

The Kozani Pilot, Greece

Cluster of Bioeconomy and Environment of Western Macedonia – CluBE,
Municipality of Kozani – MoK

Kozani 501 00, Greece

<https://www.prolight-project.eu/demo-case/kozani-greece/>



Overall summary:

The project will deploy its solutions to a social dwelling in Kozani, Greece.



ProLight Demo district – GENERAL DATA

Pilot description and expected performance results (incl. No. of buildings, Building type, Renewables, Others):

The pilot project is planned to design and implement energy efficiency solutions and smart net metering for a residential flat among the ones that have been donated by the Greek State to population with lower income in the City of Kozani. Overall, the City hosts approximately 500 dwellings (out of 25.000 total dwellings) that have been donated by the State to the poorer people. These houses were constructed with the lowest specifications of Energy Efficiency, which results into higher needs for electricity and heat, in an area (Western Macedonia, Greece) that is subject to harsh winters, being the only non-coastal and fully mountainous Region of the country.

The project will consist in renovating the flat of a public owned multi-storey house by improving its thermal insulation (to reduce the consumption at the first place) and installing PV panels on the roof to be used in net-metering mode (to balance the electricity production with free solar energy and allowing to pay only electricity costs of the supply and demand differences). In parallel, the Energy Community (EC) of Kozani has installed a solar capacity of 6MWp; although there is no surplus to be donated to the most vulnerable population. EC Kozani, in direct coordination with the Municipality, is considering acquiring further capacity, part of which may be “donated” to lower income households. This is especially even more urgent, due to the imminent decommissioning of the lignite power plants in the Region, that once used to provide up to 75% of the country’s total electric energy and which still provide the heat for the district heating in the city of Kozani.

The project which aims, among others, at installing RES and assisting the most vulnerable parts of Kozani’s population, will be carried out by the Cluster of Bioeconomy and Environment of Western Macedonia (CluBE). CluBE will be in charge of the planning and implementation process of the demonstration actions in the site of Kozani and will also raise investments and funding to complete the renovation of the selected household. The Municipality of Kozani (MoK), together with CluBE, will perform the in-depth analysis of the existing status quo of the apartments identified and the selection of the household to be upgraded. Currently, MoK in collaboration with CluBE is conducting a survey concerning the Energy poverty of the social housing of the city, in order to define the “right” dwelling that meets the criteria that MoK has set for renovation. Afterwards, CluBE will undertake the construction of the household selected. Finally, following an assessment of the performance achieved and the projection according to building types, an overall plan for the upgrade of all the buildings in Kozani will be drafted by EC Kozani and CluBE, including specific contacts with financial resources (relevant Ministries, Regional Operational Program, European Investment Bank, etc), in order to cover the entire vulnerable population in a concerted and organised manner, achieving economies of scale and drastically improving the energy performance of these households. The overall idea would be that the tenants will save 30% of their electricity bill, while they will also receive an estimation of which would be the cost and which share of that might be covered by the City of Kozani, to reach a total Climate Neutrality by 2030.



Climate area, Location urban/suburban

Climate area: Continental

Location: Urban

Energy performance [kWh/m²*a] (Current / after renovation): 252 / 50

ProLight figures for the New European Bauhaus

KOZANI, Greece

1 out of 500 apartments

2 Residents

Integrated Renovation Status: 1 out of 500 apartments will be refurbished.

Livability: The apartments are donated by the State to the lower income population. It will act as a motivation for public institutions to undergo a major refurbishment project for all these apartments & for the envisaged city's climate neutrality.

Technological advancement: Besides the upgrade & the provision of solar thermal energy, the apartment will host sensors to monitor & optimise its performance. It will be connected to a Municipal solar P/V park through virtual net metering.

Social Innovation/Business Models: The Municipality of Kozani will test & examine the technical solutions & the implementation, in order to then scale up to the rest of the population living in the social apartments.

Which business model is used (e.g. ESCO, PPP, one-stop shop, others)?

Direct investment from CluBE, potentially benefiting from a public - private co financing so as to make available solar electricity for free to very low-income populations (tenants). Net metering will be applied for the balance between self-consumption and the distribution of the rest of the electricity to the national grid, thanks to digital tools and smart meters.

