ENERGY AND CLIMATE AGENCY OF PODRAVJE - ENERGAP

About the organisation

ENERGAP is managing the preparation and implementation of energy and climate action plans for more then 20 municipalities in the region. It helps to technically and financially plan the activities to achieve positive environmental results. ENERGAP informs, educates and advices different stakeholders about possible financial options for investments.

Key facts and figures

- **Location:** Maribor, Slovenia
- **Type of organisation:** Energy and Climate Agency
- **Number of employees:** 9
- **Founding year:** 2006
- **2 main services:**
  - Managing the implementation of energy and climate action plan
  - Preparation of investment plans including different financial options like EPC, Cohesion and other funds
- **Website and email:**
  www.energap.si

Author: Surveying and Mapping Authority of the Republic of Slovenia and Energap

Meet your mentor

Dr. Vlasta KRMELJ, Dipl. Ing. Director

Vlasta has over 20 years of experience and expertise in energy and climate management. She is an expert for strategical planning and financing of climate related projects and has the degree of European energy manager. She has supported many municipalities implementing sustainable clime and energy related projects using different financial mechanisms and sources.

"It is not difficult to find finances for sustainable energy projects. Good data and documentation give you many different possibilities."
Dr. Vlasta KRMELJ, Dipl. Ing. Director

- **Financing instrument:** EPC, combination of different funds
- **Thematic areas:** public and private buildings, public and indoor lightening

24 energy refurbished public buildings in one year using EPC

Municipality of Maribor with energy performing contracting implemented the biggest energy renovation project in the region in 2019. 24 public buildings were energy refurbished (schools, kindergartens, sport halls). Its implementation was followed by many stakeholders and media and is a good practice in the country. The cost of the project was 12 mio EUR. Yearly energy consumption was reduced by 5.952 MWh, energy costs by 446.000 EUR, maintenance costs by 28.500 EUR and CO_2 emissions by 1.305 tonnes.

Energy inefficient public buildings

In 2018, the Municipality of Maribor selected 24 energy-inefficient public buildings for a comprehensive energy renovation. Energy-efficient measures and the introduction of renewable energy sources were implemented in primary schools, kindergartens, administrative buildings, the ice (skate) hall and the sports hall. They included insulation of envelopes, new windows and doors, insulation of attics and basements, renovation of heating systems, instalments of thermostatic valves, new LED interior lighting and introduced energy management. Special attention was paid to user involvement, information and educational activities to influence the good climate and energy behaviour. The project was funded by the EPC and the private partner completed the work in just one year. The results of the project are: annual reduction of energy consumption by 5.952 MWh, energy costs by EUR 446.000, maintenance costs by EUR 28.500 and CO_2 emissions by 1.305 tons. 1.000 MWh of renewable energy is yearly produced. Indoor working and living conditions have been significantly improved and users are very satisfied.

Energy performance contracting as public private partnership

The project had huge energy saving potential therefore the energy performance contracting (EPC) in the legal form of public private partnership was the best option. With savings the investments will be paid off and still some savings are seen in the municipal budget. Through public procurement procedure private partner was selected and it is Slovenian ESCO, PETROL Group. The contract was signed for 15 years and saving are guaranteed through the agreement. The private partner has done the energy refurbishment of the buildings. It manages the energy related systems in the way that saving are achieved. The indoor comfort and heating and lighting standards are assured. In many buildings the comfort is even better than before. The public partner repays it with the savings during the contract period. After the end of the contract period all savings remains with the public partner. During the concession, the private partner ensures the maintenance of newly installed or renovated energy devices and systems. The project was financed 50 % by private partner, 35 % by Cohesion fund and 15 % by the Municipality of Maribor. Project is monitored regularly and savings checked by energy agency. The users are also interviewed about their perception of indoor comfort and management.

Public perception

Slovenia as former communist country historically has no trust in private sector. The project of energy refurbishment of 24 public buildings was first of its kind in the region to be implement with public private partnership. After 3 years of operation when savings are achieved the stakeholders believe that the project is good. It is true that it could be even financially improved in some part. The big success is that the trust was build and the municipality is already planning new energy performance contracting projects with private partner.

