



SVEUČILIŠTE J. J.
STROSSMAYERA
U OSIJEKU



EKONOMSKI FAKULTET
U OSIJEKU



HRVATSKA AKADEMIJA
ZNANOSTI I UMJETNOSTI

1.

**MEĐUNARODNI ZNANSTVENI SIMPOZIJ
GOSPODARSTVO ISTOČNE HRVATSKE -
JUČER, DANAS, SUTRA**

1st

**INTERNATIONAL SCIENTIFIC SYMPOSIUM
ECONOMY OF EASTERN CROATIA -
YESTERDAY, TODAY, TOMORROW**

Osijek, 2012.

Nakladnici / Publishers

Studio HS internet d.o.o., Osijek
Sveučilište Josipa Jurja Strossmayera u Osijeku
Ekonomski fakultet u Osijeku

Za nakladnike / For the publishers

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Tisak / Print

Studio HS internet d.o.o., Osijek

ISBN

978-953-7630-42-3 (Studio HS internet)
978-953-253-106-0 (Ekonomski fakultet u Osijeku)

CIP zapis dostupan u računalnom katalogu Gradske i sveučilišne knjižnice u Osijek

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Sadržaj / Content

Predgovor / Foreword	8
Tematska područja / Topics	10
 1. Povijesne jezgre istočne Hrvatske / Historical cores of eastern Croatia	11
<i>Kuharić, Darija; Vinaj, Marina; Kuharić, Ines:</i> VIRTUAL WALK WITH MARIJA MALBAŠA ALONG THE DIVALD STREET TOWARDS SLAVONIAN ANCIENT FIELDS AND FORESTS.....	12
<i>Marijanović, Stanislav; Horvat, Jasna:</i> GOLDEN RATIO INSCRIBED CODE OF BEAUTY IN CROATIAN TRADITION OF GLAGOLITIC CULTURE.....	20
 2. Gospodarstvo istočne Hrvatske / Eastern Croatian economy	31
<i>Delić, Anamarija; Alpeza, Mirela; Oberman Peterka, Sunčica:</i> ROLE OF BUSINESS SUPPORT INSTITUTIONS IN DEVELOPMENT OF THE ECONOMY OF EASTERN CROATIA CASE OF CENTER FOR ENTREPRENEURSHIP OSIJEK	32
<i>Devčić, Kristina; Tonković Pražić, Ivana:</i> THE INFLUENCE OF ENTREPRENEURIAL ZONES ON URBAN COMPETITIVENESS OF THE TOWN OF VALPOVO	43
<i>Galić, Matej:</i> THE IMPACT OF BELJE ON ECONOMIC DEVELOPMENT OF BARANJA.....	49
<i>Glavaš, Hrvoje; Ivanović, Milan; Blažević, Damir:</i> PROGRAM OF EFFICIENT USE OF ENERGY IN FINAL ENERGY CONSUMPTION ON THE AREA OF EASTERN CROATIA	54
<i>Grebenar, Vladimir; Bošnjak, Slavko; Banović, Boris:</i> ECONOMICS OF FAMILY FARMS BUSINESS IN VUKOVAR - SRIJEM COUNTY.....	65
<i>Jakopec, Ana; Sušan, Zoran:</i> ORGANIZATIONAL INNOVATION DIAGNOSIS: A CASE STUDY.....	71
<i>Lajoš, Damir:</i> EVOLUTION OF PROJECTS FINANCED BY INTERNATIONAL FUNDS IN OSIJEK- BARANJA COUNTY AND THEIR INFLUENCE TO LOCAL ECONOMY AND SOCIAL LIFE	79
<i>Mašek Tonković, Anka; Križanović, Katica:</i> SOCIAL ENTREPRENEURSHIP IN CROATIA - OPPORTUNITIES AND CHALLENGES.....	91

