

# Research on the Promotion Willingness and Path of Green Energy Empowering Rural Revitalization from a Social Perspective

-- Take Anhui Province as an Example

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## ABSTRACT

With the intensification of global climate change and the growing prominence of environmental issues, the Chinese government has proposed the Rural Revitalization Strategy, aiming to achieve high-quality green development of agriculture and rural areas by comprehensively enhancing the "Five-in-One" construction of rural areas. However, the promotion of green energy in rural areas still faces numerous challenges, restricting its widespread application. Therefore, this study explores the paths of public willingness to promote green energy empowering rural revitalization from a social perspective. Through literature review and field surveys, using various database portals provided by the university library system and multiple model algorithms for analysis, it is found that economic interests, environmental awareness, policy support, and technological maturity are the key influencing factors. In response to these factors, corresponding promotion strategies are proposed, including strengthening economic analysis, improving environmental awareness, increasing policy support, and guiding social public opinion. The research results are of great significance for promoting the widespread application of green energy in rural areas and facilitating the formulation of effective policies and paths.

## KEYWORDS

"Dual Carbon" goal; Green energy; Rural revitalization; Public willingness; Path optimization; Anhui Province

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## 1. INTRODUCTION

### 1.1. Research Background

Against the backdrop of worsening global climate change and prominent ecological issues, green and low-carbon transformation has become a global consensus, and China has further integrated it with rural development. The 20th National Congress of the Communist Party of China clearly stated the need to "promote the green development of agriculture and rural areas". The "Opinions of the CPC Central Committee and the State Council on Accelerating the Comprehensive Green Transformation of Economic and Social Development" identified the direction of rural ecological revitalization. The Ministry of Agriculture and Rural Affairs also issued special opinions, listing the substitution of clean energy in rural areas as a core task of agricultural green transformation, forming a multi-level policy support system [1].

At the national level, intensive implementation measures have been launched: the 14th Five-Year Plan for Renewable Energy supports rural distributed photovoltaic and biomass cogeneration projects; four ministries including the National Energy Administration have launched pilot rural energy revolution projects, aiming to build pilot areas with a renewable energy proportion exceeding 30% by 2025; the "Millions of Households Enjoying Solar Energy Action", "Thousands of Towns and Villages Harnessing Wind Energy Action", and pilot projects such as the "China Zero-Carbon Plan Promotion Project" all aim to empower the "Five-in-One" construction of rural areas through green energy.

However, the effectiveness of policies has not been fully unleashed. In some regions, there are problems such as unstable subsidy policies and inconsistent standards. Policy adjustments lag behind industrial needs, increasing the investment risks of social capital. At the same time, the public's understanding of policies is insufficient (for example, 65% of respondents in a certain area of Shandong do not understand energy transformation policies). Coupled with the insufficient economy and poor technical adaptability of green energy projects, the promotion process is jointly restricted.

Existing studies mainly focus on technology or macro policies, and there is insufficient discussion on the interaction mechanism between policy implementation and public willingness from a social perspective. Therefore, analyzing the key factors of public promotion willingness in combination with national policies and constructing adaptive paths have become an urgent need to break through the bottlenecks in the rural promotion of green energy and assist rural revitalization, which is of both theoretical and practical significance.

## **1.2. Research Significance**

### **1.2.1. Actively Responding to the Requirements of the Times**

With the intensification of global climate change and the growing prominence of environmental issues, China's "Dual Carbon" goal has been deeply integrated with the Rural Revitalization Strategy, and green energy empowering rural revitalization has become an inevitable trend of the times. This study closely follows the national policy orientation, responds to the deployment requirements of four ministries including the National Energy Administration on the construction of pilot counties for rural energy revolution, and focuses on the practice of green energy promotion in rural areas of Anhui Province. Currently, the application of green energy in rural areas faces problems such as difficult technology implementation and uneven coverage. As a key scenario for achieving the "Dual Carbon" goal, the energy transformation of rural areas is directly related to the effectiveness of strategic implementation. By exploring the paths of public promotion willingness, the research not only conforms to the policy direction of high-quality green development of agriculture and rural areas, but also fills the research gap in the interdisciplinary field of green energy and rural revitalization, provides practical support for policy optimization, helps solve the bottlenecks in rural energy transformation, and demonstrates the sense of responsibility of young students in connecting with national strategies and serving social development [2].

