

# Renewable Energy - A Sustainable Entrepreneurial Solution for Romanian Rural Community Development

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**Abstract**— Rural community development has become an interest for many entrepreneurs and innovative strategies are used in this respect, having as main directions creating value for the rural communities and enhancing local inhabitants' wellbeing. Renewable energy is an issue targeted by many entrepreneurs and local authorities and action plans in this direction are developed, both at the European and country levels. This article presents a qualitative research, aimed to research on the Romanian successful projects of renewable energy implementation and their impact on local communities, from an entrepreneurial perspective. The final results of the paper consider a presentation of good practices and entrepreneurial initiatives that can be used for other Romanian villages that seek adaptation to innovative solutions and sustainable development of other rural communities.

**Keywords**— Renewable energy / biomass / rural development / sustainable entrepreneurship / Romania.

## I. INTRODUCTION

In a continuous changing economic context, countries enhance the opportunities of developing rural communities as a part of their long-term action plans. From a business perspective, entrepreneurship in the rural areas is also subject to discussions and the efforts to create sustainable business models for rural development are increasing.

Rural areas have a great potential for development, thus entrepreneurs seek for opportunities to create value in the rural communities, empowering them to actively be part in creating successful and innovative business models, encouraging cooperation among various actors involved in the community development strategies [1].

For developing countries, electrification and heating are of major importance and business initiatives to providing electrical power and heating to communities and households in rural areas are encouraged [2]. Facing EU new targets in the context of transition to green economy to be met by 2050, the entrepreneurs need to adapt their business models and find new innovative solutions for rural community development, towards a consumer-centric business model [3].

In the attempt to promote sustainable rural development, renewable energy is an issue targeted by many entrepreneurs and local authorities and action plans in this direction are developed, both at the European and country levels. Romania is rich in sources of energy, such as biomass, hydropower,

geothermal potential, wind, solar power, and photovoltaic energy, but still has a great unused potential for renewable energy usage [4]. This potential can be exploited by rural entrepreneurs that focus on the development of rural areas and their communities.

This paper presents a qualitative research on successful implemented projects in the sphere of renewable energy and biomass, with a focus on the benefits and created value for Romanian rural communities.

## II. LITERATURE REVIEW

Rural areas have as main source of development the agricultural sector. Thus, in the context of renewable energy, the agriculture is of major importance, as farming activities and rural areas exploitation represent a great percent of the Romanian economic structure, with great potential for renewable energy sources [5].

The rural environment is rich in agricultural resources that can be used for renewable energy. According to the European Court of Auditors (ECA), agriculture is very important to renewable energy, as it provides sufficient biomass that is by far the most significant renewable energy source in the EU, accounting for 63.3 % of all renewable energy production [6].

Sustainable rural development and socio-economic improvement can be obtained by modern bioenergy, that has the potential to alleviate poverty in rural communities. Moreover, poor rural people can be integrated in the local development strategy, educating them to use bioenergy technologies and have access to modern energy, as the basis for rural development and poverty alleviation [7].

A report conducted by OECD among member countries, draws some conclusions on whether renewable energy can really be a positive factor influencing the development of rural economies and the people living in the rural areas. Consequently, it specifies some positive impacts of renewable energy for the community, such as: local revenue, local jobs, innovations (in products, processes and policies), capacity building and local empowerment, as well as affordable and reliable energy [8].

Researches sustain that, at national level, Romania has a great potential for investing in renewable energy, having a direct impact on the Romanian economy. Along with the contribution to the state budget, other positive effects can be

realised, such as creation of new jobs, stimulation of the local production, community empowerment, and development of rural and isolated areas of Romania [9].

### III. METHODS AND RESULTS

In the context of renewable energy and biomass usage for rural development, this paper presents a qualitative study, aimed to research on the Romanian projects of renewable energy implementation and their impact on local communities. The case studies selected are referring to projects managed in cooperation with the *Green Energy Romanian Innovative Biomass Cluster*, aimed to enhance the production and utilization of the biomass, considered the most important renewable energy source in Romania.

The cluster is organized in six working groups, as follows: Research-Development-Innovation, Business Development, Education and Human Resource Development, Marketing and Communication, and Internationalization.

The projects developed within the cluster impact various countries that are involved in the implemented action plans. The main criteria for the selection of case studies for the present research study was the relevance of the implemented actions for the rural development in Romanian villages. In this respect, we came out with a list of case studies and projects selected for the analysis, as seen in Table I.

TABLE I. Description of the projects selected for analysis

Project title	AgroBioHeat	Bioenergy Villages (BioVill)	Biomass4energy
<b>Objective</b>	Promoting the penetration of agrobiomass heating in European rural areas	Increasing the Market Uptake of Sustainable Bioenergy	Biomass - the green business
<b>Starting date</b>	2018	2016	2014
<b>End date</b>	2021	2019	2016
<b>Duration in months</b>	36	36	20
<b>Budget (euro)</b>	2.998.043,75	1.998.917,50	219.500,00
<b>Funding</b>	Horizon 2020	Horizon 2020	Norway grants

The directions and actions defined in these projects were analyzed, so that we could understand the way in which rural areas from Romania were perceived, in different stages of development, as we can see by the periods of the implemented projects (2014-2021). Among other projects related to biomass and renewable energy, the selected projects have within their main objectives providing sustainable solutions for long-term development of the villages in the experimental countries.

