



Prof. Dr. Nižetić Sandro, Head of Department for Thermodynamics
LTEF-Head of Laboratory for Thermodynamics and Energy Efficiency
*Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture,
Univeristy of Split, Croatia.*

**Editor in Chief: Energy Sources Part A: Recovery, Utilization and
Environmental Effects (IF:2.902, Taylor&Francis)**

Associate Editor: Journal of Cleaner Production (IF: 11.072, Elsevier)

Associate Editor, International Journal of Energy Research (IF:4.672, Wiley)

The UNDP project experience in Croatia as successfully example of digitalization and networking between scientific and national institutions

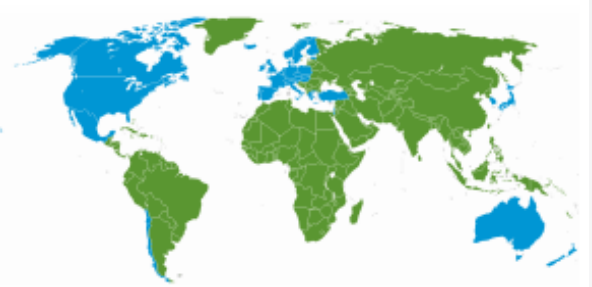
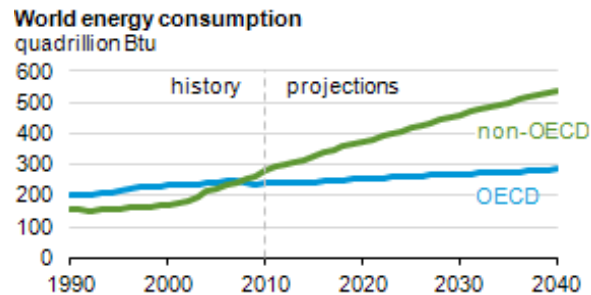


October 5, 2022, Thessaloniki



Surroundings and challenges: Energy issue

It is obvious that present economic system is UNSUSTAINABLE and leads to the long-term damage to the global population and environment!



Facts:

- Population will rise,
- Energy demands would rise,
- Environmental issues would be more severe,
- Resources utilization would be more intense.

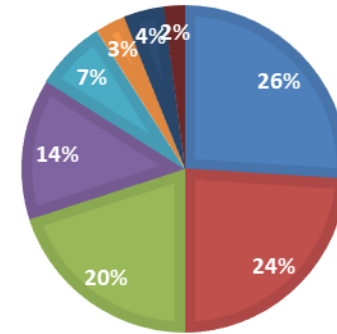
Necessity for Energy Transition & Change of bad habits is one possible respond to the present issues as well as future global population challenges! Key aspect of ET is digitalization!



