

NEW POLICIES IN RENEWABLE ENERGY AND THEIR IMPACT ON RURAL AREAS: THE CASE OF FIER COUNTY, ALBANIA

Arlinda Hoti¹, Etleva Muça (Dashi)²

e-mail: arlinda.hoti@aspa.gov.al

e-mail: evadashi@ubt.edu.al

Abstract

This study examines the impact of new renewable energy policies on rural areas in Albania, with a specific focus on Fier County. Through an analysis of solar energy projects developed during the 2018 – 2023, the study outlines the environmental and economic benefits for local communities. Investments in solar energy have improved access to clean and affordable energy, reducing dependency on fossil fuels and lowering carbon emissions. Another important aspect is that renewable energy brings sustainable development to rural areas by diversifying income sources for farmers. This helps stabilize the local economy, as farmers can benefit from energy production in addition to traditional agricultural activities. Renewable energy policies have created new economic opportunities for rural areas, through increased employment and improved energy infrastructure. The findings indicate that Albania is moving towards more sustainable development by promoting clean energy, significantly benefiting from the country's natural resources. This transformation not only contributes to the environment but also strengthens rural communities and creates a solid foundation for future economic and social growth.

Keywords: renewable energy, solar energy, Fier, energy policy, rural development

JEL: Q10, Q42, Q58

Introduction

In recent decades, renewable energy has emerged as an essential alternative for ensuring clean and sustainable energy, offering development opportunities for rural areas. Not only are they important as locations for building renewable energy plants, but they also hold great potential for creating significant synergies for sustainable rural development (Benedek et al., 2018). This approach has been a priority for many countries worldwide, including Albania, which has embarked

¹ Msc., Training and Communication Directorate, Albanian School of Public Administration (ASPA)

² Professor, PhD, Faculty of Economy and Agribusiness, Department of Economy and Rural Development Policies, Agriculture University of Tirana (UBT)

on a path toward sustainable development through renewable energy. Albania is blessed with abundant natural resources, including solar, wind, and water, which provide an extraordinary potential for the development of renewable energy. With a favorable climate for solar energy and a geographical position that allows the utilization of wind, the country is in a unique position to harness these resources to diversify its energy supply and reduce pollution.

The Albanian government has taken significant steps to improve the policy and legal framework to promote investments in renewable energy. In response to the EU Green Deal and the Paris Agreement, which are legally binding, the government has developed a National Energy and Climate Plan (NECP) for the period 2021 – 2030. The NECP includes targets and goals such as GHG emissions savings of 18.7%, an 8.4% reduction in energy consumption, and a 54.4% share of renewable energy in final energy demand by 2030 (Ministry of Infrastructure and Energy 2024). Through national energy strategies, the country aims to integrate new technologies, develop solar and wind energy projects, and encourage the more sustainable use of natural resources. These policies are designed not only to fulfill Albania's international commitments regarding climate change and European Union directives but also to improve energy supply in rural areas and stimulate economic development in regions with particular needs. However, we have to mention that associated and candidate countries face limited EU financial support, making it challenging to overcome technological and economic gaps and requiring greater reliance on their own societal efforts (Kozak & Muça 2020).

Global tendencies in renewable energy.

The danger and reality of environmental deterioration have become increasingly apparent over the past three decades. As postulated by Moriarty and Honnery (2012), all energy sources have the potential to generate unintended environmental consequences, including localised contamination of air, water and soil, as well as the emission of greenhouse gases. Several variables have contributed to the mounting evidence of environmental problems, including the growth of the global population, consumerism, industrial activity, and other factors that have resulted in the ecological consequences of human activity. Investments in renewable energy are showing a global increasing trend. In their study, Čeryová et al. (2020) reveal that global investments in renewable energy have reached considerable proportions, demonstrating a robust commitment to the transition from fossil fuels. As global awareness of climate change intensifies and the shift towards renewable energy sources accelerates, the demand for large-scale energy storage has reached unprecedented levels (Jafarizadeh et al., 2024). Governments are supporting and directing these investments toward agricultural development (Gross et al., 2003). The Green Deal represents a commitment by the

Commission to facilitate a transition to renewable energy that benefits customers and decarbonization at the lowest possible cost (Fetting 2020; Simionescu et al., 2020). It is widely acknowledged that renewable energy sources represent one of the most effective and efficient options in this regard. It is for this reason that sustainable development and renewable energy are considered to be closely related (Dincer, 2000). Moreover, the economic advantages of renewable energy are numerous, including the creation of employment opportunities and an improved level of energy security, as outlined by Eze et al. (2023). So, at this point in light of the global surge in interest surrounding the pursuit of green hydrogen, Renewable Energy Resources represent a promising avenue for future environmental sustainability (Falcão, 2023).