Oberman Peterka, Sunčica; Salihović, Velimir: ENTREPRENEURIAL UNIVERSITY WHAT IS IT AND WHY WE NEED IT?.....	98
Odoša, Rajko: THE AMBIVALENCE OF THE EU AGRICULTURAL POLICY AND THE FUTURE OF SMALL AND MEDIUM-SIZED FAMILY FARMS IN CROATIA	108
Pozderović, Andrija; Pichler, Anita; Paragović, Kristina: PRIORITY DEVELOPMENT PROGRAMS FOR PROCESSING OF AGRICULTURAL PRODUCTS IN EASTERN CROATIA	118
Romic, Lidija: FORMAL INSTITUTIONS IN EASTERN CROATIA.....	128
Varga, Miroslav: SOCIAL MEDIA AS A DEVELOPING POTENTIAL FOR EASTERN SLAVONIA.....	137
Žalac, Gabrijela; Mlinarević, Kornelija: THE ROLE OF REGIONAL POLICY IN DEVELOPMENT OF EAST CROATIA: OPPORTUNITIES AND POTENTIALS	141
Pichler, Goran; Nadvjegi, Eleonora; Šulmajster-Šodić, Mirta TRIPLE HELIX IN ENERGY EFFICIENCY PROJECTS	149
3. Graditeljstvo / Architecture	149
Ištoka Otković, Irena: ANALYSIS OF AVERAGE DELAYS OF ROUNDABOUT VINKOVAČKA - DRINSKA IN OSIJEK.....	157
Medanić, Barbara: CONSTRUCTION AS A MODERATOR OF THE NATIONAL AND REGIONAL DEVELOPMENT	164
4. Sakralni objekti / Sacral objects	175
Jokić, Mirko: SACRAL GOTHIC OBJECTS IN ARCHDIOCESE OF ĐAKOVO-OSIJEK AND DIOCESE OF SRIJEM	176
5. Turizam i hotelijerstvo / Tourism and Hospitality industry.....	193
Lončarić, Biljana; Bolfek, Berislav: MARKETING MANAGEMENT OF THE TOURIST REGION OF SLAVONIA AND BARANJA	194
Bakan, Rikard; Bosnić, Irena: PUBLIC-PRIVATE PARTNERSHIP: A MODEL FOR SUSTAINABLE TOURISM DEVELOPMENT IN REGIONAL PARK MURA-DRAVA THE POSSIBILITY OF TOURIST VALORISATION OF ABANDONED ARMY BARRACKS	201

Blažević, Zrinka; Tubić, Dejan; Brdar, Mladen: CRISIS MANAGEMENT KEY TO SUSTAINABLE DEVELOPMENT OF TOURIST DESTINATION	207
Bosnić, Irena: RIVER TOURISM IN EASTERN CROATIA: PERSPECTIVES FOR DEVELOPMENT.....	216
Čurić, Ksenija; Bosnić, Irena: INTRODUCING SWEET POTATO IN TOURIST OFFER: CASE STUDY OF PUSTARA VIŠNJICA	223
Horvat, Duro: THEMATIC CLUSTERS IN TOURISM	230
Vučetić, Šime: RURAL TOURISM OF THE EASTERN CROATIA THE ORGANIZATIONAL NEEDS AND OPPORTUNITES	240
6. Trgovina / Trade	249
Segetlija, Zdenko: DEVELOPMENT, IMPORTANCE AND RESULTS OF RETAIL TRADE IN THE REGION OF EASTERN CROATIA	250
7. Sociološki aspekti / Social aspects	257
Požega, Željko; Crnković, Boris; Weber, Marko: SOCIOLOGICAL ASPECTS OF THE CAUSES OF UNEMPLOYMENT.....	258
Stojanović, Gordana: ESTABLISHING DEVELOPMENT TEAMS ENGINES OF ECONOMIC DEVELOPMENT AND REGIONAL COOPERATION	266
8. Školstvo i šport / Education and sport	279
Dumančić, Darko; Širić, Željko: SPORT IN OSIJEK YESTERDAY, TODAY, TOMORROW	280
Milanović, Dragan; Čustonja, Zrinko; Škegro, Dario: SCHOOL SPORT IN EASTERN CROATIAN COUNTIES.....	289
Sedlan Konig, Ljerka: COMMUNITIES OF PRACTICE AS A TEACHING TOOL IN THE DEVELOPMENT OF ENTREPRENEURIAL BEHAVIOR	296
Sigurnjak, Lena; Knežević, Sanja; Kulaš, Anita: IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT FOR EDUCATION IN BRODSKO POSAVSKA COUNTY	304

<i>Veselić, Gordana; Pupovac, Zoran; Dumančić, Darko:</i> WORKERS' SPORTS GAMES A BRAND OF OSIJEK CITY OF OSIJEK CITY OF WORKER'S SPORTS.....	311
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9. Zdravstvo / Health317

<i>Vuletić, Gorka; Šincek, Daniela; Kraljik, Nikola; Vuger-Kovačić, Daria:</i> CROATIAN REGIONAL DIFFERENCES IN HEALTH RELATED QUALITY OF LIFE IN RELATION TO SELF PERCEIVED ECONOMIC STATUS	318
--	-----

10. Nobelovci, znanstvenici, književnici i istaknuti stručnjaci / Nobel prize awarded, scientists, literaries and eminent experts325

<i>Ivanović, Milan:</i> MILUTIN MILANKOVIĆ (1879 1958) ONE OF THE MOST SIGNIFICANT SCIENTISTS OF 20 TH CENTURY.....	326
--	-----

