AN ENERGETIC COMUNITY AND ITS IMPACT ON THE URBAN **REGENERATION PROCESS**

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Abstract. The European Union aims through the European Green Deal (EGD) to achieve climate neutrality by 2050 and become the champion of the global fight against climate change. The latest objectives of the new strategy to transform the European economy into a climate neutral economy are the following: economic growth to be equivalent to the use of resources and no person or place to be left behind by 2050. Investment in environmentally sustainable technologies, encouraging innovation in industry, implementing greener, cheaper and healthier public and private transport, decarbonising the energy industry and ensuring that buildings are more energy efficient.

The energy industry is a strategic sector and of national interest, thus, increasing the production of energy from renewable sources is essential to achieve the renewable energy target for 2030, as well as to facilitate its achievement of the target of reducing greenhouse gas emissions by at least 55% by 2030, according to Regulation (EU) 2021/1.119 of the European Parliament and of the Council. By 2030, Romania should eliminate emissions of 37.9 million tCO2 eq from other economic sectors, such as energy efficiency in buildings, agriculture and transport. The installation of photovoltaic panels for the total self-consumption of Territorial Administrative Units can allow, the optimization of processes and services must be oriented towards beneficiaries, implementing standard procedures and mechanisms to support decision-making and long-term strategic planning, and active participation in the process of urban territorial regeneration.

Keywords: energetic comunity, carbon reduction, urban regeneration.

1. The concept of energy community

Considering the regional geopolitical context, the Union should focus on accelerating the green transition and ensuring an energy policy that reduces emissions, in order to reduce dependence on imported fossil fuels and to promote reasonable and affordable prices for Union businesses and citizens in all sectors of the economy. accelerating the green transition and ensuring an energy policy that reduces emissions, in order to reduce dependence on imported fossil fuels and to promote reasonable and affordable prices for Union businesses and citizens in all sectors of the economy,

The European Union is working towards the efficient and sustainable use of resources, which is a necessity in the modern world. A sustainable economy must focus on developing a green and competitive economy, avoiding waste, modernising industry to reduce greenhouse gas emissions, increasing the share of renewable energy in gross energy consumption, raising the level of education and other needs. Sustainable development in the territory of a local administration must be in tandem with public policies at national, European and international levels, it will improve the quality of life of citizens. Increasing the efficiency of the use of energy sources is the main goal of investments in renewable energy technologies. This will increase energy independence and economic competitiveness throughout Europe.

1.1. Challenges and objectives

The main challenges at national level associated with implementing the climate transition in the sustainable energy, mobility and transport sectors, lead to the need for an integrated approach to measures to implement new strategic approaches in terms of investment, technology and urban regeneration.

Across Europe, we are facing multiple social crises, including climate, health, economy and

democracy. Communities are already facing the initial effects of climate change, such as droughts, crop failures, floods and fires. These effects, extreme weather conditions are forcing more and more people to leave their homes.Climate injustice: those who have contributed the least to global warming are the ones who face the worst consequences. Marginalized communities around the world, who consume the least energy, are becoming the most vulnerable to climate consequences. Europe has taken on its historic responsibility to manage this crisis, trying to be a leader in the process of solving the climate crises and consequences. Usually, the lack of solidarity and democracy seems to be the cause of the climate crisis.

To promote energy efficiency among members of local public administrations, renewable energy communities can be created that, among other things, contribute to achieving the Just Transition objectives, to providing social, economic and environmental benefits to members of the renewable energy community. Energy communities support an energy democracy, which promises an economy and a society that work together, rather than in rivalry, within the limits of the Earth's natural resources.

A practical way out of many crises is to produce and own the energy needed to achieve energy independence. We can collectively address social and climate challenges by returning energy to people and communities. Energy communities can boost local economies not only by lowering costs and keeping money in the community, but also by creating jobs. This type of initiative unites communities, reduces energy poverty and allows people to reduce their energy consumption, thus reducing the pressure on new renewable energy projects at local level.

The European energy system is currently at a critical juncture. The old system of overproduction, polluting energy and giant corporations working for profit is changing. This is the time to lay the foundations for a new system that is based on renewable resources. Much of it is flexible, decentralised and owned by communities and citizens.

