



EUROCODES IN MONTENEGRO

Country report

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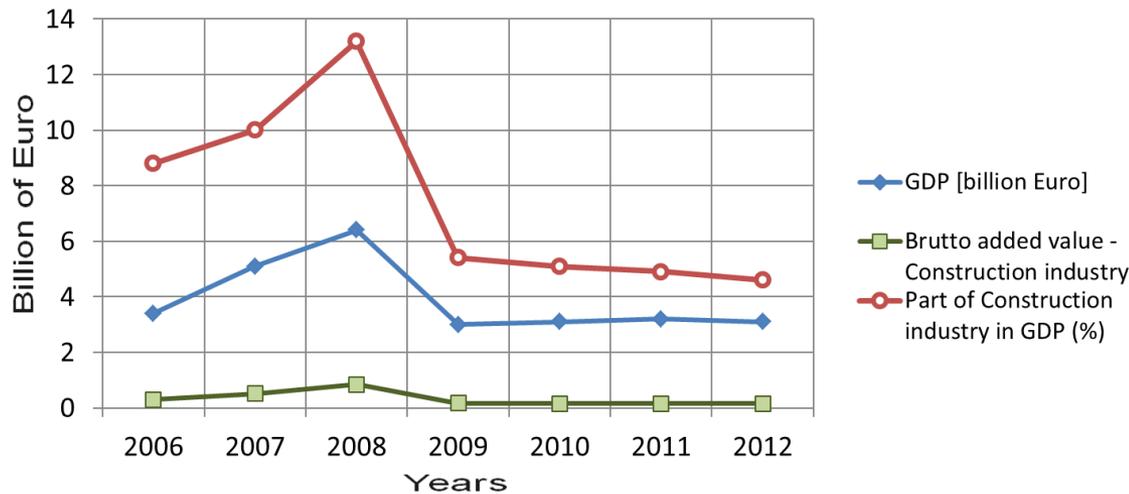
STATE OF MONTENEGRO

SOME BASIC DATA

- Became independent (from ex Yugoslavia) in 2006
- State territory surface ~ 14.000 km²
- Number of citizens ~ 620.000



Participation of Construction industry (%) in GDP



Large investments in 2007-2008 in real estate and urban development resulted by huge impact on brutto added value in construction industry – with over 13 % in GDP



CURRENT SITUATION IN ADOPTION OF EUROCODES

Chronology of some earlier activities

- Activities on harmonization of our national regulations with EU standards (JUS standards in Montenegro) started in 1975 when our country was a part of the Yugoslavia state
- The first set of harmonized technical standards “Eurocodes” was published in 1984 – and immediately was followed by our technical norm (PBAB '87) for reinforced concrete structures
- After publishing the ENV Eurocodes and at the beginning of its conversion to EN codes (1998) we started translation and publishing of these documents for reinforced concrete structures
- JRC Workshop at Brussels on Eurocodes, in March 2008 encouraged activities on Eurocodes in Montenegro



Existing relevant national regulations and recent activities

- **Law for spatial development and constructions (2008)**
- **Some regulations inherited from ex Yugoslavia, based on JUS standards are still in use**
- **Law on Construction Products, partly transposed contents of EU regulation no. 305/2011 - in the adoption phase**

Just finished:

- **IPA twining project on Eurocodes (2012 – 2013)**

In the process of adoption by the Government:

- **Action plans for Eurocodes adoption and implementation**



The adoption plan contains detailed schedule for every Eurocode, for every month: example – EN 90, 91 and 98

