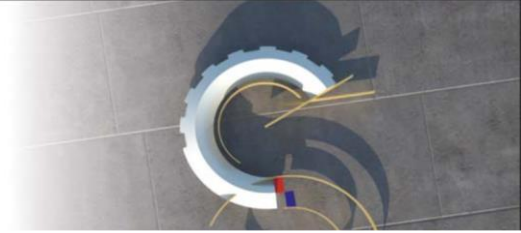




Hrvatska komora inženjera strojarstva
Croatian chamber of mechanical engineers



3. MEĐUNARODNI KONGRES DANI INŽENJERA STROJARSTVA
3th INTERNATIONAL CONGRESS MECHANICAL ENGINEERS DAYS
ŠIBENIK, 23.-24.5.2013.

Energy efficiency and public funds in Slovenia

dr. Vlasta KRMELJ, Dipl.Ing.

Director, European Energy Manager,

Licenced energy certificate expert

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European Union
European Regional
Development Fund

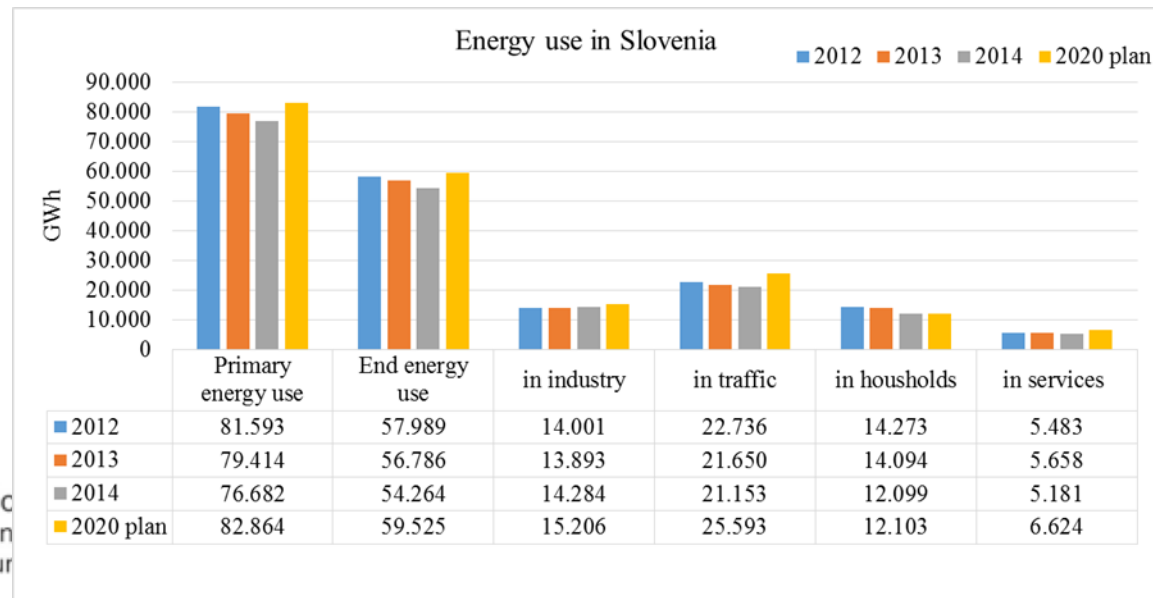




Public funds for energy efficiency

- ❑ Cohesion policy 2007 – 2013: 169 mio EUR (out off 4.3 billion EUR) :
 - 15 hospitals, 17 middle schools, 20 elderly cares, 7 high schools, 303 local public buildings
 - Savings: 150.000 t CO₂, 300 GWh end energy use
 - 300 GWh RES
 - Financial savings
- ❑ Cohesion policy 2014 – 2020: 3,2 billion EUR, for sustainable energy 250 mio EUR, mainly combined with own funding

