



EU-ASEAN DIALOGUE ON EUROCODES
Towards Increasing
Awareness of Eurocodes
in Brunei Darussalam
WORKSHOP ON TRAINING NEEDS ASSESSMENT

5-6 July 2022

EVENT BRIEFING NOTE

BACKGROUND

The Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI), funded by the EU, is a development cooperation programme that facilitates dialogue forums between the EU and ASEAN in priority policy areas of joint interest across all three ASEAN Community pillars (Political and Security, Economic and Socio-Cultural). Drawing on relevant EU regional integration experience, the E-READI dialogue facility further strengthens both the ASEAN regional integration as well as the overall ASEAN-EU partnership.

As part of the EU-ASEAN Cooperation for Regional Integration through economic growth, connectivity, trade and business development, the E-READI supported EU-ASEAN dialogue on Eurocodes has been established through a multi-annual concept note with the ASEAN Buildings and Construction Working Group (BCWG), ASEAN Secretariat and the European Commission's Joint Research Centre (JRC). The Eurocodes dialogue aims to bring a coherent approach to the adoption of the design standards for the construction sector across the ASEAN member states, through a regional approach. ASEAN member states are currently being at various stages of awareness on the Eurocodes concepts and/or their adoption at national level.

OBJECTIVES OF EUROCODES AWARENESS WORKSHOP BRUNEI DARUSSALAM

The E-READI assistance provides an opportunity for ASEAN countries to benefit from greater awareness and understanding of the content, principles and benefits of the Eurocodes, building upon the recent developments in their adoption in some ASEAN countries. Under the E-READI Eurocodes Dialogue, it is foreseen to offer support for ASEAN MS in the organisation of regional and national workshops, conducting necessary studies and a possible community of practice. Such activities would support trade, the business sector and climate resilient cities.

Key Elements of the “Towards Increasing Awareness Of The Eurocodes In Brunei Darussalam - Workshop On Training Needs Assessment”: Objectives and Programme

Within the multi-annual dialogue concept note for cooperation between relevant ASEAN and EU institutions in the construction sector, the primary objective of this Workshop is to respond to the training and capacity needs of Brunei Darussalam towards increasing awareness of the benefits of using Eurocodes, its impact to the future of construction sector and implications of climate change, as well as facilitate their implementation as national design codes.

The workshop will outline the needs and the availability of necessary technical assistance in support of the Eurocodes adoption and introduction into the national regulatory environment of Brunei Darussalam. EU MS and ASEAN experts will share knowledge with representatives from competent organisations in Brunei Darussalam on technical methods and techniques underpinning policy implementation in the construction sector. The event will provide an opportunity to build on the experience, initiatives and difficulties concerning the adoption of standards and policies for the construction sector in the EU.

The workshop is anticipated as two half-days virtual event with following objectives:

1. Present the concept of Eurocodes as a standardisation framework (targeting mainly national authorities) and also as advanced technical design codes (targeting engineers/practitioners);
2. Present information on the second generation of the Eurocodes and their links to the European Green Deal;
3. Facilitate exchange of views, knowledge and information between the EU and ASEAN stakeholders on Eurocodes and their benefits
4. Building capacities for elaboration of National Annexes for selected parts of Eurocodes according to the expressed interest in Brunei Darussalami and regional aspects of collaboration in their elaboration.
5. Present the process and support available for country willing to adopt Eurocodes.

The panel discussion is anticipated to emphasise the interest along with challenges and training and capacity needs of Brunei Darussalam and the ASEAN region towards increasing awareness of the Eurocodes, the Eurocodes adoption, as well as impact on national regulatory framework.

