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Exploration of the Current Situation and Future Development of the New Energy Industry

-- Taking Bengbu City, Anhui Province as an Example

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Abstract

The report of the 20th National Congress of the Communist Party of China proposed the policy of "actively and steadily promoting carbon peak and carbon neutrality". In order to improve infrastructure construction and promote regional economic development, Bengbu City has actively responded to the national call for energy conservation and emission reduction. However, there are still problems in its application and development, such as imbalanced technological development, unreasonable industrial structure, and low level of technological research and development. Therefore, sorting out the current development status of the new energy industry in Bengbu City and identifying the main factors that affect the development of the new energy vehicle industry in Bengbu City is of great significance for the good development of new energy in Bengbu City. Based on this, this article conducted a research on the current situation and future development of the new energy industry - taking Bengbu City, Anhui Province as an example. This survey mainly focuses on understanding the current development status of the new energy industry in Bengbu City from the perspective of new energy enterprises. Field research and questionnaire survey methods were used to investigate new energy enterprises in Bengbu City. A total of 220 questionnaires were distributed, of which 202 were valid, with an effective percentage of about 92%. Using SPSS software, establish a multivariate ordered logistic regression model and factor analysis model, and combine SWOT analysis method to comprehensively analyze the development of new energy in Bengbu City.

Keywords

New Energy Industry; Questionnaire Survey; SWOT; SPSS.

1. Introduction

The dual carbon guiding ideology refers to the strategic policy proposed by China to promote carbon peaking and carbon neutrality in the context of addressing global climate change issues. The report of the 20th National Congress of the Communist Party of China proposes to actively and steadily promote carbon peaking and carbon neutrality.

On September 23, 2022, the People's Government of Anhui Province issued the "Anhui Province Carbon Peak Implementation Plan" in response to the national dual carbon policy. The plan proposed the "Twelve Actions for Carbon Peak", including energy clean and low-carbon transformation, and green development of urban and rural construction. According to statistics, from January to October 2022, the new energy industry in Bengbu City increased by 30.9%

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year-on-year. Strictly implement various national and provincial preferential policies, further reduce taxes and fees, and lower enterprise operating costs. Develop the "Implementation Opinions on Promoting the Use of Biodegradable Plastic Products to Prevent White Pollution", compile the "Promotion Catalogue of Biodegradable Plastic Products in Bengbu City", and include biodegradable material products in the priority procurement catalog of the city and county governments. For strategic emerging industry enterprises striving to obtain policy funding support such as provincial "three heavy and one innovation", municipal level support will be provided. There are many problems in the application and development of Bengbu City, such as imbalanced technological development, unreasonable industrial structure, and low level of technological research and development. Therefore, it is of great significance to sort out the current development status of the new energy industry in Bengbu City, conduct social research on the new energy vehicle industry in Bengbu City, and identify the main factors that affect the development of the new energy vehicle industry in Bengbu City. For example, it can promote technological progress, environmental protection, economic development, and enrich academic research fields, laying a solid foundation for the future of sustainable development.

2. Review of Relevant Research

Regarding the research on the new energy industry, there is an emphasis on the importance of government and financial subsidies. For example, Xia Yuan and other authors used the financial reports of 153 new energy vehicle companies from 2015 to 2018 as the research object, emphasizing that government subsidies can to some extent drive the importance of invention patents, and proposing suggestions to improve the subsidy review mechanism, jointly carry out subsidy recession procedures, and promote the disclosure of subsidy information; While emphasizing government governance capabilities, Cheng Daojun proposed that government governance includes both within and between government organizations, emphasizing that different governance combinations play different roles in different stages of new energy development; Yang et al analyzed the impact of Chinese fiscal subsidies on renewable energy investment, and the results showed that fiscal subsidies are an important support for the development of small and medium-sized renewable energy enterprises; Emphasizing the importance of technological innovation, Gao Hua and other authors selected 60 representative new energy enterprises from various regions as research cases, and used the fsQCA method to explore the impact path of technological innovation driving the development of new energy enterprises from three levels; Staffan J et al. conducted in-depth analysis of the current status of renewable energy technologies in three European countries, including Germany, Sweden, and the Netherlands, and found that new technologies are closely related to the lifecycle of the new energy industry, indicating that new technologies can enable relevant government departments to change their energy policies. There are also specific suggestions for different research objects. For example, Zeng Guorui pointed out that Bengbu City is currently facing problems such as imbalanced technological development, high costs, and incomplete after-sales services. He also proposed that Bengbu City's new energy application should be based on the long-term, and strengthen the Bengbu City's new energy related service guarantee system while improving its new energy operation mechanism; Liu XH used panel data from 30 provinces in China from 2005 to 2020 to explore the impact of environmental pollution and digital economy on the new energy industry. By using mean growth regression, fully corrected OLS, and dynamic OLS to test the robustness of the results, recommendations were ultimately made for preventing and controlling environmental pollution, protecting consumer rights, and replacing traditional energy with new energy.

