

PAMETNE ZGRADE – ARHITEKTONSKO GRADITELJSKI ILI STROJARSKI IZAZOV



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European Commission - Press release

Commission welcomes agreement on energy performance of buildings

Brussels, 19 December 2017

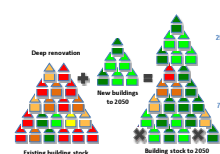
A political agreement on new rules for improving the energy performance of buildings was reached today between negotiators from the European Parliament, the Council and the Commission. The Commission's proposal forms part of the implementation of the Juncker Commission priorities – in particular "a resilient Energy Union and a forward-looking climate change policy". Today's agreement signals the closure of the first of 8 legislative proposals part of the **Clean Energy for All Europeans** package brought forward by the European Commission on 30 November 2016. It also shows that the work towards the completion of the Energy Union is on the way and that the work initiated by the Juncker Commission is being delivered.

The improvements agreed include measures to strengthen the energy performance of new buildings, to accelerate the rate of building renovation towards more energy efficient systems and tapping into the huge potential for efficiency gains in the building sector, the largest single energy consumer in Europe.

Wice-President responsible for the Energy Union Maroš Šefčovič said: "The fight against climate change starts at home, given that over a third of EU's emissions is produced by buildings. By renovating and making them smart, we are catching several birds with one stone – the energy bills, people's health, and the environment. And as technology has blurred the distinction between sectors, we are also establishing a link between buildings and e-mobility infrastructure, and helping stabilize the electricity grid. Let's stay on high gear."

ZAŠTO NADOPUNA (AMENDMENT)?

The amendment of the EPBD II



- "Energy efficiency first" is a key element of the Energy Union
- About 75% of buildings are energy inefficient
- Only **0.4-1.2%** of the stock is renovated each year
- The main objective is to **accelerate the cost-effective renovation** of existing building, which is a 'win-win' option for the EU
- Renovation work and energy retrofits **add almost twice as much value** as the construction of new buildings

ZIMSKI PAKET

- 30 November 2016, the European Commission published "Clean Energy For All Europeans" package, more commonly referred to as the "Winter Package"

ENERGY EFFICIENCY

Energy Efficiency Directive	Energy Performance of Buildings	Ecodesign Working Plan 2018-2019
- Binding 39% energy efficiency target for 2030 - Create 400,000 new jobs - Reduce gas imports by 25% - Save € 20 billion in fuel cost in 2030 - Programme measures by granting access to information on their energy consumption	- Clear vision for a decarbonised building stock by 2050 - Smart & Efficient buildings through use of Information and Communication Technologies and Smart Technologies - Smart Finance for Smart Buildings Initiative: - More effective use of public funding - Aggregation of funds - De-risking - Protect vulnerable groups & address energy poverty	- List of new product groups - Outline on how ecodesign will contribute to tackle secondary objectives - Specific measures on air conditioning - Guidelines on voluntary agreements

DOGOVORENE MJERE...

Main achievements:

- Creates a clear path towards a **low and zero emission** building stock in the EU by 2050 underpinned by national roadmaps to decarbonise buildings.
- Encourages the use of information and communication technology (ICT) and smart technologies to **ensure buildings operate efficiently** for example by introducing automation and control systems.
- Supports the roll-out of the infrastructure for e-mobility in all buildings (although to a lesser extent than in the Commission's proposal).
- Introduces a **"smartness indicator"**, which will measure the buildings' capacity to use new technologies and electronic systems to optimise its operation and interact with the grid.
- Integrates **long term building renovation strategies**.
- Mobilises public and private financing and investment.
- Helps **combating energy poverty** and reducing the household energy bill by renovating older buildings.

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ČINJENICA! - ENERGETSKO SIROMAŠTVO

- Faktori koji određuju razinu energetske siromaštva:
 - Niski prihodi
 - Visoka cijena energije u odnosu na moć potrošnje
 - Zgrade loše kvalitete



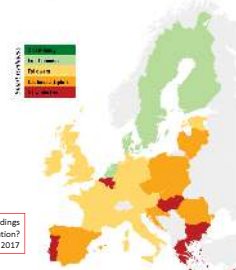
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SMARTNESS INDICATOR - „POKAZATELJ PRIPREMLJENOSTI ZA PAMETNE ZGRADE“

- Uvodi se radi

- procjene tehnološke pripremljenosti zgrade za interakciju sa stanařima i mrežom
- vlastitog učinkovitog upravljanja (eng. *manage performance efficiently*)... ???

