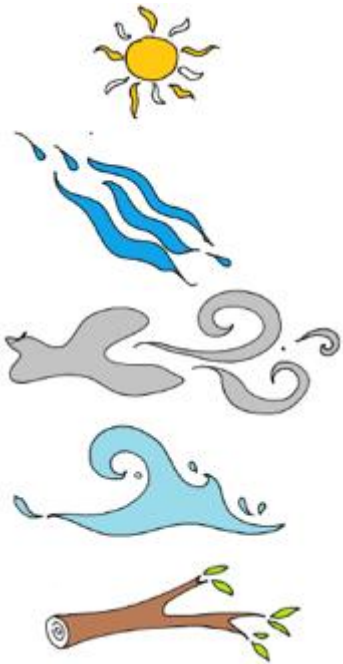


E.S.co and energy efficiency of public buildings: an opportunity for public and private actors

What role do Local Energy Agencies play?

Rajko Leban, GOLEA

***AREA Science Park, February 13th, 2014
Padriciano - Trieste***



“It’s very difficult to imagine lifting Europe out of recession without growth, and very difficult to imagine growth without competitiveness, and very difficult to be competitive without resource efficiency.”

Janez Potočnik, EU commissioner for the environment

Presentation of agency

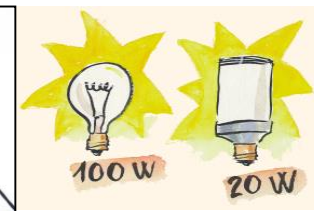
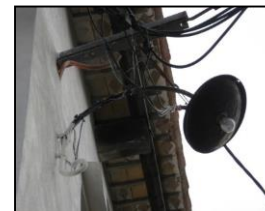
GOLEA – Goriška Local Energy Agency, Nova Gorica

- **Founded** in 2006 by Nova Gorica municipality. Co-financed by EU-Intelligent Energy Europe – IEE programme.
- **Mission of GOLEA:** promotion of Renewable Energy Source - RES and Rational Use of Energy - RUE with focus to the energy self-handling region, focus to the sustainable region.
- **Our motto:** creating renewable and sustainable future.



• Activities of agency:

- making local energy concept studies for municipalities,
- implementing and executing energy management in municipalities,
- making of public lightening studies,
- making investment studies for energy projects,
- energy reviewing (including termovision examination),
- energy auditing,
- energy monitoring and targeting (M&T)
- issuing energy performance certificate,
- energy project management,
- implementing ESCO models of financing.



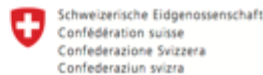


INTERNATIONAL PROJECT



MO.DEF

Swiss Contribution

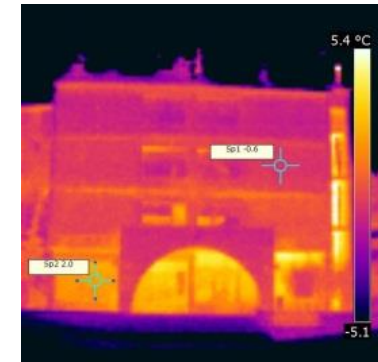
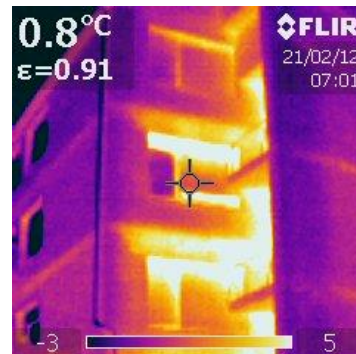


RES IN PRIMORSKA MUNICIPALITYS



PILOT PROJECT IN BRDA

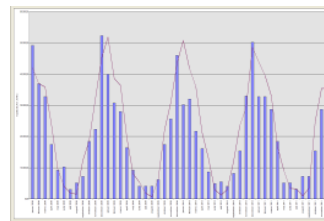
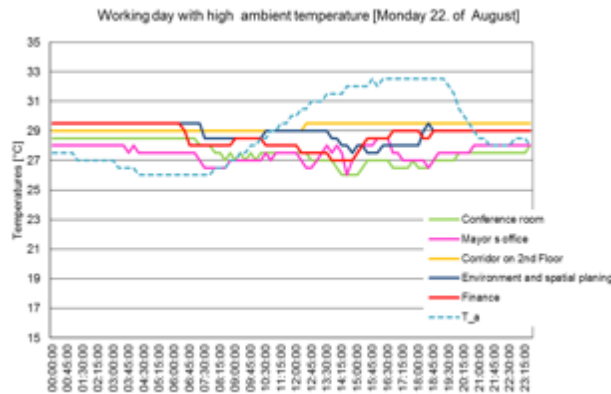
- Pilot characteristics: Energy wasteful public office building owned by municipality, built in 1945, energy using indicator 190 kWh/m², usable area 460 m².
- Area: Brda Municipality
- Population: 5 765 inhabitants of Municipality
- Number / type of buildings: 1 public office building
- Actors: Golea, Brda Municipality, subcontractors
- Motivation: Energy consumption improvement (Energy efficiency action)
- Image:



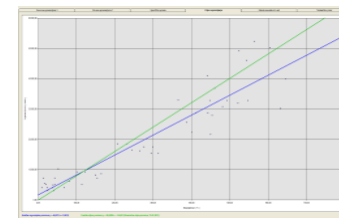
PILOT PROJECT IN BRDA - IMPLEMENTATION



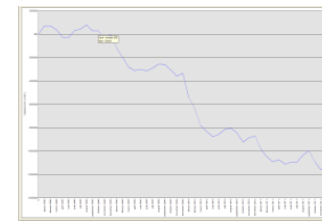
- Energy audit, proposals to reduce energy costs
- Energy management
- Energy monitoring and targeting (M&T)
- implement proposals to improve insulation (co-financing by project MARIE)
- Implement ESCO financing model



ENERGY USE



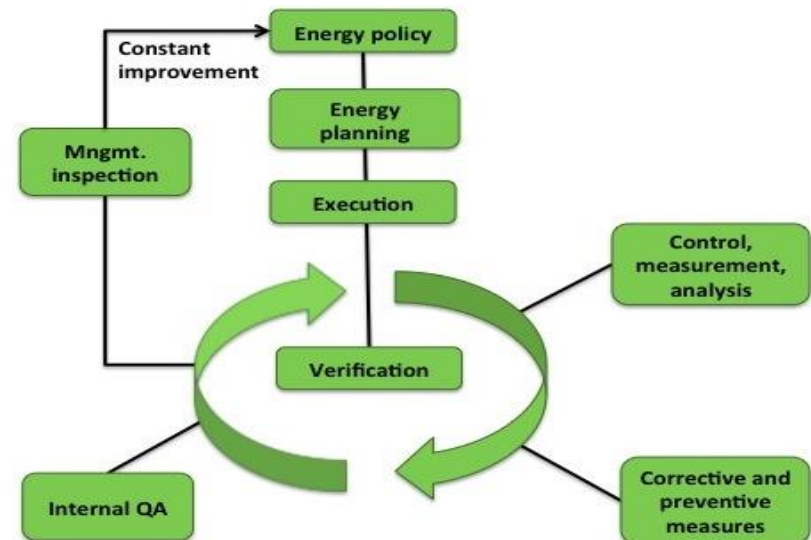
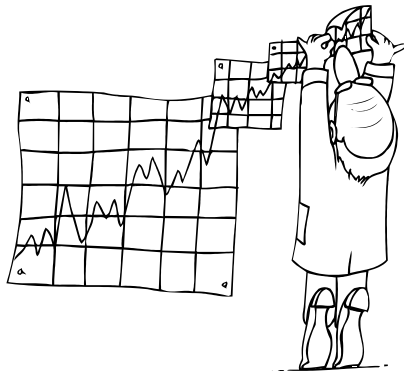
M&T DIAGRAM



CUSUM DIAGRAM

ENERGY MANAGEMENT SYSTEM AT BRDA MUNICIPALITY

- Implementation of pilot energy management system CSRE
- Based on data from monthly energy bills.
- Energy supervisory system data integration (Municipality building Brda).
- Setting first energy performance indicators.
- Evaluation on energy efficiency.
- Encouraging first steps for improving energy efficiency, based on systematic energy efficiency evaluation.
- **Setting strong base for long-term energy savings.**