### **1.2.2. Optimizing Energy Structure and Increasing Income**

The promotion of green energy in rural areas is a dual measure to optimize the rural energy structure and broaden farmers' income channels. Currently, rural energy is still dominated by traditional fossil energy, which is highly polluting and costly. The popularization of green energy such as solar energy and wind energy can effectively replace traditional energy and build a clean and low-carbon rural energy system. Taking key green towns in Anhui Province as research objects, this study finds that green energy projects can drive the diversified development of rural economy: on the one hand, the reduction of energy use costs alleviates the production and living burden of farmers; on the other hand, the green energy industry can generate employment opportunities, promote the development of related industries such as rural tourism and clean energy processing, and bring additional income to farmers. By analyzing the impact of economic interests on public participation willingness and

proposing targeted strategies, it helps rural areas get rid of dependence on traditional industries, realize a virtuous cycle of energy structure upgrading and economic growth, and inject lasting impetus into the sustainable development of rural areas.

### 1.2.3. Reducing Pollution and Assisting the "Dual Carbon" Goal

The extensive use of traditional energy in rural areas is an important source of environmental pollution. The promotion of green energy can fundamentally reduce pollution emissions and lay a solid foundation for the achievement of the "Dual Carbon" goal. Focusing on the actual situation of rural areas in Anhui Province, this study finds that rural areas generally have problems such as low energy utilization efficiency and lagging pollution control. The clean nature of green energy can effectively reduce air and soil pollution and improve the living environment. At the same time, as an important position for ecological protection, targeting rural areas for the full coverage of green energy is undoubtedly the fastest way to achieve the "Dual Carbon" goal. Through field surveys and data modeling, the study explores effective paths for green energy promotion, helps solve the difficulties such as insufficient energy supply and difficult technology implementation, and promotes the formation of green production and lifestyle in rural areas. It not only provides practical plans for the improvement of rural ecological environment, but also offers replicable regional experience for the implementation of the "Dual Carbon" goal at the rural level nationwide.

### 1.2.4. Enhancing Environmental Awareness

Insufficient public environmental awareness is a key factor restricting the promotion of green energy in rural areas, and the conduct of this study will effectively promote the rooting of environmental protection concepts in rural areas. Currently, some rural residents have problems such as resource waste and insufficient understanding of clean energy. The convenience of modern science and technology has led people to have a wrong concept about resource waste, believing that resources are abundant and inexhaustible, so they no longer cherish and save them. During the research process, through various forms such as questionnaire surveys, field interviews, and public welfare publicity, villagers are educated on the environmental value and use advantages of green energy, breaking the mindset of traditional energy use. At the same time, combined with the characteristics of rural social culture, environmental education is integrated into daily publicity to guide villagers to actively participate in green-loving and green-protecting activities, so that the concept of green development is integrated into daily life. By strengthening the public's awareness of energy conservation and environmental protection, it can not only improve the participation in green energy promotion, but also promote the formation of a new rural trend where everyone practices environmental protection, laying an ideological foundation for rural ecological governance and sustainable development.