TIME	PROGRAMME
16:45 - 17:10 (BN)	10:45 - 11:10 (CET) Eurocodes in design engineering practice of Brunei Darussalam Mr. Sammy Yip • Associate Director MEng, CEng MICE, MHKIE, Arup Consultant Content in brief: <ul style="list-style-type: none">• Eurocodes in design engineering practice of Brunei Darussalam – Sultan Haji Omar 'Ali Saifuddin Bridge Q&A by using Slido
17:10 - 17:25 (BN)	11:10 - 11:25 (CET) Available instruments to support process of adoption and use of the Eurocodes Prof. Dr. Roberta Apostolska • Senior Non-Key Expert Dr. Adamantia Athanasopoulou • JRC Scientific Officer Content in brief: <ul style="list-style-type: none">• E-READI eligible instruments for support• The international dimension of the Eurocodes• JRC technical support in adoption and implementation Closure remarks for Day 1

Day 2 - Wednesday, 6 July 2022

TIME	PROGRAMME
SESSION 3 BUILDING CAPACITIES FOR ELABORATION OF NATIONAL ANNEXES OF EN 1991, EN1992 AND EN 1997 Moderator: Dr. Adamantia Athanasopoulou • JRC Scientific Officer	
14:30 - 15:00 (BN)	08:30 - 09:00 (CET) Actions on structures Dr. Nick Malakatas • CEN/TC250/SC1 Chair Content in brief: <ul style="list-style-type: none">• EN 1991 "Actions on structures"• Elaboration of National Annex of EN 1991 (with focus on wind and temperature maps) - EU experience• Climate change and design standards Q&A by using Slido
15:00 - 15:30 (BN)	09:00 - 09:30 (CET) Design of concrete structures Prof. Humberto Varum • University of Porto, Portugal Content in brief: <ul style="list-style-type: none">• EN 1992 "Design of concrete structures" Q&A by using Slido
15:30 - 16:00 (BN)	09:30 - 10:00 (CET) Geotechnical design Dr. Sébastien Burlon • CEN/TC250/SC7 Management Group Committee, Project Team 1 Leader Content in brief: <ul style="list-style-type: none">• of EN 1997 "Geotechnical design"
16:00 - 16:15 (Cambodia)	10:00 - 10:15 (CET) Break

TIME

PROGRAMME

SESSION 4

**THE EUROCODES SECOND GENERATION
THE EUROPEAN GREEN DEAL & EUROPEAN POLICIES FOR THE CONSTRUCTION SECTOR**

Moderator: Prof. Dr. Roberta Apostolska • E-READI Senior Non-Key Expert

16:15 - 16:45
(BN)

10:15 - 10:45
(CET)

The Eurocodes Second generation

Dr. Steve Denton • CEN/TC250 Chair

Content in brief:

- Towards the Second Generation of the Eurocodes
- The European Green Deal and the Eurocodes Second Generation

Q&A by using Slido

16:45 - 16:55
(BN)

10:45 - 10:55
(CET)

Design standards towards safe, resilient, and sustainable cities

Dr. Adamantia Athanasopoulou • JRC Scientific Officer

16:55 - 17:10
(BN)

10:55 - 11:10
(CET)

Closure remarks and feedback from the participants

Mr. Aldo Dell'Ariceia • E-READI Team Leader



SPEAKER PROFILES

Dr Pavlina Karagianni

Standards Manager
The European Committee for Standardization (CEN)

Pavlina Karagianni is a civil engineer with a strong educational background and practical experience in construction sector. The last years, she is highly involved in standardization as a CEN and CENELEC project manager for construction by assisting and contribute to more than 40 CEN and CENELEC Technical Committees. CEN and CENELEC is working closely with European Commission to ensure the continuous improvement of standardization sector.

Ir. Hj Azhan Hj Abd.Karim

Acting Director of Technical Services, Public Works Department, Chairman of Technical Committee of Construction, Brunei

Ir. Azhan Hj Abdul Karim is the Acting Director of Technical Services in the Public Works Department, Ministry of Development of Brunei Darussalam. He received BEng(Hons) in Civil Engineering in 1993 and MSc in Civil with Structural Engineering in 2007. As an engineer, Ir, Azhan Hj Abdul Karim also a member of national and international professional bodies such as a Member of the Institution of Civil Engineering (MICE) United Kingdom, as well as registered with Brunei Darussalam Board of Architects, Professional Engineers, and Quantity Surveyors (BAPEQS).

Mr. Mungo Stacy, CEng FStructE MICE

Head of Profession, Civil & Bridge Engineering,
WSP Global Inc.

