DEVELOPING A COMPETITIVE ALTERNATIVE ENERGY STRATEGY: A CASE STUDY OF TAIZHOU SANXIN CO, LTD.

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Abstract

This study utilizes a mixed-methods approach, using questionnaires and group interviews as data collection tools. The sample group was selected using the cluster sampling method, with a total sample size of 400 participants and a margin of error of 0.05. The data collected from the questionnaires were analyzed using descriptive statistics, including percentages, means, and standard deviations.

The results of the analysis indicate the need for strategic planning and the selection of appropriate tools, equipment, and technologies. 1) The stability of the production system contributes to economic expansion, increasing productivity and improving operational efficiency. 2) The overall level of organizational management is at the highest level. Factors such as strategies, systems, and organizational capabilities significantly influence the success of the renewable energy business. And 3) Proactive strategies enable the continuous and rapid development of advanced technologies, increase productivity, reduce production costs, and support labor efficiency while improving the knowledge and skills of employees.

Keywords: Development, Competitive Strategy, Alternative Energy Business, China, Interdisciplinary Humanities

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Introduction

Taizhou Sanxin Co, Ltd. was founded on June 12, 2006. The company's business scope includes power supply, sales and service, installation, repair, testing and inspection of power equipment, power engineering consulting and training, power equipment sales, power equipment supervision and operation, comprehensive power services, etc. (Huang et al., 2023). In the past, the company's technology, production and operation scale have not been able to meet the increasingly scarce traditional energy consumption, and with the rise of other competitors, the company's advantage is slowly narrowing (Yang et al., 2023).

The company's business scope includes power supply, sales and service, installation, repair, inspection, and testing of energy equipment, energy technical consulting, and training, sale of energy equipment, support and operation of energy equipment, according to Aghahosseini et al. (2020), comprehensive energy services, etc. In the past, Agyekum et al. (2021) were unable to meet the increasingly scarce traditional energy consumption with the company's technology and scale of production and operations. With the rise of other competitors, the company's advantage is slowly fading (Anton & Nucu, 2020)

The overall world energy situation Energy consumption has risen sharply, and the contradiction between supply and demand has intensified (Chen et al., 2024). Fossil energy occupies the dominant position in global energy consumption. Most of the world's energy supply is still in the hands of the West. Other energy sources, Ahmad et al. (2021), especially new energy sources, are developing rapidly, but it will be some time before significant progress is made. International oil prices are difficult to return to their original levels (Sophon & Worapongpat, 2025), and price fluctuations pose major challenges to both energy producers and consumers (Wang et al., 2024). The relationship between energy supply and demand is generally tense. Despite the overall balance of oil supply and demand in the world, the balance is fragile. In some countries and regions, (Worapongpat et al., 2022). Often due to natural disaster turnover, social private activities, and other reasons, Worapongpat et al. (2021) results in some countries and regions from time-to-time oil shortages, electricity shortages, and other energy supply tensions. In general, fewer and fewer new oil fields have been discovered worldwide in the past two years, and energy production capacity has increased slowly. Nevertheless, energy demand has increased rapidly. Proven oil reserves and production status of various energy sources have continued to rise slightly, and refining capacity has continued to increase. In recent years, demand for renewable energy has increased due to concerns about the security of fossil energy supplies and climate and