## **2. CURRENT SITUATION OF PUBLIC COGNITION ON THE PROMOTION WILLINGNESS OF GREEN ENERGY EMPOWERING RURAL REVITALIZATION**

### **2.1. Overall Cognition Improvement with Individual Differences**

With the in-depth advancement of the "Dual Carbon" goal and the Rural Revitalization Strategy [3], the overall cognition of rural residents in Anhui Province on green energy has gradually improved. Through policy publicity, media dissemination, and demonstration of pilot projects, most people have realized the core advantages of green energy such as cleanliness and energy conservation, and are aware of its positive role in improving the living environment and promoting rural development. However, there are obvious individual differences in cognition: from the perspective of group differences, young people, those with higher education levels, and residents in pilot areas have a more comprehensive understanding of the technical principles, policy support, and economic benefits of green energy; while middle-aged and elderly groups, residents in remote rural areas, and those highly

dependent on traditional energy have a superficial cognition, and even have misunderstandings such as "immature technology" and "high investment costs". This deviation stems from the uneven access to information, differences in individual knowledge structures, and the impact of living habits, which directly leads to the wavering promotion willingness of some people and becomes an obstacle to the full popularization of green energy.

## **2.2. Challenges in the Social Cognition Process**

The social cognition of the public on green energy empowering rural revitalization faces multiple challenges in the process of dissemination and acceptance. On the one hand, the channels for cognitive dissemination are single and lack pertinence. Existing publicity mainly relies on traditional forms such as policy documents and public service advertisements, lacking scenario-based explanations combined with rural reality, making it difficult for the public to intuitively feel the actual value of green energy. On the other hand, the spread of negative cognition has amplified the promotion resistance. Some people have developed distrust of green energy due to cases such as technical failures of individual projects and lower-than-expected benefits, and the information dissemination characteristics of rural acquaintance society have exacerbated the spread of such negative cognition. In addition, the lack of professional knowledge related to green energy makes it difficult for the public to distinguish the authenticity of various information, and they are easily misled by wrong views, which further restricts the in-depth improvement of cognition and affects the transformation of promotion willingness.

## **3. ANALYSIS OF THE CURRENT SITUATION OF GREEN ENERGY EMPOWERING RURAL REVITALIZATION IN ANHUI PROVINCE**

### **3.1. Increased Policy Support**

In recent years, closely following the national "Dual Carbon" goal and the deployment of the Rural Revitalization Strategy, Anhui Province has continuously increased policy support for green energy empowering rural revitalization, constructing a multi-level and systematic policy guarantee system. At the provincial level, in response to the "Construction Plan for Pilot Counties of Rural Energy Revolution" issued by four ministries including the National Energy Administration, targeted implementation rules have been formulated, clarifying the development goals, key tasks, and supporting measures of green energy in rural areas, and incorporating the construction of rural green energy into the assessment indicators of rural revitalization. At the municipal and county levels, policy dividends have been implemented through measures such as financial subsidies and green channels for project approval. For example, construction subsidies and electricity price subsidies have been provided for rural photovoltaic power stations and wind energy utilization projects to reduce the landing cost of projects; financial support has been given to the promotion of green energy technologies and talent training to encourage enterprises and scientific research institutions to participate in rural energy transformation. In addition, local governments have formulated regional green energy development plans, coordinated the resource endowments of different regions such as southern Anhui mountainous areas and northern Anhui plains, and promoted the differentiated layout of green energy projects. The continuous increase of policies has provided a solid guarantee for the development of rural green energy in Anhui Province and effectively stimulated the participation enthusiasm of market entities and the public.

### **3.2. Enhanced Participation Awareness of Community Residents**

With the popularization of policy publicity and the demonstration of green energy pilot projects, the participation awareness of rural residents in Anhui Province in green energy empowering rural revitalization has been significantly enhanced. On the one hand, the public's cognition of green energy

is no longer limited to the superficial concept of "clean and environmental protection", and they have gradually gained an in-depth understanding of its actual value in reducing living costs and increasing income. The number of people actively consulting about the declaration and use processes of green energy projects has continued to increase. On the other hand, participation behaviors have become more diversified. Some farmers have actively installed distributed photovoltaic power stations and purchased new energy agricultural machinery; many rural collective economic organizations have taken the lead in introducing green energy industry projects to drive villagers' joint participation. The improvement of this participation awareness stems from the direct incentive of policy dividends, the effect demonstration of pilot areas, and the publicity and guidance of grassroots governments, enterprises, and social organizations. The rising enthusiasm of public participation has laid a solid main body foundation for the widespread promotion of green energy in rural areas, and promoted the formation of a virtuous cycle of "policy guidance, public participation, and benefit feedback".