However, environmental concerns are also at the center of the photovoltaic (PV) production debate. Kouloumpis et al. (2020) investigate and compare the life cycle environmental impacts of commercial ground-mounted and rooftop PV systems. They show that the environmental impacts of installation and operation differ significantly depending on the approach used. The process of urbanization and population growth in urban areas requires new forms of energy to be found. Hofierka & Kaňuk (2009) found that the use of photovoltaic solar panels in a small town in eastern Slovakia could cover two-thirds of the town's electricity consumption.

A key factor in increasing the effectiveness and efficiency of solar systems is technological innovation. According to Geng and Zhang (2013), technological innovation is essential to the competitive strategies of photovoltaic companies, as it can lead to improved market positioning and increased production capacity. In addition, the integration of cutting-edge technologies, such as the direct radiation amplification system mentioned by Sahebi et al, aims to increase energy output by increasing the radiation density received by PV panels (Sahebi et al., 2021). This emphasis on innovation is critical to being competitive in a rapidly changing market.

In summary, solar energy production is at an inflection point, characterised by rapid technological change, economic expansion and environmental sustainability initiatives. The future of photovoltaic manufacturing will be shaped by the interplay of innovation, economic viability and environmental impact, making it an essential part of the global energy revolution.

New policies for renewable energy in Albania

The new renewable energy policies in Albania aim to create a more sustainable energy system, focusing on reducing dependence on fossil fuels and minimizing the negative environmental impact. Over the years, Albania has faced various

challenges concerning sustainable energy supply, having traditionally relied on hydroelectric power sources and energy imports.

Investments in photovoltaic plants are showing an increasing trend. The government supports these investments, directing them toward agricultural development as well.

The Council of Ministers has approved a draft decision initiated by the Ministry of Agriculture and Rural Development regarding the use of agricultural land for agrivoltaic and wind energy activities on agricultural land with soil quality grades 9 and 10. On land with soil quality grades 7-8, mixed agro-voltaic use is allowed. However, on land with soil quality grades 1-6, photovoltaic plants are not permitted and are strictly designated for agricultural or livestock purposes.

The draft decision outlines the criteria for using agricultural land for agrivoltaic and wind energy activities, the procedures for monitoring the activity, including measures for violations of the activity's conditions, and the fees payable by entities that trade energy produced in agrivoltaic renewable energy plants on agricultural land.

Combining agriculture with photovoltaic and wind energy has the potential to increase the economic profitability of both sectors, making better use of land for suitable agricultural crops and enhancing energy efficiency. This opportunity is favorable for Albania, due to the country climatic conditions. According to Cacaj (2023), the ambition to become a producer and exporter of electricity from renewable sources is a key aspect of Albania's energy strategy.

One of the main objectives of these policies is to reduce dependence on hydroelectric energy and fossil fuels, which currently constitute the majority of Albania's energy supply. The use of fossil fuels for energy has serious consequences in terms of air pollution and carbon emissions, contributing to climate change. To address these challenges, the new policies aim to develop clean and renewable energy sources that not only provide a sustainable supply but also help Albania meet its international commitments to reduce carbon emissions under the Paris Agreement and European Union directives.

In recent years, major projects have been developed for the installation of photovoltaic farmers, aimed at producing solar energy for domestic consumption and export. The government has facilitated the licensing of such projects and has provided low-interest financing for those who wish to invest in solar energy.

Methodology

The study employs a comparative analysis methodology, relying on indirect data from various sources to assess the impact of new renewable energy policies on rural areas in Albania, particularly in Fier County. According to methodology theories comparison is a fundamental tool of analysis (Collier, 1993). The

comparative analysis method is a systematic approach and need to be considered more as a perspective or orientation than a separate research technique (Ragin & Rubinson, 2009). It is used to evaluate and compare different entities, policies, or phenomena to draw insights and conclusions. This methodology is particularly relevant in the context of renewable energy, where it can be applied to assess the effectiveness of various policies, technologies, and their impacts across different regions or countries (Eze et al., 2023).