ENERGY ACCOUNTING – first step to energy efficiency

Podatke vnese za

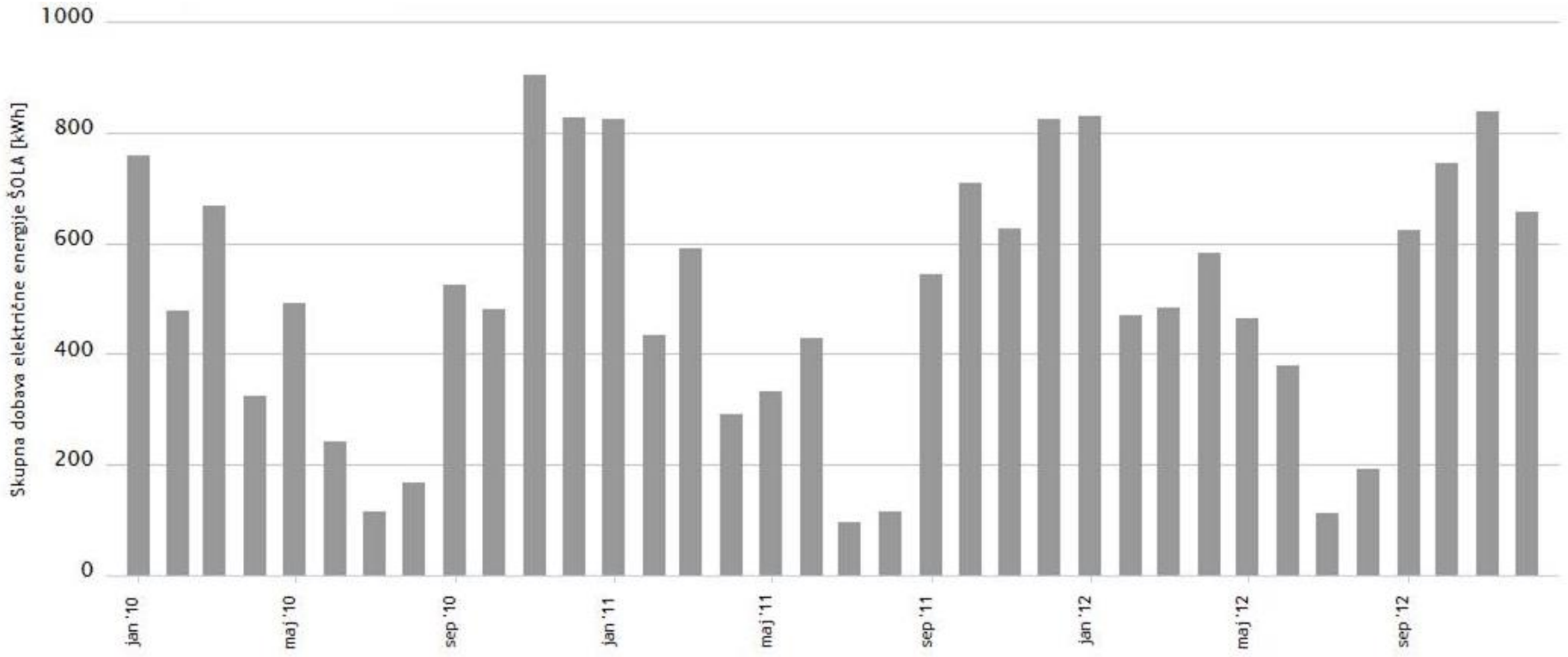
Interval: **Mesec** Časovna točka: **december 2012** Števec: **Poraba**

Naziv	Količina		november 2012	oktober 2012	september 2012
Občina Brda/Osnovne šole/OŠ Dobrovo/OŠ in vrtec Dobrovo/Fakture in meritve/Električna energija/7-003955 Obračun uporabe električnega omrežja - SOLA					
Obračunska moč	48,00	kW	60,00	59,00	57,00
Omrežnina VT	5.055,00	kWh	6.733,00	8.094,00	6.833,00
Omrežnina MT	1.404,00	kWh	1.337,00	1.993,00	1.976,00
Strošek - Obračunska moč	250,24	EUR	312,80	307,59	232,81
Strošek - Omrežnina VT	129,56	EUR	172,57	207,45	135,23
Strošek - Omrežnina MT	27,79	EUR	26,46	39,44	30,21
Strošek - Jalova en. zar. VT	11,10	EUR	11,78	0,00	0,00
Strošek - Prispevek po 64. r čl. EZ	27,72	EUR	34,65	34,08	32,92
Strošek - Prispevek po 15. čl. EZ	4,90	EUR	6,13	6,03	5,82
Skupaj	451,31				
Občina Brda/Osnovne šole/OŠ Dobrovo/OŠ in vrtec Dobrovo/Fakture in meritve/Električna energija/7-003955 Obračun dobavljene električne energije - SOLA					
Energija VT	5.055,00	kWh	6.733,00	8.094,00	6.833,00
Energija MT	1.404,00	kWh	1.337,00	1.993,00	1.976,00
Strošek - Energija VT	360,52	EUR	480,20	577,26	487,33
Strošek - Energija MT	69,81	EUR	66,48	99,09	98,25
Strošek - Trošarina	19,70	EUR	24,61	30,77	26,87
Strošek - Prispevek po 67. členu EZ	3,23	EUR	4,04	5,04	4,40
Skupaj	453,26				

Knowledge of your consumption
and cost of energy and water.

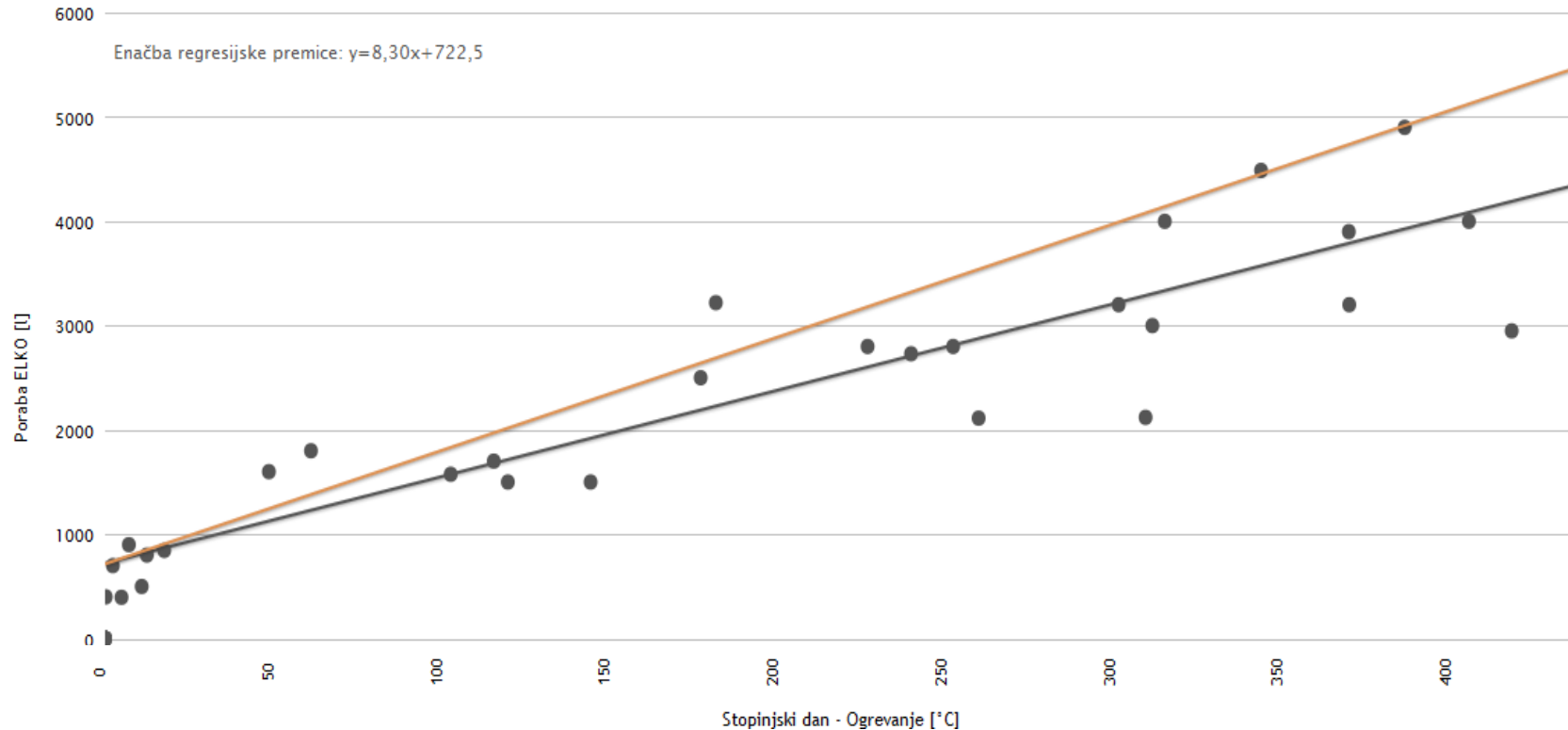


ENERGY ACCOUNTING – first step to energy efficiency



*An analyse on monthly electricity consumption
at Primary school Kojsko
January 2010 – December 2012*