Creating capacities to produce electricity contributes to achieving energy security objectives, focusing on diversifying energy sources and reducing energy dependence. Installing a photovoltaic production capacity can be used to generate energy from renewable sources, reducing annual greenhouse gas emissions, which means a significant reduction in tons of CO2 equivalent/year, for all members of the energy community.

1.2. Just Transition in Romania

The transition to a low-carbon economy, based on restructuring processes in energy-intensive industries, is underway in Romania. The restructuring of electro-intensive industrial sectors such as steel production in Galați, fertilizer production in Mureș, oil and gas extraction and refining in Prahova, coal mining and coal-based energy production in Hunedoara, Gorj and Oltenia, as well as other heavy industries that have been gradually phased out, such as fertilizer production in Dolj and steel manufacturing in Hunedoara.

The stakes of urban regeneration become important in the process of just transition, given that this process has some particularities regarding the processes of physical degradation of the built environment, but also in other aspects of a social and economic nature.

In the process of urban regeneration, development programs were promoted to help this process, it is true that at the time of their launch, the concept of just transition did not exist, but it became necessary in the context of climate change and the development vision of the European Union. In Great Britain, for example, the "ABI (Area-Based Initiatives) system was promoted and has become one of the main instruments and policies available to governments to start the regeneration process, included in approaches centered on the urban community initiative".

Practically, the programs and stakes of urban regeneration have materialized not only in revealing some particularities regarding the processes of physical degradation of the built environment, but also in other aspects of a social and economic nature.

1.3. The current situation in Prahova County

Prahova County, like many other European regions with significant potential for natural resource endowment, has grown up around the value and diversity of its output based on these resources, which include forestry, natural gas, crude oil, and others.

In order to accommodate Romanians and foreigners who came to work in the mines, refineries, and oil fields in the second half of the 19th century, villages, towns, schools, hospitals, and cultural centers were constructed. As a result, when the dominant industries of this type decline, what remains is an extraordinary challenge in terms of economic development.

The economy of Prahova County has historically been based on industry. About 53% of all economic activity is attributed to industry, with the extractive sector, crude oil processing, coal coking, etc. holding the largest shares of industrial activity.

For economic activities based on the production and use of fossil fuels, specifically coal, lignite, peat, and oil shale, these sectors are in decline, recording an irreversible reduction in economic output and employment levels. In contrast, other sectors with high levels of greenhouse gas emissions, for which technological alternatives to carbon-intensive processes can be found, will require technological transformation, re-conversion, etc., in order to maintain economic output and increase employment.

The Integrated National Plan for Energy and Climate Change (PNIESC) approved by the European Commission in 2020 provides for a 50% reduction in GHG emissions compared to 1990 levels by 2030, which translates into a 2% GHG reduction target compared to 2005 levels, the evolution of GHG emission reduction compared to 2005 is presented in the graph below



The economic structure is dominated by industrial activities. The largest share in industrial production is held by the oil processing industry, followed by the food, beverage and tobacco industry, machinery and equipment, chemical and rubber processing, mining, textiles and clothing, metallurgy, metal construction and metal products (except equipment, machinery and installations), wood processing (including furniture), pulp, paper, cardboard and printing. The EU's integrated climate change and energy policy has as its overall target to keep the increase in the global average temperature below 2°C (preferably below 1.5°C) compared to pre-industrial levels. In the event of exceeding the 2°C limit (or even the 1.5°C threshold), the risks are numerous, dangerous and unpredictable, causing an exponential increase in the costs of adaptation compared to the costs of intervention and slowing down this phenomenon. To achieve this objective, the European Union has developed the European

Green Deal package, and for areas whose industry is dependent on fossil fuels, the EU has developed the Just Transition mechanism with the stated aim of supporting these areas in making the transition to a climate-neutral economy. Prahova County is included in the list of beneficiary counties of the

² The emission values correspond to the forecasts developed in December 2018, according to the PNIESC Project; it is estimated that the final value for 2030 will decrease due to the decrease in final energy consumption, as well as the decrease in energy production from coal.
³ Source: Ministry of Environment, Waters and Forests, National Greenhouse Gas Emissions Inventory, 2018, Deloitte calculations based on Romania's reporting on GHG emissions forecasts to the European Agency

Just Transition mechanism and can benefit from these funds. Historical pollution with petroleum products still makes its presence felt in the county.

