

"The way forward for the Eurocodes implementation in the Balkans"

10-11 October 2018, Tirana

Implementation of the Eurocodes in Croatia

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**Croatian Standards Institute
(HZN)**

Croatian Standards Institute (HZN)

2005-07-01

National Standards Body – public institution

- **Law on Standardization (NN 80/2013)**
- **Decree of the Government of the Republic of Croatia on the establishment of the Croatian Standards Institute (NN 154/2004; NN 44/2005; NN 30/2010; NN 34/2012; NN 79/2012)**
- **2010-01-01 HZN became a full member of CEN&CENELEC**
- **2013-07-01 Croatia became a member of EU**

Adoption and Implementation of the Eurocodes – Croatian approach (1)

***Agreement on Cooperation in the Process of Adoption of
the Eurocodes as Croatian Standards***

signed on 2007-09-05 by

**Ministry of Construction and Physical Planning,
Croatian Chamber of Civil Engineers
and Croatian Standards Institute**

Adoption and Implementation of the Eurocodes – Croatian approach (2)

***Agreement on Cooperation in the Process of Adoption of
the Eurocodes as Croatian Standards***



**Work Plan on Adoption of the Eurocodes
as Croatian Standards for the Period
2008 – 2010**



annual bilateral contracts

Work Plan on Adoption of the Eurocodes (2)

- **Work Plan was not realized on time for various reasons:**
 - **lack of awareness at the high management level**
 - **insufficient capacities (human resources)**
 - **difficulties with reaching consensus on certain NDPs**
 - **time consuming work on new maps for actions on structures and seismic impact**
- **completion was postponed several times**

HZN/TO 548, *Structural Eurocodes* (1)

- **NMC to CEN/TC 250**
- **established 2006-11-28**
- **chairman: Prof. Ivica Džeba PhD., CEng.**
- **structure based on the structure of CEN/TC 250**
 - **9 SCs**
 - **3 WGs**
- **conditions for organized and planned work on all Eurocodes within single TC provided**
- **137 experts from different institutions/firms are involved**

HZN/TO 548, *Structural Eurocodes* (2)

- **decisions:**
 - **ENs to be adopted in original (en) immediately**
 - **adoption to be followed by translation into Croatian**
 - **NAs to be developed & published as soon as possible**
 - **NAs to be published as separate documents**

HZN/TO 548, *Structural Eurocodes* (3) SCs

- **PO 1, *Eurocode 1: Actions on structures***
- **PO 2, *Eurocode 2: Design of concrete structures***
- **PO 3, *Eurocode 3: Design of steel structures***
- **PO 4, *Eurocode 4: Design of composite steel and concrete structures***
- **PO 5, *Eurocode 5: Design of timber structures***
- **PO 6, *Eurocode 6: Design of masonry structures***
- **PO 7, *Eurocode 7: Geotechnical design***
- **PO 8, *Eurocode 8: Earthquake resistance design of structures***
- **PO 9, *Eurocode 9: Design of aluminium structures***

HZN/TO 548, *Structural Eurocodes* (4) WGs

- **RS 1, *Translation***
- **RS 2, *National Annexes***
- **RS 3, *Eurocode 0***
(not active any more)

HZN/TO 548, *Structural Eurocodes* (5) new SCs (2016-02-08)

- **PO 10, *EN 1990 Basis of structural design***
- **PO 11, *Structural Glass***

Eurocodes – ENs in Croatia (1)

1st edition

- **HRN EN 1990:2008 en**
- **HRN EN 1991:2008 en**
- **HRN EN 1992:2008 en**
- **HRN EN 1993:2008 en**
- **HRN EN 1994:2008 en**
- **HRN EN 1995:2008 en**
- **HRN EN 1996:2008 en**
- **HRN EN 1997:2008 en**
- **HRN EN 1998:2008 en**
- **HRN EN 1999:2008 en**

(with all corresponding amendments and corrigenda)

Eurocodes – ENs in Croatia (2)

2nd edition

- **HRN EN 1990:2011 hr**
- **HRN EN 1991:2012 hr**
- **HRN EN 1992:2013 hr**
- **HRN EN 1993:2014 hr**
- **HRN EN 1994:2012 hr**
- **HRN EN 1995:2013 hr**
- **HRN EN 1996:2012 hr**
- **HRN EN 1997:2012 hr**
- **HRN EN 1998:2011 hr**
- **HRN EN 1999:2015 hr**

(consolidated with all published amendments and corrigenda)

Eurocodes – ENs in Croatia (3) problems

- **hr versions – consolidated with amendments and corrigenda published before publishing HRNs – user-friendly, but...**
- **new amendments and corrigenda published after the publication of consolidated versions – "never-ending story"**
- **capacity to carry out the work on time (translation, consolidation, possible modifications of NAs)**
- **publication of separate documents adopting new As & ACs – not transparent enough?**