24 renovated buildings

Municipality and building users are very happy that project was finalized in only one year. Most of the work was done in school holidays and private partner has respected the user's needs during the renovation and now. The buildings are energy efficient, have good working and living conditions. The energy systems are new and operated and maintained by private partner what means also less work for housekeepers that sometimes have challenges to work with new equipment. And last but not least the buildings with new facades look very nice also from outside.

1.300 tonne of CO_2 per year less for 24 public buildings

- Pool of 24 public buildings energy renovated in one year
- Using energy performance contracting for 15 years
- Overall budget of the project 12 mio. EUR
- Co-financed by Cohesion fund
- Public private partnership established with the largest ESCO in Slovenia
- Energy consumption reduced by 5.952 MWh
- CO_2 emissions reduced by 1.300 tons per year
- 1.000 MWh of RES used per year
- Well improved working and living conditions for the users (children in kindergarten and schoolchildren)
- Good practice for the region with replication potential

Photos: ENERGAP

The PROSPECT+ project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101023271

Contact
ENERGY AGENCY OF PODRAVJE, Smetanova ulica 31
info@energap.si, www.energap.si

EPC for energy refurbishment of public-private building

Energy performance contracting in the form of public private partnership model is well known to be used in public and private buildings. To be used in the building that is owned both by public and private partner is technically possible but needs more coordination and understanding for all partners. Municipality Radlje ob Dravi has decided to use EPC model in such building. Municipal administration with the help of energy agency was able to manage and coordinate the project implementation and they have successfully realized it. They have newly renovated building in the town centre used for library, shop and caffe.

How to start?

The municipality owned a very old and inconspicuous building in the city center. All partners together did not have enough investment capital to be able to renovate it. The initiator was municipality that executed detailed energy audit of the building and prepared investment calculations. The documentation has showed that the renovation would achieve high enough money savings to make the investment attractive to the private partner to perform energy performance contracting business model. Into the financial calculation also Cohesion fund subsidies were included. The next step was the dialog with private co-owners. They had numerous conversations to explain how the EPC works, what an investment means and how savings are calculated. At the end the contract was signed between 4 partners: ESCO (private partner), the municipality (public partner) and two private owners. The contract precisely defines investments, savings and the methods of management and payments. The contract was signed for 15 years. The results show that savings have been achieved and all owners are satisfied with the realization.

Details of the agreement

All partners cooperated in the definition of energy refurbishment of the building. When public procurement was carried out also co-owners cooperated in the negotiation of technical, financial and legal aspects of the project. The key indicator in the agreement is the % of the ownership. The size of the building is 2.300 m2. Within the refurbishment new insulations, window and doors were built and heating system renovated. They use wooden biomass. The whole buildings in ventilated and air conditioned. During the work some additional measures had to be done like water drainage and new elevator. For each addition measure all 4 partners had to decide and agreed on technical and financial aspect and if needed signed the annexes to the agreement. When the work was finalized the management by ESCO has started. The energy use is detailed monitored in each room and within different devices to be able to define and calcite the savings and take into account the behavioural influence. The results are checked at least twice a year and once a year reported to all partners. The users are regularly contacted to be able to contribute positively to the savings and good management of the building.

Technical details

Before renovation the supermarket and caffe were in the building. After the renovation there are a shop and caffe in the lower level and library with exhibition center in 1st floor and in the attic. The investment cost of refurbishment was 1.1 mio EUR. Yearly energy savings are 389 MWh of heat and 1.1 MWh of electricity. The Heat is produced in highly efficient biomass boiler. Whole building is efficient ventilated and airconditioned. Cost saving are 42.000 EUR according to the 2019 prices. Reduction in CO2 emission is 180 tonnes per year.

Final words

Many people including some politicians were very sceptical about the success of the project. There were not many alternatives since the building is in the town centre and have to be nice looking and useful but there was not enough public money for renovation. Municipality did not want to sell it because they need more public spaces in the centre. With active role of the local administration many barriers were removed. The pilot can be used as a model and good practice for other similar buildings in the region. Not only technical details but also cooperation between stakeholders made the project successful and people are pride of it.

