Eurocodes
Background and Applications

Design of **Steel Buildings**
with worked examples

16-17 October 2014
Brussels, Belgium

**Organised and supported by**
European Commission
DG Enterprise and Industry
Joint Research Centre
European Convention for Constructional Steelwork
European Committee for Standardization
CEN/TC250/SC3

The present and the future of the Eurocodes

Dr Steve Denton FREng
Chairman, CEN/TC 250
Content

• Welcome
• Background
• Implementation
• Future developments
• Final remarks
Content

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• Final remarks
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• Welcome

• **Background**

• Implementation

• Future developments

• Final remarks
Eurocodes: 10 Standards in 58 Parts for Structural and Geotechnical Design

- EN 1990: Structural Safety, serviceability and durability
- EN 1991: Actions on structures
- EN 1992: Design and detailing
- EN 1993
- EN 1994
- EN 1995
- EN 1996
- EN 1997
- EN 1998
- EN 1999: Geotechnical and seismic design
Understanding Eurocode implementation

Eurocodes (EN1990 – EN1999)

European standards for construction
Understanding Eurocode implementation


European standards for construction
Understanding Eurocode implementation

**Eurocodes (EN1990 – EN1999) + National Annexes**

**European Product Standards**

European standards for construction
Understanding Eurocode implementation


European Product Standards

European Execution Standards

European standards for construction
Understanding Eurocode implementation


European Product Standards

European Execution Standards

Non-contradictory complementary information

European standards for construction
Understanding Eurocode implementation


European Product Standards

European Execution Standards

Non-contradictory complementary information

Client implementation and requirements

European standards for construction
Understanding Eurocode implementation

- European Product Standards
- European Execution Standards

European standards for construction

- Non-contradictory complementary information
- Client implementation and requirements
- Support to the profession
Content

- Welcome
- Background
- **Implementation**
  - Future developments
  - Final remarks
Are/will be the Eurocodes implemented?

EU/EFTA MS: on-going Commission enquiry

Source: European Commission
Are/will be the Eurocodes obligatory?

EU/EFTA MS: on-going Commission enquiry

Eurocodes implementation

Source: European Commission

No other standards/regulations (will be) used in parallel

Are/will be the Eurocodes obligatory?
Content

• Welcome
• Background
• Implementation
• **Future developments**
• Final remarks
Timeline

1975

Eurocodes started
Timeline

1975
Eurocodes started

1990
ENVs started
Timeline

- 1975: Eurocodes started
- 1990: ENVs started
- 1992: Publication of ENVs
Timeline

- Eurocodes started: 1975
- ENVs started: 1990
- Publication of ENVs: 1992
- Conversion of ENV to EN: 1998
Timeline

1975
- Eurocodes started

1990
- ENVs started

1992
- Publication of ENVs

1998
- Conversion of ENV to EN

2007
- Publication 1st generation of the Eurocodes
Timeline

1975 Eurocodes started
1990 ENVs started
1992 Publication of ENVs
1998 Conversion of ENV to EN
2007 Publication 1st generation of the Eurocodes
2010 Programming Mandate
Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>Eurocodes started</td>
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<tr>
<td>1990</td>
<td>ENVs started</td>
</tr>
<tr>
<td>1992</td>
<td>Publication of ENVs</td>
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<tr>
<td>2010</td>
<td>Programming Mandate</td>
</tr>
<tr>
<td>2011</td>
<td>Response to Programming Mandate</td>
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</tbody>
</table>
Timeline

- Eurocodes started: 1975
- Publication of ENVs: 1990
- Conversion of ENV to EN: 1992
- Conversion of ENV to EN: 1998
- Publication 1st generation of the Eurocodes: 2007
- Programming Mandate: 2010
- Response to Programming Mandate: 2011
- Specific Mandate: 2012
Timeline