| Grupa | Dokument | Mjesec 1 | Mjesec 2 | Mjesec 3 | Mjesec 4 | Mjesec 5 | Mjesec 6 | Mjesec 7 | Mjesec 8 | Mjesec 9 | Mjesec 10 | Mjesec 11 | Mjesec 12 | Mjesec 13 | Mjesec 14 | Mjesec 15 |
|-----------------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-------------------------------|-----------|-----------|-----------|
| ISME/TC 002 | Sastanak | S3 | S | S | S | S | | | | | S | | | S | | |
| | Sedmica | 40 | | | | | | | | | | | | | | |
| | Dan | | | | | | | | | | | | | | | |
| adHoc - EN 1990 | Sastanak | | S | S | | | | | | S | | | | S | | |
| | EN 1990-Annex A1 | | P | KOREK | | | | | | ODL | | STAND | Nat. standard MEST EN 1990 | | K | |
| | NA for Annex A1 | | | PRIP | DISK | | | | | ODL | | STAND | Nat. standard MEST EN | | K | |
| adHoc - EN 1998 | Sastanak | | S1 | S2 | | | | | | | S3 | | | S4 | | |
| | Sedmica | | | | | | | | | | | | | | | |
| | Dan | | | | | | | | | | | | | | | |
| adHoc - EN 1991 | EN 1998-1 | | P | | KOREK | | | | | | ODL | STAND | Nat. standard EN1998-1 | | K | |
| | NA for EN 1998-1 | | | PRIP | | DISK | | | | | | STAND | Nat. standard EN1998-1/NA | | K | |
| | Sastanak | | | | | | | | | | | | | | | |
| adHoc - EN 1991 | Sedmica | | | | | | | | | | | | | | | |
| | Dan | | | | | | | | | | | | | | | |
| | EN 1991-1-3 | | | | | | | | | | | | | | | |
| | NA for EN 1991-1-3 | | | | | | | | | | | | | | | |
| adHoc - EN 1991 | EN 1991-1-4 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |



The total cost of Eurocodes adoption (translation, NDPs determination and NAs preparation) is expected to be ~ 1 million Euros

| Godina | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|-------------|--------------|--------------|----------------|-------------------|
| Usvajanje Eurokodova i izrada nacionalnih aneksa | 55.328,00€ | 372.568,00€ | 262.847,29 € | 201.902,40 € | 113.674,40 € |
| Izrada karata vjetra, snijega i izotermi | | 15.000,00 € | | | |
| Izrada karata seizmičkog hazarda | | 35.700,00 € | | | |
| UKUPNO PO GODINAMA | 55.328,00 € | 423.268,00 € | 262.847,29 € | 201.902,40 € | 113.674,40 € |
| | | | | UKUPNO: | 1.042.796€ |

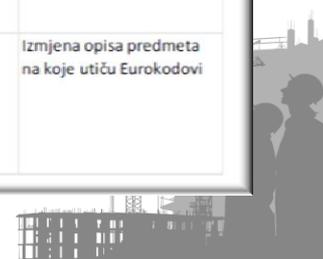


Implementation Plan contains detailed priorities, dead lines, cost, responsible institutions and indicators for success

