



Tips Learned

5th Interregional Event

ENERSELVES Policy instruments for energy self-consumption in buildings



Country: **Romania**

Region: **North-East Region | Iasi**

Host partner: **North-East Regional Development Agency [ADR Nord-Est]**

Dates: **30th – 31st January 2018**



Objectives of the event

Even though the North-East Regional Development Agency (North-East RDA) has no legal responsibilities nor competencies in the field of energy efficiency, since 2011 the agency has been involved in several energy efficiency projects in order to support North-East Region's actors in the transition to sustainable energy and to boost the added value of regional initiatives, including the involvement of local and regional partners in experience exchanges in this area.

Therefore, the overall objective of the event was to increase the capacity of project targets groups with interregional learning while the focus on the 5th Interregional Event was to present regional best practices already implemented in the region by using ERDF funds from Regional Operational Programme and Sectorial Operational Programme for Competitiveness 2007-2013 as basis for the regional target group to be able to get out the most of them as source of inspiration for increasing the energy-related project pipeline and further elaboration and submission of the projects of energy efficiency in public buildings as well as improving the self-consumption in public and residential buildings under Priority Axis 3 - Supporting the transition to a low carbon economy of the Regional Operational Program 2014-2020 which is also the policy instrument envisaged under ENERSELVES project by the North-East RDA.

Day 1, 30th of January 2018

Summary of agenda including speakers

09.30 - 10.00	Registration of the participants – Welcome coffee
10.00 – 10.30	Presentation of ENERSELVES project and of Self-Assessment Report on Renewable Energy Technologies in North-East Region of Romania <i>Ovidiu Savu, project coordinator, North-East RDA</i>
10.30 – 11.00	Tools for supporting the implementation of nZEB (nearly-zero energy buildings) concept in Romania – transition to a sustainable building stock. <i>Dr. Horia Petran, Romania Green Building Council - National Institute for Research and Development in Construction, Urban Planning and Sustainable Territorial Development, Bucharest</i>
11.00 – 11.45	Presentation of the projects implemented on energy efficiency: EFFECT and EMPOWERING <i>Ramona Tanasă, Head of External Cooperation Office, North-East RDA</i>
11.45 – 12.15	Coffee break
12.15 - 13.00	Presentation of the projects – Thermal Rehabilitation of Tudor Vladimirescu University Campus and ENERED Centre <i>Prof. Dr. Eng. Neculai Eurgen Seghedin, Prorector responsible with didactic activity and quality insurance, Gh. Asachi Technical University of Iasi</i> <i>Eng. Camelia Nițulescu, Head of Social Office, Gh. Asachi Technical University of Iasi</i>
13.00 – 14.00	Lunch break
14.00 – 14.30	Investment projects for providing the energy self-consumption in public buildings – good practices of Roman Municipality <i>Marius Chirugu, Energy Manager, Roman Municipality Town Hall</i>
14.30 – 15.00	Miroslava Photovoltaic Park – investments into the benefit of the community <i>Eduard Stoica, executive director, Miroslava Commune Hall</i>



Project meeting

The project meeting was initiated with a brief yet comprehensive presentation of the ENERSELVES project followed by a summary of Self-Assessment Report on Renewable Energy Technologies in North-East Region of Romania. As far as the self-assessment report is concerned, it was highlighted the fact that given the fact that in Romania: 1. the regions are statistical NUTS2 and not administrative regions (with no regional government); 2. there are no regional energy agencies, the energy-related issues & strategies are regulated and coordinated from national level; 3. regional energy suppliers and/or distributors do not provide any information concerning public/household/industry supplying/consumption data as the latter are considered subject to be confidential data that may negatively influence free-market competition – it was impossible to collect information concerning total energy /renewable energy consumption. This is the reason why all information was referred to/provided in relation to total existing potential/production capacity. The report analysis also showed that the most adequate technologies to be used in the NE Region of Romania for production of energy from renewable sources are: micro-hydro power units, wind and biomass technologies.

Lectures

Tools for supporting the implementation of nZEB (nearly-zero energy buildings) concept in Romania – transition to a sustainable building stock.

The presentation included a very comprehensive set of information for substantiation of nZEB concept and related legislation, starting from definition of nZEB and levels of performance, the European context (2030 framework concerning EU's climate and energy policy), Pro-nZEB Cluster (www.pro-nzeb.ro), nZEB competences and skills, energetic renovation of buildings, green buildings (example and technical requirements imposed by a passive house), sustainable communities as well as relevant project concerning the above-mentioned issues. Oh high interest was proved the ENERFUND project, a tool intended to evaluate and classify the major building renovation opportunities for energy efficiency for assessing the points in credits and banking products to be used also by banks in evaluating the customers and the application developed: app.enerfund.eu.