environmental issues. However, Worapongpat (2024A), Renewable energy development is more dependent on government support and subsidies, and the development of late renewable energy still faces many difficulties and problems (Wu, et al., 2024). Improving the secure consumption capacity of the power grid for new energy. Worapongpat (2021). We will strengthen the security and stability of new energy units connected to the grid and improve security support for key nodes' frequency and voltage (Worapongpat & Sriaroon, 2024). We will promote establishing a nationwide monitoring system for sub-synchronous oscillations to improve the ability to prevent and control the risks of new stability problems (Worapongpat & Khamcharoen, 2024). We will encourage the establishment of a consultation mechanism between the government and businesses. for planning and developing new energy and improving the secure capacity of the power grid to absorb new energy (Wu et al., 2024). for future global economic development Worapongpat (2024B). For a long time, the primary energy market will be the master energy means to capture the global economy, from the market source to get the initiative, Worapongpat et al. (2024). Traditional coal-fired power generation technology (Worapongpat et al., 2024). backward, inefficient, belongs to non-renewable resources, causes severe environmental pollution, serious harm to human health, does not meet the future economic development, (Worapongpat & Pongwiritthon, 2020). New renewable energy is the future direction of growth in developed countries (Su et al., (2023).

Therefore, the researcher is interested in developing a competitive strategy for an alternative energy company: A Case Study of Taizhou Sanxin Co., Ltd. to increase competitiveness in the said company and ensure the sustainability of the business. future business

Research Objectives

1 To study information on the condition of renewable energy projects and the development of competitive strategies in the alternative energy business: a case study of Taizhou Sanxin Co., Ltd.

2. To study management in the industry Organizational management factors, Business Performance Factors, and Competitive Strategy Development in Alternative Energy Business: A Case Study of Taizhou Sanxin Co., Ltd.

3 To analyze the factors of industry success and the development of competitive strategies in the alternative energy business: a case study of Taizhou Sanxin Co., Ltd.

Literature Review

Figure 1.

Pascaris et al. (2021) This qualitative research aims to identify strategic recommendations for appropriate approaches, processes and procedures to change the submission of energy management reports by operators. Leads to electronic forms of the Department of Alternative Energy Development and Efficiency research findings based on organizational change management theory using innovative e-forms for energy management report submission.

Research Conceptual Framework

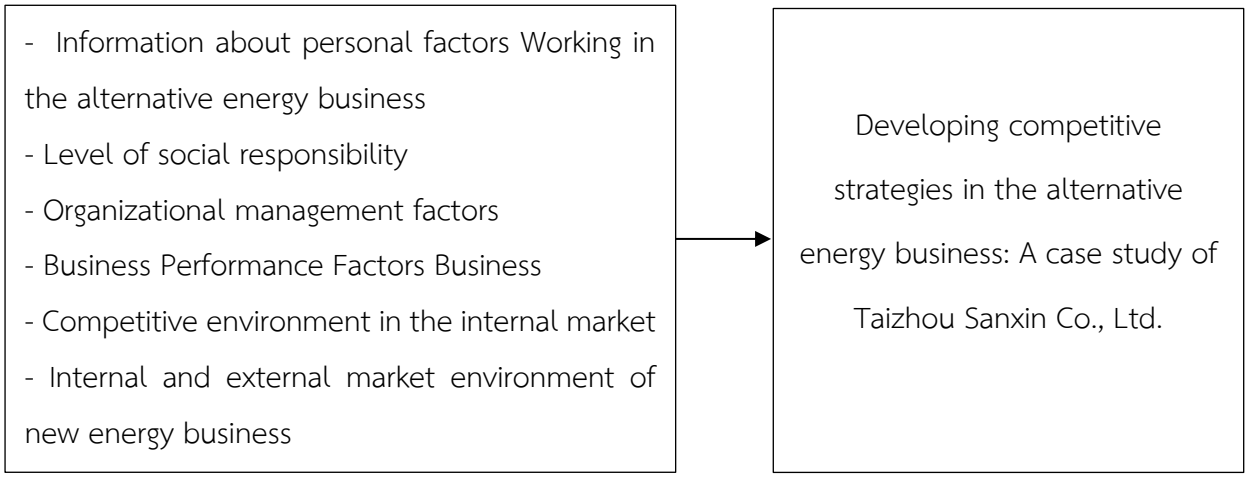

Figure 2. Conceptual framework

How to Conduct Research

How to conduct the research (The following steps are required)

This research combines qualitative and quantitative research (mixed methods)/ qualitative/ quantitative research. The research method is as follows:

1. The population and sample groups in the research include:

1.1 The population and sample used in the quantitative research study included iSanxin Special Materials (Changzhou) Co, Ltd: Xiaxi North Road, Jiaze Town, Wujin District, Changzhou City, Jiangsu Province, according to the sampling method. Random sampling and reservation of another sample of 16 people. Therefore, this research used a sample size of 400 people who met the criteria according to the specified conditions, not less than 384 people, as in the formula. Cochran.

