENELEC Guide 6 and ISO/DIS 21542.

3.3. Key requirements for the projects

3.3.1. General requirements for the projects

The general requirements for the projects are:

- Ensure involvement of all relevant stakeholders;
- Undertake an analysis of related existing standards/guidelines;
- The projects should take account of and make specific reference to standardisation activities already ongoing at national, European and international level;
- Background information should be developed for all new Eurocode parts or revisions.

<u>Guiding Principles</u>

All projects developed should follow these principles:

(1) Aim at a further harmonisation of the Eurocodes through a minimum number of Nationally Determined Parameters (NDPs), i.e.:

(a) when related to modifications/revisions/extensions of existing standards the potential for reducing the number of NDPs should be assessed;

(b) when related to new standards and standards parts the standardisation work should aim at a minimum number of NDPs only related to safety and national conditions.

(2) Aim at a reduction or elimination of the need for existing Non-Contradictory Complementary Information (NCCI). In order to achieve this reduction/elimination, an assessment should be undertaken to determine the feasibility of replacing the existing NCCI by European level rules.

Each project and each outcome from the projects will constitute a component of the overall programme of the EUROCODE work.

3.3.2. Detailed requirements for the projects.

The project proposals (i.e. the replies of CEN to this Programming Mandate) should include the following non-exhaustive information:

- Project title and acronym;
- Expected overall duration;
- Resource needs;
- Type of activities and corresponding durations;
- Milestones and Deliverables;
- Intermediate Reports and Final Report (including background information);
- Summary of the project;
- Justification and Impact;
- Parties and consulted stakeholders;
- All other relevant information to define the scope and limits of a possible standardisation mandate.

3.4. Standardisation mandates

It is expected the reply of CEN, covering the individual projects of this mandate, will be sufficiently detailed to constitute the basis for defining possible future standardisation mandates. In particular, this reply should provide all technical details needed to define the standardisation work to be undertaken as well as its outer limits.

On the basis of the reply received from CEN, the Commission will select projects for standardisation (i.e development of standardisation mandates) according to perceived needs and impact on the construction market on the European level (including the construction design market, the construction products market and site construction activities) as well as European policy priorities. Since the ambition is to achieve results on all actions before 2015, the estimated duration of the standardisation work linked to each project should normally fit within such a timeframe.

It is noted that item 3.2.2.a (assessment of possibility to reduce the number of NDPs) is of a different nature than the other mandates and the Commission intends to initiate a consultation/discussion with the Member States prior to issuing a standardisation mandate covering this item.

4. ORGANISATIONS TO BE ASSOCIATED

Scientific and Technical International Associations will be associated with the EUROCODE work as far as needed.

As appropriate, CEN will invite the representative organisations of consumers' interests (ANEC), environmental protection (ECOS), workers (ETUI) and small and medium-size enterprises (NORMAPME) and other relevant organizations as appropriate to take part in the standardisation work.

5. IMPLEMENTATION OF THE MANDATE

CEN will reply to this mandate, i.e. submit the complete standardisation work programme to the Commission as soon as possible, but no later than **9 months** following the acceptance of this mandate. It is foreseen that the forthcoming development steps, related to the development of standardisation mandate(s) will be undertaken in consultation with the Eurocodes National Correspondents group (ENC).