Digitalization application areas

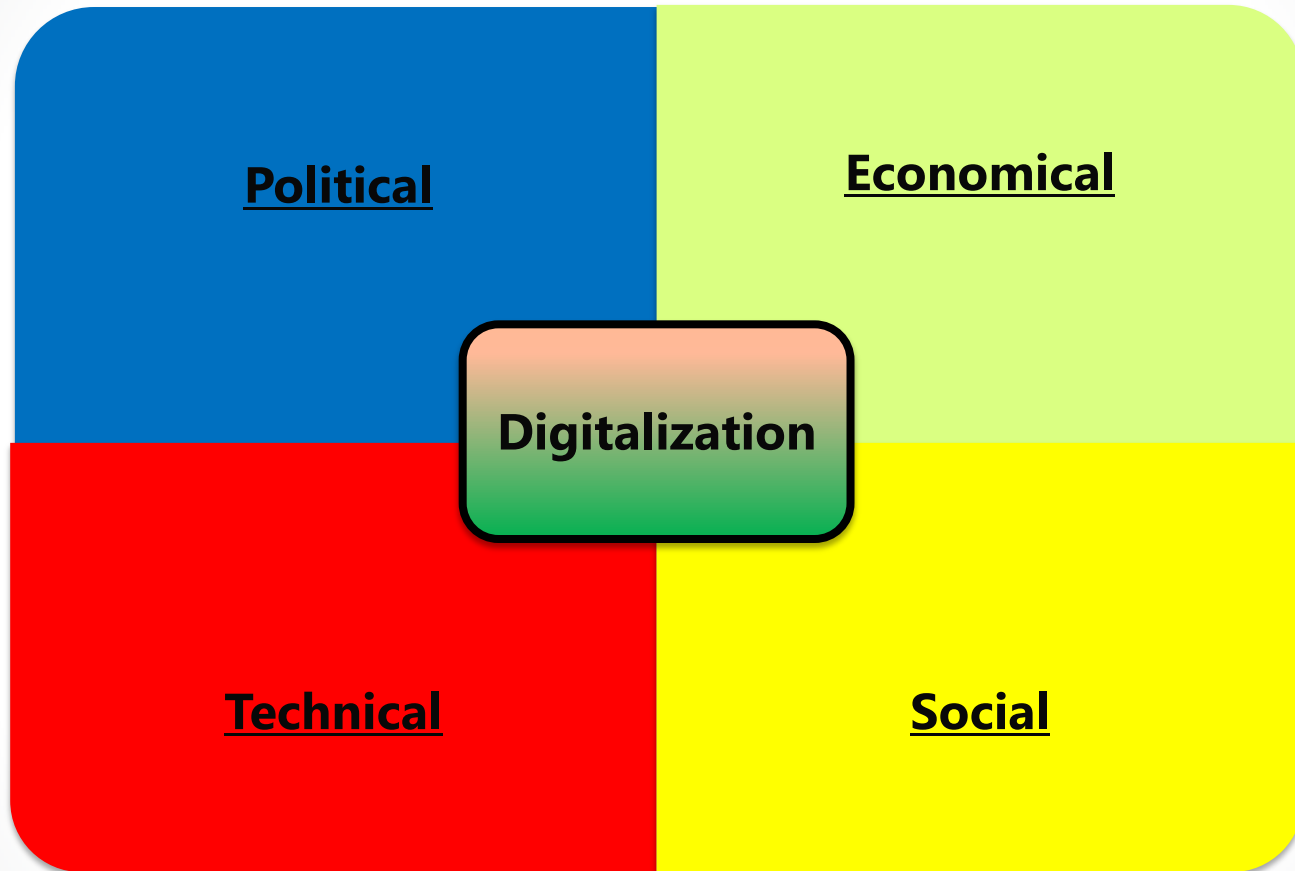


■ Smart Cities
 ■ Industrial IoT
 ■ Connected Health
 ■ Smart Homes
■ Connected Cars
 ■ Wearables
■ Smart Utilities
■ Others



Source: Nižetić, S., Šolić, P., González-de-Artazac, D.L., Patrono, L. Internet of Things (IoT): Opportunities, issues and challenges towards a smart and sustainable future, Journal of Cleaner Production 274,122877, (2020).

Digitalization is complex task...



Different factors that have impact on success of digitalization

Sustainable energy management in public buildings: Removing barriers to energy efficiency in Croatia

(UNDP project)



FOND ZA ZAŠTITU OKOLIŠA I
ENERGETSKU UČINKOVITOST



General project structure regarding organization

Implementing

Funding

UNDP – United Nations
Development Programme
(Agency)

FZOEU

GEF – Global
Environmental
Facility

Projects in Croatia

SEM project-Sustainable Energy
Management in cities
and counties

HiO project-House in order
(Sustainable energy management in
government buildings)

Projects

In cooperation with

Croatian government

Ministry of Economy,
Labour and Entrepreneurship

Ministry of Construction

Fund for environmental protection
and energy efficiency (FZOEU)

Main goal of the project

Continuous process of monitoring and improvement of energy efficiency

- people with responsibilities,
- monitoring efficiency procedures,
- energy consumption indicators,
- defined objectives for improvements (EE projects),
- establishment of education chain in different layers.