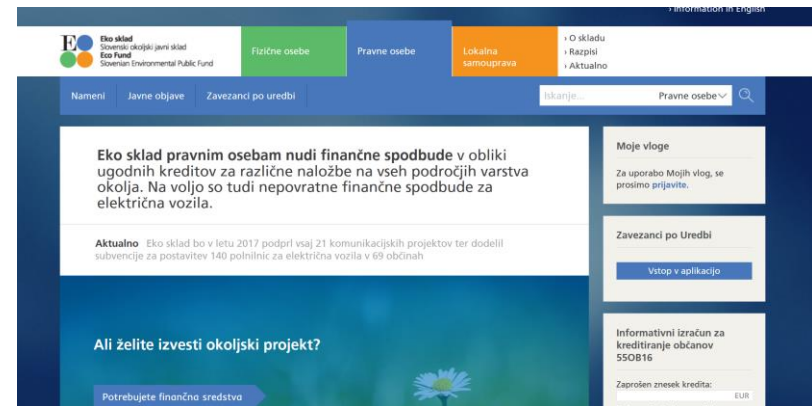
5. MEĐUNARODNI KONGRES DANI INŽENJERA STROJARSTVA
5th INTERNATIONAL CONGRESS MECHANICAL ENGINEERS DAYS
VODICE, 29.-31.3.2017.





Public funds for energy efficiency

- ❑ Climate changes fund (20 mio per year):
 - Energy efficiency and renewable energy projects
 - Sustainable mobility
 - New buildings and refurbishments
 - Public and private sector
 - Individual and multi apartments buildings
 - Education and information activities (ENSVET)
 - 20 % to 100 % subsidies
 - Towards deep renovation





Energy efficiency in hospitals – Izola hospital

BEFORE:

- Oil heating system
- Old cooling system with cooling tower
- Bad Insulation
- Old windows

- zrak/voda, ogrevalna moč 697,5 kW, hladilna moč 561,3 kW,
- voda/voda, ogrevalna moč 926 kW, hladilna moč 743,4 kW.

AFTER:

- Heat pumps for heating and cooling using waste heat from air condition systems (150.000 m³/h)
- Oil boiler as a back up and for overheating (legionella)
- Solar collectors 225 m²
- Control electricity power with energy management system
- New windows (thermal transmittances - glass - 0,7 W/m²K, window 0,95 W/m²K)
- Insulation: 8-12 cm, 20 cm to the attic
- Shading
- LED lighting





Energy efficiency in hospitals – Izola hospital

ca. 25.500 m²

DANI INŽENJERA STROJARSTVA
S MECHANICAL ENGINEERS DAYS
29.-31.3.2017.

BEFORE:

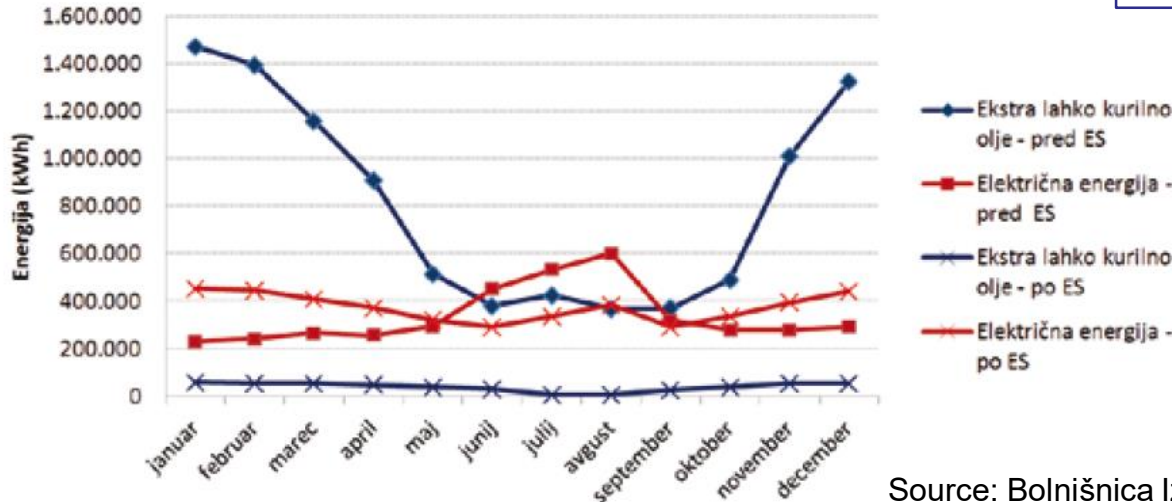
- End energy use more than 14 mio kWh per year
- More than 1 mio heating oil per year (3 x 2,3 MW)
- Cooling aggregate (2 x 1 MW)