11. Istaknuti kardinali i biskupi / Notable cardinals and bishops337

<i>Božić Bogović, Dubravka:</i> JURAJ PATAČIĆ DE ZAJEZDA, BISHOP OF BOSNIA OR ĐAKOVO (1670-1716)	338
---	-----

<i>Kušen, Dražen:</i> STROSSMAYER'S COLONISATION OF JOSIPOVAC: THE ECONOMIC AND LEGAL ASPECTS	347
---	-----

12. Društveno odgovorno poduzetništvo / Social responsible entrepreneurship355

<i>Britvić, Josip; Blažević, Zrinka; Tubić, Dejan:</i> ANALYSIS OF COMPETITIVE ADVANTAGES OF ORGANIZATION WITH THE IMPLEMENTED STANDARDS OF SOCIAL RESPONSIBILITY SA 8000 AND ISO 26000:2010	356
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<i>Perić, Julia:</i> DEVELOPMENT OF UNIVERSITIES' SOCIAL RESPONSIBILITY THROUGH ACADEMIC SERVICE LEARNING PROGRAMS	365
--	-----

13. Zaključna razmatranja / Final Reviews377

<i>Mašek Tonković, Anka:</i> ZAKLJUČNA RAZMATRANJA / FINAL REVIEWS.....	378
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Zahvala sponzorima / Gratitude to sponsors	382
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Foreword

In its origins, Eastern Croatia was a center of worldwide events. Various tribes and nations from the East and the West have passed through and conquered it, such as: Tartars, Mongols, Romans, Germans and others. Archaeological researches have proven that people in this region lived as farmers, crop growers and stock breeders, and craftsmen who were settled here with special benefits by the Roman Emperor Hadrian who knew that their activities were necessary for development of settlements and life within them.

Along with its farmlands, forest and game wealth, there were numerous other advantages of living in this region. These advantages attracted entrepreneurs from all over the continent and from all parts of the world. Waterways of Sava, Drava and Danube rivers were suitable for development of trade, and Eastern Croatia served as a crossroads of various global trade routes.

Wealth of resources speeded up the development of economy, and Eastern Croatia soon became the leading region in Austria-Hungary, Kingdom of Serbs, Croats and Slovenes, and later in Yugoslavia.

After the Ottomans left the region, abandoned towns and villages were filled by immigrants from Germany, Hungary, Ukraine, Czech Republic, Slovakia, Poland, France, Italy, Serbia, and also by numerous Jews and Muslims.

Industry and trade were flourishing, and people celebrated their success and spent their incomes in well-known gastronomic and ethnic premises (Central, Royal, Psunj, Čingi lingi čarda and others).

Osijek was in the center of everything. There wasn't a single entrepreneur that wasn't familiar with Osijek brand, which included: center of Slavonia, high quality of life, hospitality (multiple green ribbon award winner), multitude of cultural, sports and other events, high level of satisfaction and happiness.

Osijek was also praised for its schools (which gave two Nobel Prize winners, and multiple award-winning authors, academics and athletes) and various trading companies. There wasn't a single branch of industry that wasn't represented in Osijek, and the city provided job opportunities for everyone willing to learn and work. The city was a generator of innovative processes of electrification and informatization, which were basic prerequisites for globalization.

It is important to emphasize that the founding of University of Osijek stems from applied science, long-time work and experience of professors working in various branches, such as prof. Dragutin Rilke, PhD, prof. Slavko Dobrenić, PhD, prof. Zvonimir Benašić, PhD, prof. Tomislav Salitrežić, PhD, prof. Boško Bešir, PhD, prof. Tibor Karpati, PhD, and others.

Apart from that, one of main characteristics of Osijek was its multiculturalism, a characteristic possessed by today's European and world capitals.

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**PROGRAM OF EFFICIENT USE OF ENERGY IN FINAL ENERGY
CONSUMPTION ON THE AREA OF EASTERN CROATIA
PROGRAM UČINKOVITOG KORIŠTENJA ENERGIJE U
NEPOSREDNOJ POTROŠNJI NA PODRUČJU ISTOČNE HRVATSKE**

SUMMARY

According to provisions of the Act on the efficient use of energy in final energy consumption, each county in the Republic of Croatia is obliged to make a plan and program of energy efficiency in energy consumption. Until now this programs and plans in the Croatia have been prepared only by the City of Zagreb and the Osijek-baranja County (OBC). The results of conducted research and the purpose of energy efficiency programs for OBC are presented. Measures for increase of energy efficiency for the OBC area are proposed for: buildings, transport and public lighting infrastructure sectors, and also measures that relate to the whole eastern Croatia area - since the number of activities in the field of EE needs to be implemented regionally.