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3. Planning and Implementation of New Energy Industry Research in Bengbu

3.1. Research Content

The main content of this survey is the development status of local new energy enterprises in Bengbu City, as well as the opinions and suggestions of new energy enterprise employees on the development status of new energy in Bengbu City. The survey is conducted online and offline, and representative new energy companies in Bengbu City are visited offline for offline research. The online survey is conducted through a combination of questionnaires and online surveys, Conduct online surveys on employees of new energy enterprises in Bengbu through questionnaire surveys and search engine introductions to these companies.

3.2. Questionnaire Content

The questionnaire includes three parts: basic information of employees, understanding and satisfaction with new energy, and opinions and suggestions on the new energy industry. The basic information includes the respondent's gender, age, education background, professional classification, operating direction of the company, position, and length of service; The understanding and satisfaction with new energy include whether they understand new energy and whether they are engaged in new energy related work. These two questions will screen the respondents, exclude those who do not know about new energy and are not engaged in new energy work, evaluate the satisfaction and development potential of the current situation of new energy development in Bengbu City, and evaluate the overall development environment of the new energy industry in Bengbu City; The opinions and suggestions on the new energy industry include sorting the reasons that constrain the development of the new energy industry in Bengbu City, considering the future development direction and drawbacks of the industry, methods to promote the development of the industry, policy recommendations for the Bengbu Municipal Government on new energy, benefits brought by new energy in daily life, and suggestions for the development of the industry from the perspective of Bengbu citizens.

This survey mainly investigates the current development status and future industrial development of new energy enterprises in Bengbu City from the perspective of national new energy policies. The main reason is that under the guidance of national new energy policies, the development of enterprises can have a more direct and accurate understanding of the government's direction, and to a large extent, understand the market, thus producing new energy products that are more in line with market demand, Therefore, enterprises are powerful tools that can reflect the implementation of national policies and market reactions.

3.3. Comprehensive Evaluation Index System for New Energy Industry in Bengbu

This article analyzes questionnaire data, constructs a multivariate ordered logistic regression model and factor analysis model to obtain the industry satisfaction of employees in Bengbu City towards the new energy industry. Since 2015, the China Quality Association has organized user satisfaction assessments in the Chinese new energy vehicle industry for 8 consecutive years, and regularly publishes the assessment results to the society every year. With the improvement of satisfaction, users' expectations for new energy vehicles will become higher and higher, and they will become more picky about the problems that arise during the experience process, and the complaint rate will also increase. To cope with future market competition, automobile manufacturers must effectively track and identify user needs, effectively address user feedback complaints and issues, and continuously improve quality.

This article analyzes the development of the new energy industry from the perspective of the two-way impact of enterprises and new energy in Bengbu City, in order to obtain the industrial

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development laws of the new energy industry in Bengbu City. The law of industrial development mainly refers to the various stages of the birth, growth, expansion, decline, and elimination of an industry. At the corresponding development stage, it is necessary to have some material foundation and external environment to take effective policy measures. Studying the laws of industrial development is beneficial for decision-making departments to adopt different industrial policies based on the development laws of different stages of industrial development, and also for enterprises to adopt corresponding development strategies based on these laws.