1.2 The population of this qualitative research study includes the entrepreneurs of Sanxin Special Materials (Changzhou) Co, Ltd. Xiaxi North Road, Jiaze Town, Wujin District, Changzhou City, Jiangsu Province, as well as the people related to the company and — government work in determining the population. The researcher used simple random sampling to determine a population of 9 people and considered the informants who could answer the objectives. And the questions of this research. They were categorized into three groups: Entrepreneurs, people with duties related to the business and governmental agencies

2. The research instruments include 1) an interview form (interview) and 2) a questionnaire (questionnaire). The questionnaire (questionnaire) consists of part 1: general status of respondents. It is like a survey, part 2, a questionnaire on industry management. Organizational management factors Factors of organizational performance are a 5-level rating scale (Rating Scale) and Part 3. Qualitative research uses data collection methods from in-depth interviews. The structure is divided into two parts as follows. General information about the respondents, interviews, industry success factors, Competitive environment in the domestic market, and the internal and external market environment of China's new energy. The researcher took the questionnaire to determine the quality of the instrument. This included 1) handing over the questionnaire to a consultant and making improvements according to the recommendations and 2) handing over the revised questionnaire to the moderator. Three experts checked the consistency of the content by determining the congruence of the objectives with the questions (Index of Item – Objective Congruence: IOC),

that the IOC value was between 0.80 - 1. 00 and 3) testing the instrument with a non-sample population of 3 0 sets, where the assessment results showed a discriminatory power between 0.25 - 0.75 and the reliability of the questionnaire was determined using the Cronbach method, where the results of the confidence assessment showed a confidence value of 0.95.

3. The data collection includes the collection of data from 1) primary data from in-depth interviews with the target group and questionnaires. 2) Secondary data will be collected from various documents such as books, textbooks, academic documents, research papers, relevant electronic media, etc.

4. The data analysis is divided into two parts: 1) Qualitative data analysis. Using the information from the in-depth interviews with the target groups and collecting information and documents for content analysis 2) Quantitative data analysis: The data obtained from the distribution of questionnaires are analyzed using statistical programs.

5. The statistics used in the study include a ready-made descriptive statistics program consisting of percentages and the mean. Standard deviation

Research Results

Based on Objective 1, the results of data analysis on the status of renewable energy projects and the development of competitive strategies in the alternative energy sector: a case study of Taizhou Sanxin Co., Ltd.

Table 1. shows the number of frequency values and the percentages of personal factors. Development of competitive strategies in the alternative energy industry: a case study of Taizhou Sanxin Co., Ltd.

Sex	Quantity	Percentage
Man	152	38.00
Female	248	62.00
Together	400	100

Table 1 shows that the number of personal factors in the development of competitive strategies in the alternative energy industry: a case study of Taizhou Sanxin Co., Ltd. 152 men, accounting for 38.00 percent, and 248 women, accounting for 62 percent.

Table 2. shows the number of frequency values and percentage of personal factors in Competitive Strategy Development in Alternative Energy Business: A Case Study of Taizhou Sanxin Co., Ltd. in terms of age

Age	Quantity	Percentage
Not more than 35 years	18	4.39
36-40 years	153	38.51
41-45 years	122	30.43
46-50 years	68	17.27
50 years and older	39	9.70
Together	400	100

From Table 2, the number of frequency values and percentage of personal factors in the development of competitive strategies in alternative energy business: a case study of Taizhou Sanxin Co., Ltd. As for age, most of the respondents were between 36and 40 years old, totaling 153 people, accounting for 38.51 percent.