In the end, considering the availability and accessibility of information, the results presented in this paper refer to describing the innovative entrepreneurial solutions developed by AgroBioHeat project, and the benefits that it brought to the targeted beneficiaries, with the aim to finally develop a framework for delivering value to rural communities through agricultural biomass and local resources usage. In this respect, secondary data put at the public disposal by the management organization Green Energy Romanian Innovative Biomass

Cluster were used, as well as reports and study cases disclosed within the AgroBioHeat project ongoing implementation.

#### A. Objectives and General Specifications on the Project

The objective of AgroBioHeat is to promote modern heating solutions on agricultural biomass in rural European areas, with three main directions: (1) reducing heating costs; (2) supporting rural development and the circular economy; (3) reducing the carbon footprint and supporting the fight against climate change.

The beneficiaries of the heating solutions based on agricultural biomass targeted are the farms and households in rural areas, schools, municipal buildings and other community projects in the field of energy, as well as agro-industries, and greenhouses.

From a community development perspective, some objectives are mentioned for this project, among which the most relevant ones would be: to support policy makers at local level with recommendations and guidance, in order to overcome the barriers for the advancement of the agrobiomass heating sector; to understand the social acceptance factors and local specificities behind the success or hindering the development of agrobiomass heating solutions; to promote changes in the mind-set of the value chain actors and clusters as well as to empower them for the deployment of agrobiomass heating solutions.

In another direction, the aim of the AgroBioHeat project is to increase competitiveness capabilities of the European biomass heating solutions manufacturers and installers and to enhance a competitive position at the european level. In this idea, promoting the visibility of agrobiomass heating to a large audience, including target and key actors as well as the general public is mandatory, and objectives of the project are directed towards this subject as well.

In terms of budgets and funding, the AgroBioHeat project was sustained with an EU contribution of 2.998.043,75 euro, co-financed under the Horizon 2020 EU Framework Programme for Research and Innovation. The implementation period is from January 2019 to December 2021.

#### B. Social Perception Study on Agrobiomass Heating

The development of rural communities through biomass heating implies empowerment and a strong support from local authorities and effective policy frameworks. New projects of agrobiomass heating implemented at local level can be affected by lack of awareness and low social acceptance levels, as bioenergy implementation is a complex subject whose sustainability and success requires the involvement of various actors in the community.

In the implementation process of the AgroBioHeat project, a European survey was conducted, with the aim to assess the main motivating factors influencing social acceptance of an agrobiomass heating project in the communities. The study was conducted in 22 different European countries, with 3,725 collected responses, focusing on enhancing perceptions among interested groups, capturing differences between countries, as well as types of regions. The duration of the data collection was 2 months, from

February 2020 to April 2020.

Consequently, data collected were analyzed and driving forces and barriers among local communities regarding agrobiomass heating were defined, as results of the conducted survey. With respect to the drivers, the results show that local communities are more positive towards the development of the rural area using local resources for agrobiomass heating once they see the real benefits of the implemented projects, seeking for benefits that impact the local community, such as: the participation of local farmers, enterprises, and manufacturers for agrobiomass resources and technologies, local community initiatives and involvement in decision making, and improvement of the local community image.

Results concerning the barriers of implementing community development projects with agrobiomass heating refer to three categories: economic, political and resource related. The study shows that the political related barriers are a great importance, such as lack of trust and policy gaps are the key aspects that need to be tackled, political complications, policy inadequacies and lack of transparency.

### C. Romanian Implemented Projects within AgroBioHeat

At national level, the analysis of the AgroBioHeat project results identify some Romanian facilities developed on agrobiomass heating, that integrate the objective of local development and cooperation within the community. In the context of rural development and entrepreneurial solutions that impact the local community, some social, environmental and economic benefits have been identified through the analysis of some enterprises that have developed towards renewable energy and agrobiomass heating, as shown in Figure 1.

From a social perspective, the impact generated was tackled by one case study in particular, an enterprise involving local young people with mental disabilities in the collecting and production of biomass. This result is of great importance for the community as a whole, but especially for the individuals that need help from the community. Moreover, new job opportunities have emerged, and disadvantaged people were able to find support to financially develop.

In terms of economic results, the AgroBioHeat project provided great benefits for the community development, as new businesses were developed, demand for local farmers and local businesses increased, and Romanian manufacturers were able to supply the needed equipment for local entrepreneurs. Collaboration within the community among several actors was encouraged, for the well-being of locals, as well as for the economic development of the rural areas.



Fig. 1. Social, economic and environmental impact of Romanian enterprises developing agrobiomass heating within the AgroBioHeat project

Considering the results identified, further analysis could define a more clear measurement method in terms of the impact generated at local level, and especially in the idea of community development. Consequently, the business models identified in the communities embracing the idea of renewable energy and agrobiomass heating could be replicated, as to continue creating value in the rural areas in Romania.

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