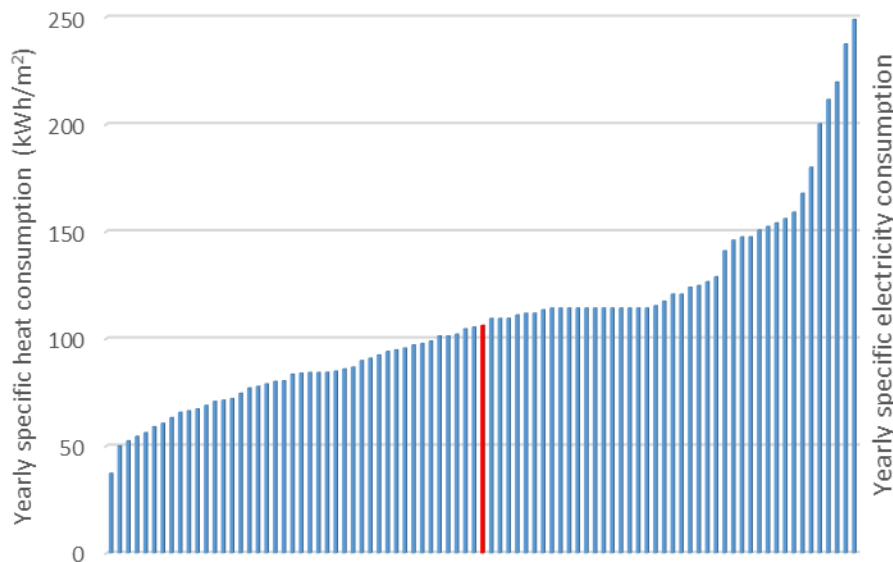
ENERGY MONITORING & TARGETING – BAT FOR EMS



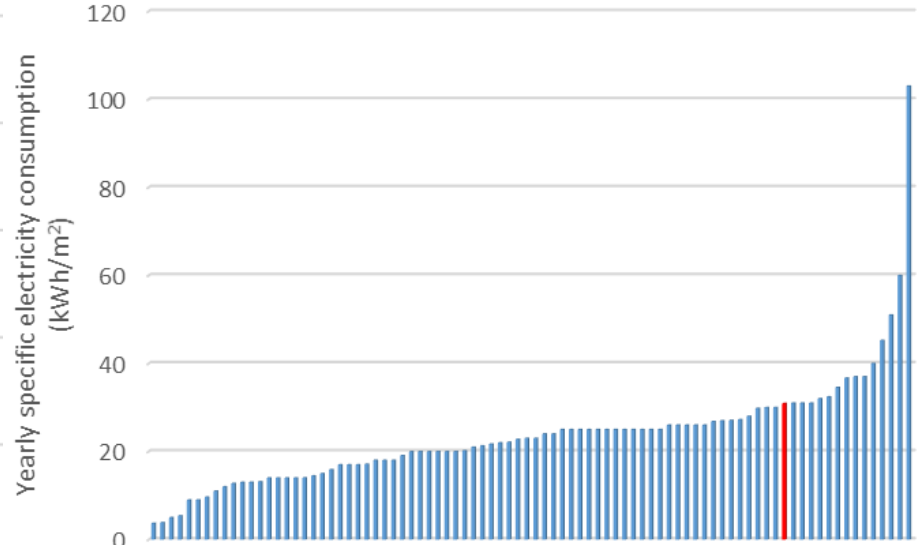
Definition of characteristic energy use according to energy factor.

Targeted value of energy consumption is set on the basis of the target line.

ENERGY EFFICIENCY COMPARISON



Yearly specific heat consumption

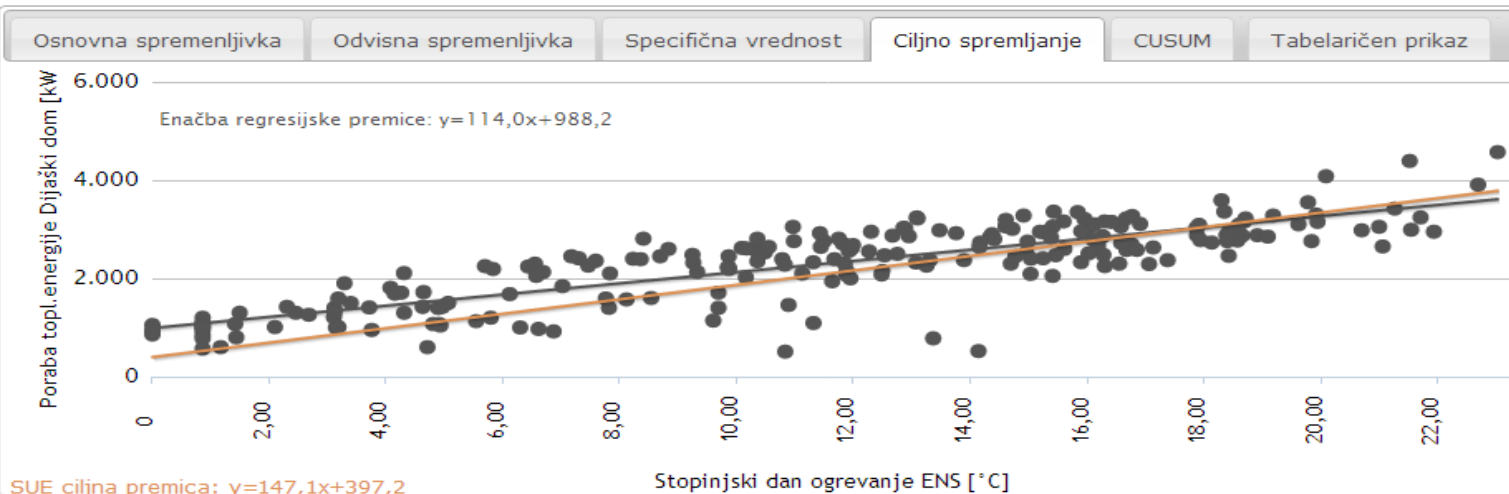


Yearly specific electricity consumption

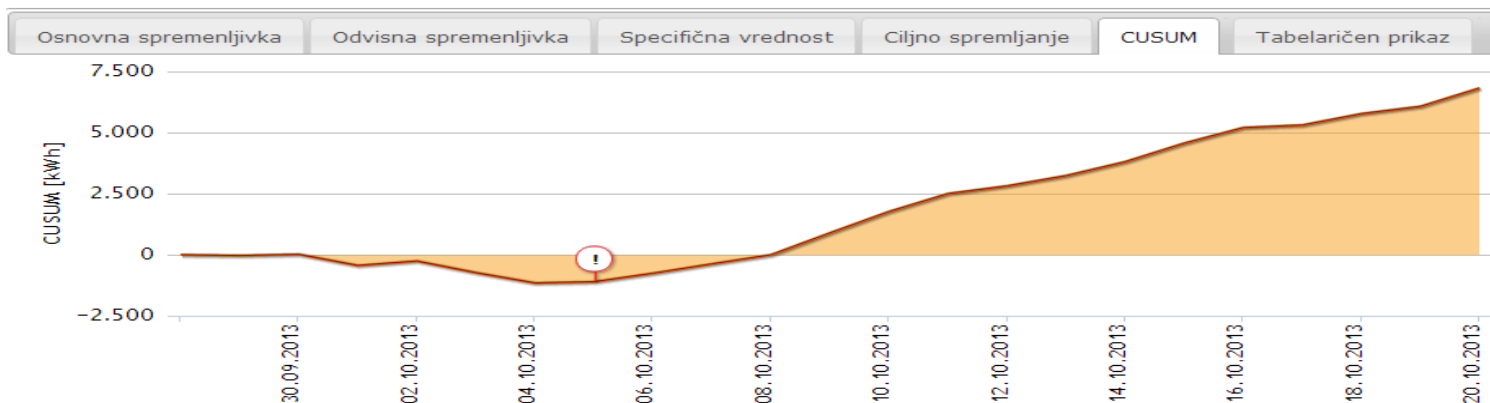
Primary school Dobrovo energy efficiency in comparison to similar Slovenian buildings

ENERGY MONITORING & TARGETING – CUSUM

M&T diagram:



CUSUM diagram:



MUNICIPAL BUILDING BRDA – ENERGY LABEL



MUNICIPAL BUILDING BRDA – ENVIRONMENTAL LABEL



Trg 25. maja 2, 5212 Dobrovo v Brdih
Tel: +386 5 335 10 30
Fax: +386 5 335 10 39
info@obcina-brda.si
www.obcina-brda.si