Table 3. Shows the number of frequency values and percentage of personal factors in developing competitive strategies in alternative energy business: a case study of Taizhou Sanxin Co., Ltd. experience

Status	Quantity	Percentage
less than 10 years	216	54.00
10-15 years	80	20.00
16-20 years	54	13.50
more than 20 years	50	12.50
Together	400	100

From Table. 3 It was found that personal factors in the development of competitive strategies in the alternative energy industry: a case study of Taizhou Sanxin Co, Ltd in terms of experience. Most of them have less than 10 years of experience, accounting for 54.00 percent.

Table 4. shows the number of frequency values and percentage of personal factors in developing competitive strategies in alternative energy business: a case study of Taizhou Sanxin Co, Ltd in terms of job position

Position	Quantity	Percentage
Senior executives	13	3.00
middle management	59	3.00
Junior executives	106	26.50
expert	83	20.80
Working group, department head	139	34.70
Together	400	100

Table 4 shows personal factors in the development of competitive strategies in the alternative energy industry: a case study of Taizhou Sanxin Co, Ltd. In terms of occupational position, most of them were first-level managers, 106 people, accounting for 26.50 percent.

From Objective 2: Results of data analysis on management in industry. Organizational management factors Factors of corporate performance, development of competitive strategy in alternative energy business: a case study of Taizhou Sanxin Co., Ltd.

Table 5. shows the average values and standard deviation Development of competitive strategy in alternative energy business: a case study of Taizhou Sanxin Co, Ltd in the field of strategic operational process adjustment.

Adjusting the strategic execution process	Mean	SD	level
Evaluation and strategic control	4.15	0.59	High
Carrying out strategies into practice	4.10	0.64	High
strategic planning	4.02	0.66	High
Together	4.09	0.55	High

Table 5 shows that the sample group has a high level of adaptation of the entire strategy implementation process. It is at a high level ($\overline{X}$ = 4.09; SD = 0.55) when looking at the individual aspects. 1 is the evaluation and strategic control, order no. 2 is that the implementation of strategy into practice has a high evaluation level ($\overline{X}$ = 4.10; SD = 0.64), and in order 3 is the strategy planning the evaluation level was at a high level ($\overline{X}$ = 4.02; SD = 0.66).

Table 6. shows the mean scores and standard deviation of developing competitive strategies in the alternative energy industry: a case study of Taizhou Sanxin Co., Ltd. at the social responsibility level

Social responsibility alternative energy business	Mean	SD	level
Environmental responsibility	4.87	0.76	High
Community responsibility	4.93	0.75	High
Legal responsibility	4.85	0.75	High
Together	4.91	0.58	High

Table 6 Results of the data analysis: It was found that the sample group has a high level of social responsibility. Overall, it is at a high level. ($\overline{X}$ = 4.91; SD = 0.58) When looking at the individual aspects, the order is 1 is the responsibility towards the community There is a rating level. is at a very high level ($\overline{X}$ = 4.93; SD = 0.75) 2 is the responsibility towards the environment There is a rating level at a high level ($\overline{X}$ = 4.87; SD = 0.76) and the 3. is the legal responsibility The rating level is at a high level ($\overline{X}$ = 4.85; SD = 0.75)

Table 7. shows the average and standard deviation of the development of competitive strategies in alternative energy business, a case study of Taizhou Sanxin Co., Ltd. in terms of the degree of utilization of technology and innovation

Level of use of technology and innovation	Mean	SD	level
Developing and using technological media for public relations of the organization	3.84	0.56	High
Development of work processes	3.68	0.56	High
Development and promotion of work skills	3.95	0.55	High
Together	3.81	0.55	High