Investments: ca 6 (Coh.) + 3 mio EUR

AFTER:

Savings: 6 mio kWh per year

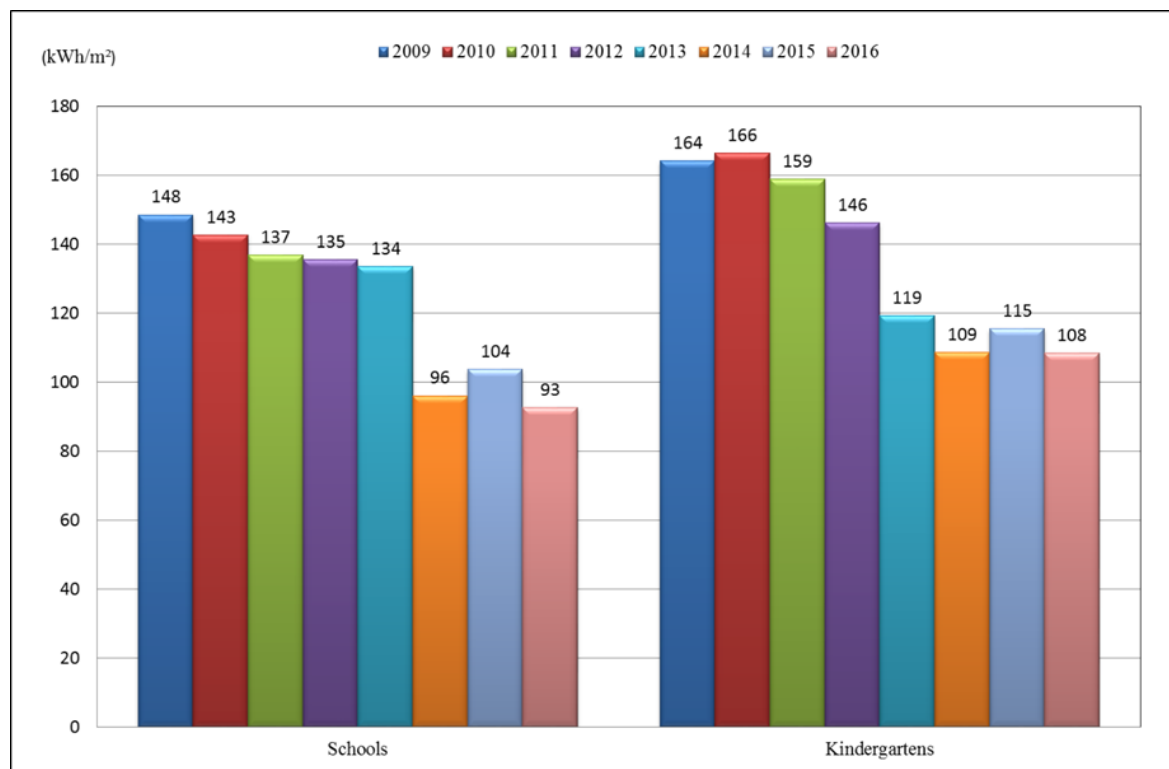
- 5.753 MWh/a of heat saved
- 394 MWh/a electricity saved
- Specific savings 241 kWh/m²/a
- Energy end use 8.818 MWh/a





Public buildings in MUNICIPALITY OF MARIBOR

- 36 kindergartens
- 22 primary schools
- 4 schools and 5 kindergartens refurbished



9 mio EUR investments (4,5 mio from Cohesion fund)



Kindergarten LUPINICA MARIBOR

New low energy building, 1,8 mio EUR investment from ERDF, 1000 m²

5. MEDULNARODNIKOVANJE ZA INŽENJERSKI POSREDOVANJE
5th II
5. MECHANICAL ENGINEERS DA
31.3.2017.

BEFORE:

- 220 kWh/m²

AFTER :

- Expectations 30 kWh/m², real 75 kWh/m²
- heat pumps, air conditioning system
- LPG back up system
- LED lighting
- walls (60 cm +30 cm insulation)