Figure 4 - Smart-readiness across Europe (Source: calculations see Figure 2)



Is Europe ready for the smart buildings revolution?
Buildings Performance Institute Europe, 2017



Kada je zgrada
pametna?

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UREDAJI, SENZORI I "STVARI" POSTAJU DIO INTERNETA

ČINE LI ONI ZGRADU PAMETNOM?



IoT u projektima u građevinarstvu

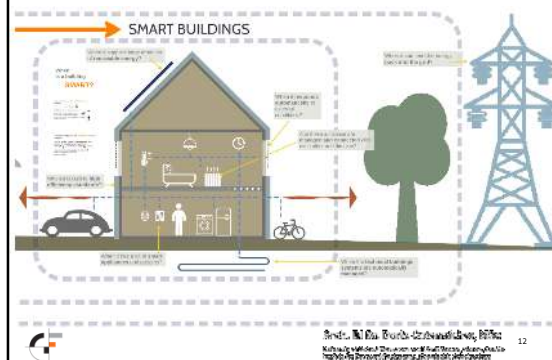
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The fundamental aim of constructing buildings was always to **provide shelter**.
To provide **comfortable and secure** indoor environments under the given **climatic conditions** and with the **available renewable resources**.
That was smart.



Stranica 101 BPIE, Building Performance Institute Europe
Building Performance Institute Europe
Building Performance Institute Europe

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Stranica 102 BPIE, Building Performance Institute Europe
Building Performance Institute Europe
Building Performance Institute Europe

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But let's not forget that this is all about...

energy and resources sustainability

From the perspective of the user:

- healthy
- easy to maintain
- easy to use
- affordable
- useful for me!

From the perspective of the environment:

- local
- renewable
- sustainable
- with no harmful emissions
- adaptive to the local climate

Pametna zgrada pruža maksimalnu kvalitetu života uz minimalno korištenje resursa.

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■ An energy efficient building enables the end-user to **shift its heating or cooling demand**: well-designed and efficient buildings maintain the desired indoor temperature better and over a longer period, which makes them more appropriate for pre-heating or pre-cooling, **allowing energy consumption shifts to other time periods.**

Is Europe ready for the smart buildings revolution?
Buildings Performance Institute Europe, 2017

ENERGY RELEASE ON EVENING

CHARGE ON DAYTIME

FLATTENED CURVE OF DEMAND

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SMARTNESS MATTERS!

RATIONALE

Acknowledging and leveraging building smartness in the Energy Performance of Buildings Directive

- Modern nearly zero-energy buildings are in essence smart, flexible buildings.
- Building smartness is beneficial:
 - Leads in itself to significant energy savings in a cost-effective way.
 - Improves comfort.
- Smart buildings are key enablers of our future energy system
 - Larger share of renewables,
 - Distributed supply,
 - Adaptive demand-side.

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10 principles for smart buildings in a decarbonised energy system

BPIE

• All principles important separately, but most effectively considered together

• Apart from principle 1, the sequence is not in order of importance

1. SMART BUILDING 1: Energy efficiency and energy conservation

2. SMART BUILDING 2: Energy efficiency and energy conservation

3. SMART BUILDING 3: Energy efficiency and energy conservation

4. SMART BUILDING 4: Energy efficiency and energy conservation

5. SMART BUILDING 5: Energy efficiency and energy conservation

6. SMART BUILDING 6: Energy efficiency and energy conservation

7. SMART BUILDING 7: Energy efficiency and energy conservation

8. SMART BUILDING 8: Energy efficiency and energy conservation

9. SMART BUILDING 9: Energy efficiency and energy conservation

10. SMART BUILDING 10: Energy efficiency and energy conservation

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izgradimo li ono što projektiramo?

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Sjećamo li se...?

CO₂

Das Problem.

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ZGRADA – PROIZVOD?