Utilised financial supporting instruments:

Sponsorships from local construction companies and local material stores.

Main economic activities in your city/region:

The main economic activity of the city, for many decades, was the lignite mining and the power plants which is expected to last until 2028 due to the decarbonisation phase Kozani is experiencing. Kozani is also a pole for winter tourism as well as an emerging agro-tourism destination.



Envisaged local dissemination activities:

CluBE will perform local and regional dissemination activities, in order to show case the construction works and demonstrate its effectiveness and capacity to improve the living conditions and economics for the most vulnerable population. At the same time, a parallel campaign will target the local ecosystem of construction companies, in order to improve their understanding of the benefits that these interventions can have and the size of work involved for the local companies. A special attention will be given towards promoting its applicability to the rest of the similar houses in Kozani and the whole Region, while through one of its members, the Association of all Municipalities in Greece (KEDE), it will promote the scheme to all cities in the country.

LEGISLATION

Did you have any special challenges regarding town planning and legislation? What are the lessons learnt?

The Directives 2010/31/EU (Energy Performance of Buildings Directive-EPBD) [5] and the 2012/27/EU (Energy Efficiency Directive – EED) introduced specific measures for improving the energy performance of the European building stock. Although the aforementioned Directives were amended by 2018/844 and 2018/2002 Directives a major focus of the EPBD is nearly Zero-Energy Buildings (nZEBs) both for new buildings and renovations, as well as the long-term renovation strategies through cost-effective approaches.

Lessons learnt: The first Thermal Insulation Regulation was introduced in 1979, and it was for its time a very strict one. However, it was not updated or recast until the introduction of the Energy Performance of Buildings Regulation (KENAK 2010) in 2010. The results of this hiatus period are unfortunately felt to this day. In terms of the date of construction of residential buildings 30% were constructed before 1980, i.e., they have no thermal protection, and 60% were constructed from 1981 to 2005. Hence, the buildings constructed in the period between 1990 and 2005, when the construction sector was booming, were built according to the initial Thermal Insulation Regulation, which by that time was already quite outdated. Due to the economic recession, the number of buildings constructed after 2008, near the year of implementation of the minimum requirements foreseen by KENAK (KENAK 2010), represents only 7% of the total stock of normal residential buildings used by households..



How are energy communities regulated in your country/region?

Greece adapted the European Union energy community legislation in 2018. The establishment and operation of the Energy Communities, as introduced and established by Law 4513/2018, constitutes a new and integrated institutional intervention supporting social economy in the energy sector. In this context, the founders of Plegma Labs started the initiative which would later become the Plegma Energy Community.

The concept of energy communities was introduced in the Greek reality with the Law 4513/2018. This legislation has been welcomed in Europe as an innovative, participatory tool that enables the local community (natural persons, SMEs, and local authorities) to contribute to the transition of the country towards clean energy sources. Unfortunately, the recent developments on the framework of energy communities in Greece threatens their existence and development and, thus, the participation of citizens in the energy transition.

The legislation about the EPBD doesn't mention anything regarding the microclimate conditions. Changes concerning this issue are expected to be published based on the EU legislation.

STAKEHOLDERS

Local stakeholders and partners:

The Cluster of Bioeconomy and Environment of Western Macedonia will undertake the renovation and PV activities, assisted by MoK and one of CluBE's members, the University of Western Macedonia, which is in charge of the engineering and project development in the building renovation process. The University of Western Macedonia will perform the analyses of data regarding the household(s), before and after the interventions. CluBE will also undertake the local coordination of all involved parties and stakeholders (Municipality of Kozani, other regional municipalities, technical experts, etc), the promotion and dissemination activities, the contacts and attraction of public and private investors, etc. Also, due to its great network of members and connections with the local productive tissue, CluBE will undertake the mobilisation of local manufacturers in order to maximise the added value of the project implementation.

What are the advantages that the stakeholders may have when they contribute to or are involved in the project?

The stakeholders that are getting involved in the project will gain knowledge and experience on how to deal with the energy efficiency upgrade of buildings with lower income residents. Furthermore, they will have the chance to contribute to the design phase of the renovation actions trying to achieve the indicators that were set by the project. Finally, it is a good opportunity that different types of stakeholders (Regions, Municipalities, Property owners, Construction companies, Energy providers, Local district heating companies, Citizens) will come together and have the chance to exchange knowledge.