Mr. Mungo Stacy leads the technical excellence strand of WSP's strategy in the civil, bridge and ground discipline. He has responsibility for the capability and competence of over 550 engineers in the discipline. Mungo is a civil engineer with extensive experience of the design, construction, maintenance, and refurbishment of a wide range of structures, both in the UK and overseas, notably in Hong Kong.

Mr. Chris Hendy

Head of Bridge Design and Technology
Atkins Global

Chris is Professional Head of Bridge Engineering in Atkins where he has led some of their most complex bridge projects. In 2012 he was awarded the Royal Academy of Engineering Silver Medal and was elected a Fellow of the Royal Academy in 2013. He was awarded the Institution of Civil Engineer's Gold Medal in 2016. He is Chairman of the BSI bridge committee, the UK's Steel Bridge Group and fibUK. He is a Project Team member for the next generation Eurocodes EN 1993-1-5, EN 1993-2 and EN 1993-1-11 which deal with plate buckling, steel bridge design and cable-supported structures respectively.

Ir. Gunasagaran Kristnan

Institution of Engineers in Malaysia

Ir. Gunasagaran Kristnan graduated from The University of Michigan, Ann Arbor, Michigan USA with a Bachelor of Science in Engineering (Civil Engineering). Fellow member of IEM and Honorary Fellow of AFEO. Experience as a Road Contractor for over 35 years and Civil Engineering consultant. He was also Past honorary Secretary of IEM, Excomm, Council Member. Past Chairman of HTETD. A Certified IBS Trainer by CIDB, Certified Mycessm2 trainer by CIDB. Working group committee member of CIDB on the conversion of MYscessm to MS civil engineering standard of measurement. PEPC Experience in civil construction work: building, factory, resist one retaining wall system and structural design works. He is also specialising in Special interest Civil Engineering Contract, Adjudication and Arbitration; Geotechnical. Pavement and Transportation, IBS.

Sammy Yip, MEng, CEng MICE, MHKIE

Associate Director
Arup Consultant

Sammy is an Associate Director in Arup. With 18 years of experience in all phases of design and construction of long span cable-stayed bridges, sea crossings and viaducts around the world, Sammy has led teams for feasibility study, detailed design, independent checking and procurement/contract documentation of bridges. In particular, Sammy led the feasibility study, preliminary design and detailed design of Sultan Haji Omar Ali Saifuddien Bridge. The 27km long sea-crossing is the longest bridge in Southeast Asia and involves various types of structures, including two long span cable-stayed bridges. The bridge design was carried out using Eurocodes.

Roberta Apostolska, Prof. Dr

EREADI Eurocodes Senior Non-Key Expert
Professor of Seismic Design of RC, Masonry and Steel Structures at University Ss Cyril and Methodious, IZiIS, Skopje, RN Macedonia

She has over 30 years of experience in seismic design and assessment of RC and masonry structures with more than 70 publications in the field. She participated and was principal investigator of several national, bilateral and international projects. She was seconded expert at the EC for providing scientific and technical contribution in the context of the JRC support work to DG ENTR for the implementation, harmonization and further development of the Eurocodes, (2013- 2014). Served as an Editor of the SPRINGER book "Experimental Research in Earthquake Engineering" (2015). She is a member of ISRSM – Mirror TC250-TC40 Committee on Eurocodes (2019-now); Member of the Executive Board of MAEE and national delegate to the EAEE (2018-now).

Adamantia Athanasopoulou, PhD, MEng, MSc, CEng

Scientific Project Officer
European Commission Joint Research Centre (JRC)

Dr Adamantia Athanasopoulou is a Scientific Project Officer in the Safety and Security of Building Unit of the European Commission's Joint Research Centre (JRC) since 2016. She is contributing to the activities on support to EU policies and standards for safe and sustainable construction, including facilitation to the implementation and further development of the European standards for structural design - the Eurocodes. Adamantia is particularly involved on the dissemination, promotion and training for the worldwide use of the Eurocodes. She also coordinates European expert networks and working groups on various scientific topics related to the construction sector and she is involved in the works of several Technical Committees of the European Standardization Committee (CEN).