The SWOT analysis method mainly conducts a comprehensive dynamic analysis of the specific situation of the internal and external environment of things, and then objectively analyzes and summarizes the internal advantages and disadvantages as well as the external opportunities and threats; Obtain the current development status of the entire thing, and finally combine and analyze these four types of influencing factors to construct a SWOT analysis matrix, obtaining a series of countermeasures and strategies, providing suggestions and choices for decision-makers. Wang Chuandi used the SWOT analysis method to systematically analyze the environment faced by the development of new energy, and proposed suggestions on construction cost recovery, power system consumption, and market mechanism matching after the large-scale development of new energy; From the perspective of automotive marketing strategies, Chen Yan and other authors use the SWOT analysis method, combined with existing relevant research, to analyze the marketing strategies of domestic new energy vehicles, and propose improvement strategies for domestic new energy vehicle marketing.

In summary, this article constructs a comprehensive evaluation index system from three aspects: constructing a multivariate ordered logistic regression model and factor analysis model for industry satisfaction, analyzing the industrial development laws and SWOT analysis of the new energy industry development in Bengbu City, in order to explore the current situation and future development of Bengbu City's new energy industry.

4. Questionnaire Data Analysis

4.1. Data Processing

4.1.1. Questionnaire Distribution

The distribution of this questionnaire survey was 220 questionnaires were recovered and 202 were valid, with the percentage of valid questionnaires recovered being 91.9%.

4.1.2. Reliability and Validity Analysis

Validity refers to the degree to which the measurement tool or means can accurately measure the desired measurement. Validity refers to the degree to which the measured result reflects the content to be investigated. Therefore, the higher the degree of agreement between the measured result and the content to be investigated, the higher the validity; Otherwise, the validity is lower. There are three types of validity: content validity, construct validity and criterion validity.

In order to reflect the overall structural validity of the whole questionnaire, factor analysis was used to evaluate the structural validity of the questionnaire through three main indicators: cumulative contribution rate, common degree and factor load. In order to test whether the questionnaire data can be factor analyzed, Bartley spherical test was first used for analysis, and the specific results were shown in Table 1.

The Chi-square statistic of Bartlett sphericity test is 11959.74, and P is less than 0.0001, indicating that the data is suitable for factor analysis, the rotation matrix is meaningful, and the questionnaire validity can be well explained.

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Table 1. KMO and Bartlett tests

KMO Sample appropriateness measure		0.608
Bartlett's sphericity test	Approximates Chisquare DF P	2039.342 741 0

4.2. Survey Sample Characteristics

As shown in Table 2, (1) the proportion of males is 50.5%. The proportion of women is 49.5%. The proportion of men and women is relatively average. (2) In terms of employment age, people under 25 years old and those between 25 and 35 years old account for over 80% of the total, showing an overall youthfulness. (3) In terms of professional education, the proportion of graduates with a master's degree or above is 19.35%. The proportion of undergraduate students is 58.9%; Overall, the number of undergraduate students is the highest, while the number of other students is relatively average. (4) In terms of job positions, the proportion of company leadership and middle management personnel is 30.71%. The proportion of employees (functional departments) is 42.07%; (5) In terms of working hours, the proportion of employees who have worked for less than three years is 57.42%; The proportion of 4-5 years is 26.24%; The proportion of those who have been over 5 years is 16.34%.

Table 2. Summary of basic information of survey samples

Name		Percentage	frequency	Effective percentage	Cumulative percentage
sex	men	102	50.50	50.50	50.50
	women	100	49.50	49.50	100.00
age	<25	76	37.60	37.60	37.60
	25-35	87	43.10	43.10	80.70
	36-55	31	15.30	15.30	96.00
	>55	8	4.00	4.00	100.00
Educational background	High school and below	15	7.40	7.40	7.40
	Junior college	29	14.35	14.35	21.75
	Undergraduate course	119	58.90	58.90	80.65
	master	30	14.85	14.85	95.5
	Doctor's degree or above	9	4.50	4.50	100.0
Position	Company leadership	18	8.91	8.91	8.91
	Middle management	44	21.80	21.80	30.71
	Employees (Functional departments)	85	42.07	42.07	72.78
	Staff (Production line)	46	22.77	22.77	95.55
	other	9	4.45	4.45	100.0
Working hours	Less than a year	56	27.72	27.72	27.72
	1-3 years	60	29.70	29.70	57.42
	4-5 years	53	26.24	26.24	83.66
	More than 5 years	33	16.34	16.34	100.0