REQUIREMENTS

Energy poverty (redistribution of benefits)

- How do you address energy poverty?
- How do you redistribute the benefits generated by the project to the tenants?
- How do you prevent gentrification after the renovation?

Response:

- Two-fold approach: reducing energy consumption and providing renewable energy.
- The project will lead to decreased consumption, which constitutes the benefit of the residents.
- It is a small scale renovation, so there is no risk for gentrification in Kozani.

Circular economy and local value chains

- How do you include principles of circular economy in your project? (i.e. specific local value chains like for example timber wood construction etc.)
- Do you use or are you interested in using by-products from other value chains for your renovation? (i.e. alternative materials for insulation)

Response:

- This is not really covered: even if we talked about recycled wood and other materials from construction sector, it wouldn't be allowed by the current national legislation.
- Not allowed normally by the legislation.

Industrialization and prefabrication

- How is your renovation process including or is compatible with industrialization, standardization and prefabrication? (i.e. modular cladding, prefabrication of modules with integrate BIPV BAPV, Lean process construction... etc.)

Response: It is not currently; however, we had some initial discussions with local construction companies for their potential interest to industrialize their production line and the first approach was very positive. We will include them as stakeholders.

Energy communities (ict and/or social driven)

- How your project promotes the activation of energy communities based on ICT and Social Innovation?

Response: The Energy Community of Kozani will be associated to the project as a stakeholder, for the endorsement of the concept and principals and potential future replication.



New European Bauhaus

How your city – or local context hosting the project – is promoting the New European Bauhaus concept?

1. sustainability, from climate goals, to circularity, zero pollution, and biodiversity
2. aesthetics, quality of experience and style, beyond functionality
3. inclusion, from valorising diversity, to securing accessibility and affordability:
 - a. reconnecting with nature:
 - b. regaining a sense of belonging:
 - c. prioritising the places and people that need it most:
 - d. fostering long term, life cycle and integrated thinking in the industrial ecosystem

Response: Kozani is starting to endorse the New European Bauhaus concept and incorporating it within its strategic way of thinking for the future of the city. In fact, Kozani is one of the 100 Climate Neutral Cities by 2030 (EU Mission), where the Bauhaus concept is playing an important role in the sense of wood becoming a widely used material for façade refurbishment. Consequently, wood will act as a carbon sequestration tank, while it will also contribute to aesthetic reasons, reviving old local traditions where wood used to be a significant component of local house construction. Finally, the use of wood is expected to have very positive impacts on the efforts of reviving and boosting the local wood industry. Also, Kozani is one of the Lighthouse cities of the Eyes Hearts Hands Urban Revolution (EHHUR) project, which aims to revitalise a whole area of the city, including two schools, the University Research Center and a park, with main goal to develop and test a co-designed methodological structure in their built environment transformation by using already existing good practices and complementing them with the New European Bauhaus and EU Missions principles.



AMBITIONS

What are the demos' visions?

Bringing in motivation for public institutions to undergo a major refurbishment project for all the social dwellings & for the envisaged city's climate neutrality.

Did you have a statement, which?

To be one of the 100 Climate Neutral and Smart Cities in Europe and one of the 6 in Greece.

How was it to establish an energy community?

Due to the reduction of electricity production from coal which will have a big impact on the local economy. The Municipality of Kozani created an energy community and the name is Energy Community of the Just Transition.

In this Community, apart from the Municipality, private investors and citizens (natural persons) also participate. Its form ensures the enhancement of shareholders' incomes, the development of local entrepreneurship while contributing to the protection of the environment.

This Community acts as an example of good practice, opening perspectives in the field of the new economy that has been formed, while its concern is the utilization of local renewable resources for the benefit not only of its shareholders but also of local communities.

The Energy Community (EC) is of high success and the Municipality of Kozani also examines the possibility of "net - metering" part of that PV energy to the most vulnerable population of the city.





ProLight

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- Energy communities in [Spain](#), [Italy](#) & [Portugal](#) combined in so-called Innovation clusters

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