The following synthesis outlines the key components and applications of comparative analysis in the field of renewable energy, supported by relevant literature. The data were collected from the Institute of Statistics and the Ministry of Energy and Infrastructure, including economic and social indicators such as unemployment, employment in agriculture, and the capacity of solar and wind energy. The comparative analysis examines changes in these indicators between 2018 and 2023, identifies trends in decreasing unemployment and increasing investments in renewable energy, and interprets the data in the context of economic and environmental benefits. This methodology provides a clear overview of the impact of renewable energy on the sustainable development of rural areas in Albania, linking this impact to economic development strategies and the improvement of living conditions for local communities. Furthermore, the study also examines opportunities for increasing renewable energy capacities and aims to enhance institutional and financial support for projects in this sector.

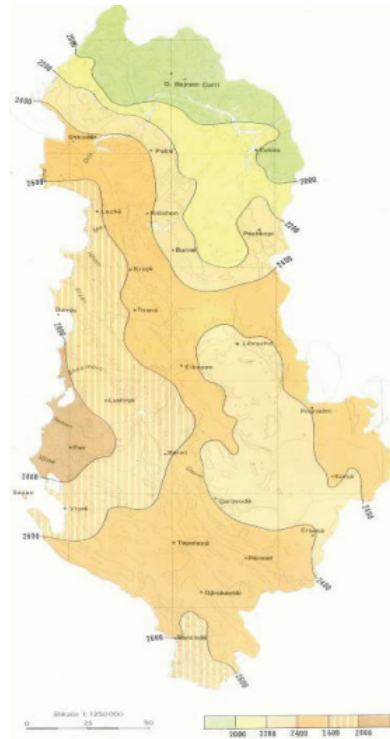
The impact of renewable energy policies on the rural areas of Fier County

Fier County is located in the southwest of Albania, bordered by Vlora County to the west, Berat County to the northeast, and Korça County to the east. The capital of this county is the city of Fier, known for its rich history and culture. Fier is also known as the “City of the Sun” due to its favorable climate and high number of sunlight hours per year. According to Cinaj’s (2010) study, Fier County is located in a section where solar radiation lasts around 2,800 hours per year. The area has a Mediterranean climate, with warm and dry summers and mild winters. This favorable climate makes the region suitable for agricultural activities and the development of solar energy.

Investments in Fier County, particularly in photovoltaic energy, have been influenced by the favorable climate and solar radiation, as this area is known as the sunniest in Albania. This offers excellent opportunities for the development of energy projects, making it an attractive choice for farmers who want to utilize unproductive agricultural lands with low soil quality (grades 7-10), thereby increasing their income from non-agricultural sources through economic

diversification. Low-quality agricultural lands are either leased or sold by farmers for use in renewable photovoltaic energy investments. Moreover, Fier has agricultural areas near the sea, which, while rich in soil, often face production challenges due to soil salinization. This has encouraged farmers to diversify their activities by investing in photovoltaic energy as a way to offset the decline in yields from these lands and to create a sustainable energy source for their needs.

In **Figure 1**, the dark brown area represents Fier County, and as shown on the map, it is the sunniest region in Albania.



Source: Cinaj (2010).

Figure 1: Lasting of the solar radiation in hours for Albania and the study zone

In Fier County, implementing new renewable energy policies has significantly benefited rural communities, improving access to clean and affordable energy. Fier, a region with great potential for the development of the agricultural sector and one of the country's most important industrial and agricultural centers, has greatly benefited from policies that promote solar energy.

Table 1: Photovoltaic production licenses in the Fier area

Year	Number of License Issuance	Agregated Capacity (MW)	Location
2018	7	10	Topojë (Sheq Marinas), Seman-1 (Sheq Marinas), Plug Lushnje
2019	2	4	Sheq Marinas Topojë, Lugani, Sheq Marinas
2022	9	263	Remas – Karavasta Lushnjë, Sheq Marinas Fier, Dërmenas Fier, Povelçë Fier, Darzezë Fier
2023	8	84	Povelçë Fier, Sheq Marinas, Fier, Dërmenas Fier
2024	4	8	Sheq Marinas Fier, Topoje Fier
Total	30	369	

Source: Annual report of the Energy Regulatory Authority and author calculation

These policies have not only helped reduce energy costs for farmers but have also contributed to creating a more sustainable energy infrastructure, strengthening the local economy, and improving the livelihoods of rural communities.