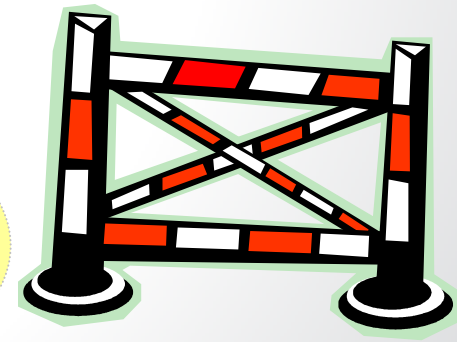


Ministry of Economy, Labour and Entrepreneurship

United Nations Development Program



Fund for environmental protection
and energy efficiency (FZOEU)



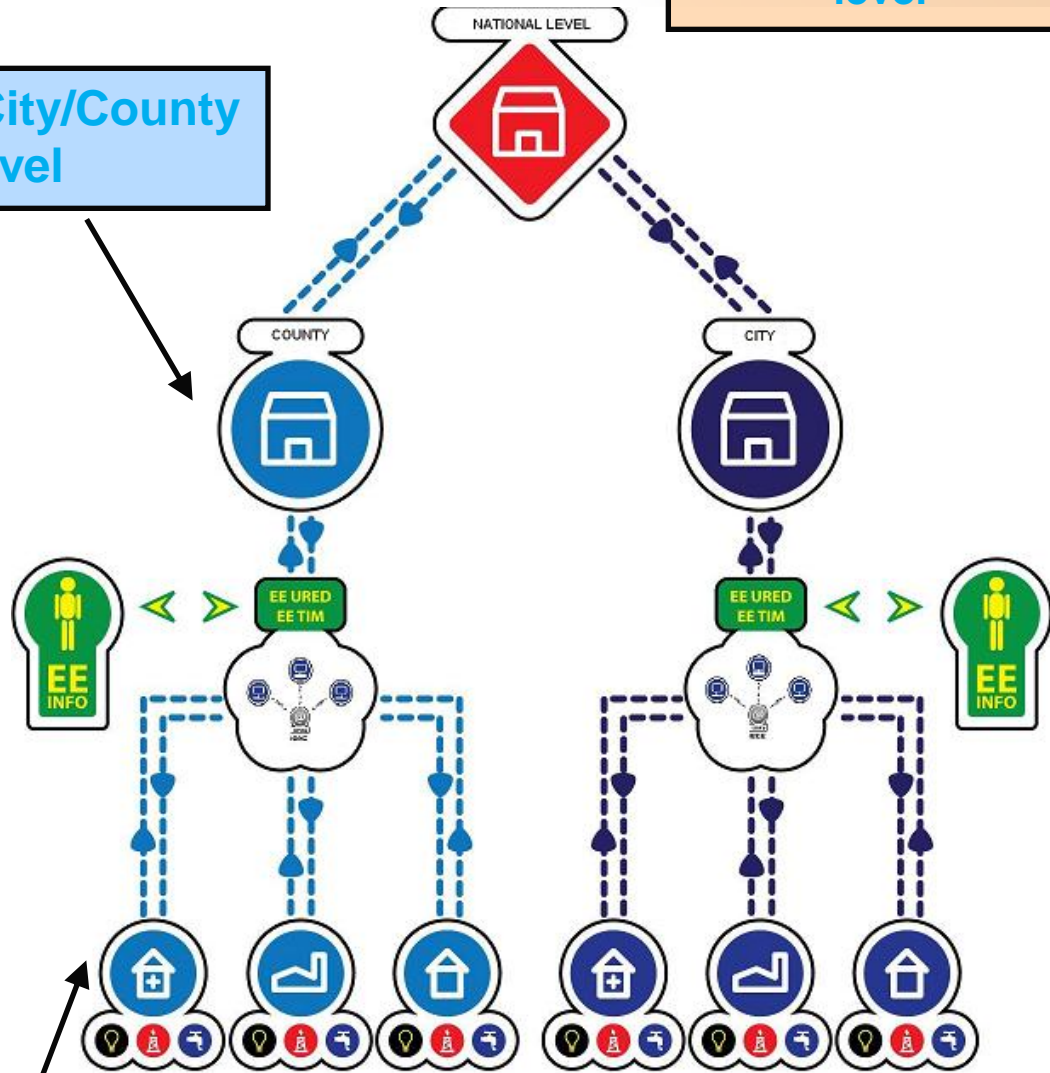
SUSTAINABLE ENERGY MANAGEMENT (SGE project)

Implementation of SEM?