Presentation of the projects implemented on energy efficiency: EFFECT and EMPOWERING

The general objective of EFFECT project (EFFECT - Upgrading Energy Efficient Public Procurement To Support A Balanced Economic Growth In See Area, funded by South-East Europe Transnational Operational Programme) was to stimulate the adoption and adaption of EU renewable energy policies in SEE area, upgrading public authorities and energy local key actors, acting on the leverage of energy efficient public procurement (EEPP) as key instrument to improve competitiveness and promote balanced and sustainable economic growth in involved Countries, able to face the growing energy demand. EU public procurement impacts for more than 16% on EU GDP and it is an important tool for public authorities to effectively address energy efficiency policies fostering production and consumption of energy efficient products and services and the adoption of energy technologies. The main result was the first Guide for Energy Efficient Public Procurement in Romania.

Based on the experience gained through the implementation of the EFFECT project, the North-East Regional Development Agency continued its incentive actions to integrate energy efficiency in as many areas as possible in the region. A first step in this endeavour was to create a strategic framework to support concrete actions and measures aimed at energy efficiency at local and regional level. The EMPOWERING Project - Supporting Local Public Authorities to Build Integrated Strategies in the Field of Sustainable Energy (H2020) started in February 2016 and was dedicated to encouraging and accelerating the transition to a low-carbon society, aiming to strengthen the capacity of regional representatives and mayors to develop strategies and integrated action plans for energy efficiency. The aim of the project is, among others, to develop a set of working tools for energy planning in the context of the EU Climate and Energy Policy, to support mayors in the region to develop new



SEAPs (Sustainable Energy Action Plans) and update the existing ones (a total of 12 municipalities), to support the mayors to join the Covenant of Mayors and the elaboration of the 2050 regional energy vision, including the correlation of the action plans developed with ERDF and ESF funds for investment and growth, as well as new models of innovative financial instruments.

ENERED Centre and Thermal Rehabilitation of Tudor Vladimirescu University Campus

ENERED Center is an interdisciplinary research and development platform for efficient and sustainable energy, created within the "Gheorghe Asachi" Technical University in Iasi. The project led to the development of the R&D infrastructure through the modernization of 10 existing laboratories and the establishment of a brand new one. The organizational framework was also established and functional collaborative research links established between the component laboratories of the platform. The total value of the project was 51,031,879 Romanian Lei (approx. 11.3 million Euro) funded by Sectorial Operational Programme for Competitiveness 2007-2013 (grant of 85%).

The project for **Thermal Rehabilitation and Modernization of the "Tudor Vladimirescu" Campus** in Iasi from the energy point of view and the complementary services provided to the students in order to ensure the medium and long term access of the population from the North-East region to the technical higher education in accommodation conditions and complementary services provided at European standards, envisaged – among others – the following main investment objectives, namely:

- Thermal rehabilitation of 12 dorm buildings and 2 thermal points in campus Tudor Vladimirescu
- External thermal and electrical networks in Student Campus
- Cogeneration modules for electric and thermal energy





Through the same project, the canteen of the institution was renovated, two sports fields were modernized, all the pipes (2.2 km length) that brought heat to the dorms were tiled and provided with thermal insulation. Thus, the savings made in 2013 compared to the same period in 2009 were of 13% for heating and 32% of energy consumption. This means an estimated saving of 1 million Romanian lei (222.000 Euro) and without this European project, the investments made in about four years would have been made instead in 30 years.

The "Tudor Vladimirescu" Campus belonging to the Technical University in Iasi is one of the largest in Eastern Europe, with a capacity of 8,500 students in its 21 dorm buildings.

The total value of the project's budget was of 55,816,260.00 lei (12.4 million Euro).

The municipality of Roman presented a hybrid solution that uses heat pumps, solar thermal panels and natural gas heating, considered the best for public buildings in terms of both investment and efficiency. With the new annual technical system, 1,282 MW of solar energy and 2,225 MW of geothermal energy are produced. This energy is not polluting, the amount of CO₂ that will no longer be emitted into the atmosphere is of 1,578.23 tons year.

Last but not least, **the Photovoltaic Park of Miroslava Commune** was presented, investment that was also part of the study visit of the next day 31st of January 2018.

Tips learned – comment from participants

Most interest was shown to ENERFUND project especially to the application **app.enerfund.eu** willing to have even more information about this pilot project. On the other side, many of the stakeholders got in touch with the expert (energy auditor and evaluator of energy projects) brought to the meeting by the organizer, North-East RDA, for asking specific questions related to technical and procedural aspects for a very good elaboration and submission of the projects to be funded under the Regional Operational Programme 2014-2020, Priority Axis 3 - Supporting the transition to a low carbon economy.