Environ.certificate
 Display

Choose interval
 Year From

Elektrika 2011/ 2010

Consumption	Cost	Price		Index
14,715 kWh	2,069.49 EUR	140.64 EUR/MWh		0.94

Toplota 2011/ 2010

Consumption	Cost	Price		Index
76,960 kWh	7,741.39 EUR	100.59 EUR/MWh		0.83

Voda 2011/ 2010

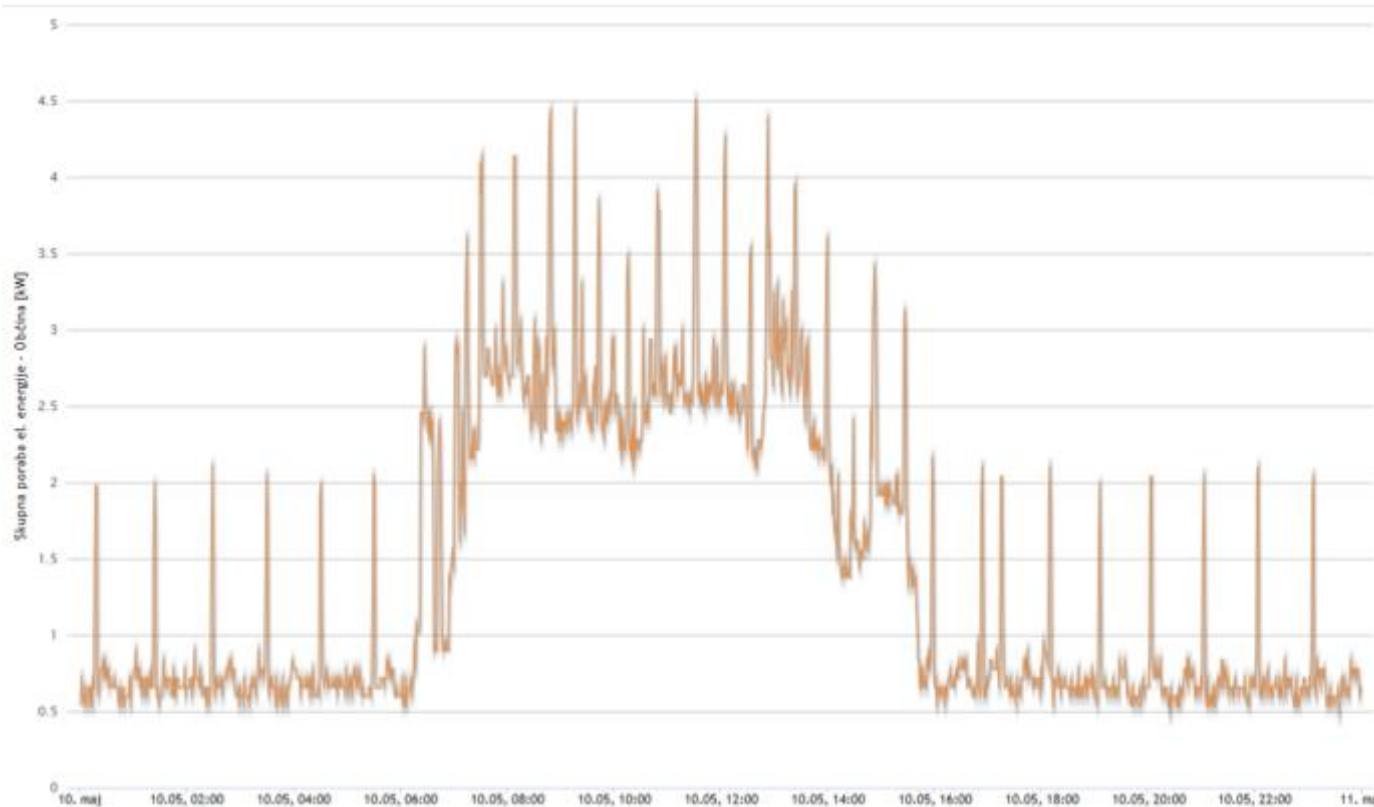
Consumption	Cost	Price		Index
151.1 m ³	269.67 EUR	1.79 EUR/m ³		0.98