Key words: energy efficiency, final energy consumption, building construction, transport, public lighting, Eastern Croatia

SAŽETAK

Sukladno odredbama Zakona o učinkovitom korištenju energije u neposrednoj potrošnji svaka županija u RH obvezna je izraditi Program i Plan energetske učinkovitosti (EnU) u neposrednoj potrošnji energije na svome području. Do sada su ove programe/planove u Hrvatskoj izradili samo Grad Zagreb i Osječko baranjska županija (OBŽ). U radu se kratko prikazuju rezultati istraživanja provedenih u cilju izrade Programa energetske učinkovitosti u OBŽ, prijedlog mjera za povećanje EnU na području OBŽ u sektorima: zgradarstvo, promet i javna rasvjeta te predlažu infrastrukturne mjere koje se odnose na cijelo područje istočne Hrvatske – budući da se niz aktivnosti u području EnU treba regionalno realizirati.

Ključne riječi: energetska učinkovitost, neposredna potrošnja energije, zgradarstvo, transport, javna rasvjeta, istočna Hrvatska

1. Obligation of program preparation of effective energy consumption

According to provisions of the Act on the efficient use of energy in final energy consumption [8] each county in the Republic of Croatia (RoC) is obliged to make a Plan and Program of energy efficiency (EE) in final energy consumption in its area. Provisions of this Act have determined that are the Programme and the Plan of energy efficiency, three-year/annual planned documents which defining the implementations of politics to improve energy efficiency in the county. The final energy consumption is defined as the delivery of energy to the industry, transport, households, services, agriculture and civil engineering. In accordance with those certain sectors of final energy consumption; this includes the following three sectors: a) buildings; b) transport and c) public lighting. In the analysis of each sector is divided to subsectors based on technology and consummation specific qualities; from analysis has been excluded energy consumption in the industry and the energy for energy transformation.²⁴

1.1. Paradigms of post-war rebuilding and developments

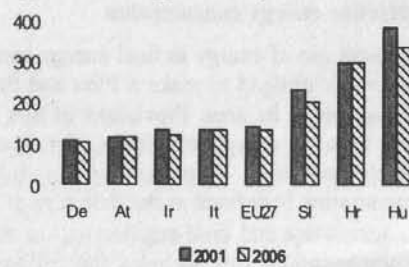
Faculty of Electrical Engineering Osijek in the beginning 2011 yr. started with the scientific project *Energy efficiency in the OBC area*. Based on research EE Program for OBC was later developed. The fundamentally postulate in this energy efficiency analysis on the OBC area – but also the entire Slavonia-Baranja regions (SliB) – must accept the fact of war aggression on the RoC and the ravages of war – which on this area created a great human casualties, large number of wounded and displaced people, with enormous material destructions industry and communal infrastructure and residential buildings, with broken societal relations and the low level of social cohesion. All this had a negative impact on the economic activity, public utility and the living standard of inhabitants as well as in the field of living building constructions, transport and public lighting, and power consumption. [1] [5] [6]

1.2. The national energy framework

The EU has adopted the strategy of energy development in order to: a) increase of quality and the safety energy supply, b) to increases economic competition and c) mitigating of climate changes. To ensure the new local energy sources and reduces greenhouse gas emissions EU decide on the greater usage of renewable energy sources (RES) and on the increase of the energy output-efficiency, especially in the buildings construction. The main objectives of EU energy policy to 2020 yr. are: a) 20 % decreases of green house gas emissions, b) 20 % the energy production of the RES, c) 20 % energy savings and d) 10 % bio-fuels consumption of motor fuels. Croatia has adopted the EU goals, but consumes 125 % more energy per GDP than the EU-27. [11] Besides decreases the amount of supply with own primary energy sources in consumption [2], while at the same time there are significant potentials RES which are not in function of energy and the economic development. [3] [4] [5] RoC is the energy intensity significantly below the EU average; on 1000 € GDP RoC uses 295 kg oil equivalent; EU-27 consumes 131 kg, and the Germany 98.9 kg. [9]

²⁴ Industrial consumers prepare their own special programmes;

Figure 1. Energy intensity of EU countries and RoC in 2001 and 2006 yr. (kgoe/1000€ GDP)



Source: [9]