Dr Nikolaos (Nick) Malakatas

CEN/TC250/SC1 Chair
The European Committee for Standardization (CEN)

Dr Nikolaos (Nick) Malakatas, is a civil and structural engineer who spent most of his career in the Greek Administration (Ministry of Infrastructure and Transport) being personally involved in various important bridge and tunnel projects, motorways and transport infrastructure concession projects and has served as Director in various relevant posts. He has been involved with the Eurocodes since mid '80ies, initially as national delegate for Greece and since 2008 as the Chairman of CEN/TC250/SC1 for EN 1991. Since many years involved in the standardisation at national level, he became in 2014 the Charman of the Greek Eurocodes Mirror Committee.

Prof. Dr Humberto Varum

University of Porto, Portugal

Humberto Varum is full professor and director of the PhD Program in Civil Engineering at the Faculty of Engineering of the University of Porto, Portugal. Since May 2015, he is member of the directorate body of the Construction Institute from the University of Porto, and President since May 2019. He has been Seconded National Expert to the ELSA laboratory, Joint Research Centre, European Commission, Italy, in the period July 2009 to August 2010. He was member of the Project Team 2 for the development of the 2nd generation of EN Eurocodes (SC8.T2 - material dependent sections of EN 1998-1).

Dr. Sébastien Burlon

CEN/TC250/SC7 Management Group Committee, Project Team 1 Leader
The European Committee for Standardization (CEN)

Sébastien Burlon is a Project Director at Terrasol (Setec group), a major consultancy in geotechnical engineering in France and abroad. He has been involved since the beginning of his career in many projects: high rise towers, nuclear power plants, wharfs. He has participated or directed several research projects in France and Europe, such as swelling-shrinkage of clays, piles under cyclic loads, geothermal energy, and pressure meter tests. He is a member of the SC7 Management Group and is also involved as convenor of two project teams for the second generation of Eurocode 7.

Dr Steve Denton, FREng. FICE FStructE

CEN/TC250 Chair
The European Committee for Standardization (CEN)

Steve Denton is WSP's Head of Civil and Bridge Engineering in UK, leading a unit of over 500 staff. Steve's expertise and experience span many facets of engineering and strategic consultancy, research and construction. In addition to his business and project leadership responsibilities, Steve retains a high degree of technical involvement in complex projects. He is an internationally recognised expert in bridge engineering and a global leader in the development and implementation of design standards.

Steve is the Chairman of CEN/TC 250, the international committee with overall responsibility for the Structural Eurocodes. In this role, he is leading the development of the second generation of the Eurocodes, which is the largest international standardisation programme ever of its type.

Steve is a Fellow of the Royal Academy of Engineering (FREng) and a Fellow of the ICE and IStructE. He has an MA and PhD from Cambridge University. In 2019 he was awarded the ICE International Medal and the BSI Leadership award for his ongoing work as Chairman of CEN/TC 250. He is also a visiting Professor at the University of Bath, a trustee of Clifton Suspension Bridge Trust and a Non-exec Director of CIRIA.

EN Eurocodes: Synopsis

The Eurocodes within the European Construction Sector

As in the many countries across the world, the construction sector is of strategic importance also to the European Union (EU), contributing to about 9% of the EU's Gross Domestic Product and provides 18 million direct jobs. The construction sector is key element for the implementation of the Single Market and other construction relevant EU policies, e.g. Sustainability, Environment and Energy, since 40-45% of Europe's energy consumption stems from buildings with a further 5-10% being used in processing and transport of construction products and components (Athanasopoulou et al., 2019).

The EU has put in place a comprehensive legislative and regulatory framework for the construction sector, including corresponding European standards. Health and safety in construction and the free movement of engineering/construction services and products are important policy priorities. Concerning the construction activity itself, the focus is on the competitiveness of the sector, not least in the field of sustainable construction.