JOHN F. KENNEDY

"Potrošači, po definiciji, uključuju sve nas. I mene kao predsjednika SAD-a. Potrošači su najveća gospodarska skupina na koju utječe svaka javna ili privatna gospodarska odluka. Ovi su najvažnija skupina čiji se stavovi vrlo često ne čuju. Glas potrošača mora se čuti."



(J. F. Kennedy, ožujka 1962. godine u prigodi predavanja američkom Kongresu "Deklaracije o zaštiti potrošača.")

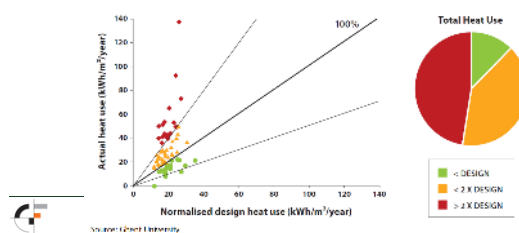
POTROŠAČI, UPOZNAJTE SVOJA PRAVA



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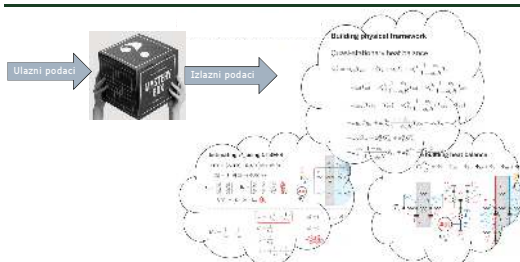
STVARNA & PROJEKTIRANA POTROŠNJA

- Usporedba projektirane potrošnje i stvarne potrošnje
- Uzroci:
 - korištenje
 - Izvođenje???



Source: Ghent University

EUROPEAN STANDARDISATION



Any calculation is only as good as the actual planning and construction.

The influence of quality is often neglected!!!

PRIJEDLOG TEKSTA DODATKA EPBD-A

4. 'energy performance of a building' means the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting;

EPBD Recast, article 2



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IZAZOVI

"The construction sector faces three major challenges: energy transition, process digitization and the introduction of energy performance contracting" (*)

Garancija da će projektirana potrošnja biti ostvarena

CSTB - Centre Scientifique et Technique du Bâtiment
Eng. Scientific and Technical Centre for Building

Etienne Crépon
President **CSTB**
Paris, 17/05/2017



(*) Translated quote. Original quote: Le secteur de la construction fait face à 3 défis majeurs : la transition énergétique, la digitalisation des processus et l'introduction des garanties de performance énergétique



"As an expert in the field of energy efficiency in new building I find it astonishing that countries, states and cities do not pay more attention to the actual energy consumption of new buildings.

How can we be sure of the value of the codes if we don't know how well the new buildings are performing under them? So, I guess large savings could be achieved if more attention was paid to the actual energy performance:

Jens Laustsen, IEA



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STANJE U HRVATSKOJ...

■ Gradimo li pametno?

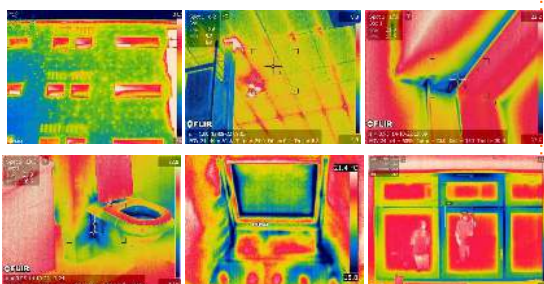
- iz određenih razloga **kvaliteta projekata** arhitektonske ili građevinske struke u dijelu koji se odnosi na racionalnu uporabu energije i toplinsku zaštitu **opada**,
- a ovo je dodatno popraćeno **neodgovarajućim izvođenjem** samih radova.



JESMO LI ZAISTA SPREMNI ZA IZVEDBU KVALITETNE VANJSKE OVOJNICE ZGRADE?



JESMO LI ZAISTA SPREMNI ZA IZVEDBU KVALITETNE VANJSKE OVOJNICE ZGRADE?



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CLEAN ENERGY FOR ALL EUROPEANS

WHAT ARE OUR GOALS?