### **3.3. Expanded Application Scenarios of Green Energy**

The application scenarios of green energy in rural areas of Anhui Province have expanded from a single living energy use to multiple fields such as production and services. In the field of daily life, the popularity of solar water heaters and photovoltaic power generation lighting in rural areas has gradually increased, replacing traditional fossil energy and reducing residents' energy use costs; in the field of production, solar irrigation and wind-powered precision agricultural technologies have been promoted in some areas, helping the green transformation of agriculture; in the field of services, rural public lighting and sewage treatment facilities powered by green energy have been continuously improved, improving the living environment. In addition, the integrated model of "green energy + characteristic industries" has emerged. Some pilot villages have built "photovoltaic + tourism" and "wind power + homestay" projects, achieving a win-win situation of ecological and economic benefits. However, there is still a problem of regional imbalance in application scenarios. It is necessary to further optimize the adaptability according to the characteristics of regional resources and promote the full integration of green energy into rural production and life [4].

## **4. PROMOTION WILLINGNESS PATHS OF GREEN ENERGY EMPOWERING RURAL REVITALIZATION IN ANHUI PROVINCE**

### **4.1. Rural Residents' Level**

#### **4.1.1. Proactively Participating in Project Co-construction**

Active participation is the core driving force for green energy to take root in rural areas and the key for the public to transform their promotion willingness into practical actions. As direct beneficiaries and users of green energy, rural residents should break the passive mindset of "waiting, relying, and asking for help", and actively respond to the declaration and construction of various green energy-related projects such as distributed photovoltaic power stations, collective wind energy projects, and the promotion of new energy agricultural machinery. In the project planning stage, they should take the initiative to put forward suggestions combined with their own production and living needs to ensure that the project design is in line with rural reality; in the construction process, they should cooperate with professional teams in site coordination, equipment installation and other work to ensure the smooth progress of the project; after putting into use, they should take the initiative to learn equipment operation skills, standardize the use process, and timely feedback problems such as failures and energy consumption abnormalities during operation to provide first-hand grassroots data for project optimization and upgrading. For large-scale green energy industry projects, residents can deeply participate through methods such as capital contribution and labor participation, not only sharing the economic benefits brought by industrial development, but also enhancing their sense of identity and responsibility for the project, forming a virtuous cycle of "co-construction, shared use,

and shared benefits", and laying a solid practical foundation for the continuous promotion of green energy in rural areas [5].

#### 4.1.2. Building a Neighborhood Mutual Assistance Communication Network

The interpersonal network of rural acquaintance society is a natural carrier for information dissemination. Building a neighborhood mutual assistance communication network can effectively reduce the cognitive threshold for green energy promotion. Compared with official publicity, the public's "personal testimony" is more convincing and influential. Villagers who have participated in green energy projects can take the initiative to share their own use experience, including actual benefits such as energy cost savings, additional income increases, and ease of use, and use real data to break the cognitive misunderstandings of surrounding residents such as "immature technology" and "high investment and low return". At the same time, they should patiently answer questions and provide practical guidance for neighbors regarding green energy knowledge, project declaration processes, and equipment operation skills, helping more villagers eliminate participation concerns. Through word-of-mouth and experience sharing among neighbors, the advantages and value of green energy are penetrated into daily interactions, forming a radiating effect of "one person participates, driving a whole area", making the concept of green energy widely spread in rural society, and gradually gathering the joint force of universal participation in promotion.