European legislation defines the essential requirements that goods must meet when they are placed on the market and the European standards bodies have the task of drawing up the corresponding technical specifications. In the construction sector, the Construction Products Regulation¹ (CPR) is delivered to enable the proper functioning of the internal market for construction products by establishing harmonised rules on how to express their performance. Technical specifications shall be drawn by European standardisation bodies and shall be based on seven Basic Requirements (BR) for construction works:

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and the environment
4. Safety and accessibility in use
5. Protection against noise
6. Energy economy and heat retention
7. Sustainable use of natural resources

The free movement of construction-related products and services is facilitated by the EU-wide implementation of common European technical standards for the structural design of buildings and other construction works—the Eurocodes.² They are recommended means of giving a presumption of conformity with the basic requirements of the CPR in particular BR1 "Mechanical resistance and stability" and BR2 "Safety in case of fire".

The European Standardisation system relating to the construction sector is a comprehensive system of design standards that comprises the Eurocodes, along with material and product standards, as well as execution and test standards (Fig. 1.1). Thus, for the design and construction of buildings and other civil engineering works, the Eurocodes are intended to be used in combination with execution, material, product and test standards. This set of standards covers all aspects of construction, namely design rules, material properties, execution of structures and special works, specifications for construction products, as well as quality control (Athanasopoulou et al., 2019).

Figure 1.1. The European standard family for the construction sector



Source: <https://eurocodes.jrc.ec.europa.eu/>

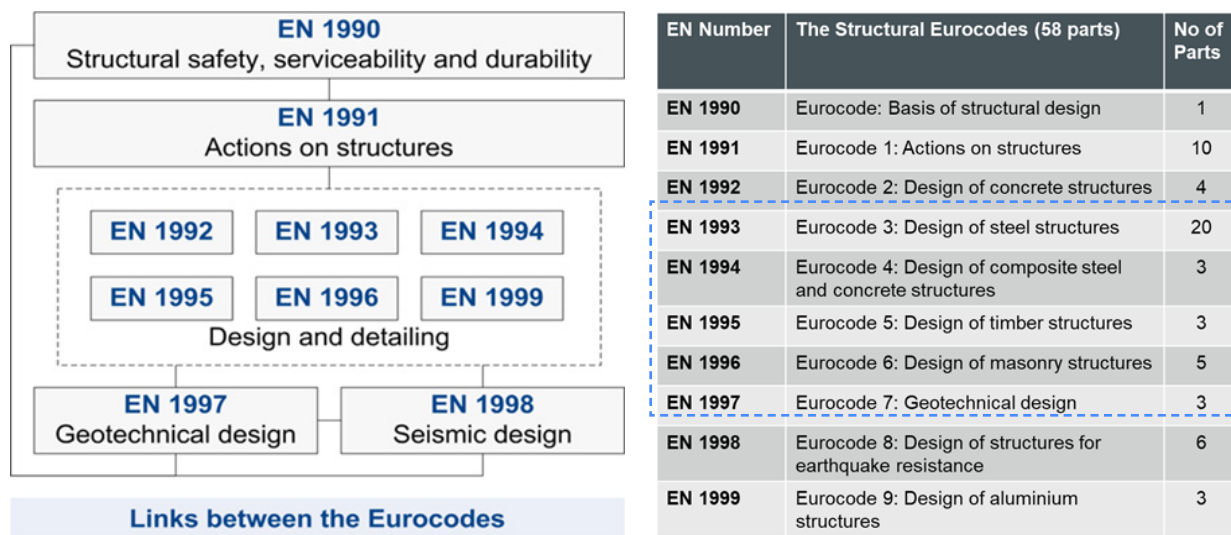
1 <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:088:0005:0043:EN:PDF>

2 <https://eurocodes.jrc.ec.europa.eu/>

What are the Eurocodes?