Table 7, the analysis results, shows that the sample group has a high level of use of technology and innovation. Overall, it is at a high level ($\overline{X}$ = 3.81; SD = 0.55) when looking at the individual aspects. 1 is the development of work skills has a high level of evaluation ($\overline{X}$ = 3.95; SD = 0.55) Where 2 is the development and use of technological media for public relations of the organization, there is a high level of evaluation ($\overline{X}$ = 3.84; SD = 0.56), and

the order 3 is the development of operational processes with a high level of the assessment ($\overline{X}$ = 3.68; SD = 0.5 6)

Based on objective 3, examine the analysis of industry success factors and the development of competitive strategies in the alternative energy sector: a case study of Taizhou Sanxin Co., Ltd.

Table 8. Mean and standard deviation of overall factors for alternative energy business management.

Alternative energy business management factors	Mean	SD	level
Strategic aspect	4.28	0.42	high level
Organizational structure	4.25	0.49	high level
Organizational management style	4.25	0.44	high level
System side	4.20	0.43	high level
Personnel side	4.11	0.55	high level
Skills and expertise	4.17	0.47	high level
Value aspect	4.25	0.45	high level
Together	4.21	0.46	high level

Table 8 shows the average values of the overall organizational management factors. The value is at the highest level ($\overline{X}$ = 4.21; SD = 0.46). When looking at the individual aspects, it was found that the element with the highest mean score is Strategy ($\overline{X}$ = 4.28; SD = 0.42), followed by Organizational Structure ($\overline{X}$ = 4.25; SD = 0.49) Organizational Leadership Style ($\overline{X}$ = 4.25; SD = 0.44) Shared Values ($\overline{X}$ = 4.25; SD = 0.45) and the aspect with the lowest mean score is Human Resources ($\overline{X}$ = 4.11; SD = 0.55)

Table 9. Mean value and standard deviation of the efficiency factors of companies in the alternative energy sector.

Performance factors of alternative energy businesses	Mean	SD	level
Cost side	4.36	0.46	Highest
Quality	4.39	0.43	Highest
Quantity side	4.23	0.47	Highest

Table 9. Mean value and standard deviation of the efficiency factors of companies in the alternative energy sector. (Cont.)

Performance factors of alternative energy businesses	Mean	SD	level
Production method	4.36	0.43	Highest
Time aspect	4.33	0.45	Highest
Together	4.36	0.43	Highest

Table 9. shows that the average value of the factors for overall company performance is the highest ($\overline{X}$ = 4.34; SD = 0.36). When looking at the individual aspects, it was found that the element with the highest average value is quality ($\overline{X}$ = 4.39; SD = 0.43), followed by cost ($\overline{X}$= 4.36; SD = 0.46), the production method side ($\overline{X}$= 4.36; SD = 0.43) and the side with the lowest average value: Chan Quantity ($\overline{X}$ = 4.23; SD = 0.47) and the side with the lowest average value are: Special offers during different festivals.

Table 10. shows the mean and standard deviation of the success levels. Alternative energy business: a case study of Taizhou Sanxin Co., Ltd. on the factors of organizational characteristics

Factors and characteristics of alternative energy business organizations	Mean	SD	level
Capital side	3.83	0.85	Highest
In terms of the number of manpower	3.92	0.80	Highest
Location	3.70	0.79	Highest
Estimated production capacity	3.71	0.73	Highest
Alternative energy	3.89	0.78	Highest
Processing time	3.69	0.83	Highest
Together	3.78	0.67	Highest

From Table 10 show the results of data analysis revealed that the success level of alternative energy business: a case study of Taizhou Sanxin Co., Ltd. in terms of organizational characteristics factors Overall, the score is at the highest level ($\overline{X}$ = 3.78, SD = 0.67). When looking at the individual aspects, it was found that the element with the highest average value

is related to the number of workers ($\overline{X}$ = 3.92; SD = 0.80) followed by Alternative energy ($\overline{X}$ = 3.89, SD = 0.78)

Episode 3 SWOT analysis TOWE MATRIX

Table 11. Results of analyzing the strengths, weaknesses, opportunities, and threats (SWOT analysis) and developing competitive strategies in alternative energy: a case study of Taizhou Sanxin Co., Ltd.