Skupaj 2011/ 2010

CO2 Emissions	Cost		Index
25,593 kg CO ₂	10,080.55 EUR		0.86

ENERGY METERING – IMPROVED VIEW ON ENERGY CONSUMPTION

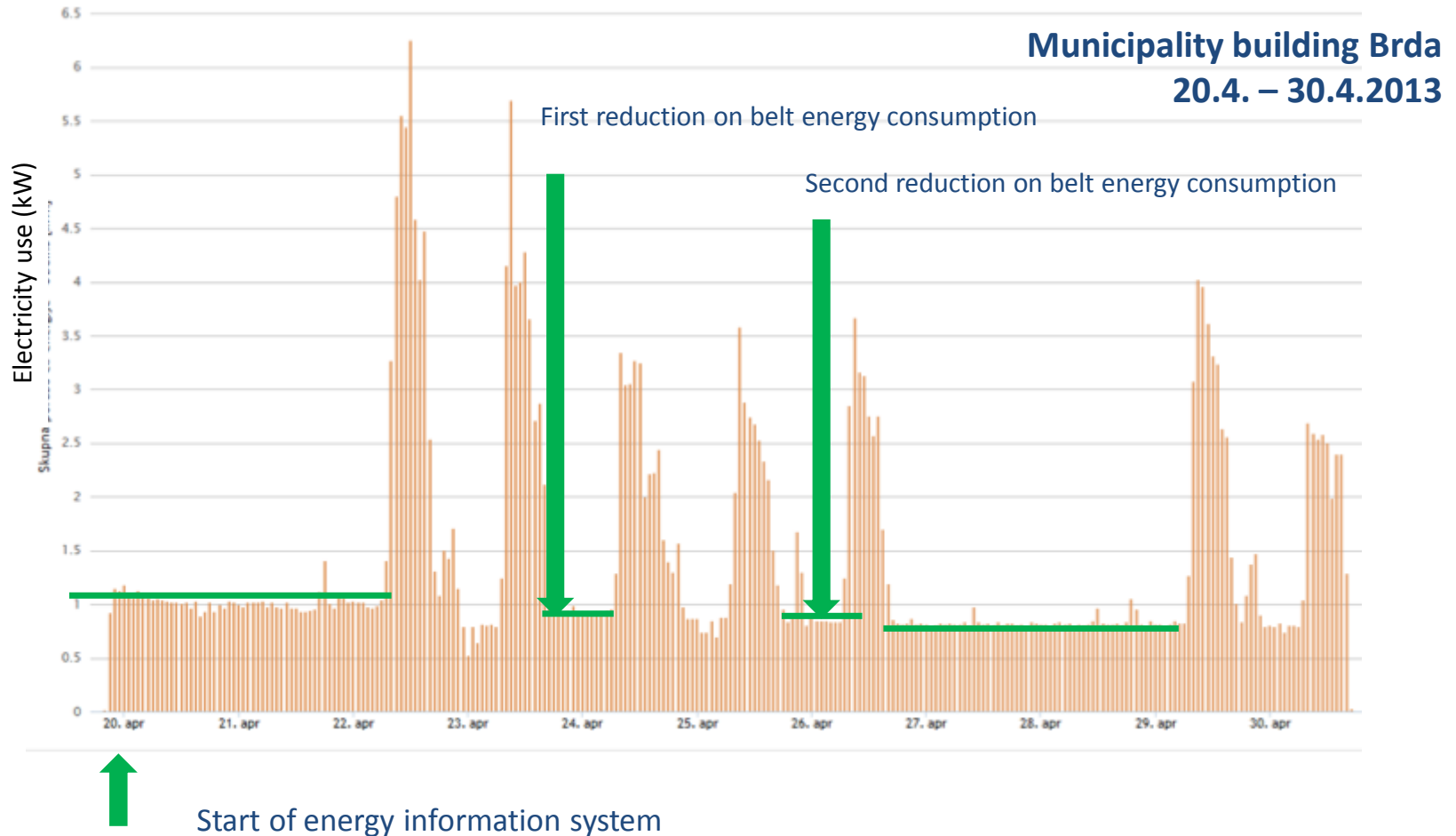
Municipality building Brda 10.5.2013



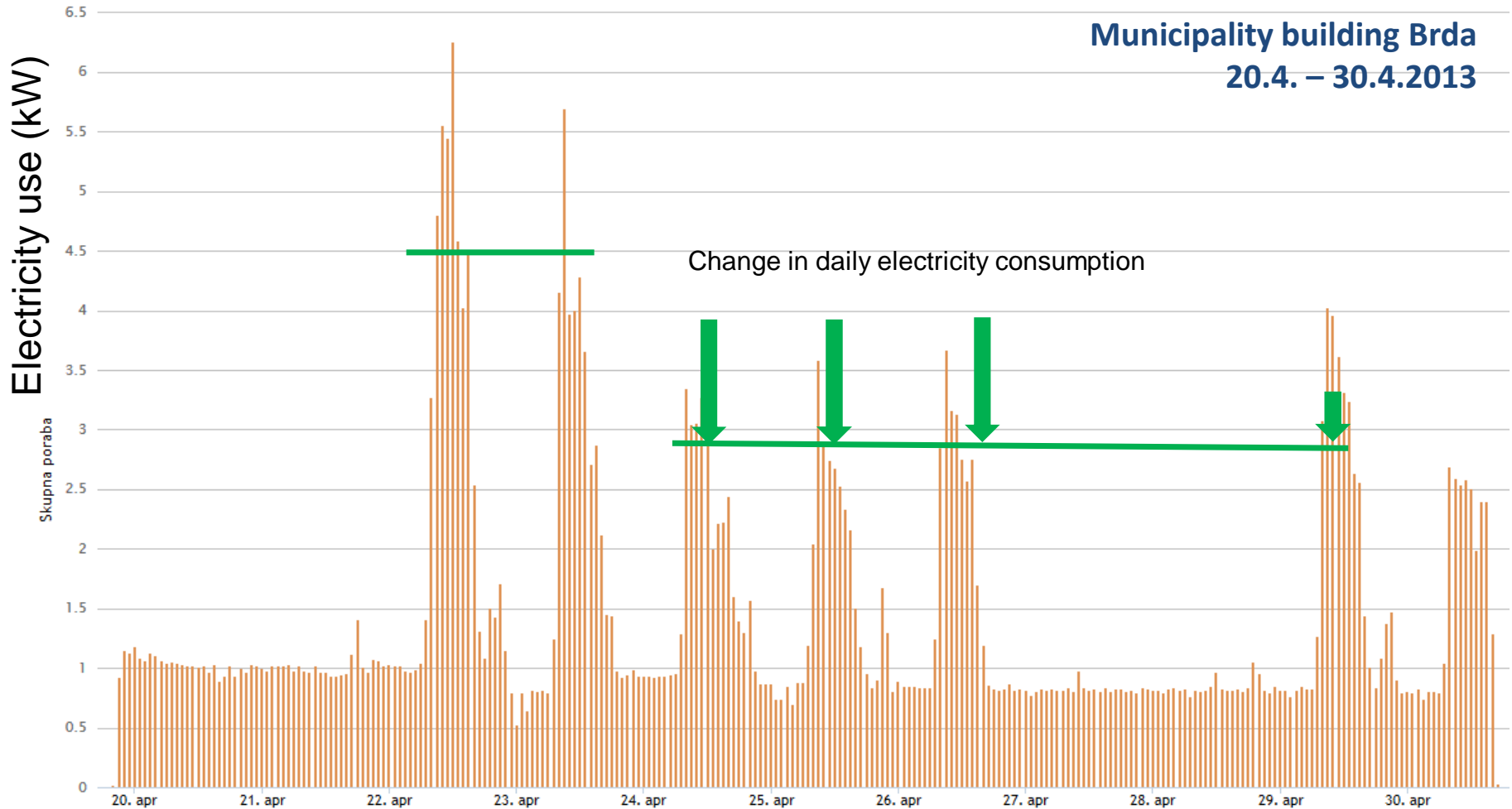
Smart grids
on energy
efficiency

Integration of on-line energy metering system.

ENERGY METERING – IMPROVED VIEW ON ENERGY CONSUMPTION



ENERGY METERING – IMPROVED VIEW ON ENERGY CONSUMPTION



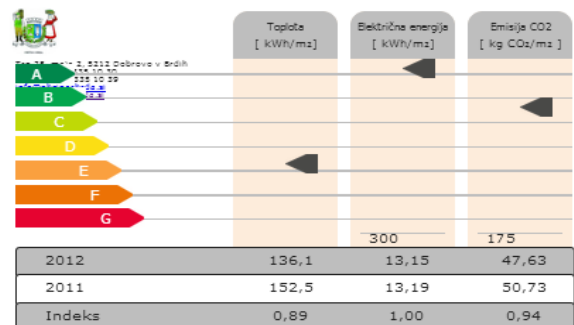
ENERGY MONITORING SYSTEM – MUNICIPALITY BUILDING BRDA

http://dashboard.enekom.si/? Code=GOBRD_GOLEA%20Ob%C4%8Dina%20Brda

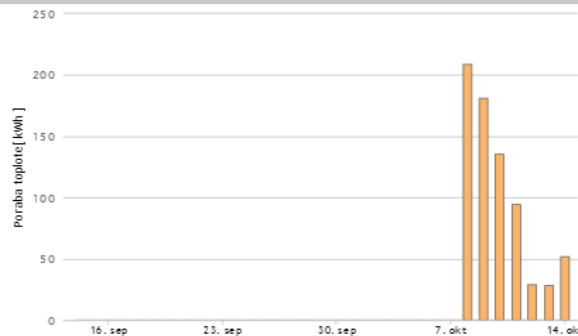
Energetski nadzorno informacijski sistem **Občina Brda**

14:16
14 OKTOBER 2013

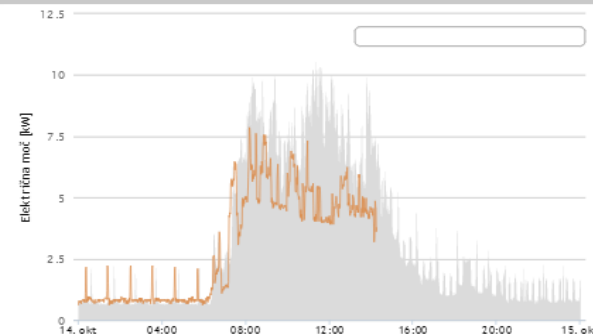
Energetska izkaznica



Poraba toplote



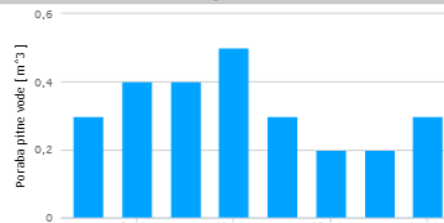
Raba električne energije



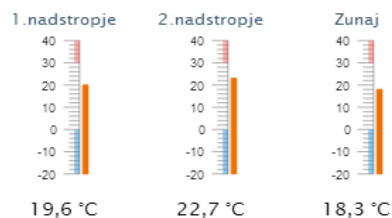
Trenutna električna moč

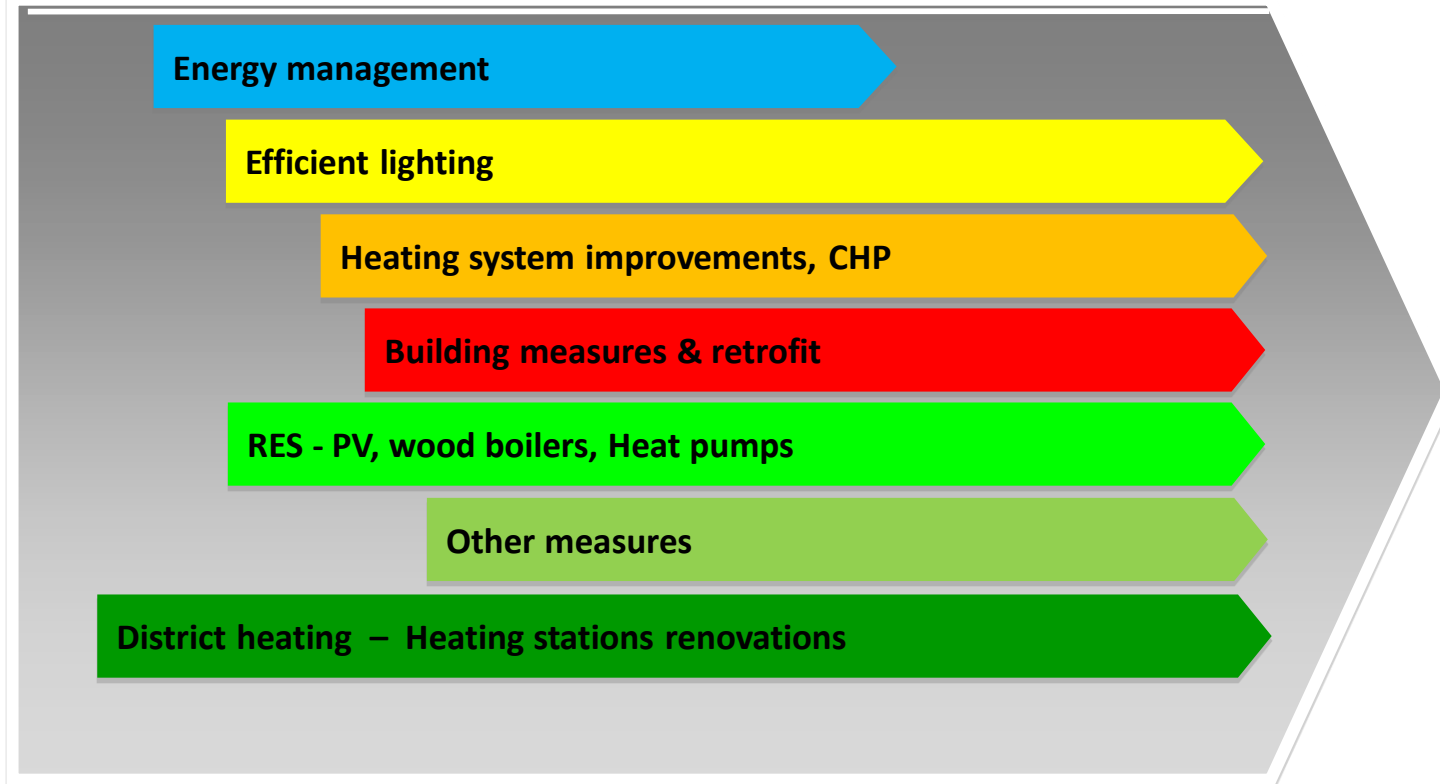


Poraba pitne vode



Temperature





Measures for Energy Efficiency and Renewable Energy

http://www.eib.org/products/technical_assistance/elena/index.htm

PUBLIC TENDERS – Examples of good practise the Agency GOLEA

MUNICIPALITY	PROJECT
MUNICIPALITY of TOLMIN	ENERGY RECONSTRUCTION of the ROOF SC - School Centre TOLMIN
MUNICIPALITY of PIVKA MUNICIPALITY of BRDA MUNICIPALITY of CERKNO MUNICIPALITY of TOLMIN MUNICIPALITY of ILIRSKA BISTRICA MUNICIPALITY of PIRAN MUNICIPALITY of KOPER TRIGLAV NATIONAL PARK MUNICIPALITY of NOVA GORICA	REPLACEMENT FUEL BOILERS WITH FOREST BIOMASS BOILERS AND SUPPLY HEAT FOR A PERIOD 15 YEARS The first such call in Slovenia. ESC – Energy Supply Contracting (Project RES in Primorska Municipalities – Swiss Contribution)
CLOSING PROCEDURE, IN IMPLEMENTATION	