Eurocodes – ENs in Croatia (4) new documents

- **publication of new documents continued**
 - **numerous amendments (14)**
EN 1991 (2), EN 1992 (2), EN 1993 (6),
EN 1994 (1), EN 1995 (1), EN 1997 (1), EN 1998 (1)
 - **new standards**
EN 1992-4:2018
- **all published amendments translated into Croatian and published as separate documents**

Eurocodes – NAs in Croatia (1)

- **HRN EN 1990:2011/NA:2011 hr-en**
- **HRN EN 1991:2012/NA:2012 hr-en**
- **HRN EN 1992:2013/NA:2013 hr-en**
- **HRN EN 1993:2014/NA:2014 hr-en**
- **HRN EN 1994:2012/NA:2012 hr-en**
- **HRN EN 1995:2013/NA:2013 hr-en**
- **HRN EN 1996:2012/NA:2012 hr-en**
- **HRN EN 1997:2012/NA:2012 hr-en**
- **HRN EN 1998:2011/NA:2011 hr-en**
- **HRN EN 1999:2015/NA:2015 hr-en**

(57 parts)

Eurocodes – NAs in Croatia (2)

- **exception: HRN EN 1997:2012/NA**
 - **not published (not aware that it had to be)**
 - **more formality than a need**
 - **working draft nrHRN EN 1997-2/NA prepared**
 - **not convinced it is necessary – use of other national procedures except form the nrHRN EN 1997-2 are allowed in Croatia, Annexes A to X remain informative**
 - **HZN/TO 548 will decide about the publication**

Eurocodes – NAs in Croatia (3)

- **new maps for actions on structure (based on 30 years period 1971 – 2000):**
 - **snow load map (HRN EN 1991-1-3/NA)**
 - **basic wind velocity map (HRN EN 1991-1-4/NA)**
 - **air temperature maps (HRN EN 1991-1-5/NA)**

(made by Croatian Meteorological and Hydrological Service)

Eurocodes – NAs in Croatia (4)



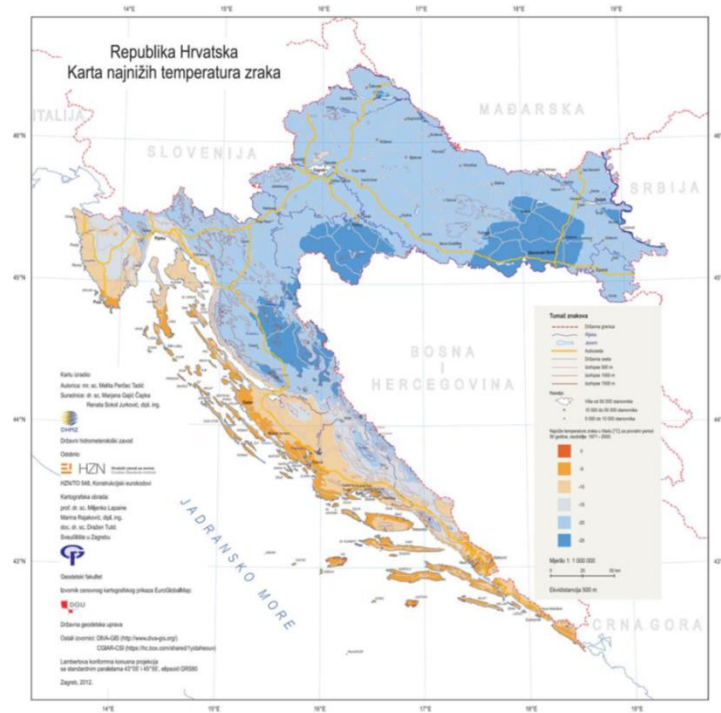
Map of snow areas

Eurocodes – NAs in Croatia (5)



Fundamental value of the basic wind velocity $v_{b,0}$

Eurocodes – NAs in Croatia (6)