(Strength)	(Weakness)
1. Overall creativity 2. Overall, technical techniques are the most appropriate. 3. Overall level of technical progress	1. General social aspect 2. Improving the quality of life of society and the community as a whole 3. Creation of jobs for people in the community through an overview 4. Economic aspects affecting the community and the area as a whole 5. Creation of a general awareness 6. Sustainable urban and rural development and growth as a whole 7. Consideration of stakeholders through Overview Quality
(Opportunity)	**(Thread)**
1. Category Economy Finance and Marketing 2. Economic aspects and investment returns overall 3. Overall, marketing and commerce are very appropriate. 4. Creating value for businesses, with a focus on supply chain management Overall, it was very appropriate. 5. In terms of creating economic benefits General competition	1. Operation and maintenance overall project 2. Increasing management efficiency overall management 3. Competence of personnel in the implementation of the overall project 4. Dealers, suppliers and partners involved General relevance

Table 12. The results of the analysis show strategies for developing industrial enterprises and developing competitive strategies in the field of alternative energy. The case study of Taizhou Sanxin Co., Ltd. strategic analysis TOWS Matrix Analysis found that

Strategy (SO)	Strategy (WO)
Proactive strategy: the government has established energy security, made investments, set up an energy research center, and improved the transmission system to prevent the backflow of electricity. Good management, efficiency, and effectiveness use energy storage smart grid technology to work, use digital systems to analyze data to create an efficient smart microgrid that can support disruptive technology	Reactive strategy: The government lets communities and citizens participate in production and manage energy to create energy security. Increase the efficiency and stability of renewable energy generation.
Strategy (ST)	**Strategy (WT)**
Strategies to solve, develop and turn to alternative energies. The introduction of advanced technology or new technologies to make the generated electrical energy stable. Rapid expansion of technological knowledge in the field of renewable energy. For highly efficient technology	Preventive strategies Change laws and regulations that are not yet conducive to developing renewable energy. Use devices to create alternative energy models. Call on industrialized countries to reduce greenhouse gas emissions in the atmosphere to a level that is not harmful to the climate system.

Discuss the Results

Results from research objective 1: Current situation and problems in managing renewable energy use. It raises the level of work of coordination and cooperation. It is a management solution to the problem of using alternative energy. Support and create awareness. Be mindful and impart knowledge to staff. Be able to access knowledge and participate in the formulation of strategies. Improve basic structures to support the use of alternative energy. There is an analysis of planning and selecting appropriate tools, equipment and technology. The stability of the production system leads to economic expansion. Increasing productivity and efficiency Dent, Strielkowski, et al. (2021). Renewable energy in the

sustainable development of the electricity sector China is at the forefront of the recent global expansion of renewable energy (RE). This study examines how the country has become the world's largest producer and exporter of RE products and the largest producer of electricity from renewable energy.

Findings from Research Objective 2 It was found that the overall organizational management level in all aspects at the level. Most of the organizational management, strategy, systems, and capabilities influence the success of the renewable energy business in Thailand is consistent with the research of Solangi, et al. (2021). Assessing and Overcoming the Barriers to Renewable Energy for Sustainable Development in Pakistan. This qualitative research aimed to identify strategic recommendations on appropriate approaches for procedures and processes to change entrepreneurs' submission of energy management reports in the e-forms of the Department of Alternative Energy Development and Efficiency.