GREEN PUBLIC PROCUREMENT

MUNICIPALITY	PROJECT
MUNICIPALITY of ŠEMPETER VRTOJBA	SUPPLY and OFFTAKE of ELECTRICITY for the period 2013 – 2016 (Electricity is produced from photovoltaic power plant on noise barriers on highway Vrtojba - Podnanos)

ENERGY REFURBISHMENT OF PUBLIC BUILDINGS

APPLY - NOVEMBER 2012 - Ministry of Infrastructure and Spatial Planning

MUNICIPALITY	BUILDING	AMOUNT of the GRANT (€)	ENERGY SAVINGS (MWh)
ILIRSKA BISTRICA	HOME AT VIDEM 1.	823.007,25 €	919
NOVA GORICA	CENTRAL KINDERGARTEN and KINDERGARTEN MOJCA 5.	355.643,87 €	297
BRDA	PRIMARY SCHOOL DOBROVO 30.	574.865,73 €	296
KOPER	KINDERGARTEN SEMEDELA 44.	271.424,63 €	105
KOPER	PRMARY SCHOOL PRADE 98.	566.347,72 €	210
PIRAN	PRIMARY SCHOOL PIRAN 51.	812.096,44 €	371
*CERKNO	PRIMARY SCOOOL CERKNO 67.	1.121.732,49 €	461
DIVAČA	PRIMARY SCHOOL DIVAČA 110.	602.632,40 €	226
DIVAČA	and SUBSIDIARY SENOŽEČE 81.	311.002,17 €	119
*TOLMIN	SCHOOL CENTRE TOLMIN 98.	2.310.854,57 €	1.071
Secondary School for Forestry	and Wood Technology POSTOJNA (2011)	954.537,64 €	356
UNIVERSITY of LJUBLJANA	FACULTY of ECONOMICS (January 2013)	1.607.127,61 €	1.177
TOGETHER		10.311.272,52 €	5.608 MWh

* administrative dispute

REDUCTION OF GREENHOUSE EMISSIONS - CO₂: 1.499 tons

ENERGY REFURBISHMENT OF PUBLIC BUILDINGS

APPLY - MARCH 2012 - Ministry of Infrastructure and Spatial Planning

MUNICIPALITY	BUILDING	AMOUNT of the GRANT (€)	ENERGY SAVINGS (MWh)
IDRIJA	PRIMARY SCHOOL IDRIJA 66,61	440.712,45 €	536
KOPER	PRIMARY SCHOOL DUŠANA BORDONA 64,13	404.372,74 €	350
KOPER	KINDERGARTEN KEKEC 64,13	191.019,52 €	137
KOPER	KINDERGARTEN MARKOVEC 63,91	292.944,12 €	166
KOBARID	PRIMARY SCHOOL KOBARID 63,5	343.833,49 €	357
MIREN-KOSTANJEVICA	PRIMARY SCHOOL BILJE 63,44	106.479,18 €	78
ŠEMPETER-VRTOJBA	PRIMARY SCHOOL VRTOJBA 62,45	198.072,53 €	157
TOLMIN	PRIMARY SCHOOL PODBRDO 62,05	232.949,63 €	218
TOLMIN	MEDICAL CENTRE TOLMIN 61,64	117.301,64 €	105
RENČE-VOGRSKO	PRIMARY SCHOOL RENČE 60	258.828,85 €	234
PIRAN	KINDERGARTEN MORNARČEK PIRAN and KINDERGARTEN SEČOVLJE 60,81	331.377,49 €	220
KANAL	KINDERGARTEN DESKLE 52,86	163.179,62 €	72
AJDOVŠČINA	KINDERGARTEN BY HUBLJ 47,22	155.657,30 €	64
ILIRSKA BISTRICA	PRIMARY SCHOOL DRAGOTIN KETTE	334.077,52 €	352
TOGETHER		3.570.806,08 €	3.046 MWh

REDUCTION OF GREENHOUSE EMISSIONS - CO₂: 792 tone

Finished energy refurbishment - SGLŠ Postojna (Secondary school for forestry and wood technology)

BEFORE RECONSTRUCTION

AFTER RECONSTRUCTION



APPLY MAY 2013

(Ministry of infrastructure..) :
Municipality Koper:
Primary school Anton Ukmar
and Kindergarten Škofije

ENERGY RECONSTRUCTION OF PUBLIC LIGHTING

MUNICIPALITY	TENDER	AMOUNT of the GRANT (€)	ENERGY SAVINGS (MWh)
AJDOVŠČINA	UJR	116.953,39 €	589
AJDOVŠČINA	PETROL URE	25.675,43 €	97
KANAL	UJR	83.629,25 €	262
<u>BRDA</u>	<u>PETROL URE + ESCO</u>	<u>175.249,20 €</u>	<u>292</u>
<u>MIREN – KOSTANJEVICA</u>	<u>UJR + ESCO</u>	<u>46.511,40 €</u>	<u>133</u>
NOVO MESTO	UJR	435.492,84 €	1.522
TOGETHER		883.511,51 €	2.895 MWh

REDUCTION OF GREENHOUSE EMISSIONS - CO₂: 1.620 tons

UJR – tender of Ministry of infrastructure and Spatial Planning

PETROL URE - tender of Petrol as a great eco-taxpayer

Energy reconstruction of public lighting in Municipaities Brda and Miren-Kostanjevica ruled through ESCO EPC – Energy Performance Contracting

DISTRICT HEATING ON FOREST BIOMASS

MUNICIPALITY	PROJECT
MIREN – KOSTANJEVICA	MIREN (realized)
BOVEC	BOVEC
KOBARID	Joinery Peter Koren Kobarid (realized) Primary school KOBARID
AJDOVŠČINA	AJDOVŠČINA
KANAL	Primary school KANAL, Primary school DESKLE
TOLMIN	Business zone Na Logu - Tolmin (realized) Retirement home Podbrdo (realized) TOLMIN
KAMNIK	ŠMARTNO

In project of district heating systems on forest biomass we used ESCO model of ESC – Energy Supply Contracting.



PROCEDURES for PUBLIC PRIVATE PARTNERSHIP – PPP

1. To find the public interest by representative body of Municipality (art. 11 ZJZP).
2. To make the investment documentation for the PPP model (art. 8 ZJZP).
3. To implement procedure by representative body (art. 31 ZJZP).
4. To adopt the Act on PPP by representative body of Municipality.
5. To prepare and publish the tender and the tender documents.
6. To select the concessionaire (ESCO).
7. To sign the contract ESC (Energy Supply Contract) or / and EPC (Energy Performance Contract)

ZJZP – Zakon o Javno Zasebnem Partnerstvu – The law of PPP in Slovenia

Example:

$$\text{SUM} = (\text{RP} \times \text{C} + \text{RV}) \times \text{F}$$

F < 1!!!