Good cooperation is saving 180 t of CO_2 per year

- EPC models can be used in different buildings with the public and private owners
- Good technical and financial documentation should be prepared to have all information need to make decisions
- Stakeholders have to understand all aspects of renovation – technical, financial, administrative and legal – and have the possibility to influence the different measures
- Energy and financial savings are high, also CO_2 emission are much lower
- With energy refurbishment the building looks nicer and get higher market value
- In the city centre such renovated building is shining example also for citizens and visitors
- EPC model help public sector to finance some projects that have high environmental, social and economic value

Photo: ENERGAP

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Energy efficient streetlighting with energy contracting performance model

Streetlights are essential in every village and city to assure safety, security and evening life. At the same time, they harm the environment – use a lot of energy and negatively influence the life of night animals. Therefore, the energy efficient and well-designed streetlight system is very important for each community and public spaces. In Slovenia many municipalities have used energy performance contracting to energy and environmentally refurbish the streetlighting systems. The reports show that they have saved money and improve the lighting conditions without the initial investment when using EPC.

Energy and environmentally efficient design of lighting

Two smaller municipalities in Podravje region have renovated the streetlighting system in 2017. Initial energy audit was done where detailed register of all lights was prepared. The current energy use was calculated and the lighting standards were checked. The audit of municipal budget was also done to find all streetlighting related cost were checked like maintaining, new bulbs, transport and lift costs and similar. The refurbishment project was prepared where for each lighting point new LED light of certain power and characteristic was proposed. Then the investment cost, energy and financial savings potential were calculated. When financial analysis had shown that with savings the initial investment could be paid the municipality had decided to use EPC model for renovation. Private partner was selected within public procurement procedure was selected. Within the negotiation phase the municipality also decided to use colored lights in the historical center and private partner was able to offer them within the proposed financial model. The work was done in very short period what was very important for citizen. Private partner guarantees the energy savings in the EPC contract for 15 years. They also maintain the streetlighting system according to the standards and needs of the municipality. The annual cost savings are then used to cover the investment and capital costs. Overall project objectives were to achieve savings and to have the lightening accordance to the environmental and technical standards.

Money and CO_2 savings with better lighting

Success factors of the projects are good technical preparation. It is crucial to have a meaningful and accurate inventory of the existing street lighting system as well as a good-quality audit to determine reliable saving potentials. LED solutions are showing to be proven technologies that are suitable for very small and very large projects and permit high energy savings at high lighting comfort. Even if investments are not very big usually municipal's budget is lacking of the capital or they have more needs in the areas where public private partnerships are not possible. In many cases EPC can offer a solution to overcome this obstacle. More than 70 % of money saving can be achieved. LED lights has longer life time and need less maintaining work what is also very important. In Slovenian law the maximal energy use for municipal streetlighting is defined. Therefore, it is very important to have energy efficient lighting to be able to fulfil also all lighting needs in the future. LED technologies are also very propriate to be combined with solar energy what can give even higher savings. Usually experienced private partners have good overview of the global solutions in the field of lighting that could be implemented in your areas.

Modern street lighting

When preparing streetlighting projects, it is important to look also in the future and set modern quality criteria. Technical specifications for a street lighting refurbishment include electrical power, luminous efficacy, light colour, expected service life, the ability to switch on/off and control the system and test certificates. New technologies of monitoring and control combined with solar energy, smart city solutions like video signals, environmental sensors are opening the whole new filed for municipalities. Street lighting poles can also serve as the filling stations for e-vehicle.

Are savings achieved?

When implementing the streetlighting projects using EPC model the savings are guaranteed with the agreement. According to the law not achieving them usually means that penalties should be paid. Energy agency of Podravje is monitoring the standards and savings in energy and money. The results shows that energy savings are reached in all projects or even higher than planned. Financial savings are depending on the electricity costs and when taking into account the price rise also financial savings are realized. There is no problem adding new lights. They can be easily added to the management system. In some cases, also new lights can become part of EPC agreement.

The society believe in environmentally efficient lighting

- Streetlighting is an important contributor to traffic and public safety
- Energy and environmentally efficient lighting is already a standard in modern world
- 70 % of energy and CO_2 savings can be achieved when using modern LED lights and management systems
- It is important to have good technical design of the projects
- LED lighting can be combined with solar energy and smart city solutions
- Energy performance contracting EPC can be used for small and big projects
- Expansion of the number of lights is easy also within EPC contract
- Yearly monitoring of the results is important

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