Predlog Akcionog plana za implementaciju Eurokodova

| Br | Prioritet u odnosu na aktivnosti gradnje u CG | Dogovor | Vremenski rok | Troškovi | Nadležna ustanova | Uključene ustanove | Indikatori |
|----|--|--|---------------|----------|---------------------------|--|--|
| 1 | Dostizanje referentne tačke milestone M1 u skladu sa AP za usvajanje Eurokodova (moguće je projektovanje betonskih i zidanih konstrukcija) | | | | | | |
| 2 | Donijeti odluku o implementaciji Eurokodova u Crnoj Gori | | | | | | |
| 3 | Informativna kampanja i obuka o objavljenim Eurokodovima | | | | | | |
| 4 | Informativna kampanja i obuka o objavljenim Eurokodovima | | | | | | |
| 5 | Informativna kampanja i obuka o objavljenim Eurokodovima | | | | | | |
| 6 | Adaptacija predmeta u srednjim građevinskim školama | | | | | | |
| 7 | Početak nastave adaptiranih predmeta za učenike | Vidjeti br. 6 | do sept. 2015 | 0 | srednje građevinske škole | učenici | Đaci uče Eurokodove iz predmeta na koje utiču Eurokodovi |
| 8 | Adaptacija predmeta studijskog programa na univerzitetu i građevinskim srednjim školama | Adaptiranje sadržaja predmeta na koje utiču već objavljeni Eurokodovi u skladu sa referentnom tačkom M1, i priprema ažuriranih nastavnih materijala | do okt. 2015 | 0 | Univerzitet | Građevinski fakultet; Arhitektonski fakultet | Izmjena opisa predmeta na koje utiču Eurokodovi |
| 9 | Početak nastave iz prilagođenih predmeta | vidjeti br. 7 | do okt. 2015 | 0 | Univerzitet | studenti | Studenti uče Eurokodove iz predmeta na koje utiču Eurokodovi |
| 10 | Dostizanje referentne tačke 2 (Milestone - M2) u skladu sa AP za usvajanje Eurokodova (moguće je projektovanje betonskih i zidanih konstrukcija) | Usvajanje i objavljivanje sljedećih djelova Eurokodova i sastaviti nacionalne anekse: EN 1991-1-2, EN 1991-1-6, EN 1991-1-7, EN 1991-2, EN 1992-1-2, EN 1992-2, EN 1993-1-1, EN 1993-1-2, EN 1993-1-8, EN 1993-1-9, EN 1993-1-10, EN 1993-2, EN 1994-1-1, EN 1994-1-1, EN 1994-2, EN 1995-1-1, EN 1995-1-2, EN 1995-2, EN 1996-1-2, EN 1996-2, EN 1997-2, EN 1998-2, EN 1998-3 | 2016/06/01 | 0 | ISME | TK 002 | Dostupnost pomenutih Eurokodova i nacionalnih aneksa |
| 11 | Adaptacija predmeta u građevinskim školama | Adaptacija sadržaja predmeta na koje utiču već objavljeni Eurokodovi u skladu sa referentnom tačkom M2 i priprema ažuriranih nastavnih materijala | do sept. 2016 | 0 | srednje građevinske škole | - | Izmjena opisa predmeta na koje utiču Eurokodovi |

Predlog Akcionog plana za implementaciju Eurokodova



Responsible institutions

- **Ministry of Sustainable Development and Tourism** - responsible for regulations in sectors: spatial development, construction and urban planning
- **Institute for Standardization of Montenegro (ISME)** - adoption of standards
- **Institute of Hydro-meteorology and Seismology** - NDPs in EN 1991 and EN 1998
- **Institute of Geology** – NDPs in EN 1997
- **Faculty of Civil engineering** – general education
- **Chamber of engineers** – practical education of engineers



INSTITUTIONS INVOLVEMENT

Institute for standardization of Montenegro

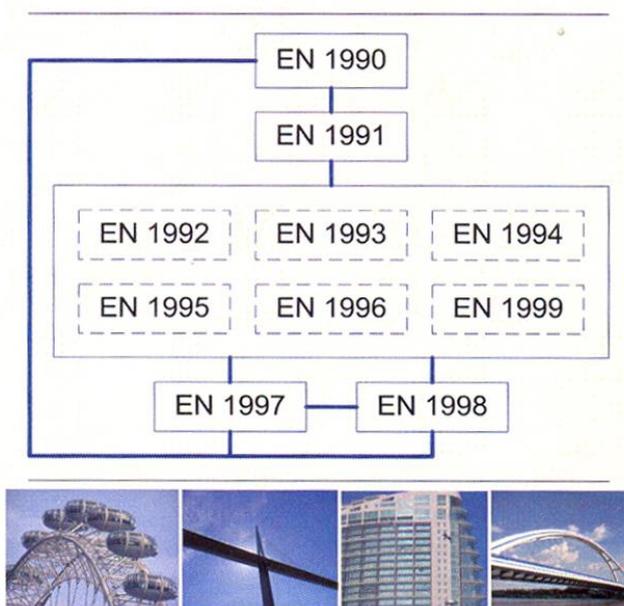


- In 2007 Government established National Institute for Standardization (ISME),
- In 2011 ISME adopted harmonized standards for construction products by implementing EU Directive 89/106/EEC into National regulations,
- In July 2011 ISME established Technical Committee TK 002: Eurocodes to manage adoption and implementation of Eurocodes,
- In September 2012 Technical Committee established 8 working groups (W0 - W7) for all Eurocodes.