The EN Eurocodes are a series of 10 European Standards, EN 1990 - EN 1999, (Fig. 1.2) providing a common approach for the design of buildings and other civil engineering works and construction products. The EN Eurocodes are the reference design codes. They cover the basis of structural design, actions on structures and the design of concrete, steel, composite steel-concrete, timber, masonry and aluminium structures, together with geotechnical, seismic and structural fire design. The EN Eurocodes are developed under the guidance and co-ordination of CEN Technical Committee 250 (CEN/TC250) "Structural Eurocodes". CEN/TC250 has the overall responsibility for all CEN work on structural design codes.³

Figure 1.2. Links between the Eurocodes



Source: <https://eurocodes.jrc.ec.europa.eu/>

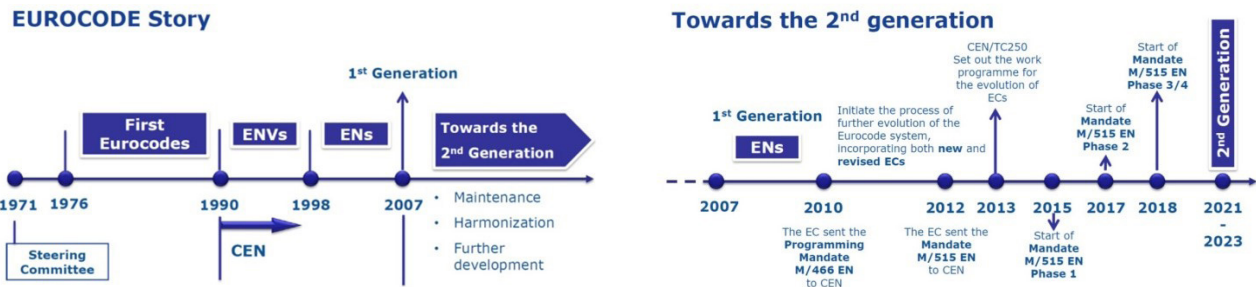
The considerable interest in the implementation and adoption of the Eurocodes in EU MS but also in third countries is based on the opportunity to have an advanced common standardization environment, which is adaptable to the particular requirements of each country and represents:

- a complete set of design standards that cover in a comprehensive manner all principal construction materials, all major fields of structural engineering and a wide range of types of structures and products
- the most up-to-date codes of practice
- flexible, offering the possibility for each country to adapt the Eurocodes to their specific conditions regarding climate, seismic risk, traditions, etc. through the Nationally Determined Parameters. Nationally Determined Parameters can also be adapted to the national approach and setup regarding risk and safety factors
- are a major tool for the successful removal of trade barriers for construction products and services;
- contribute to the safety and protection of the people in the built environment, on the basis of the best possible scientific advice;
- are a common basis for technical and scientific collaboration

The publication of the Eurocodes by CEN in May 2007 (Fig. 1.3) marked a major milestone in the European standardisation for the construction sector, since the Eurocodes introduced common technical rules for calculating the mechanical and fire resistance, and the stability of constructions and construction products.

³ https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6231&cs=IDE5F6AD2EAID540EEF59F3719FCDFE7FE

Figure 1.3 EN Eurocodes - timeline



Source: Formichi, workshop "The way forward for the Eurocodes implementation in the Balkans", 10-11 October 2018, Tirana, https://eurocodes.jrc.ec.europa.eu/showpage.php?id=2018_10_WS_Balkan

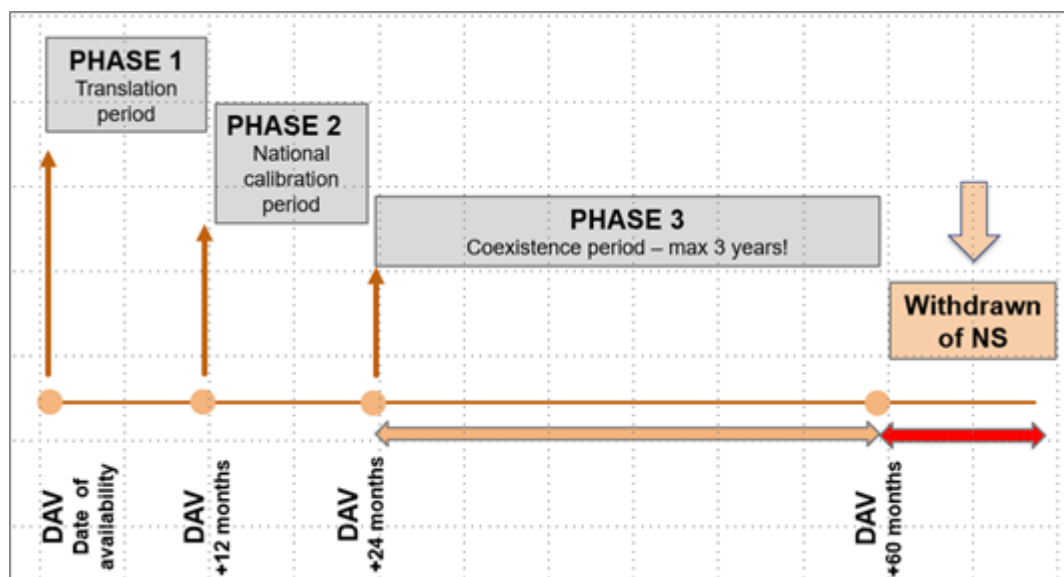
The adoption and implementation of the Eurocodes