2. Final energy consumption on the OBC

The largest final energy consumption in 2010 yr. on the OBC area was in the building sector (60.7 %), second is the transport sector (38.5 %) and the public lighting (PL) is with amount of energy almost negligible in the total of final energy consumption (0.8 %). [6] These facts are respected when defining the objectives of energy savings and corresponding measures for their realization. Main energy sources in the final energy consumption in OBC area is: natural gas (26.3 %), diesel fuels (24.6 %), electricity (21.2 %), motor gasoline (12.6 %) and heat from centralized heating system (7%). In the period of 2007 - 2010 yr. has accomplished the increase of total energy consumption from 11.123 on 11.532 PJ on the average annual rate of growth (ARG) 1.2 %. [6] Total the final energy consumption on the OBC area in 2007-2010 periods on sectors shows tab. 1 and fig. 2;

Table 1. Final energy consumptions on the OBC area in 2007 - 2010 yr. (GWh)

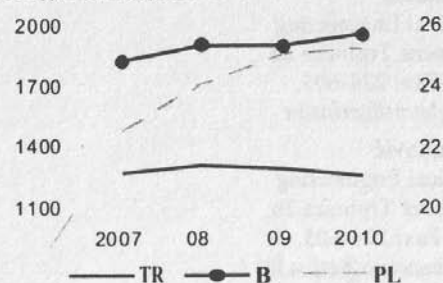
Sector	2007	2008	2009	2010	AGR
Public lighting	22.4	23.9	24.9	25.2	3.9
Transport	1,259	1,299	1,277	1,244	- 0.4
Buildings	1,808	1,887	1,885	1,934	2.3
Total	3,089	3,210	3,187	3,203	1.2

Source: Ivanović, Glavaš, Blažević (2011)a

2.1. Buildings

The total final energy consumption in the buildings on observed period increased from 6.474 to 6.928 PJ (petajoul) with an annual growth rate (AGR) of 2.3 %. The following is a representation of used energy sources: natural gas (43.8 %), el. energy (33.8 %), heat CTS-and (12.0 %), fuel wood (3.9 %), fuel oil (2.8 %), liquefied petroleum gas (2.7 %), agricultural waste (1.5 %) and the geo-thermal energy (1.3 %). Analysis has included sectors: public education, health care, social care, local government, culture and the sport, services and households. [6] [7]

Figure 2. Total final energy consumption on OBC in 2007 - 2010 yr. - on the sectors (GWh)



2.2. Transport

Energy consumption in transport (+ agriculture and civil engineering) in the period of 2007 - 2010 yr. is decreased; AGR = - 0.4 %. At the passenger transport needs point out the increase to the EE in the public transport of passenger and will grow the passenger transport in plane and river transport, and fall in the passenger transport in the railway. Especially worries increase of freight transports (and energy consumptions) in the road transport in addition to the simultaneous fall of freight transport in railway, river and the air transport (tab.2). Railway and river transport is economic, energetically and environ-mentally far more acceptable and more efficient from the road transports which in addition to told insufficiencies causes increased investments in the maintaining of road infrastructure, contributes to traffic congestion and traffic accidents. The transport of brick, roof tile, cement, fuel wood and sugar beets by truck transport (if there is railway and river transport infrastructures present) on EE is not reasonably. [6] [7]

Table 2. Freight transport on OBC area in period 2007 - 2010 yr. (000 t)

Transport sector	2007	2010	AGR
Road transport	4,097	6,514	16.7
Railway transport	1,369	835	-15.2
River transport	2,475	1,426	-16.9
Plane transport	0,271	0	-
Total	7,941	8,775	3.4

Source: Ivanović, Glavaš, Blažević (2011)a

2.3. Public lighting

From 67 urban settlements in the OBC area 30 settlements don't have built public lighting (PL) in 125 streets in the overall length from 48.9 km. From 161 settlements in municipalities 6 settlement there is no PL, in 40 settlements there is no PL in 152 street with a total length of 51.5 km. Total consumption electricity for PL in OBC increase from 22.4 GWh (2007) to 25.5 GWh (2010) an increase of 12 %; tab.3. In the observed period the share of OBC electricity consumption for PL in the PL sector of RoC increase from 5.38 to 5.63% [1] [6]

Table 3. Consumption electricity for PL and stoplight in OBC 2007 – 2010 yr. (MWh)

<i>Sector</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>AGR</i>
Towns	14,747	15,437	16,077	16,527	3.9
Municipalities	6,784	7,541	7,853	7,576	3.7
Stoplights	918	1,001	1,043	1,053	4.7
OBC	22,449	23,979	24,973	25,156	3.9