ENERGETSKA IZKAZNICA STAVBE

Podatki o stavbi

Št. izkaznice: 2017-24-61-46256 Velja do: 09.02.2027

Identifikacijska oznaka stavbe, posameznega dela ali delov stavbe: katastrska občina 680 številka stavbe 5249

Klasifikacija stavbe: 1263001

Leto izgradnje: 2012

Naslov stavbe: Ulica Hinka Nučiča 11, 2000 Maribor

Kondicionirana površina stavbe A_k (m²): 1.037

Parcelna št.: 1888/1

Katastrska občina: TEZNO

Vrsta izkaznice: merjena

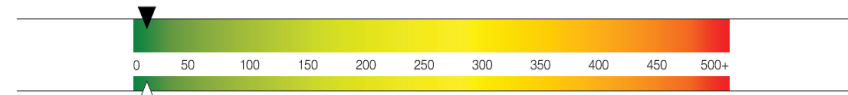
Vrsta stavbe: nestanovanjska

Naziv stavbe: Vrtec Tezno Lupinica



Dovedena energija

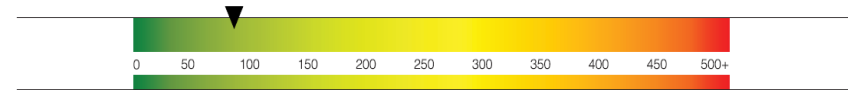
15 kWh/m²a



POVPREČNA RABA ENERGIJE PRIMERLJIVE STAVBE (15 kWh/m²a)