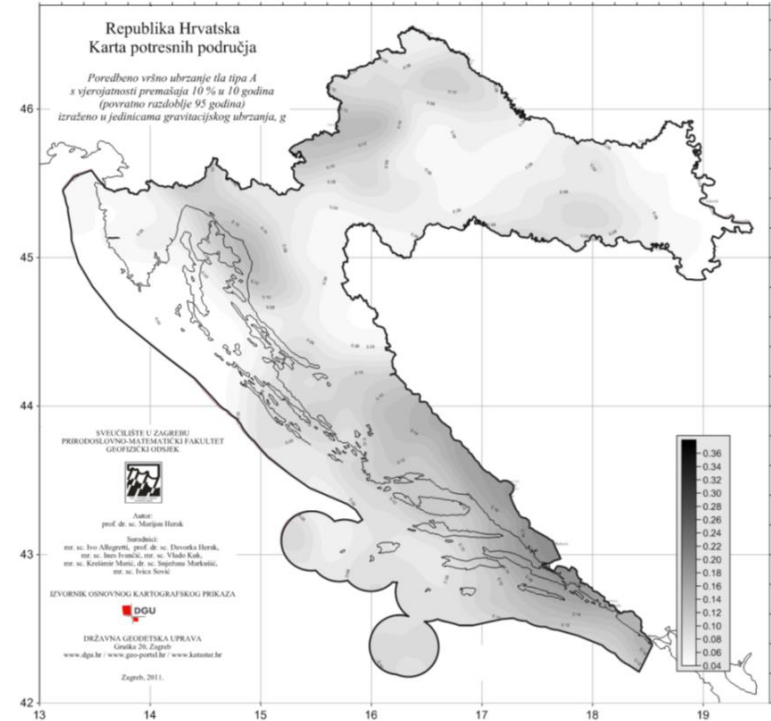
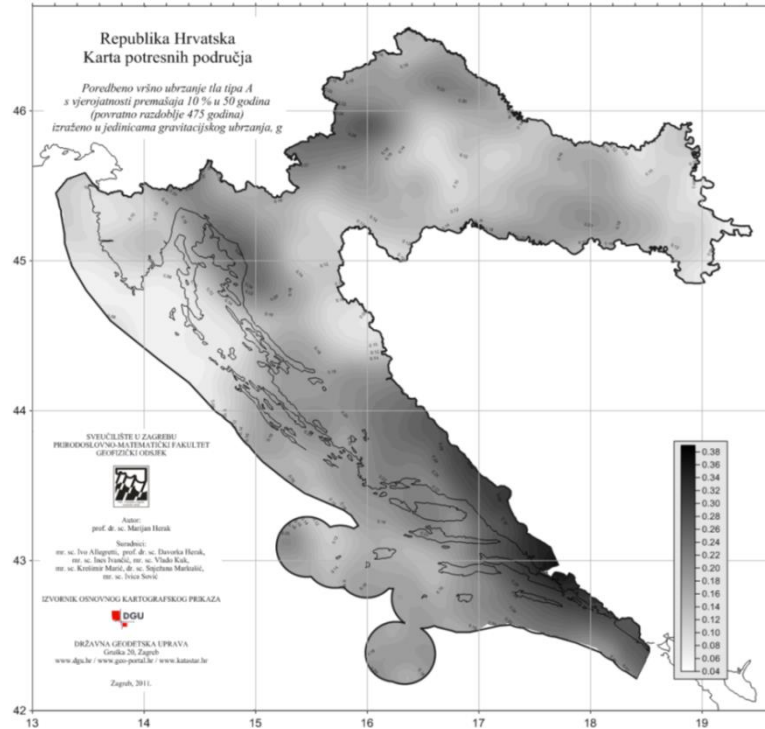
Map of maximum/minimum shade air temperatures

Eurocodes – NAs in Croatia (7)

- **new maps for seismic impact – reference peak ground acceleration:**
 - **reference return period 475 years**
 - **reference return period 95 years**

(made by University of Zagreb, Faculty of Science,
Department of Geophysics)

Eurocodes – NAs in Croatia (8)



Seismic zone map for peak ground acceleration for return period $T_{NCR}=475/T_{DLR}=95$ years

Eurocodes – NAs in Croatia (9)

Proportion of accepted recommended values of NDPs

Eurocode	NDPs accepted [%]
EN 1990	74
EN 1991	94
EN 1992	98
EN 1993	95
EN 1994	78
EN 1995	63
EN 1996	82
EN 1997	48
EN 1998	70
EN 1999	100
Average	~ 80

Eurocodes – NAs in Croatia (10) new documents

- **publication of NAs continued**
 - **updated/modified NAs (8)**
EN 1991 (1), EN 1992 (1), EN 1993 (5), EN 1997 (1)
 - **new NAs in preparation**
nrHRN EN 1992-4/NA
- **all published updated/modified NAs translated into English**

Eurocodes – NAs in Croatia (11)

- **Croatian NDPs are regularly uploaded in JRC EN Eurocodes NDP Database (established by JRC EC)**
- **upload of NDPs made by the National Authority – Ministry of Construction and Physical Planning**

Eurocodes

Implementation in Croatia

- **implementation achieved by means of technical regulations**
- **technical regulations prepared by the Ministry of Construction and Physical Planning**
- **6 regulations – one for each type of structures (concrete, steel, composite steel and concrete, timber, masonry & aluminium) – withdrawn**
- **Technical regulation for building structures – a single regulation for all types of structures published 2017-03**

Eurocodes

HZN – further activities

- ***M/515 Mandate for amending existing Eurocodes and extending the scope of structural Eurocodes***
- **active participation of Croatian experts in the development of the new generation of Eurocodes (CEN/TC 250/SCs/WGs)**
 - **regularly participate in certain SC meetings (SC 5, SC 7, SC 9, SC 11)**
 - **experts working in WGs (14) (timber structures, aluminium structures, structural glass)**
- **preparing of NDPs for the new generation of Eurocodes**

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Thank you for your attention!

Stay in touch



<http://eurocodes.jrc.ec.europa.eu/>