Source: Ivanović, Glavaš, Blažević (2011)a

3. Measure for increase of energy efficiency on the OBC area

Facts on the energy consumption in buildings, transport and the public lighting in the area OBC impose the need of complex approach in the proposing measures for increase of the energy efficiency. Preparation this Programme the series of problematic occasion in determination of the state, as well as results of this state points out the kind of neglect in final energy consumption in OBC starting from the register of data on the energy consumption, code of system at energy service providers and distributors of energy sources, lacks of coordinate actions to improve energy efficiency, evaluate potential of RES to the lack of awareness of modern technological and organizational solutions in the field of energy efficiency and lack of engagement on the issues of energy efficiency to create a positive attitude about energy efficiency. [6]

Existing knowledge and expert teams in academic and public institutions in the OBC area represent the potential that provides relevant insight into contemporary technical solutions and their application in the final energy consumption, but focus and coordination of activities are insufficiently. The implementation of proposed measures can mobilize all important subjects in the field of final energy usage. Their action will be create professional backgrounds which can: a) prepare and implement a research and technological studies, b) prepare and implement educational programs, c) prepare and implement pro-motional campaigns, d) prepares the project on tender for (co)financing of modernizations facilities for EE increase from domestic and international funds, and e) implement procedures to rationalize energy and efficient energy consumption in OBC.

Here are the most important measures of education; it is difficult to implement a program without sufficient awareness and education of participants in the process. Educated participants are far easier to be motivated and mobilize for the implementation of process and achieving the goal. Besides measures of education and measures of standards require much less funding and at the same time reduce the required amount of investment in modernization. Proposed measures for all sectors are discussed in the annual OBC plans (for 2012 and 2013), and here is given just a short review. [6]

3.1. Buildings

Measures for the buildings are sub-divided according to subsectors: a) buildings in the public sector, b) residential buildings and c) building of enterprise/offices and services; measure are ranked towards: rate of financial expenses and terms of realization from smaller/shorter toward larger/longer.

Table 4. EE measure for OBC buildings sector in period of 2011- 2013 yr.

<i>N°</i>	<i>Name measures</i>
<i>Buildings in the public ownership</i>	
1.	Education of users of buildings of public institutions on the importance of EE
2.	Green public procurements for building of public institutions
3.	Modernizations of lighting in school classrooms
4.	Energy saving light bulbs in buildings of public ownership
5.	Installations of thermostatic regulators in buildings of public ownership
6.	Replacements of carpentry in buildings of public ownership
7.	Thermal insulation of buildings in public ownership
8.	Solar collectors implementation in LSGU institutions
9.	Boiler replacements in educational institutions
<i>Residential buildings/households</i>	
10.	Education and promotions of energy efficiency for citizens
11.	Usage of renewable energy sources in households
12.	Improving local markets of the heating fuels
13.	Alternatively heating of households in emergency situations
14.	Reconstruction of thermal protection on residential buildings
15.	Installation thermostat regulator for buildings connected at central heating system
16.	Installations of solar collectors for hot water in the house and apartments
17.	Encouraging installation of solar collectors for hot water in new buildings
<i>Building of commercial activity and services</i>	
18.	Education and promotions EE for commercial and service sector
19.	Connection of prefabricated offices on central heating system and gas
20.	Installations of solar collectors for hot water in enterprise buildings

Source: Ivanović, Glavaš, Blažević (2011)a

3.2. Transport

In the transport sector measures are divided into four subsectors: a) vehicle for the passenger transport owned by public institutions, b) public transport passenger, c) personal and commercial vehicles for passenger transport and d) freight transport. First three subsectors have counted in the final energy consumption which under the authority of counties, and fourth subsector only partially. However, because of the important issue of road freight transport - which on the OBC area is over-emphasized while more environmentally friendly types of transport with lower external costs is neglected in the measure, is involved and fourth sub-sector freight transport.

Table 5. EE Measure for OBC transport sector in period of 2011- 2013 yr.

<i>N^o</i>	<i>Name measures</i>
<i>Vehicle for the passenger transport owned by public institutions</i>	
1.	Education of user of vehicle in public institutions on the importance EE
2.	The systematically energy management in vehicles LSGU
3.	The green public tender procedure for the vehicle owned by LSGU
4.	Use of same car for employees of public companies
<i>Public transport passenger</i>	
5.	Implement. Greens public tender procedure for vehicle of public transport
6.	Changing the system of pay for transport costs from home to the workplace
7.	The new schedule in city / the suburban passenger transport
8.	Implementation of public transport in towns OBC
9.	Networks of bicycles for rent
<i>Personal and commercial vehicles for passenger transport</i>	
10.	Education of users of personal vehicles on the importance EE
11.	Educational-promotional campaign „ Ride a bike “
12.	Construction and the marking of bikeways in all settlements
13.	Go to work with public transportation
<i>Public freight transport</i>	
14.	Education of freight users and transport operators on importance of EE
15.	Reduction of road and increase of railways and river freight transports

Source: Ivanović, Glavaš, Blažević (2011)a

3.3. Public lighting

In the sector of public lighting, because of specific qualities of situations in this sector, measures for increasing the quality of public lighting in the OBC area are suggested in addition to the simultaneous increase of EE. Until the year 2016 the quality and EE of PL in OBC is supposed to reach the EU level.