4.3. Industry Satisfaction Analysis based on Multiple Ordered Logistic Regression

In order to study how employees' characteristics affect their satisfaction with the industry, we adopted multiple ordered logistic regression and selected indexes such as majors and years of

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work as explanatory variables, and the explained variables were employees' satisfaction with the new energy industry.

Table 3 and Table 4 show the statistics of the goodness offit of the model description and the results of the significance test of the regression equation between the zero model and the current model. Among them, the Cox-Snell value reaches 0.564, and the Negorko value is 0.613. The log-2 likelihood of the zero model is 448.450, the current model is 280.959, the likelihood ratio chi-square is 167.491, and the probability p value is 0, less than 0.05, then the null hypothesis of the significance test of the regression equation is rejected. The linear relationship between explanatory variables and Logit function is significant, and the multiple ordered logistic regression model is selected correctly.

Table 3. Pseudo R square

Pseudo-R square	
Cox. - Snell	0.564
Negolko	0.613
McFadden	0.328

Table 4. Model fitting information

Modle	Model fitting condition	Likelihood ratio test		
	-2 logarithmic likelihood	Chi square	degree freedom	P
Intercept only	448.450			
finally	280.959	167.491	96	.000

4.4. Analysis of Investigation Results

The survey results show that Bengbu employees have varying degrees of affirmation for the development status and prospects of the city's new energy industry, and also provide suggestions for the development of Bengbu's new energy industry. As for the current situation of new energy industry in Bengbu city, the domestic and foreign markets are broad at present, and all major economies in the world are actively promoting the development of new energy industry, especially in developed countries such as Europe and the United States, which have huge market demand. Bengbu new energy enterprises can make full use of the domestic market size and policy advantages to vigorously develop domestic and foreign cooperation. Strengthen technological innovation and research and development, technology is the core of the new energy industry, new energy enterprises should increase investment in technology research and development, promote technological innovation and upgrading. At the same time, the government should also provide more policy and financial support in technological innovation. The government should revise and improve relevant policies and regulations in a timely manner according to the development needs of the new energy industry to ensure the healthy and orderly development of the new energy industry.

5. Analysis of New Energy Industry Development in Bengbu

5.1. The New Energy Industry

In recent years, due to the role of favorable policies, market development and other factors, the new energy industry has ushered in epoch-making opportunities. Many new energy enterprises have accelerated the pace of transformation and upgrading. As the world's largest new energy industry market, over the years, China's new energy occupies a dominant position in both new energy investment, total share of assets and enterprise scale, among which the development of wind energy, solar energy, hydro energy and nuclear energy has maintained a strong

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momentum for a long time. Driven by the goal of "reaching the peak of carbon" and "carbon neutrality", the market size of the new energy industry still has a large room for growth. Although the impact of macro factors will make the market fluctuate in the short term, in the long run, the development trend of the new energy industry is still stable and upward.

5.2. Bengbu Enterprises' Attitude Towards New Energy

In recent years, Bengbu City plans to build a comprehensive layout of new energy industry cluster highland in northern Anhui. By the end of July 2023, Bengbu City has a total of 44 new energy enterprises above designated size. Since the beginning of this year, Bengbu City has signed a total of 28 new energy industry projects, with an investment of 27.3 billion yuan. According to the survey and data analysis, 38 of the 44 new energy enterprises have long- term and strategic planning and layout for the new energy industry, accounting for as high as 86.36%. 40 new energy enterprises said that they are full of confidence in the development of the industry and enterprises, and believe that in the next ten to twenty years, the new energy industry will become one of the pillar industries of Bengbu City, accounting for as high as 81.81%.