Working groups on Eurocodes

Technical Committee for Eurocodes



W_0 – EN 1990

W_1 – EN 1991, EN 1996

W_2 – EN 1992

W_3 – EN 1993, EN 1999

W_4 – EN 1994

W_5 – EN 1995

W_6 – EN 1998

W_7 – EN 1997



Activities of Technical Committee

- **EC 1990, EN 1991 and EN 1998 adopted (December 2012) in English - until preparation of national NDPs,**
- **EC 1990 and NA 1990 - now on public inquiry,**
- **Adoption of some basic parts of EC 1991 and EC 1998 - in preparation stage.**

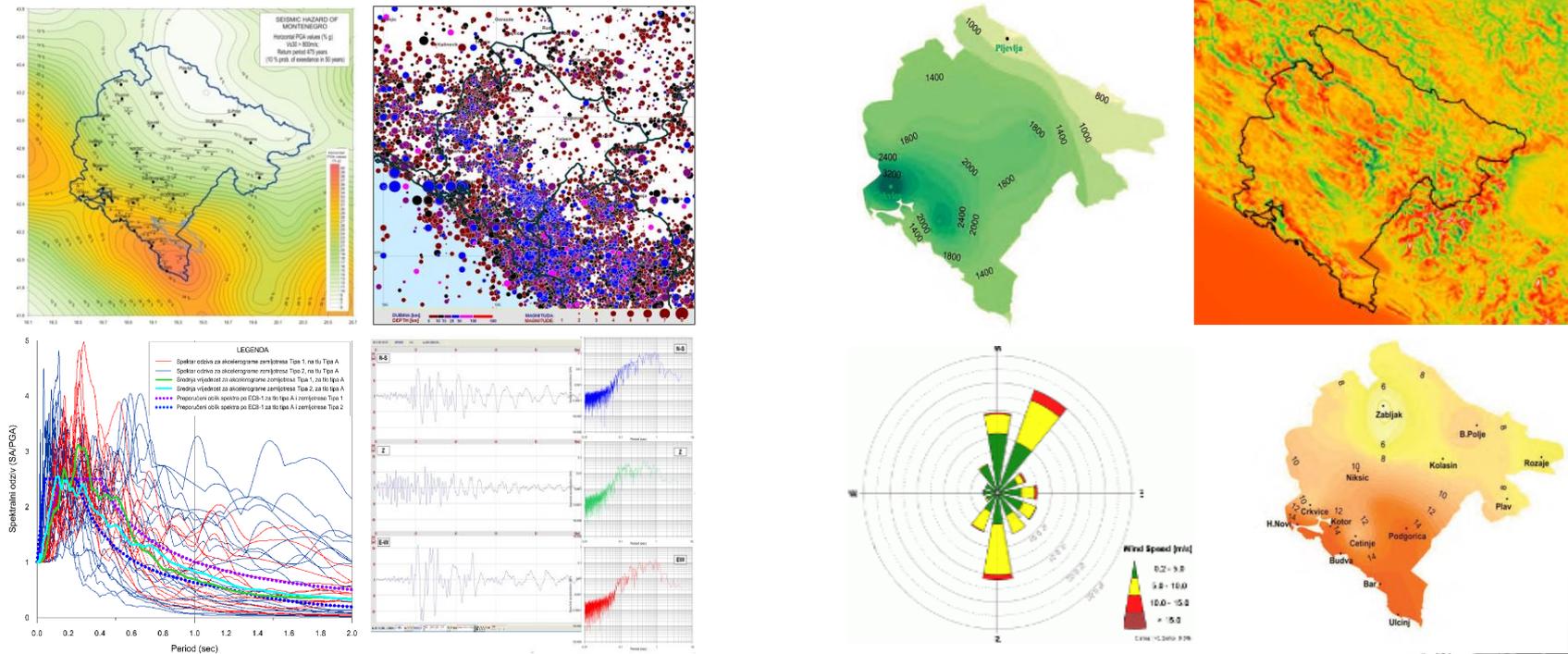


EN98-1 NDPs:

responsible Institute for Hydro-meteorology and Seismology

Seismic hazard data - finished
 Spectral response data - ongoing
 Strong motion data base - existing
 Soil type characterization – in 2014