Sustainability for the entire society is ensured through a sustainable urban regeneration process that is correlated with the just transition process. This is achieved by providing manageable units of information that aid in decision-making, as well as adequate indicators that measure actions that have value for the community and the evaluation of the measurement.

1.4. Just Transition and the European Green Deal in Prahova County

On 11 December 2019, the Commission adopted a Communication on the European Green Deal, setting out its roadmap for a new growth policy for Europe. This growth policy is based on ambitious climate and environmental targets and participatory processes, bringing together citizens, cities and regions in the fight against climate change and for environmental protection.

In keeping with the goal of efficiently and fairly attaining EU carbon neutrality by 2050, the European Green Deal suggested a Just Transition Mechanism, which includes a Just Transition Fund, to ensure that no one is left behind.

The negative consequences of climate change and environmental degradation are most likely to affect those who are most at risk. However, handling the shift will result in major structural changes, thus Prahova County workers and residents will be impacted differently, and not all parts of the county begin the transition at the same level and have the same ability to respond.

Under current technological conditions and without investments, the cost of extracting crude oil and underground coal is relatively expensive. These expenses are then reflected in the cost of producing energy.

Prahova County mine closures and activity restrictions are the result of this occurrence as well as the decline in the energy requirements of the Romanian economy during the past 20 years. The depopulation of the county's areas is a result of the mining, extractive industries, and petroleum product refining industries' dispossessions, which have occurred without the creation of alternative work opportunities or a reconversion program. One of the main causes lowering the likelihood of internalizing the elements generating local well-being is labor migration, particularly among highly specialized workers. This also subtly lowers public, local, and federal budget revenues.

Significant changes to the local industrial paradigm will highlight the necessity of an innovative mindset, knowledge and technology transfer, spin-off creation, or, if applicable, providing the professional training needed for the shift to new specializations.

1.5. Urban regeneration in the context of just transition

By drawing in new enterprises and activities, updating urban infrastructure, enhancing the urban environment, and broadening the social structure, urban regeneration is defined as "the conversion of old areas into new functional and sustainable spatial forms."

The three primary pillars of urban regeneration are social, economic, and physical. Following an assessment of the region in question and based on the findings, interventions are suggested for each of the three pillars by developing an urban regeneration plan.

The only way to ensure the success of urban regeneration programs and promote sustainable urban growth is to take an integrated approach to economic, social, demographic, and environmental challenges for a just transition.

Finding the local community's pillars that sustain its survival and expansion is essential to achieving the goal of sustainable development through urban regeneration of a region, city, or municipality. These pillars need to guarantee the long-term continuation of sustainable development and urban renewal.

Therefore, it is evident that certain local conditions simultaneously support and limit urban renewal. These challenges can be overcome by creative and well-managed solutions that can be used even in subpar circumstances. The European Green Deal strategically supports the goal of climate neutrality. The Deal encompasses a broad range of proposals, initiatives, and legislative and non-legislative acts. They address issues like energy, industry, transportation, agriculture, digitalization, environmental protection, climate change, and the business and financial sectors. The European Green Deal lays out plans and actions to mitigate the effects of climate change quickly and to make it easier for laws that promote a fair shift to a green economy to be adopted.

The shift to climate neutrality is also aided by investments that fight energy poverty and enhance living standards. The linked environmental goals and the shift to a low-carbon economy (2050) will be facilitated by investments.

2. Methodology, Analysis/Results interpretation

To make sure that there was more material accessible to clearly convey the issue in connection to excellent practice examples and the existing relationships amongst correspondents, a number of stages of research technique were conducted.

The goal of the research technique was to integrate the analyses of European legislation and current best practices in the areas of activity that were being examined. The qualities that can ease the transition process were identified through the suggested qualitative and quantitative assessments. These analyses were carried out in the following stages:

Stage I: Thematic documentation.

The goal of this stage was to analyze technical materials in order to ascertain the present condition in the areas under study.

The primary findings focused on the necessity of operationalizing sustainable development through intersectoral cooperation in the field and the need for a European tool to support sustainability at the local level.