- 1975: Eurocodes started
- 1990: ENVs started
- 1992: Publication of ENVs
- 1998: Conversion of ENV to EN
- 2007: Publication 1st generation of the Eurocodes
- 2010: Programming Mandate
- 2011: Response to Programming Mandate
- 2012: Specific Mandate
- 2013: Response to Specific Mandate
Eurocodes started

1975

ENVs started

1990

Publication of ENVs

1992

Conversion of ENV to EN

1998

Publication 1st generation of the Eurocodes

2007

Programming Mandate

2010

Response to Programming Mandate

2011

Specific Mandate

2012

Response to Specific Mandate

2013

Publication 2nd generation of the Eurocodes

2020
There will be a period of stability for the published Eurocodes until 2020
Timeline

1975
- Eurocodes started

1990
- ENVs started

1992
- Publication of ENVs

1998
- Conversion of ENV to EN

2007
- Publication 1st generation of the Eurocodes

2010
- Programming Mandate

2011
- Response to Programming Mandate

2012
- Specific Mandate

2013
- Response to Specific Mandate

2020
- Publication 2nd generation of the Eurocodes
Specific mandate

Eurocodes development should:

- Encourage innovation
- Take into account new societal demands and needs
- Facilitate the harmonisation of national technical initiatives on new topics of interest for the construction sector
- Enhance user-friendliness
Timeline

1975 - Eurocodes started
1990 - ENVs started
1992 - Publication of ENVs
1998 - Conversion of ENV to EN
2007 - Publication 1st generation of the Eurocodes
2010 - Programming Mandate
2011 - Response to Programming Mandate
2012 - Specific Mandate
2013 - Response to Specific Mandate
2020 - Publication 2nd generation of the Eurocodes
Response to mandate

- 138 pages
- Over 1000 experts from across Europe involved
- Structure of tasks and sub-tasks
- Phased programme
Structure of tasks and sub-tasks
Overall structure of work programme (Annex 2)
Complete work programme (Annex 1)
### Outline Schedule (Annex 3)

#### Preliminary Project Team activity awaiting other tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Task 1.1: Introduction</td>
</tr>
<tr>
<td>1.2</td>
<td>Task 1.2: Task 1.2</td>
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<tr>
<td>1.3</td>
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<tr>
<td>1.4</td>
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#### Main Project Team work

<table>
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#### Finalization by relevant SCWG

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#### Interrelated activities

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#### Note

- The schedule is subject to change based on the progress of the project.
- Specific tasks and deadlines may vary depending on external factors.
- Regular updates will be provided to ensure all team members are informed.

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**Maximum extension of activity**

- **Call for experts and establishment of Project Teams**
- **Preliminary Project Team activity awaiting other tasks**
- **Main Project Team work**
- **Finalization by relevant SCWG**
- **Interrelated activities**

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**Joint Research Centre**

**Design of steel buildings with worked examples**

**Brussels, 16 - 17 October 2014**
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

- **Glass**
- **FRP**
Design of steel buildings with worked examples
Design of steel buildings with worked examples

Eurocodes

- EN 1990
- EN 1991
- EN 1992
- EN 1993
- EN 1994
- EN 1995
- EN 1996
- EN 1997
- EN 1998
- EN 1999

Robustness

Glass
FRP
Membrane
Design of steel buildings with worked examples

Eurocodes - Design of steel buildings with worked examples

Brussels, 16 - 17 October 2014

EN 1990
EN 1991
EN 1992
EN 1993
EN 1994
EN 1995
EN 1996
EN 1997
EN 1998
EN 1999

Robustness

Assessment

Glass
FRP
Membrane
Eurocodes - Design of steel buildings with worked examples

Glass
FRP
Membrane

Robustness
Assessment
Climate change
Design of steel buildings with worked examples

- EN 1990
- EN 1991
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- EN 1997
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- EN 1999

Robustness

Assessment

Climate change

Ease of use

Glass

FRP

Membrane
Chairman’s Advisory Panel on ‘Ease of use and reduction of NDP’

5 Pillars

1. Users’ needs
2. Principles and priorities
3. Guidance / Examples
4. Management and support
5. Measurements
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