In addition, among the 30 relevant enterprises in the random survey, 22 enterprises said that new energy is the main direction of the future transformation and upgrading of enterprises, and at present, enterprises have reached cooperation intentions with new energy companies, accounting for 50%. On the whole, Fuyang enterprises have a long-term optimistic attitude towards the development of new energy industry, that new energy is the future direction of development, help to reduce environmental pollution, reduce energy consumption, and meet the requirements of sustainable development, both in the development trend, investment cooperation with other enterprises, obtain information sources in various aspects in the process of cooperation, and at the same time introduce head enterprises to reduce investment risks. However, there are still some enterprises on the sidelines of new energy, will pay close attention to the development of new energy technology and market prospects, but there is no large-scale investment or transformation plan for the time being.

5.3. The Impact of New Energy on Bengbu Enterprises

Judging from the development of Bengbu new energy industry in recent years, the impact of new energy on Bengbu enterprises is positive and significant. In terms of layout, the rapid development of new energy has made Bengbu enterprises form a new energy cluster effect and build a new energy industry base, creating new opportunities and providing new ideas for the development of many enterprises. Enterprises can enter the new energy industry chain to carry out the research and development, production and sales of new energy products, such as solar photovoltaic, wind power generation, electric vehicles and so on. From the perspective of transformation, the development of new energy in Bengbu City has accelerated the pace of transformation and upgrading of enterprises and strengthened the competition and cooperation between enterprises. From the market, the development of new energy in Bengbu City has contributed to the creation of high-quality "Bengbu brand".

With the continuous release of production capacity and the stable market sentiment, the market share of the industry will be further improved. From the perspective of environmental protection, the development of Bengbu new energy industry will help enterprises achieve energy conservation and emission reduction, and reduce the dependence on traditional fossil energy. Reducing energy consumption and reducing pollutant emissions can help enterprises improve their environmental image, meet environmental protection requirements, and reduce energy costs.

In general, the development of new energy industry in Bengbu Cit is more active, the government attaches importance to the development of new energy industry, and has

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introduced a series of supporting policies. Some achievements have been made in the fields of solar power generation, wind power generation, new energy vehicles and smart grids. In the future, with the advancement of technology and the promotion of policies, Bengbu new energy industry is expected to continue to develop and grow, and make greater contributions to energy conservation and emission reduction and sustainable development.

6. New Energy Application Problem Solving Ideas

6.1. Policies Support the Development of New Energy

Bengbu new energy enterprises can make full use of the domestic market scale and policy advantages, and vigorously develop domestic and foreign cooperation; Strengthen technological innovation and research and development, technology is the core of the new energy industry, new energy enterprises should increase investment in technology research and development, promote technological innovation and upgrading. Introduce or support the development of current mainstream technology routes and future technology routes, and reduce the technical support that has been marginalized. At the same time, the government should also provide more policy and financial support in technological innovation. We will help enterprises introduce talents and strengthen subsidies and support for professional and technical personnel. The government should revise and improve relevant policies and regulations in a timely manner according to the development needs of the new energy industry to ensure the healthy and orderly development of the new energy industry.

6.2. Strengthen Cooperation with Other Enterprises

New energy is the future development direction, with the Bengbu government issued support policies and continuous technological innovation, the new energy industry will usher in a broader development prospect. Therefore, new energy enterprises should strengthen cooperation with other enterprises, obtain information sources in various aspects in the process of cooperation, and at the same time introduce head enterprises to reduce investment risks.

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References

[1] A. Rehman, A. Paul, M. A. Yaqub and M. M. U. Rathore, "Trustworthy intelligent industrial monitoring architecture for early event detection by exploiting social IoT", Proceedings of the 35th Annual ACM Symposium on Applied Computing, pp. 2163-2169, 2020, 3.

[2] W Qi and G. Xiaoli, "Countermeasure and Interaction of Common Technoinnovation and New Energy Industry Development[J]", Energy Procedia, vol. 5, no. 1, pp. 1308-1312, 2011.

[3] C Jiang, Y Zhang, Q Zhao et al., "The Impact of Purchase Subsidy on Enterprises' R&D Efforts: Evidence from China's New Energy Vehicle Industry[J]", Sustainability, pp. 12, 2020.