Stage II: Qualitative and quantitative analysis

In this step, data was analyzed to determine the possibility for just transition; existing excellent practices at pertinent national and European levels were discovered; and the difficulties of just transition vs urban regeneration were considered.

Stage III: Development of proposals

This stage involved identifying best practices in the field, attempting to provide answers regarding the specifics of the relationship between just transition and urban regeneration, and taking into account how to incorporate the findings from the qualitative and quantitative analysis into the developed proposals.

2.1. Energy Communities

Renewable energy communities should be associations with citizens, IMMs, or local government authorities as members. They prioritize social and environmental goals, make financial gains, and produce, supply, occasionally transport, and distribute renewable energy at the local level. Additionally, this structure can be used in community energy efficiency projects that are focused on or involve sustainable mobility.

At the European Union level, it is estimated that 4% of the population currently participates in energy communities, with 9,000 such entities at the bloc level. The vast majority of communities use solar energy, and biomass. Compared to identical renewable energy capacities devolved by private actors outside of communities, European energy communities generate two times as much revenue for local communities.

In Romania, it has spread over the entire country and is a very ambitious movement that aims to build energy communities. There are around twenty-one implemented energy community projects that were able to be defined and operate within the existing legal parameters.

The preferred technology among Romania's energy community initiators is photovoltaics, with only

one project using biomass to accommodate local thermal energy consumption. Despite efforts to demonstrate a strong entrepreneurial spirit and technical expertise in the energy sector, Romanian energy communities now lack the capacity to advocate and represent themselves.

Romania's tendency supports the findings of international specialized literature, according to which the goal of all identified initiatives is one of necomercial, with profit serving as a component of the motivation of initiators. In Romania, however, more than half of initiatives use energy as the primary motivator, in contrast to European trends where leaders of energy communities have strong ecological motivation.

Future energy investments must take into account both national priorities, such as the need to diversify energy supply and reduce pollution, as outlined in national energy strategies, as well as the constructive framework of the National Energy System, primarily the Rețeaua Electrica de Transport (RET). The planning of RET development will be implemented by identifying opportunities to increase the number of people with production and development skills in the area of electricity consumption.

This entails not only increasing installed capacity to produce thermal and electrical energy from renewable sources, but also gradually switching from fossil fuels to more sustainable energy sources. As a result, efforts are being made to cut carbon emissions from the energy sector, which will greatly aid in the fight against climate change and improve environmental quality.

Many European research projects and citizen capacity building initiatives in the energy sector have resulted in studies and public policy reports about energy communities. These studies are primarily focused on countries designed to improve a community or inventory methods that the State supports.

2.2. Energy Communities in Prahova County

Realization of our production and electrical energy capacities from solar sources through the installation of photovoltaic panels for self-consumption in proportion to 100% of Prahova's administrative territorial units.

Optimize processes and align beneficiaries with the strategy for integrating public administration through the implementation of standard procedures and mechanisms to support decision-making and long-term strategic planning.

The Prahova Development Strategy focuses on improving the quality of life for Prahova citizens through sustainable development in the region, involving public politicians at the regional, national, European, and international levels. Investing in renewable energy technologies ensures the main goal of increasing the efficiency of energy source utilization, which will contribute to energy independence and economic competitiveness at the European level.

In order to promote energy efficiency at the member level of the partnership, renewable energy communities are being developed at the county level providing social, economic, and environmental benefits to members of renewable energy communities.

Promoting awareness of the level of use of renewable energy by the citizens of the country, and to develop the skills to create energy in a consumer-like manner for partnership members' self-consumption and to contribute to the achievement of energy security goals, with a focus on reducing energy dependence and diversifying energy sources, by establishing a photovoltaic power plant with our installed capacity to generate energy from renewable sources.

The reduction of annual greenhouse gas emissions that has a significant impact and a comparable amount of CO2 producing a moderate amount of electricity each year from renewable sources.

The guiding principles and long-term development goals should be integrated into the overall framework of cognition, appropriateness, and sociocultural and personal performance. The project's implementation will support environmentally balanced and sustainable development by ensuring sustainable global development through an open system and responsible use of resources with the highest level of environmental protection.

Energy community pilot projects have so far highlighted the following advantages, which are perceived by all parties involved—from community members to suppliers and operators of energy—as being the most significant: lowering emissions, fostering a sense of community and independence, lowering energy costs, and promoting financial stability.