The results of research objective 3 revealed that proactive strategies can lead to modern technologies developing continuously and rapidly. And increase productivity and reduce production costs. The plan to prevent fragmentation of renewable energy installations means no fuel is imported. Therefore, no money flows out of the country. Remedial strategies can increase production quickly and continuously utilize renewable energy. Defense strategy In renewable energy production, there are no infrastructure constraints for fuel transportation and little investment. This aligns with Song, et al. (2022) Overview of renewable energy development policy tools in China. Can invest in renewable energy power plants to expand production capacity. This aligns with research on developing business continuity management strategies in the renewable energy sector. Sustainable use of technology and modern workflows include 1) developing and using technological media for the organization's public relations, convenience for receiving information, and fast communication with modern communication tools that respond to needs and save costs in contact and coordination. 2) Develop work processes that are modern and flexible. Increase skills and work potential and reduce workload. Convenient and fast 3) Develop and promote work skills, including encouragement and support. Make work more efficient Have more knowledge and skills

New Knowledge from Research

The study of environmental opportunities outside the organization of Taizhou Sanxin Company found findings that can be summarized as follows.

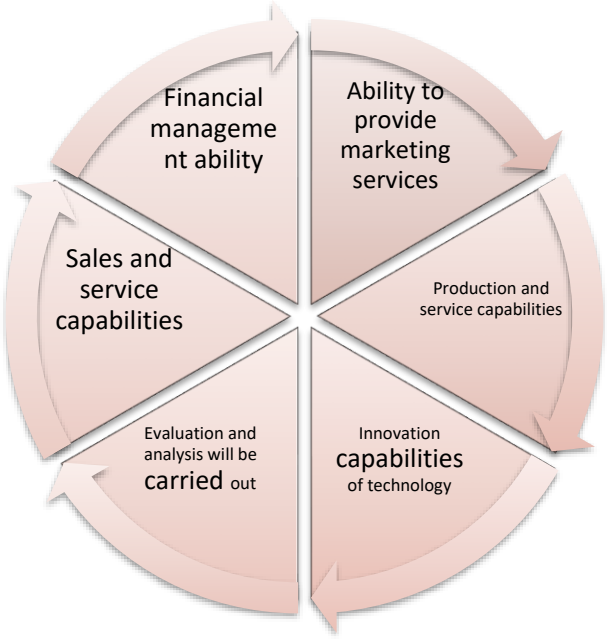

Figure 3. Five indicators for the external environmental opportunities of Taizhou Sanxin

Found knowledge that can be summarized can be represented by 5 indicators: technology innovation ability, production ability, service, marketing service delivery capability, financial management capability, and sales and service capability. An evaluation and analysis are conducted.

Suggestions

Policy recommendations

1. The government should set up a budget for national development. This would mean increasing the efficiency of the production process, thereby reducing production costs, and providing management advice to promote and create awareness and the ability to access knowledge. This kind of balanced management can enable the economy to expand for the growth of the country.

2. Entrepreneurs, administrators and managers can set policies and project plans, leading to participation in policy making. They can explain the development process in the renewable energy industry and make recommendations for practice.

3. The state sector should support the production industry for renewable energy technologies in the country and be able to compete in trade on the international market. They can use organizational characteristics, organizational management factors and

organizational effectiveness factors that influence success and can be used for the development of the renewable energy industry in Thailand.

4. The management of private energy sector development consists of 3 main aspects: 1) The economic aspect involves creating maximum benefits from energy by conserving social capital. I (natural resources, human resources) 2) The environmental aspect focuses on maintaining the stability of the ecosystem, both biologically and physically, through energy production and use. And 3) the social aspect must maintain the stability of society and culture. This includes reducing conflicts in society caused by energy production and use.

Suggestions for future research: Different agencies can use the findings to investigate and utilize them compared with this research. To find conclusions. Promote and succeed by applying strategies, systems, and skills to develop the renewable energy business. Thailand brings innovation by using efficiency, quality, quantity, and time to solve problems. Solving problems is beneficial for increasing renewable energy production potential, utilization, and market. Develop regularly and keep up with the changes.

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