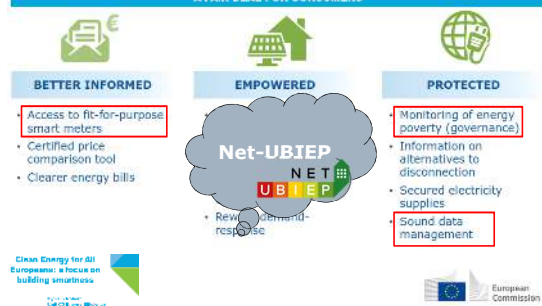
CREATING JOBS & GROWTH, BRINGING DOWN GREENHOUSE GAS EMISSIONS, SECURING ENERGY SUPPLY



CLEAN ENERGY FOR ALL EUROPEANS

A CONSUMER-CENTRIC STRATEGY

A FAIR DEAL FOR CONSUMERS



THE AMENDMENT OF THE EPBD II



- Long-term strategies for renovation of the building stock (Art. 4/EED becomes Art. 2a/EPBD)
- Mobilizing funding for carbon-free buildings: targets for 2030/2050: market signals to investors
- ICT and smart technologies, automation and BIM, e-mobility
- Link between public funding and EPCs; focus on microclimate and health (heating and ventilation)

Net-UBIEP

NET UBIEP

Network for Using BIM to Increase Energy Performance

www.net-ubiep.eu

KOORDINATOR: 

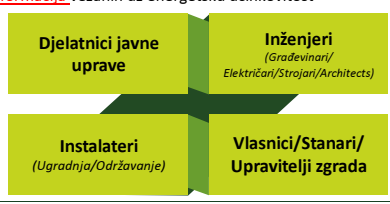
CILJEVI PROJEKTA NET-UBIEP

- Net-UBIEP nastoji doprinijeti povećanju energetske učinkovitosti u zgradama promoviranjem korištenja BIM-a tijekom cjelokupnog životnog ciklusa zgrade.
- BIM – building information management

Better management of the information during the whole life cycle of the building is absolutely necessary in order to avoid mistakes and have trustful information at any time / when an intervention is necessary.

CILJANE SKUPINE

- Tehnologija, ali i ljudi!
- Svi sudionici u gradnji i korištenju zgrada moraju biti svjesni svoje uloge u prikupljanju, upravljanju i čuvanju potrebnih informacija vezanih uz energetske učinkovitost



TKO ĆE IZVESTI OBNOVU SVIH OVIH ZGRADA?

Evropski direktora i inženjerski konstituci

ZA ENERGETSKU OBNOVU ZGRADA SAVRŠENI USTANOVA KOJE OBRAVLAJU DIELA I NOSTI ODGOJA I OBRADOVANJA ZAPRIJMLJEN JE 231 PROJEKT

22. veljače 2017. Dan je dostava projekata za obnovu zgrada i energetske učinkovitosti u zgradama. Dan je dostava projekata za obnovu zgrada i energetske učinkovitosti u zgradama. Dan je dostava projekata za obnovu zgrada i energetske učinkovitosti u zgradama.

Odobreno 616 projekata za energetske obnovu zgrada

Tržište rada

Usprkos velikoj stopi nezaposlenosti, Hrvatska gladna stručne radne snage

'Nedostaje 10 tisuća zidara i 600 vozača'

Hrvatskoj sve više nedostaje stručne radne snage, a najkritičnija situacija je u turizmu, pomorstvu i građevinarstvu. Na kadrovske probleme u ovom potonjem sektoru upozorava je i jučer na otvaranju međunarodnog sajma građevinarstva i pratećih industrija SANSI 2017 u Splitu. Ideji je premijer ministar graditeljstva i prostornog uređenja Predrag Šturmik komentirao da se hrvatski građevinarstvo oporavlja. Dragutin Ranogajec, predsjednik HOK-a, upozorava da taj gospodarski grani nedostaje 10.000 radnika. Dodao je kako postoji potreba i za oko 600 vozača ocijenivši neopterećenost da u Hrvatskoj koje ima posebnih škola za vozače, zakaon prijeti osoblja do 21 godine upravljanje vozilima novosti veće od 7,5 tona. "Imamo niz apsursa koje moramo mijenjati jedino li opet i potražiti nove poslove. Apstraktno je da zemlja s takvom nezaposlenosti, nema radne snage. Nisi je prijedlog da se uključiti zadržavaju osiguranje za one koji odbijaju posao. Ne pokrenemo li se, ostat ćemo bez radne snage, nećemo rasti preuzimajući nove poslove i dugolet černo kuli", kazao je Ranogajec pozivajući Vlade da se angažira u strukovnom obrazovanju kako bi mladi bili osposobljeni za tržište rada.