SUM – annual payment for user (Municipality) (€)

RP – the reference energy consumption (MWh)

C – the price of energy in the reference year (€/MWh)

RV – the reference costs of maintenance and / or service

F – a factor of Division achieved savings

MUNICIPAL BUDGET		EXPENDITURES	
REVENUES		EXPENDITURES	
Investment			
x. Energy refurbishing	100	Energy refurbishing	100
x.1 Grants	49		
x.2 Concession Fee	51		
		402. Expenditures for goods and services	
		4025. On-going maintenance	
		Services for contractually guaranteed savings	

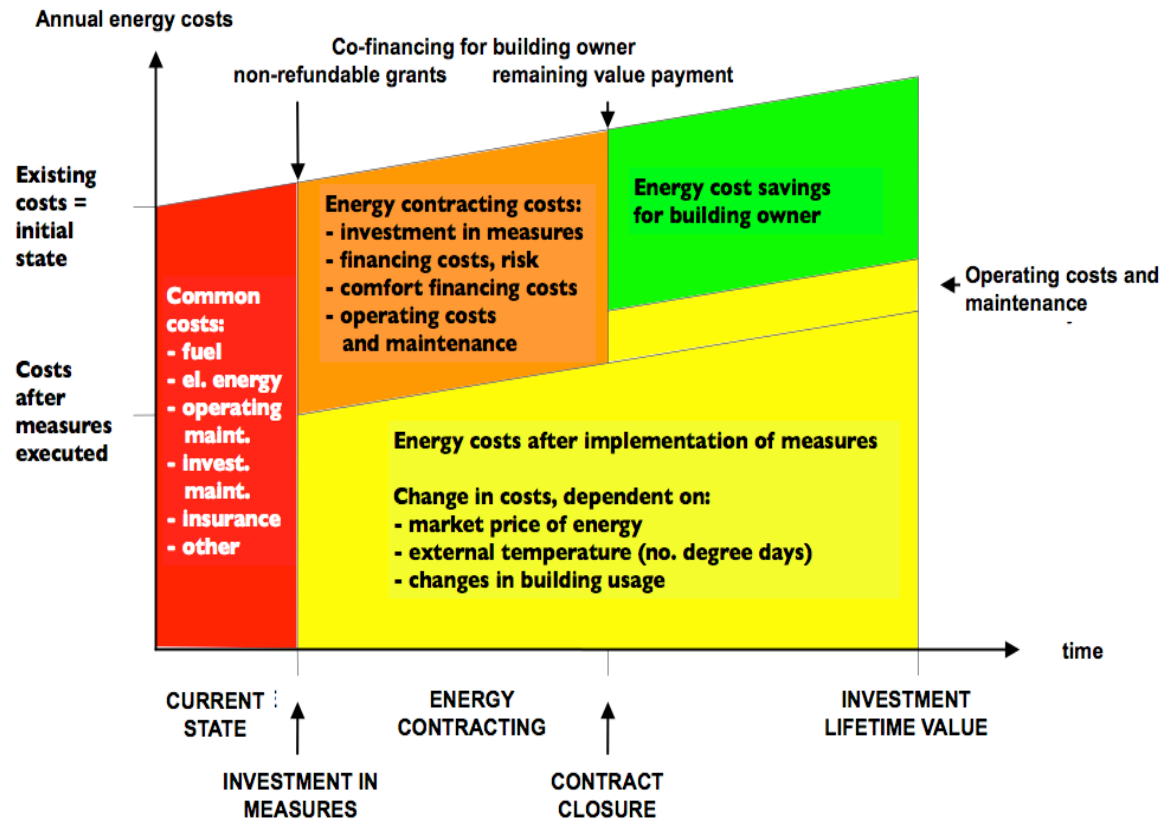
ESC - Energy Supply Contract

or / and

$$SUM = (RP \times C + RV) \times F \quad F < 1 !!!$$

annual payment for client (Municipality) should be reduced

EPC - Energy Performance Contracting

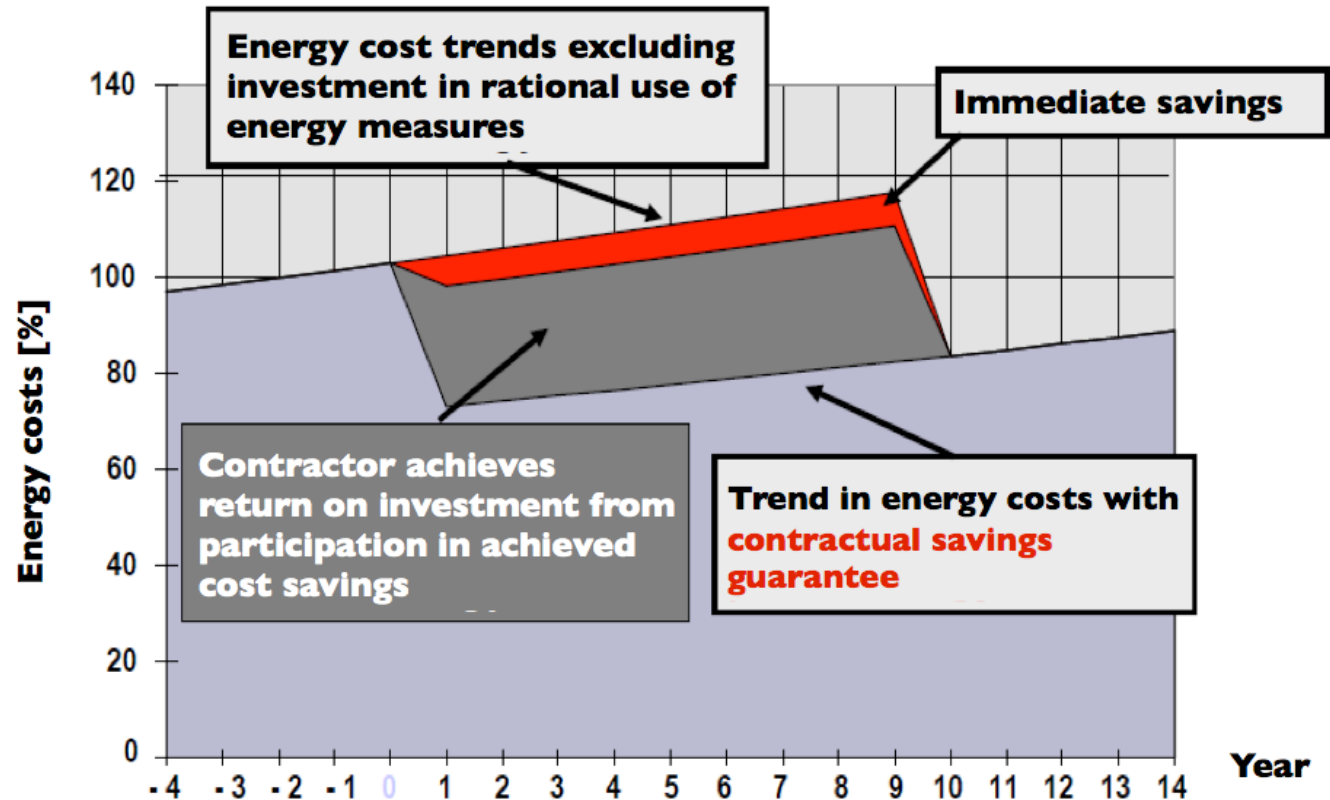
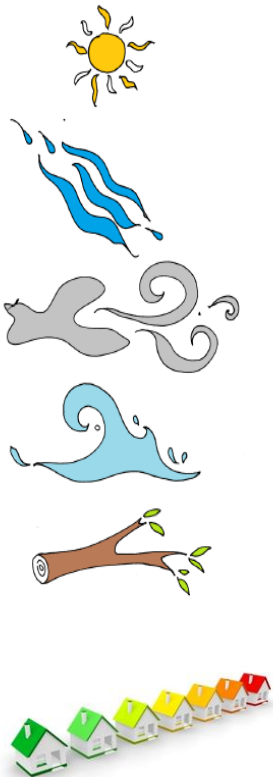


ESC - Energy Supply Contract

$SUM = (RP \times C + RV) \times F$ $F < 1$!!!
annual payment for client (Municipality) should be reduced