Table 6. EE Measures for OBC public lighting in OBC for period 2011- 2013 yr.

<i>N^o</i>	<i>Name measures</i>
1.	Education on the importance EE in the sector of public lighting
2.	The green public tender procedure for the public lighting
3.	The obliged yearly debate in the LSGU on the state of public lighting
4.	Publishing of data on qualities of public lighting in the LSGU
5.	Report on possibilities of Public Private Partnership in the sector of PL
6.	Preparations of local land registries of public lighting
7.	Regionally markets of designs and maintaining public lightings
8.	Action „With Light Against Our Dark“
9.	The electric-power inspection of PL in the area OBC
10.	Modernisations of public lighting
11.	Installation of public lighting

Source: Ivanović, Glavaš, Blažević (2011)a

4. EE infrastructure measures

In order to realize above mentioned measures an adequate infrastructure framework is essential. Process of energy development in OBC and entire SliB region needs to be managed on scientific base and with insight to the broader context. Besides the national interest accents are placed at and development of local areas. Energy consumption in the RoC is still far above the GDP respective ratios, with significant proportion of imported energy and energy sources (RoC imports around 40 % primary energy sources) that strongly affect economies operating costs and social services as well as living costs of citizens. Prognoses for the future are that the negative effect of dependency on imported energy sources will affect economy and GDP even more strongly. [4] [6]

SliB region has significant potentials the area of RES which, if and when put in use, can change the negative trends in energy production and, at the same time, solve series development problems. Development of local energy plants and setting of resource in function can contribute to the solution of dependency on imported sources and improve stability of local energy supply. Also it should solve series developmental problems of SliB region which can result with more new jobs, increased employing, development of local science and professions in energy sector, development of local companies and employment of local population. Therefore, six infrastructure measures, which correspond to a) County developments of strategy and b) Strategy of energy development of Croatia, are proposed.²⁵ [9]

4.1. Regional energetic council

Strategic decision concerning development of energy sector cannot be made at lower levels (towns, counties), and the national level often cannot objectively observe regional specific features. Therefore geographic and territorially organized regions are the first level for projecting development of energetic with the respect to the national framework. [6] Five counties in the SliB area have more similar and common economic and developmental assumptions, tradition and resources, and similar developmental problems. Energy sector and the development of local energetic are areas of common interest for all five SliB counties and that are recognized as a regional framework which can be optimally managed for further development. There by, foundation of regional council for the energetic are proposed, as the high body which considers/adopts development plans of the strategic importance for the development of energetic on the area of all five counties SliB regions. Regional energetic council of county heads (currently on function) of five SliB counties and six professionals from the scope of energetic would form. In accordance with the European civil system of value, six members of Regional energetic council would be selected as citizens of five counties and professionals from public companies and scientific communities, based on the public tender procedure and excluding the persons from private sector. The later precaution is to ensure that council's decisions take into account public interest over the interest of private companies and corporations. [9]

4.2. Regional RES strategy

All counties of SliB region have considerable potential of renewable energy sources (RES), but they are not valorised nor are realistic plans for their development and realization made. Strategy of energy development of RoC points out the importance of energy sources, but (on developmental aspect of SliB region) small concrete plans are developed. Several Slavonian

²⁵ For each proposed measure projected time schedule and financial mechanisms for their implementation.

authors, in last few years, pointed to this potential and try to estimate their potential energetic value. Based on rough estimates annual RES potential in the SliB region is around 3 mil. tones of oil equivalent. [5] [6] [9] For the purpose of evaluation of RES potentials on the SliB region it is necessary to make regional development strategies for implementation of RES which would determine exploitable amounts in short-term and the medium-term period, would define technology for their exploitation and would supply economically frameworks of bringing into operation. Special reference should be set on the developmental element of local communities. The regional development strategy of RES implementation would represent the detailed specific of national strategy in the regional segment for SliB, and this measure need to be realised by regional researchers in cooperation with *Institute Hrvoje Požar*, Zagreb.