Table 2: Photovoltaic production licenses in other counties

Year	Number of License Issuance	Agregated Capacity (MW)	Location
2014	1	1	Korçë
2019	2	4	Tren – Korçë,
2020	1	2	HEC Banja- Elbasan
2022	9	21.14	Vau i Dejës, Bilisht, Korçë, Bitincke Bilisht Korce, Bisht Kamëz Durrës,
2023	2	40	Ersekë
2024	1	78.6	Libohovë, Gjirokastër
Total	16	146.74	

Source: Annual report on the Energy Regulatory Authority and author calculation

The number of licences for photovoltaic plants in Fier County, which has reached 30 (table 1), shows a significant commitment to the development of

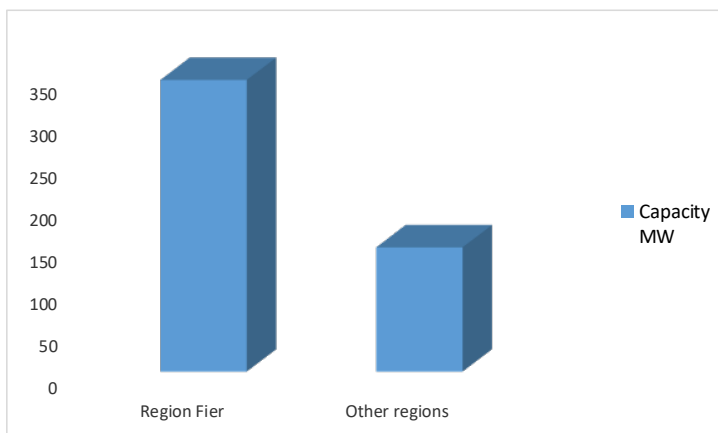
renewable energy in this area. This is a sign of positivity and investment in solar energy, which helps to diversify energy sources and improve energy security.

In comparison, with only 16 licenses in the rest of Albania (table 2), it suggests that Fier County has a significant percentage of the country's solar energy projects. This could be the result of favorable climatic conditions, support from local institutions, or economic development strategies that encourage investments in renewable energy.

This development may also have a positive impact on job creation and the reduction of carbon emissions, contributing to the national goals for clean energy and sustainable development. So in general photovoltaic systems, are considered useful in monitoring and optimizing energy output (Kymakis et al., 2022).

Even with the high profits of the photovoltaic systems in Fier County, we have to consider and the constraints caused by such systems. So we have to consider the implications of the photovoltaic park in the Karavasta Lagoon. The mirage of the photovoltaic mirrors is damaging and compromising the birds living there, and as consequence they are abandoning the ecosystem.

According to INSTAT (2023) it was noticed that 62.5% of the total licensed entities concentrated in the Fier region. This significant portion highlights the key role of Fier in the development of solar energy in Albania, suggesting a strong commitment to renewable energy initiatives in this area compared to the rest of the country. The focus on Fier can be attributed to favorable conditions for solar energy projects, including geographical advantages and supportive local policies.



Source: Self-prepared based on data from the annual report of the Energy Regulatory Authority.

Figure 2: Photovoltaic plant production capacity in Fier county compared to other counties

The 345-megawatt production capacity in Fier, compared to 147 megawatts in other regions, highlights a significant difference in the development of solar energy in Albania (figure 2). This concentration of capacity in Fier suggests a great potential for local economic growth, creating jobs and stimulating investments in the renewable sector. Moreover, this high level of solar energy production can help reduce energy costs for consumers and contribute to meeting national renewable energy targets. This positive situation positions Fier as an important hub for sustainable energy and economic development in the country.

In the Fier region, around 420 hectares of land have been used for constructing photovoltaic plants with a capacity of 350 MW (1 MW requires approximately 1.2 hectares of land). Based on my calculations and considering market prices, farmers have either leased their land to investors or sold it to them. In the first case, through leasing, farmers have earned around 22 million euros. This is based on 420 hectares leased at 1,500 euros per hectare per year over 35 years. In the second case, if farmers sold the land, they earned 21 million euros (420 hectares multiplied by 10,000 square meters per hectare and then by 5 euros per square meter, which is the land price). On the other hand, investors have invested 800,000 euros per MW, meaning they invested a total of 280 million euros for 350 MW in Fier. This is a substantial investment that brings increased income for farmers, job creation, pollution reduction, and regional development.

In conclusion, the development of photovoltaic plants in Fier is not only a step towards sustainable energy but also an opportunity to strengthen the local economy and improve the quality of life for the region's residents. This is a good example of how investments in renewable energy can create a multifaceted positive impact.

As seen from the data above, government policies have facilitated investments in renewable energy, which have led to significant development in the rural areas of Fier, creating new employment opportunities and improving economic conditions for farmers. During the period 2018 – 2023, renewable energy production in Fier County has experienced continuous and stable growth, reflecting the positive impact of new clean energy policies and commitments to more sustainable economic and environmental development. These two aspects form a strong connection between energy investments and noticeable improvements in economic indicators, as shown in the official data below, which highlight the increase in energy production and the advancement of living conditions during this period.