Snow loads data
 Wind loads data
 Max&min shade air temperature



Faculty of Civil Engineering related activities

- ECTS Catalogue adopted with new Eurocodes contents (implementation officially will begin in 2014/15 study year),
- National experts attended workshops on Eurocodes: Brussels (2008 & 2011), Lisbon (2012), Dublin (2013), than visited ASI, DIN and DIBt (2013),
- Every two years Faculty organizes Symposiums on constructions - *From Theory to Practice*, partially dedicated to Eurocodes implementation,
- During several last years, in more than 40 cases PhD and Master theses as well as final diploma works, were prepared with the subjects on Eurocodes.



STRATEGIES FOR TRAINING

- still to be determined

Chamber of engineers of Montenegro

- Chamber of engineers licenses all engineers and companies for authorized urban planning, building design and construction, in accordance with the *Law on spatial development and construction (2008)*
- Chamber occupies near 2.000 licensed engineers and more than 600 licenced companies.

<http://www.ingkomora.me>



Several seminars on Eurocodes organized by Montenegrin Chamber of engineers and Civil Engineering Faculty

- First informative seminar on *Eurocodes implementation in Montenegro, 2009*
- Round table *EU standards: EC 0 and EC 1, 2010*
- Several conferences on *Eurocodes topics, 2010-2012*
- Round table on *Construction products and European regulations, 2013,*
- Second informative seminar on *Eurocodes implementation, 2013, etc.*



The recent Seminar (October this year) covered next topics

- Overview and comparison of Eurocodes and existing National rules
- Explanation of Eurocode EN 1990
- EN 1991-1-1: Densities, self-weight, imposed loads for buildings
- EN 1991-1-3: Snow loads
- EN 1991-1-4: Wind action
- EN 1991-1-5: Thermal actions
- EN 1998: Earthquakes - basic rules
- EN 1998: Seismic actions and rules for buildings
- EN 1992: Design of concrete structures
- EN 1993: Design of steel structures
- EN 1996: Design of masonry structures



www.ingkomora.me



For successful process of Eurocodes implementation - education is crucial

- Education on all levels in Eurocodes implementation, especially for civil engineers, as well as for the students of Civil engineering Faculty,
- We realized that besides *Faculty of Civil engineering*, the *Chamber of engineers* should play the crucial role through the practical process of education on Eurocodes,
- Mostly, we finished the informative campaigns, as well as top level specialists education (state administration and construction companies) even further, continual informing is planned.



Expectations, specific problems and needs

- Based on Action plan we expect adoption and implementation of Eurocodes to be finished until the end of 2016, including period of coexistence with the National regulations,
- We experienced a problem in financing the process of adoption and implementation, mostly as the consequence of small capacity of related business entities interested in Eurocodes. In this case – the Government decided to finance the drafting of National Annexes,
- Relatively poor existing research databases - necessary for preparation of NDPs in National annexes – rise requirement for additional research activities,
- Still we are looking for a model for proper rewarding of experts engaged in educational process of Eurocodes and NDPs determination (out of the Universities),
- We need more Eurocodes related international projects to improve the knowledge and experience,
- We emphasize the need for better regional cooperation: a regional center for Eurocodes would be very helpful.



**ADOPTION OF THE EUROCODES
IN THE BALKAN REGION**

5-6 December 2013, Milan & Ispra, Italy



**Thanks for your
patience !**