4.3. Regional EE Fund

All five counties of SliB region have suffered large damages from aggression on the RoC and in all counties GDP per capita is under average for RoC. Therefore all five counties have needs for finance support from EE projects. Therefore the initiation of decentralisation process of national EE fund and founding Regional EE fund which would co-finance local EE project are proposed. Rational presumptions are that: a) national EE fund needs to be released from small projects which are not of significant importance for national EE politics, but are important for the local community, b) faster bringing into operation of separate financial resources for EE on a national scale, c) respect of the regional specific characteristic and d) additional mobilizations of free assets from the regions. Substance of regional fund would accumulate and through the participation on international tenders and of legal and individuals donations.

4.4. EE project in the Slavonia-Baranja region

The energy development in contemporary conditions is not possible without the continuous goal oriented scientific research. University J.J. Strossmayer in Osijek has posse's relevant research and technical potential which can completely answer to the challenges of the contemporary energy processes. Researchers from the SliB area in cooperation with professionals of the economy and administrative bodies have, in recent decades, realised large number of scientific works which significantly contributes to the energy development of the region [6] [9]. Focus on importance of energy supply for development, in the RoC and its surroundings, is put by dynamic social, economical, politically and technological processes. Therefore proposal to *J.J. Strossmayer University* is initiative of *EE project in Slavonia-Baranja regions* as integral framework of the existing scientific projects and future researches which need include all key elements of energy development and application of emerging technologies in SliB energetic.²⁶ Model of co-financing projects as well as the communication model on research reports and their application in practice would discuss and adopt Regional energetic council.

4.5. Regional ESCO company

In Croatia currently operates only one ESCO company - HEP ESCO which has been established in year 2003.²⁷ In last years HEP ESCO successfully implemented more than 60 projects in different sectors e.g. public lighting, buildings, industry and energy supply systems.

²⁶ I that goal propose that preparations of graduation theses on all faculties of technical sciences thematically be on EE function in every municipality/town in the area of region.

²⁷ HEP Inc. for the development this project has got World Bank loan assets in the amount of 4,4 mil. € and donation of Total Environment Facility of 5 mil. US \$.

Limitations concerning financing of EE projects in SliB region impose the need to establish funding mechanism for EE projects through ESCO model. For a number of reasons (times, presence on site, costs of realization, supervision on the implementation of projects, development of own experts teams) it would be necessary to found new ESCO company in RoC which would operate in SliB area. [9]

ESCO is abbreviation from *Energy Service Company* and present concept on the market service in energetic field. ESCO model includes development, execution and financing projects of improvements energy efficiency. Project goal is the cost reduction for the energy and maintaining the installation of the new more effective equipment and optimizing energy systems, by which ensures repayments of investment through achieved savings in the period of several years depending on the client and the project. Risk of achievements of savings, in general, assumes ESCO company providing guarantees, and in addition to the implementation of emerging technologies and decrease of energy consumption widely proffer and financial solutions for the realization

4.6. EE monitoring system in public sector

It is necessary to develop system and corresponding software support for monitoring and control of EE in the public sector in the OBC area (and other SliB counties). In this way, the LSGU in all five counties receives unique IT tool for the monitoring effects of economic and energy efficiencies in energy consumption. Especially interesting are educational and health institutions, social welfare institutions, culture and sport and public transport. Based on above system it should be possible to budget and perceive effects of energy sources price changes and - in crisis situations (reductions of respective kind energy) the regional government and distributors of energy sources have adequate parameters for control the „crisis“ consumption.

5. Conclusion

Croatia has taken over the EU energy policy objectives which have been integrated within the Strategy of the energetic development. Part of its implementation - in the segment of local government - has been transferred on to counties through the Act of the efficient use of energy in final consumption. Four out of five counties in eastern Croatia have not yet fulfilled their obligation of the programme and the plan elaboration of final energy consumption on their areas.

Programme and plan elaboration is complex professional and the re-search process. It requires an accurate system and up-to-date documentation on the distribution of energy consumption according to consumer groups, effective team work during the elaboration phase and explanation of these facts as well as a good understanding of modern technologies and organisational models for the planning of rational use of energy and the increase of energy efficiency. There are not many expert teams in Croatia which could respond to these challenges and this is one of the reasons for the insufficient implementation of regulation commitments.

The Faculty of Electrical Engineering in Osijek has formed such a team of experts. It successfully carried out a Plan and Programme of energy efficiency in the Osijek-Baranja County in 2011. Researching energy efficiency in OBC area the team of experts have identified the problem of infrastructure framework for the implementation of the Programme and proposed several measures for a more qualitative access to energy efficiency referring to all five SliB counties. Implementation of these measures would significantly contribute to an efficient use of energy in the commercial and communal sector as well as in public institutions (budget users) and households. What is more, these measures would solve a number of developmental questions, the most important being: efficient exploitation of natural resources, development of research institutions and new business entities as well as creating employment for the local population.

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