Study visit

1. Cogeneration modules for electric and thermal energy





Data and Key Performance Indicators

In the following table, some data and Key Performance Indicators (KPIs) of the installations visited are showed:

Cogeneration modules for electric and thermal energy	
THERMAL SIDE	
Installed (nominal) renewable power capacity (kW):	15,202 kW
Type of energy generated:	Hot water (max. temp at outlet: 105°C; min. temp. at inlet: 70°C; max. pressure in the hydraulic system: 6 barr)
Energy generated per year (kWh):	5,965,000 kW
Energy Self-consumed per year (kWh):	835,000 kW
Increased efficiency after installation (%)	43%
ELECTRIC SIDE	
Installed (nominal) renewable power capacity (kW):	3,674 kW
Type of energy generated:	electricity
Increased efficiency after installation (%)	41%
OVERALL INVESTMENT	
Annual net reduction of GHG emissions:	894 tons of CO ₂
Investment (€):	5.36 million Euro (24,141,699.37 Romanian Lei)
Payback (in years):	24 years
Grant type (if any):	85% ERDF; 13% National co-financing; 2% own co-financing - Regional Operational Program 2007-2013 (Priority Axis 3: Improvement of Social Infrastructure, Area of Intervention 3.4: Rehabilitation/Upgrading/Development and Equipping of Pre-university Educational Infrastructure and University Infrastructure for Continuing Vocational Training)
Total quantity of grant (€):	4,67 million Euro

2. Laboratory of engineering of energy systems supplied from renewable sources





The purpose of the research carried out in this laboratory is represented by the latest trends in the world regarding:

- Changing the type and characteristics of primary resources: use of renewable resources, distributed generation, etc;
- Increasing the demand for reliability of service and energy quality for consumers sensitive to disturbances;
- the emergence of Smart Grids-type smart networks.

The laboratory has:

- A physical simulation system, which is one of the most complex power system models on the international market. It includes 3 main modules:
 - a simulator module comprising submodules for all components of an electric power system;
 - generator module for system simulator (consisting of submodules for classical and renewable sources - wind, solar, hydro);
 - SCADA module.

The simulator is a useful support in expanding researches in power systems relative to:

- Validation of models based on theoretical methods;
- study of the integration of renewable sources into existing networks;
- optimizing the exploitation of energy sources;
- Integrated energy management;
- analysis of disturbances caused by power sources in electrical networks.

The simulation system also allows testing of protection and automation systems, the operation of switching equipment, optimization solutions for the structure and operating regimes of current systems in the context of the integration of new energy sources.

- Phase Shift Measurement Device that must allow multi-functional monitoring and analysis in power systems, with Phasor Measurement Unit (PMU) facilities. It is based on a modular hardware structure that meets the needed requirements in the operation of power systems and is easily modified or expanded if these change requirements allow.
- Modern computer network with high performance software (EMTP, PSCAD, FLUX 2D) required to conduct research in good conditions.

Through these facilities, the laboratory contributes to the development of the scientific research capacity and to the achievement of international scientific and technological results of the specialists in the Technical University of Iasi. **The level of investment needed to acquire the equipment: about 700,000 euros (ROP 2007-2013).**





The laboratory equipment, its functionality and fields of applicability were presented by Conf. dr. eng. Gheorghe Grigoras, Head of the Research Lab, Faculty of Electrical Engineering, Energetics and Applied Informatics and his Ph.D team

3. Photovoltaic Park, Miroslava Commune

The solar park investment was carried out by the Hall of Miroslava Commune with funding support from the Sectorial Operational Programme for Competitiveness 2007-2013. The project implementation period was 14 October 2013 - 31 July 2015. It led to a reduced dependency on primary energy resources, insertion into the economic circuit of 5 hectares land with direct effects for the social-economic development of the area, created 7 new jobs and providing the energy consumption for the public buildings and public lighting system. Due to the complexity of the project, it was structured per 7 different objects of activity:

1. Photovoltaic station and technological electric installations
2. Main building with control panel
3. Video security surveillance, detection and alarming system
4. Firefighting detection and alarming system & Data and communication system
5. Civil constructions
6. Access roads, parking lot
7. Connection to the national grid (including transformers)



Data and Key Performance Indicators

In the following table, some data and Key Performance Indicators (KPIs) of the installation visited are showed:

Photovoltaic park – Ciurbesti village, Miroslava Commune	
Renewable energy – installed capacity (MW):	1MW
Number of trackers:	97
Total number of photovoltaic panels	4,200 monocrystalline panels
Number of photovoltaic panels /tracker:	80 trackers have 44 panels and 17 trackers have 40 panels
Type of generated energy:	Electricity
Energy generated per year (kWh):	1,605.55 MWh (in 2017)
Total energy generated since getting into operation:	3,292.55 MWh during August 1st, 2015 until December 31 st , 2017
Saved emissions (kgCO ₂ /year):	Not available/not applicable
Investment value (€):	3.78 million Euro (17,016,458.47 RON)
Payback time (years):	Information not available
Type of grant	85% ERDF, 13% co-financing from Romanian State budget, 2% own contribution (Sectorial Operational Programme for Competitiveness 2007-2013).
Total value of the grant	3.69 million Euro (16,582,509.83 RON)