Dragutin Ranogajec, predsjednik HOK-a



Propisi - informacija

NACRT PRAVILNIKA O SUSTAVU IZOBRAZBE I CERTIFICIRANJA GRAĐEVINSKIH RADNIKA KOJI UGRAĐUJU DIJELOVE ZGRADE KOJI UTJEČU NA ENERGETSKU UČINKOVITOST U ZGRADARSTVU NA JAVNOM SAVJETOVANJU

20. veljače 2017. - Ministarstvo graditeljstva i prostornog uređenja izradilo je **Nacrt Pravilnika** o sustavu izobrazbe i certificiranja građevinskih radnika koji ugrađuju dijelove zgrade koji utječu na energetska učinkovitost u zgradarstvu koji se nalazi na javnom savjetovanju. Pravilnikom se propisuje sustav izobrazbe i certificiranja građevinskih radnika koji ugrađuju dijelove zgrade koji utječu na energetska učinkovitost u zgradarstvu.

Zainteresirana i stručna javnost svoje prijedloge, primjedbe i mišljenja na **Nacrt Pravilnika** može uz prethodnu registraciju dostaviti putem portala **e-savjetovanje** najkasnije do 22. ožujka 2017. godine. Ovim putem skrećemo pozornost da je Prilog 2 - Izjed i sadržaj Certificata moguće vidjeti u rubrici **Dostali dokumenti**.

Pravilnik donesen u NN 67/2017, na snazi od 20.7.2017.

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TRENING MATERIJALI

www.croskills.hr
Svi materijali dostupni!!!!

Priručnici za radnike
• 6 različitih priručnika

Priručnici za trenere
• 7 različitih priručnika
• 6 priručnika sa specifičnim temama
• 1 priručnik sa zajedničkim temama

Fit-to-NZEB
Innovative training schemes for retrofitting to nZEB-levels

www.fit-to-nzeb.com

KOORDINATOR: **EnEffect**
Center for Energy Efficiency EnEffect – Bulgaria

FIT-TO-NZEB

Cilj projekta
je povećanje kompetencija i vještina građevinskih djelatnika u području obnove postojećih zgrada na razinu GOEZ

Kako?
kroz jedinstvene programe edukacije razvijene od strane konzorcija

Zašto?
Potrebno je povećati broj obnova i
Potrebno je povećati kvalitetu dubinske obnove postojećih zgrada.

EXPECTED IMPACTS

Increased number of training courses and activities for building professionals → Increased number of trained professionals → Increased number of energy efficient buildings → Reduced CO₂ emissions and improved air quality

WP4 - TRAINING PROGRAMMES FOR INSTITUTIONS OF HIGHER EDUCATION

Razvoj novih programa edukacije koji su u skladu s EQF razinama 6 i 7

Razvoj potrebnog **nastavnog sadržaja** (learning content):

- Definirati programsku povezanost,
- Nastavni materijali
 - Prezentacije,
 - Praktične vježbe
 - 3D vizualizacije
 - Video materijali
 - E-learning
 - Način provođenja ispita
- Provesti **barem 3 pilot edukacije**

© Passive House Academy

- ... na kraju krajeva, želimo osigurati **izgrađeni okoliš** **visoke kvalitete** korištenjem **učinkovitog projektiranja** u kombinaciji s **tehnološkim napretkom** na svim razinama.



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DA BI IMALI VIŠE OVOGA...



... A MANJE OVOGA



" We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because **that goal will serve to organize and measure the best of our energies and skills**, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."



September 12, 1962;
Rice University, Houston, Texas



Hvala na pažnji!

Bojan Milovanović
bmilovanovic@grad.hr



ODVJETAČSTVO U ZAGREBU
GRAĐEVINSKI FAKULTET
UNIVERSITY OF ZAGREB
FACULTY OF CIVIL ENGINEERING