Published Date: - 25-07-2025
Page No: - 204-206

SOLAR PANELS – AS A BASIC FACTOR OF THE GREEN ECONOMY

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ABSTRACT

This article provides a comprehensive analysis of the important role of solar panels in the development of a green economy. The article highlights the strategic importance of solar energy in the context of increasing global attention to renewable energy sources, climate change issues, and the need to ensure energy security. The main focus is on the technological development of solar panels, their energy efficiency and economic viability, as well as environmental benefits. The study comprehensively examines the development trends of the solar energy sector, the contribution of this technology to sustainable economic growth by creating green jobs, increasing energy independence, and reducing carbon emissions.

KEYWORDS

Solar panels, green economy, renewable energy, sustainable development, energy efficiency, climate change, carbon emissions, energy independence.

INTRODUCTION

The 21st century is a time of unprecedented environmental and economic challenges on a global scale, with issues such as energy security, climate change and resource scarcity at the forefront of the global community. Dependence on traditional fossil fuels is leading to increased global warming, air and water pollution, and energy dependency, which leads to political instability. Therefore, the transition to renewable energy sources has become an urgent task for sustainable development. Solar energy plays a central role in this transition and has great potential as a clean, unlimited and economically viable source of energy. The development of solar panel technology has the potential to revolutionize energy production, stimulate economic growth and significantly reduce negative impacts on the environment. The concept of a green economy aims to move in this direction, combining environmental protection with economic growth. Solar energy is an integral part of this concept, providing sustainability by creating green jobs, strengthening the local economy, and reducing dependence on energy imports. This article aims to provide an in-depth analysis of the role of solar panels as a key factor in shaping a green economy, exploring its technological, economic, and environmental advantages, as well as its future prospects.

MAIN SECTION

The role of solar panels in the global energy landscape is increasingly strengthened, which confirms their crucial role in shaping a green economy. Over the past decade, solar energy has made significant progress in terms of capacity, production efficiency and cost effectiveness. Due to technological innovations, the cost of manufacturing solar panels has decreased dramatically, making them competitive with traditional energy sources

Table 1: Global Solar Energy Capacity and Production Cost Dynamics (2015-2024)

Date	Installed Global Solar Energy Capacity (GW)	Levelized Cost of Electricity (LCOE) for Solar Panels (USD/MWh)	Note
2015	229	100	Initial stages of technology development
2018	509	60	Significant price reduction
2021	940	40	Widespread globally
2024 (forecast)	1600+	25-30	Continuous innovation and scale effect

As this table shows, global solar power capacity increased by almost sevenfold from 2015 to 2024, while the cost of electricity generation decreased by more than fivefold. This makes solar power an attractive investment option and outperforms traditional energy sources. In particular, solar power has become the cheapest new source of electricity in many regions

Solar power has a positive impact on the development of a green economy in several important areas:

Reducing the environmental impact: Solar panels do not emit any greenhouse gases or other harmful substances during the process of generating electricity. This is important for mitigating climate change and improving air quality. For example, one gigawatt-hour of solar power can prevent approximately 400-700 tons of CO2 emissions (depending on the region and energy mix).

Economic growth and job creation: The solar energy sector has great potential to create green jobs. These jobs include solar panel manufacturing, installation, maintenance, and research and development. According to the International Renewable Energy Agency (IRENA), more than 13.7 million jobs will be created globally in the renewable energy sector by 2023, with solar power accounting for the largest share.

CONCLUSION

Solar panels are now more than just a power generation technology; they have become an integral pillar of the global green economy, environmental sustainability, and economic development. This study shows that solar energy is not only a renewable, unlimited, and clean resource, but also offers a comprehensive solution to complex global challenges, including climate change, energy security, and resource scarcity.

In recent years, the significant increase in the efficiency of solar panels and the sharp decrease in production costs have made them an economically competitive, and in some cases even preferable, energy source to traditional fossil fuels. This presents enormous opportunities, especially for countries seeking to modernize and diversify their energy infrastructure.

The solar energy sector not only cleans up electricity generation, but also makes a significant contribution to socio-economic development by creating many new jobs. The

process of job creation covers the entire value chain - from research and development to production, installation, maintenance and processing. This contributes to the development of the country's intellectual potential by ensuring employment and increasing the need for new qualified specialists. In addition, solar energy increases local energy independence, protects countries from price fluctuations in the global energy market and strengthens political stability. In the long term, this allows saving money on energy imports and redirecting these funds to other areas of economic development.

However, the large-scale implementation of solar energy faces a number of obstacles. These include high initial investment costs, the lack of fully developed energy storage technologies, grid integration problems and political instability. However, innovative financing mechanisms, subsidies, tax incentives, improved regulatory frameworks and increased investment in scientific research are essential to overcome these obstacles. In particular, sustained political support from governments, the development and implementation of clear strategies for the development of renewable energy sources, as well as international cooperation will play a decisive role in ensuring further rapid development of this sector. In the future, further improvement of solar panel technology, especially research on increasing efficiency, reducing costs and integrating energy storage solutions, will remain a priority.

Solar energy has the potential to reduce global poverty, improve health and allocate more resources to education by providing humanity with clean, sustainable and affordable energy. Thus, solar panels will retain their importance not only as a symbol and a supporting factor for revolutionary changes in the energy sector, but also for sustainable development and the transition to a green economy around the world.

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