Numerous studies have highlighted the factors that lead to the emergence of energy communities and the barriers that these communities face. Cross-cutting issues in the majority of European states demonstrate that the main challenges continue to be vague legal definitions, complicated regulations, and the lack of an appropriate support system

Other challenges include a lack of support for the growth of energy communities in national politics, resistance by communities to adopt certain renewable technologies, skepticism regarding cooperative and collective structures, and ignorance regarding the advantages of energy communities over national energy systems.

The need for green energy production (from renewable sources) is the driving force behind this project. Investing can help address the need to eliminate pollution on a global scale. Effective management of this energy will be carried out with the aid of an information management system integrated into the photovoltaic park.

This paper, describes the installation of photovoltaic electric power plants and demonstrates their usefulness. The central photovoltaic system consists of a series of photovoltaic panels that generate electricity in the current continuum (cc) and convert it into the current alternative (ca) through the use of electronic inverters. The characteristics of the system include frequency and the tension required of the transport operator.

For example, the installation using 550 W monocrystalline photovoltaic panels, results in production of an installed power of 8.6 MW. To achieve this goal, an 15636-watt photovoltaic panel system should be installed. The overall power of the photovoltaic panels, that will produce 8.6 MW; will have an inverter of 100 kW to convert current continuous energy into current alternative. The entire installed power is 8.6 MW.

These REPowerEU-specific communities with the goal of obtaining prosumator status don't refer to the fact that they are more commonly communities in the sense of general terms, such as local communities, local public authorities, care, installing their own photovoltaic panels, and becoming individual prosumators.

Participation in the green energy project has overcome initial skepticism, and local communities are proud to be able to contribute to the production of their own energy.

Estimates indicate that the energy communities should recover the investment in approximately three years.

In the emerging area where it is located, the Prahova energy community presented as an example, are characterized by a lot of enthusiasm, a variety of ideas, a good fit in the local context and in needy communities, a relationship with similar initiatives in Romania and outside of it, but regrettably, a lack of advocacy and representational capacity.

The idea behind the project was to establish an energy community where people could offset and share the energy they produced. The need to provide resilience and independence from the grid was essential given the lone distributor and remote location.

Due to their intense interest in the topic, the initiators have freely dedicated their time and energy to comprehending the idea, recording the requirements, figuring out the technical solution, and uniting the community around their notion. Romania 40's energy communities in perspective In an effort to gain support for their proposal, the initiators have a strong entrepreneurial profile, solving problems and conquering challenges. A small percentage of them are more in the anticipatory stage, waiting for a funding opportunity, a guide created by public authorities on the creation of energy communities, more specific legislation in the area, or even an authority-backed pilot project that they can use as a model.

Creative solutions from certain organizations and towns in Prahova County, indicate that challenges

may be overcome with cooperation and regulations better tailored to the requirements or unique characteristics of energy areas. Exposing examples of successful practices that have already been implemented or even endorsing pilot projects that mark a sea change in the dynamics of Prahova's energy communities.

Conclusions

Urban regeneration aims to revitalize urban areas that are in decline, improve living conditions, design public spaces, provide long-term solutions for urban mobility, and improve quality of life, among other things.

Ensuring the health and well-being of citizens; safeguarding and promoting built heritage; bolstering urban resilience to natural disasters and climate change effects, as well as supporting a dynamic economy, can all become easier to manage when combined with stable results through local strategic frameworks.

Therefore, in order to achieve the goals of sustainability and climate protection, industrial "verzi" policies that envision an urban regeneration process integrated into the transition to a carbon-reduced economy must be adopted.

The initiatives' framework to create an energy comuninty is basicaly a non-commercialone; neither the context in which they originated nor the motive of their founders included profit. However, in Romania, the primary driving force for the creation of energy communities is social, even though ecological factors predominate at the European level.

Community initiators recognize that another barrier in the Romanian setting to create enegy comunities, is resistance to association, difficulty in cooperation, or hesitation toward shared property and the concept of cooperatives.

It is crucial that the authorities' degree of ambition rises in light of the strong public interest in creating energy communities in Romania and the severe delays in the full implementation of the European legislative framework.

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