In 2018, based on INSTAT data, renewable energy accounted for only 20% of the total energy produced in the county, primarily concentrated in small-scale hydroelectric production. With the increase in solar energy investments, this percentage rose significantly to 42% by 2023, demonstrating significant progress

in integrating renewable sources into the overall energy production. Investments in renewable energy during this period have been accompanied by growth in macroeconomic indicators.

Table 3: Macroeconomic data for Fier county for the period 2018 – 2023

Year	Unemployment (%)	Employed in thousands	Photovoltaic Capacity (MW)	GDP (million euros)
2018	15	25	2-3	1,200
2019	14	26	5	1,250
2020 ³	16	24	10	1,100
2021	13	27	20	1,300
2022	12	28	30	1,400
2023	11	29	40	1,500

Source: Self-prepared based on data from the Institute of Statistics 2023

Based on the data in Table 3, for the period from 2018 to 2023, we see that unemployment has decreased by 4%, indicating a significant improvement in the labor market.

The number of employed people has increased from 25,000 to 29,000 over the same period. This represents an increase of 4,000 employees, or about 16%. The increase in employment reflects a stabilization and development in this sector, with improvements in productivity and investments.

The installed capacity in photovoltaic energy has grown from 2-3 MW in 2018 to 40 MW in 2023. This is an extraordinary increase, showing a rise in investments and a strong commitment to renewable energy. The increase in capacity by 37-38 MW over five years suggests a strong orientation towards sustainable energy. Investments in this sector are creating new job opportunities and contributing to the diversification of energy sources and increasing farmers' incomes.

GDP has also seen a noticeable increase, from 1,200 million euros in 2018 to 1,500 million euros in 2023. This is a growth of 300 million euros, or about 25%. This reflects an overall improvement in the local economy, driven by growth in various sectors such as agriculture and energy.

In conclusion, we can say that from 2018 to 2023, Fier County has shown significant improvement in economic and social indicators. The decrease in unemployment, the increase in the number of employed people in agriculture, the

³ During the year 2020, there was a decline in the indicators due to the Covid pandemic.

expansion of investments in photovoltaic energy, and the growth of GDP are all signs of a recovering and developing economy. These positive trends suggest a brighter future for Fier County, offering opportunities for sustainable growth and continued development.

The new renewable energy policies in Albania, especially in the Fier area, have brought significant changes both in the sustainable development of the energy sector and by helping farmers generate income from their agricultural land. This is because farmers can install solar panels on their land, generating renewable energy while continuing to use the land for cultivation. This approach contributes to the diversification of income sources for farmers and promotes more sustainable energy and rural development at the same time. The implementation of solar and wind projects in this region has brought noticeable benefits, improving access to clean and affordable energy for rural communities, which previously relied mainly on energy produced from fossil fuels.

Conclusions

1. **Diversification of income for agriculture:** One of the main conclusions is that the new policies have helped diversify energy sources in Fier County. The production capacity of renewable energy sources (such as photovoltaic solar energy) has increased significantly during the period 2018 – 2023, reaching 350 MW. This has improved the energy sustainability of the region, reduced dependence on energy imports, and created new income streams for farmers, helping them offset costs and enhance financial sustainability. Farmers are expected to increase their income from land leasing or sales, estimated at 22 million euros.
2. **Reduction of environmental impact:** The use of renewable energy has significantly reduced greenhouse gas emissions and environmental pollution in the region, helping Albania meet its international climate commitments. This has led to an improvement in air quality and contributed to the protection of rural ecosystems, which are sensitive to pollution from traditional energy sources.
3. **Economic benefits for rural communities:** The implementation of solar energy projects in Fier has created new economic opportunities for residents of rural areas. Projects such as solar farms have generated new jobs, improved local infrastructure, and provided sustainable income sources for farmers and local producers. It is estimated that around 280 million euros have been invested in the Fier area from the construction of these plants alone.
4. **Long-term development and new investment opportunities:** Through these policies, Albania has created a favorable environment for new

investments in the renewable energy sector. Fier county, with its significant potential for solar energy, is positioned as a leader in the development of clean energy sources in the country. This will help establish a sustainable model for rural development and encourage further investments in renewable energy projects.

5. **Energy policies provide substantial benefits**, such as reducing reliance on fossil fuels, decreasing greenhouse gas emissions, and enhancing energy security, while also promoting economic growth and sustainability

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