The national implementation of a Eurocode Part has three phases: translation period, the National calibration period and the Coexistence period (Fig. 1.4).

The National Authorities and National Standardization Body (NSB) should:

- translate the Eurocode Part in authorised national languages;
- set the Nationally Determined Parameters (NDP)s to be applied on their territory;
- publish the [National Standard](#) transposing the EN Eurocode and the National Annex (NA), containing the national choice on the NDPs and reference to non-contradictory complementary information (NCCI), and notify the European Commission;
- adapt, as far as necessary, their National Provisions so that the Eurocode Part can be used on their territory: (I) as a means to prove compliance of construction works with the national requirements for "mechanical resistance and stability" and "resistance to fire" and (II) as a basis for specifying contracts for the execution of public construction works and related engineering services;
- promote training on the Eurocodes.

Figure 1.4 Phases in national implementation of the Eurocodes



The National Standard transposing the EN Eurocode Part, when published by NSB, will be composed of the EN Eurocode text (preceded by a National Title page and by a National Foreword), generally followed by a National Annex (Fig. 1.5). The NSBs should normally publish a National Annex, on behalf of and with the agreement of the national competent authorities.

Figure 1.5 National publication of EN Eurocode part



Source: <https://eurocodes.jrc.ec.europa.eu/>

Application of EN standards including the Eurocodes is voluntary according to the principle of the European Standardisation.⁴ However, the national legislative provisions may refer to standards making the compliance with them compulsory. Thus, in relation to the implementation procedure of the Eurocodes Parts, it is important to stress that the regulatory environment in each country is very important. In the different regulatory environments, the national regulations either refer to standards - thus making the compliance with them compulsory- or introduce directly a set of design rules. In the latter case, no National Standards exist, and hence there is no need to withdraw conflicting standards. Contrary, there are countries where the rules for structural design are enforced by legislative acts, i.e. national regulations (Athanasopoulou et al., 2019).

The complete Eurocodes glossary (abbreviations and definitions) can be found at <https://eurocodes.jrc.ec.europa.eu/showpage.php?id=7>.

Reference

Athanasopoulou A., P. Formichi, P. Spehl, I. Dabizheva, V. Gacesa-Moric, J. Markova, J. A. Calgaro, N. Malakatas, M. Lurvink, P. Croce, R. Apostolska, D. Sumarac, M. L. Sousa, S. Dimova, The implementation of the Eurocodes in the National Regulatory Framework, EUR 29601 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-79-98657-4, doi:10.2760/033434, JRC115175.

Links for Further Information on Eurocodes

- European Commission's Joint Research Centre: https://joint-research-centre.ec.europa.eu/index_en
- European Committee on Standardization (CEN): <https://www.cencenelec.eu/>
- Information on Eurocodes: <https://eurocodes.jrc.ec.europa.eu/>
- The Eurocodes Parts: <https://eurocodes.jrc.ec.europa.eu/showpage.php?id=13>
- National implementation of the Eurocodes: <https://eurocodes.jrc.ec.europa.eu/showpage.php?id=3>
- Use of Eurocodes outside EU: <https://eurocodes.jrc.ec.europa.eu/showpage.php?id=8>
- Training material published by the JRC: <https://eurocodes.jrc.ec.europa.eu/showpage.php?id=33#wslst>

⁴ Regulation (EU) 1025/2012 on European standardisation.