#### 4.1.3. Promoting the Integration of Green Concepts into Village Regulations and People's Contracts

Integrating green concepts into village regulations and people's contracts is an important guarantee for the long-term promotion of green energy, which can elevate environmental protection and energy conservation from personal awareness to collective consensus and behavioral norms. Rural residents can propose to include content such as green energy promotion, energy conservation and consumption reduction, and resource recycling into village regulations and people's contracts through forms such as villagers' assemblies and consultation meetings, clarifying the responsibilities and obligations of villagers in the use of green energy, project maintenance, and ecological protection. At the same time, they should cooperate with the village collective to establish corresponding incentive and constraint mechanisms, give spiritual recognition or material rewards to villagers who actively participate in green energy projects and practice a green lifestyle, and reasonably restrict behaviors such as wasting energy and damaging green energy facilities. Through the guidance and standardization of village regulations and people's contracts, the concept of green development is deeply integrated into rural governance and transformed into the conscious actions of villagers, creating a new rural trend of "everyone loves green, protects green, and uses green", and providing continuous and stable cultural support and institutional guarantee for green energy empowering rural revitalization.

### 4.2. Government Level

First, improving policy support and guarantee is an important pillar for stimulating the public's promotion willingness. The government should optimize the financial subsidy policy according to the actual situation of rural areas in Anhui Province, expand the coverage of construction subsidies and electricity price subsidies for green energy projects, and reduce the initial investment cost of the public; at the same time, establish and improve the technical standard system, standardize equipment quality and installation service requirements, build an after-sales maintenance service network, and alleviate the public's worries about technical stability and follow-up support. In addition, low-interest loans, tax reductions and exemptions and other financial support policies can be launched to help farmers and village collectives with fund shortages, further reduce the participation threshold, and fully stimulate the public's participation enthusiasm.

Second, carrying out precise publicity and guidance is a key measure to improve promotion efficiency. The government needs to abandon simplistic and stereotyped publicity methods and formulate differentiated publicity strategies for groups of different ages, educational levels, and industrial types.

For middle-aged and elderly groups, use down-to-earth forms such as rural radio broadcasts, field lectures, and case exhibition boards to explain policy dividends and actual benefits in plain language; for young groups, use new media platforms such as short videos and WeChat official accounts to push content such as green energy technology popularization and project declaration processes. At the same time, organize villagers from pilot villages to share their experiences, educate people around them with real-life stories, enhance the pertinence and appeal of publicity, and make the concept of green energy deeply rooted in the hearts of the people.

Third, coordinating resource layout and integration is the core means to break through promotion bottlenecks. Based on the regional resource endowments of Anhui Province, the government should scientifically plan the layout of green energy projects in combination with the natural conditions of different regions such as southern Anhui mountainous areas, northern Anhui plains, and riverside areas, and develop characteristic industries such as solar energy, wind energy, and biomass energy according to local conditions. Strengthen the connection and cooperation between enterprises, scientific research institutions and rural areas, build technology promotion platforms, introduce advanced and applicable green energy technologies and equipment, and solve problems such as insufficient energy supply and difficult technology implementation. At the same time, integrate public infrastructure resources such as transportation, electricity, and communications to provide supporting support for the construction of green energy projects, promote the in-depth integration of green energy with rural industries, eco-tourism, and infrastructure construction, and create a multi-dimensional and three-dimensional promotion pattern.

## 5. CONCLUSION

This study focuses on the promotion willingness and paths of green energy empowering rural revitalization in Anhui Province. Combining policy orientation and rural reality, it analyzes the current situation of green energy promotion, public cognitive characteristics, and core influencing factors. The research clarifies that the active participation of rural residents and the precise policies of the government are the keys to promoting the landing of green energy. Through the co-construction and sharing, mutual assistance and communication, and concept integration at the public level, combined with the policy guarantee, precise publicity, and resource coordination at the government level, the problems such as cognitive deviations, technical bottlenecks, and insufficient participation motivation in promotion can be effectively solved. The research results provide practical references for Anhui Province to optimize the rural promotion paths of green energy, help build a clean and low-carbon rural energy system, promote the coordinated development of ecological, economic, and social benefits in rural areas, and provide strong support for the in-depth integration of the Rural Revitalization Strategy and the "Dual Carbon" goal.

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