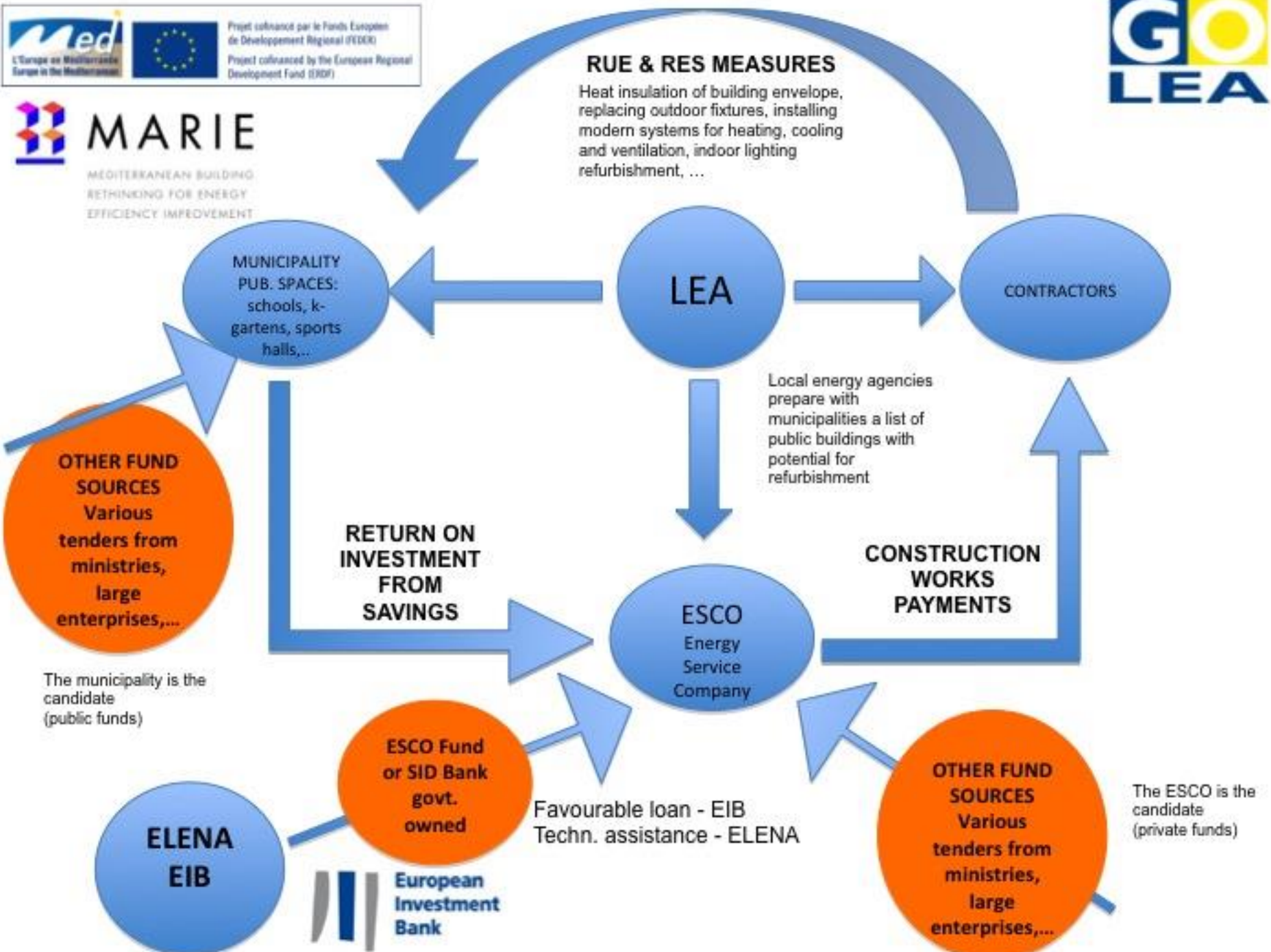
or / and

EPC - Energy Performance Contracting



RUE & RES MEASURES

Heat insulation of building envelope, replacing outdoor fixtures, installing modern systems for heating, cooling and ventilation, indoor lighting refurbishment, ...



OTHER FUND SOURCES
Various tenders from ministries, large enterprises, ...

The municipality is the candidate (public funds)

ELENA
EIB

 **European Investment Bank**

ESCO Fund or SID Bank govt. owned

Favourable loan - EIB
Techn. assistance - ELENA

OTHER FUND SOURCES
Various tenders from ministries, large enterprises, ...

The ESCO is the candidate (private funds)

MUNICIPALITY
PUB. SPACES:
schools, k-gartens, sports halls, ...

LEA

CONTRACTORS

Local energy agencies prepare with municipalities a list of public buildings with potential for refurbishment

RETURN ON INVESTMENT FROM SAVINGS

CONSTRUCTION WORKS PAYMENTS

ESCO
Energy Service Company

ELENA CONCEPT

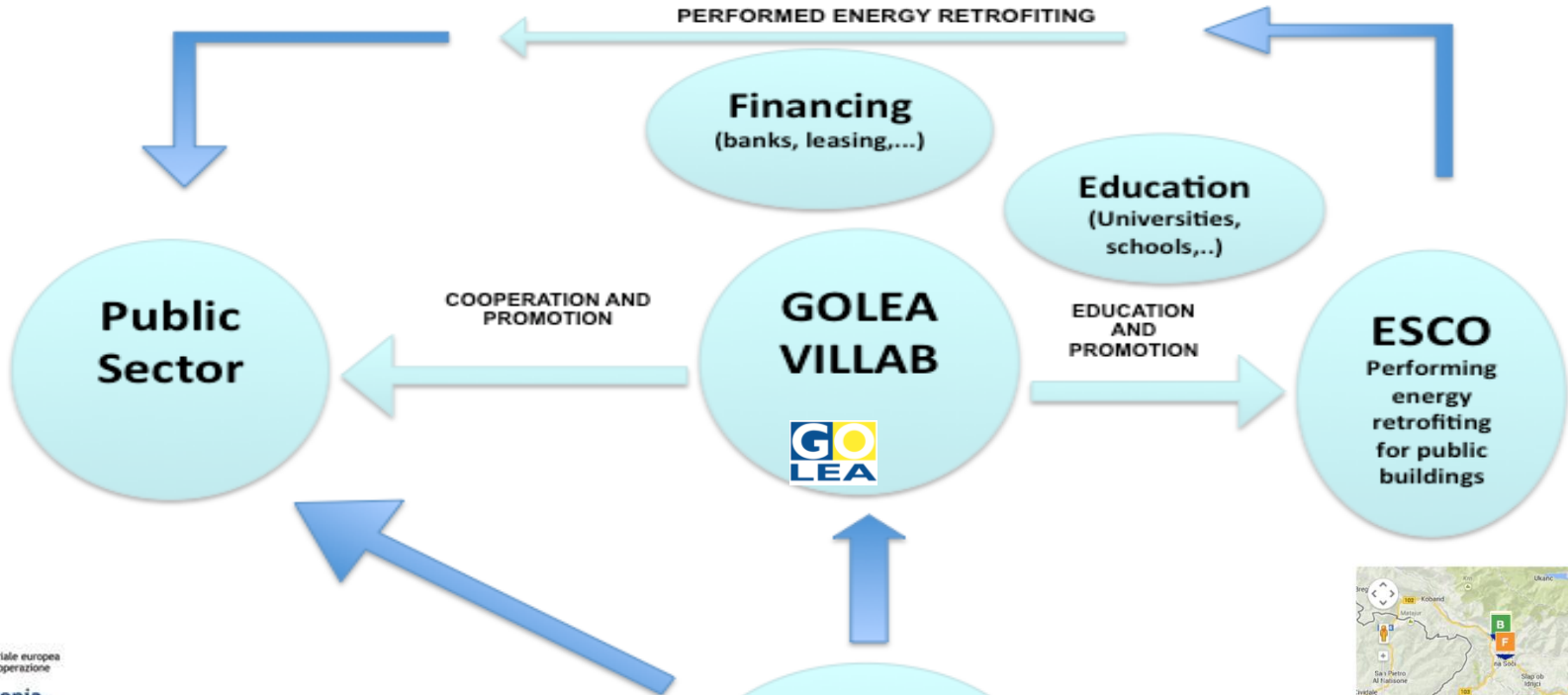
ELENA Technical Assistance
EU co-financing up to 1/25 inv. value

Preparing projects

**Implementation of RUE and RES
projects in public sector**
(municipalities, towns, etc., min. €50 million)

ESCO

VIRTUAL LABORATORY OF ENERGY EFFICIENT PUBLIC BUILDINGS - VILAGO



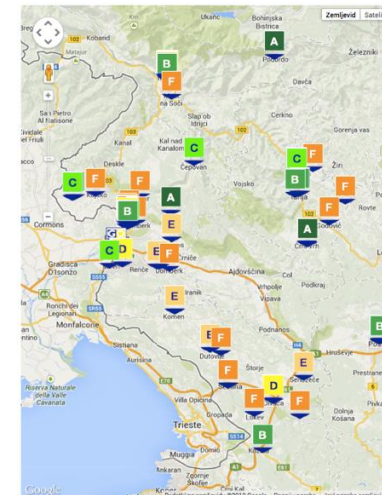
2007-2013
cooperazione territoriale europea
programma per la cooperazione
transfrontaliera
Italia-Slovenia
evropsko teritorialno sodelovanje
program čezmejnjega sodelovanja
Slovenija-Italija

Investiamo nel vostro futuro!
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Progetto cofinanziato dal Fondo europeo di sviluppo regionale
Projekt sofinanciran Evropski sklad za regionalni razvoj

ENERGY ViLLab
LIVING LAB FOR SUSTAINABLE DEVELOPMENT

<http://vilago.golea.si>





WHAT ROLE DO LOCAL ENERGY AGENCIES PLAY?

LOCAL ENERGY AGENCIES:

- are an energy manager to municipalities, which lead energy accounting and propose and advise municipalities on energy efficiency project as independent expert,
- preparing project to improve the energy efficiency of the ESCO model, such as the EPC or and ESC,
- coordinating between municipality and ESCO and carry out monitoring of energy savings.

Condition for implementation of new financial mechanisms (ESCO, EPC or / and ESP) is to overcome administrative and legislative barriers by the Government of the Republic of Slovenia and were is the new proposal of Energy law good opportunity.



GOLEA, Nova Gorica

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SI – 5000 Nova Gorica
Slovenia

Tel.: +386 4 393 42 60
e-mail: info@golea.si
web: www.golea.si

CREATING SUSTAINABLE FUTURE