1. PROJECT PREPERATION
2. ESTABLISHMENT OF EE OFFICES
3. ESTABLISHMENT OF BUILDING REGISTER
4. IMPLEMENTATION OF EMIS INFORMATION SYSTEM
5. ESTABLISHMENT OF EE INFO POINTS
6. PERFORMING OF ENERGY AUDITS

SEM on national level

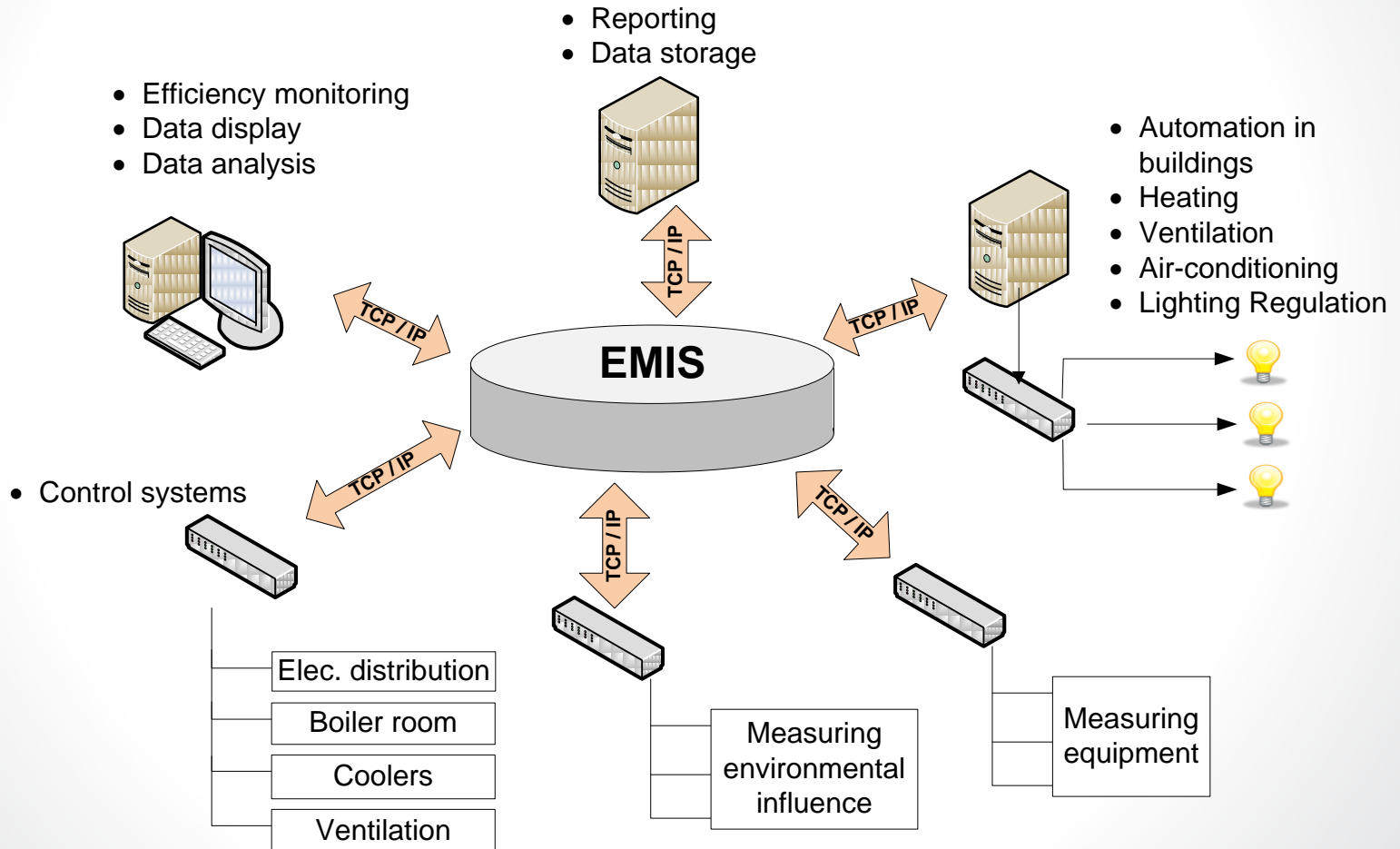
SEM on City/County level



SEM on the level of single objects

CONTINUOUS SUSTAINABLE ENERGY MANAGEMENT IN BUILDINGS

EMIS - Energy Management Information System



Provided education for EMIS users (1,550 educated users)

Dobro došli u INFORMACIJSKI SUSTAV ZA GOSPODARENJE ENERGIJOM



Korisnik:

Zaporka:

[Zaboravili ste zaporku?](#)

Slika



$Q_{H,nd,rel}$	%	Izračun [%]
A+	≤ 15	
A	≤ 25	
B	≤ 50	
C	≤ 100	
D	≤ 150	
E	≤ 200	
F	≤ 250	
G	> 250	

Osnovni podaci o objektu

Osnovni podaci

ID objekta: HIO_0002557
 Naziv objekta: PU Split
 Vrsta objekta: Javna zgrada
 Adresa: Trg Hrvatske Bratske Zajednice 9
 Grad: Split
 Županija: Splitsko-dalmatinska županija
 Država: Croatia
 ISGE šifra: HR-21000-0380-1
 Vlasnik: MUP
 Korisnik: Policijska uprava splitsko-dalmatinska
 Kontakt osoba: Vladimir Bračić
 e-Mail:
 Fax:
 Tel:
 Mobitel: 091 576 7038

Kalendar i sat

Siječanj 2007

P	U	S	C	P	S	N
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Očitavanja i računi

Voda (003621) Zadnji račun: 12.2009.	➔	<input type="text" value="Unos računa"/>
Električna energija (2590511) Zadnji račun: 2.2010.	➔	<input type="text" value="Unos računa"/>
Ekstra lako loživo ulje (ellu) Zadnji račun: 6.2009.	➔	<input type="text" value="Unos računa"/>
		<input type="text" value="Unos mjerenja"/>

Vremenska prognoza

Poruke od energetskog administratora

Savjeti za energetske učinkovitost

Eko savjeti: Odlazite papir u za to predviđene kontejnere i odlagališta.

Education

- ✓ EE teams
- ✓ Investment departments,
- ✓ Building managers,
- ✓ Employees



....presentations, workshops, seminars, public lectures,....

www.energetska-efikasnost.undp.hr

The screenshot shows the homepage of the website www.energetska-efikasnost.undp.hr. The page features a dark blue header with the UNDP logo and the title "Poticanje energetske efikasnosti u Hrvatskoj". A search bar is located in the top right corner. Below the header is a navigation menu with tabs for "EE", "SGE", "HIO", "ISGE", "INFO-EDU", and "Kontakti". A secondary navigation bar contains links for "O projektu", "Rezultati projekta (2005.-2011.)", "Zakonski okvir", "Novosti", "Konferencije", "Financiranje EE projekata", and "EE savjeti".

The main content area features a news article titled "U Splitu održana radionica Energetska učinkovitost u kućanstvima" (Energy efficiency in households workshop in Split), dated 16. travnja 2013. The article describes a workshop held at the Sveučilišna knjižnica in Split, organized by the EE info office of the City of Split and UNDP. It mentions that participants learned about energy efficiency, EE advice, and the use of solar collectors in central heating systems. The article is attributed to Gašpar Energetić and includes a "više >" link.

Below the article are two smaller images: one showing a woman in a professional setting and another showing a person in a meeting room.

On the right side of the page, there is a contact information box with the phone number 0800 200 170, labeled as a free info-telephone. Below this is the "Zelena knjižnica energetske efikasnosti" (Green energy efficiency library) logo, which includes the text "Zeek obuhvaća publikacije objavljene u sklopu provedbe EE projekta". At the bottom right, there is a small image of Gašpar Energetić with the text "Gašpar Energetić savjetuje" and "Štedne žarulje troše 5 puta manje energije nego žarulje sa žarnom nit, a traju i do 8 puta dulje."

FREE INFO TELEPHONE: 0800 200 170

Conclusions:

- ✓ Digitalization is important driver and one of the key features in necessary energy transition and it already affected societies in various aspects,
- ✓ Digitalization creates collaboration opportunities and networking between academic and national institutions,
- ✓ Critical barriers related to the successful digitalization are mainly linked with lack of sufficient human resources, investments in IT equipment and finally education in all layer of societies,
- ✓ More intense collaboration between academic and national institutions is needed in order to better understands specific needs and to secure sufficient labour capacities.



Thank you

for your kind attention!

Prof. Dr. Sandro Nižetić

University of Split snizetic@fesb.hr

Head of Department for Thermodynamics

LTEF-Head of Laboratory for Thermodynamics and Energy

Efficiency