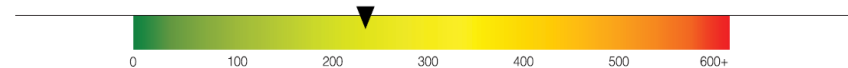
Dovedena električna energija

88 kWh/m²a



Primarna energija in Emisije CO₂

237 kWh/m²a



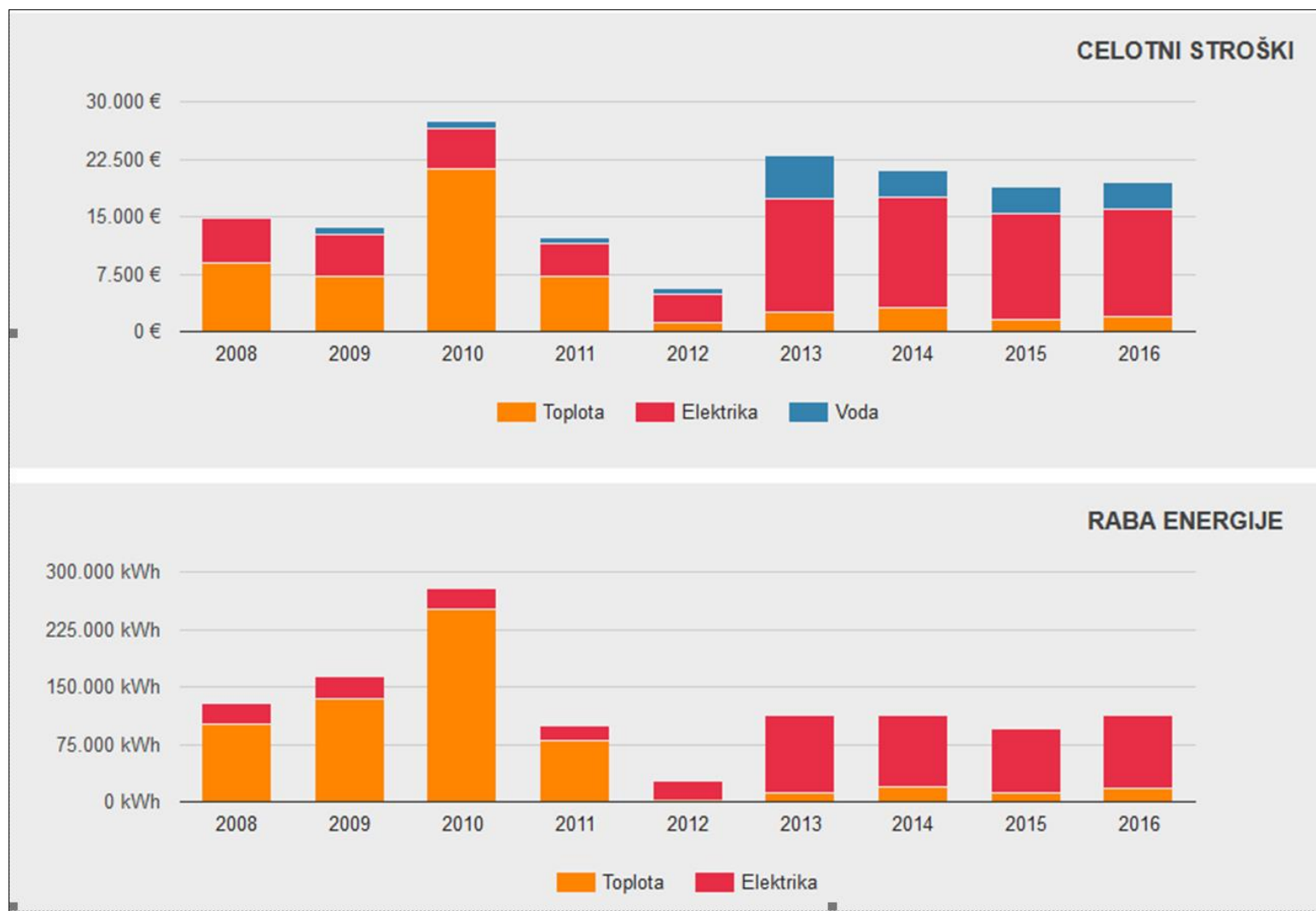
50 kg/m²a





Kindergarten LUPINICA MARIBOR

Continuous monitoring



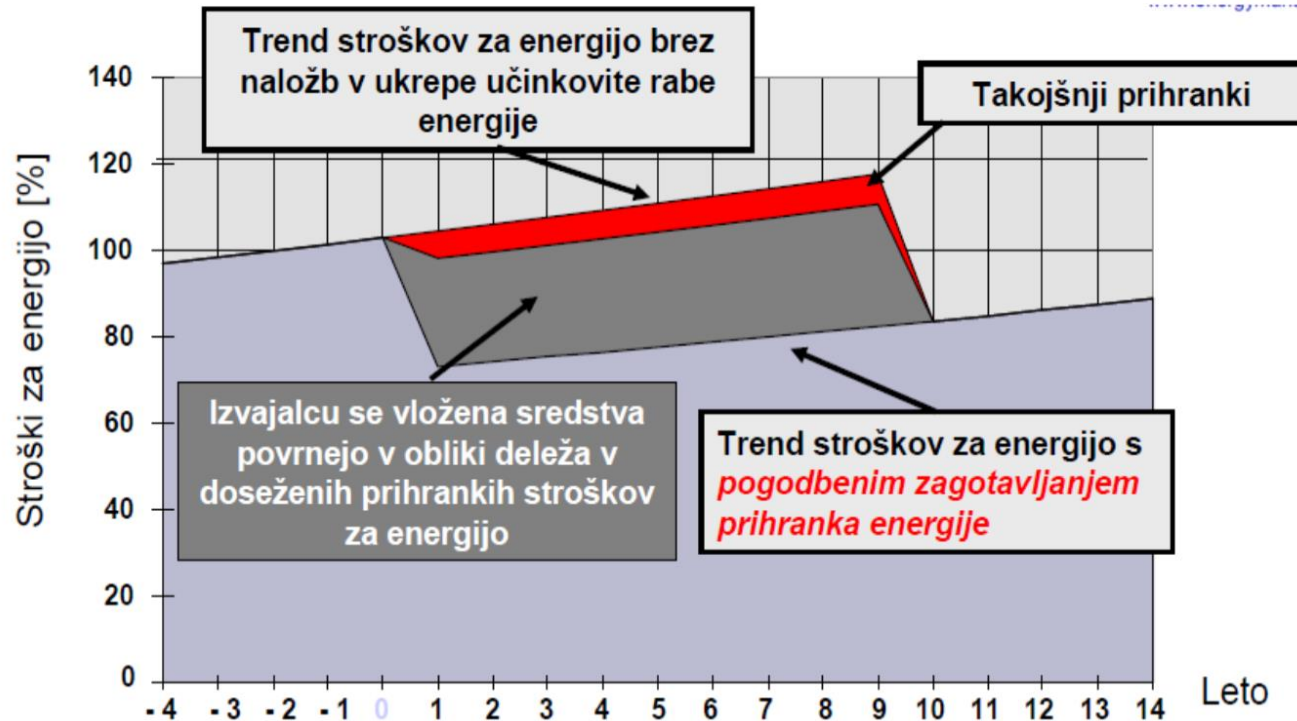


PUBLIC PRIVATE PARTNERSHIP – ENERGY PERFORMANCE CONTRACTING

- Deep refurbishment
- Good approach toward historical buildings
- Linked with e-mobility

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURU

Energetsko pogodbeništvo





PUBLIC PRIVATE PARTNERSHIP – ENERGY PERFORMANCE CONTRACTING

Initial conditions for EPC public procurement - 1

Procurement
1st phase

Procurement
2nd phase

Post procurement
phase

- EPCs have long term agreements therefore the PPP procedures apply.
- PPPs are complex arrangements. They require institutional and legal frameworks that are clear and conducive to their implementation, not all region have them. Most ESCOs are not well informed about them.
- Each public partner should have enough human capacity to implement EPC.
- Preparation phase and implementation of the procurement should involve at least experts from technical, legal and financial field. Usually some costs are incurred with the preparation phase. Cooperation with ESCOs is needed.



PUBLIC PRIVATE PARTNERSHIP – ENERGY PERFORMANCE CONTRACTING

Initial conditions for EPC public procurement - 2

Technical expertise
including
environmental impact
assessment

Legal expertise

Financial expertise
and public
budgetary roles

- ❑ Legal framework is very complex: to set the roles within the call and to prepare partnership agreement. The agreements are long-term and have a lot of specifics regarding technical and financial aspects.
- ❑ Financial conditions has 2 points of view: value for money issue and budgetary restrictions regarding public debts.
- ❑ Procurement preparation phase includes some market analysis including market development trends.
- ❑ Many new ESCOs have no clear knowledge about PPP, their risks and obligations especially in the countries with short PPP history.



