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# EXPLORING GREEN ENERGY FINANCING POSSIBILITIES IN THE CONTEXT OF ENERGY EFFICIENCY IN ROMANIA

**ELENA CLAUDIA SÎRBULESCU, LUMINIȚA PÎRVULESCU, SIMONA CRISTINA CONSTANTINESCU, TIBERIU IANCU, IOANA ANDA MILIN**

*University of Life Sciences „King Mihai I" from Timisoara, Faculty of Management and Rural Tourism, Romania*

**Abstract**: *In this paper, the authors wanted to present an analysis of financing opportunities in this expanding field of green energy, which is becoming essential for the future in light of the need to protect natural resources and the surge in energy costs. Organizations in Romania are integrating modern projects, with an emphasis on green energy, which has become the preferred option for implementing sustainability and efficiency strategies that govern business decisions. As a result, this sector opens up new career opportunities and specializations, thus creating new jobs in the rapidly developing field of green energy. In conclusion, by financing green energy, the environmental impact is proven to bring major benefits, in terms of reducing carbon emissions, reducing air and water pollution, and protecting ecosystems and increasing biodiversity.*

## • Introduction

Internationally, it is considered that climate change has created one of the greatest economic opportunities of our time. The beneficiary areas are the most diverse, such as: energy, energy efficiency, along with transport and agriculture, etc. In terms of volume, these types of financing with the aim of reducing the effects of climate change were estimated by the UN at 830 billion dollars annually, at the level of 2050, only in the energy field.

| Types of Green Energy | Operation | Examples | Benefits | Limitations |
|---|---|---|---|---|
| **Solar Energy** | Photovoltaic or thermal panels convert solar radiation into electricity or heat for domestic water | Industrial hall roof equipped with solar panels reduces dependence on the classic network by up to 50%. | They can be installed quickly, maintenance is easy, costs are reduced in the long term. | Production will be low during cloudy weather or winter, large space is required for large installations |
| **Wind Energy** | It is based on the power of the wind that drives the turbine blades, and through an internal generator electricity will be produced | Existing wind farms in Dobrogea, which directly feed the national energy network | Zero emissions during operation due to the rapid response to the high consumption requirements of a well-located area | Need to be located in areas with constant wind periods, can produce noise, have limitations related to local fauna |
| **Hydro Energy** | The difference in water levels in dams or micro-hydropower plants is used to move turbines | Microdams installed on the mountain river that can be used for a factory or isolated rural communities | The energy flow will be continuous, the yield is predictable, it is easily integrated into the national energy system mix | Important initial investments, and the impact on local aquatic habitat will be considerable, |
| **Biomass and Biogas Energy** | It is based on organic waste that enters anaerobic digestion and produces biogas that will be used either for heating or for electricity | Farms collect vegetable and organic waste, will process them in modern plants, resulting in energy that reduces the electricity bill and reduces waste. | By valorizing local waste, the remains will be transformed into useful resources for agriculture or industry | Need for well-organized logistics to ensure the collection of raw materials, but also manage odor emissions |
| **Geothermal Energy** | By extracting heat or hot water from the basement, savings will be made on conventional fuels. | Spa complex that is based on the use of geothermal water to heat the pools and the interior space | The energy stock is secure, emissions are few, costs are low when exploited. | Geographically limited to certain areas, requires specific drilling and equipment |
| **Waste-to-Energy** | Based on specialized plants that operate by burning municipal or industrial solid waste, producing heat and electricity | Large cities use installed plants that process garbage and will reduce the pressure on landfills | The volume of landfills is reduced, lost energy will be recovered, and it helps with local waste management policies. | Require strict emission standards, continuous monitoring and increasingly efficient technologies. |
| **Tidal and Wave Energy** | Through specific installations, the movement of water created by the tides or the force of waves is captured and transformed into energy | Norway or France, benefit from specific technologies that contribute to local mixed consumption in the coastal area | It has uninterrupted operation due to the predictable source in appropriate areas | Investments can be high, significant local impact on marine ecosystems |

**Figure 1. Types of green energy and main characteristics**

## • Material and method

The article focused on exploring green energy financing opportunities, especially since, in Romania, we have witnessed a large-scale development in recent years, contributing essentially to the energy mix of the energy system. Moreover, the territory of Romania benefits from a significant potential rich in renewable resources (solar energy, biomass, wind energy and especially hydroelectricity.

## • Results and discussions

| Bank | Loan product | Types of projects funded (destinations) |
|---|---|---|
| Banca Transilvania | GreenEnergy | Construction and equipment of photovoltaic parks<br>Complete installations for prosumers<br>Implementation of the Modernization Fund, Electric Up2 |
| | Energy Efficiency | Modernization of lighting, heating, air conditioning<br>Thermal insulation<br>Purchase of efficient equipment<br>Energy management systems |
| | Water and Waste | Water treatment infrastructure<br>Recycling systems, Waste to Energy<br>Eco-friendly equipment<br>Plastic compaction stations |
| | Sustainable agriculture | Purchase of agricultural machinery<br>Irrigation systems<br>Monitoring equipment, GPS, software<br>Photovoltaic panels for farms |
| BCR | Green energy | For companies, supporting investment projects in solutions tha ensure better management of energy and/or fuel consumption. |
| | Credit prosumers | Prosumers who consume, store and can sell the energy produce in individual, commercial or industrial spaces |
| | PNRR grants for energy efficiency in the industrial sector | Systems dedicated to modernizing, monitoring equipment an making energy consumption more efficient for companies. Th project must include the installation of an energy managemen system (EMS) for general energy consumption metering<br>Replacement of equipment for companies, retrofitting an modernizing production systems<br>Recovery of thermal energy losses from technological processe<br>Remote management systems<br>Systems for identifying consumption peaks and the gradua release of energy and its planning<br>Acquisition of digital platforms for centralizing consumptio data / reducing consumption / monitoring indicators across th entire activity, at the operator level, digitalization and remot data transfer, different from EMS |
| | PNRR funding for green electricity | The financed objectives are to increase energy production fron renewable wind and solar sources |
| BRD | Habitat Green / Expresso Green | Energy efficiency, sustainable and durable materials, high quality building and increased comfort |
| ING Bank | Green Credit<br>Green Building<br>ESG Bonds | Investments in new technologies<br>Circular economy financing<br>Green, more sustainable buildings<br>Sustainable transport and mobility financing |
| UniCredit Bank | Green Energy Efficiency Loan | Green credit for photovoltaic panels (Term Loan Invest ESG |
| | Green Loan Without Mortgage | Purchasing energy-efficient electronics, appliances, equipment, or materials for the home |
| Raiffeisen Bank | Your Green Home Mortgage<br>Green Credit<br>Bio Credit SME | government programs that aim to promote an ecological and sustainable lifestyle.<br>they provide photovoltaic panels |

**Figure 2. Credit products offered for green energy**

## • Conclusions

The opportunity to benefit from financing for green energy may create the impression of a complicated process at first, but through good documentation and activity planning, it becomes achievable. Large companies, SMEs or non-profit organizations can benefit from these opportunities, to choose according to the needs of each one.

As a conclusion, we can appreciate that the existing programs support the transition to renewable energy sources, which will ensure energy independence, stimulating the creation of new jobs and economic and ecological benefits