PUBLIC PRIVATE PARTNERSHIP – ENERGY PERFORMANCE CONTRACTING

BENEFITS

- **Turnkey Service** – The ESCO provides all of the services required to design and implement a comprehensive project at the customer facility, from the initial energy audit through long-term Monitoring and Verification (M&V) of project savings.
- **Comprehensive Measures** – The ESCO tailors a comprehensive set of measures to fit the needs of a particular facility, and can include energy efficiency, renewables, distributed generation, water conservation and sustainable materials and operations.
- **Project financing** – The ESCO arranges for long-term project financing that is provided by a third-party financing company. Financing is typically in the form of an operating lease or municipal lease.
- **Project Savings Guarantee** – The ESCO provides a guarantee that the savings produced by the project will be sufficient to cover the cost of project financing for the life of the project.

Source: [https://www.energystar.gov/ia/partners/spp_res/Introduction to Performance Contracting.pdf](https://www.energystar.gov/ia/partners/spp_res/Introduction%20to%20Performance%20Contracting.pdf)

PERFORMANCE MONITORING AND VERIFICATION SYSTEM



- Essential for effective implementation of energy efficient measures and achievement of the imposed targets.
- Involvement of specialized institutions is needed (energy agencies).
- Develop a bottom up approach
- Have to have good, verified, traceable databases.
- It should be a Part of the energy efficient action plans.

EMPOWER PROJECT – co-financed from program INTERREG EUROPE, 2,3 mio EUR

<http://www.interregeurope.eu/empower/>

EMPOWER (More carbon reduction by dynamically monitoring energy efficiency) works on the exchange of good practices on dynamically monitoring energy efficiency in buildings, with special focus on the use of innovative financial instruments, in order to achieve more carbon reduction and to improve low-carbon economy policies.

Continuous approach: PLAN → DO → CHECK
AKT



HVALA ZA POZORNOST!

<https://maribor-pohorje.si>



TV
DAYS