DEVELOPMENT AND UTILIZATION OF GEOTHERMAL ENERGY OF XI'AN ENERGY

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ABSTRACT

To cope with climate change and meet the demand for clean energy heating and geothermal energy in China. Since 2013 our company has started to research medium-deep undisturbed clean geothermal energy technology for heating, mainly in Xi'an, Shaanxi Province for some projects heating services, China itself is relatively rich in geothermal energy resources, for this technology to provide security. This paper mainly introduces the company structure, development direction, and feasibility analysis, through this analysis can help the operator to correctly formulate the company strategy, as soon as possible to achieve the goal of business bigger and stronger, the economic benefits of this project are outstanding, the social benefits are significant, and the feasibility show that the construction period is 0.5 years, the static payback period is more than 25 years and internal rate of return (IRR) is 4.70%.

keyword: Energy Environmental, Development and utilization**,** geothermal energy, Xi'an Energy

INTRODUCTION

Xi 'an Energy of Xi' a New Area, Shaanxi Province (hereinafter referred to as the "Energy Company") was established in June 2014 with a registered capital of 2 billion yuan. The company is located in Xi ' a High-tech Zone, Shaanxi Province. The project is distributed in Xi' a New City. It applies the middle and deep clean geothermal energy technology for heating, which truly takes "heat without water" and discharges any waste gas and waste residue from the surrounding environment. which is a real green technology.

INDUSTRY ANALYSIS

2.1 SWOT analysis, full-factor analysis and summary

The company has been established for a relatively short period, the standardization system has not yet been established, the whole process service capability is not yet balanced, the core technology research and development innovation is not deep enough, and the capital pressure of the asset-heavy business model is relatively high. The company's strategic environment SWOT analysis matrix is shown in the following table.

Table 1 SWOT analysis matrix SWOT matrix

SWOT matrix	**STRENGTHS** 1. Differentiated competitive advantage of integrated energy mode; 2. The first-mover advantage of large promotion volume; 3. Demonstration effect of major projects; 4. Strong anti-risk ability of the main business; 5. Young team, with great development potential; 6. A certain range of government resources.	**WEAKNESS** 1. Asset-heavy model has heavy capital pressure; 2. Insufficient market competitiveness; 3. The urgency of business expansion; 4. Insufficient in-depth research and development of core technologies: 5. Unbalanced service capacity of the whole process.
OPPORTUNITIES (favourable) 1. Clean heating policy support; 2. Social and economic development; 3. Company listing; 4. Better marketization level.	**SO** Make use of advantages, seize opportunities, expand the scale.	**WO** Seize the opportunity, make up for the shortage, have a planned adjustment of the product structure.
TREATS (threaten) 1. Rapid entry of large central enterprises and private enterprises; 2. Development of new technologies and alternatives; 3. The very possible vicious competition.	**ST** Use your advantages to avoid or mitigate risks.	**WT** Reduce disadvantages and avoid risks。

MARKET ANALYSIS MARKETING PLAN

3.1 Market Segmentation and Target Market Selection

From China's urban heating industry mainly through the energy conversion of energy products such as coal, supply, and transport of thermal energy for industrial

enterprises and residential users to protect the winter heating in northern areas, while providing thermal energy for the industrial production of enterprises, the characteristics of the industry itself determines that its supply and demand generally does not appear to be greater than the demand situation, in terms of the industry's supply and demand indicators in 2014. Industry output and revenue values and growth rates are relatively close, supply and demand are basically in a balanced state. From the perspective of potential demand, there are still many areas in China that do not carry out centralized heating, rural areas rely on their own coal heating in winter is still common, with the increase of urbanization in China there will be more areas into the urban category, these newly incorporated areas centralized heating of new projects in great demand. China's urban heating industry has a great potential demand, and there is still a lot of room for development in the future.

MANAGEMENT TEAM AND COMPANY STRUCTURE

4.1 management team

Firstly, the construction of "wolf culture". Although our company is a state-owned enterprise, we have incorporated wolf culture into our team since the beginning of construction. We have implemented a last-place elimination system, a strict performance appraisal system, and a policy of breaking the iron rice bowl by distributing work according to work. The ability of individuals is greatly improved, innovation is actively encouraged, and economic benefits are created according to the degree of dedication, and economic gains can directly catch up with the leadership level if there is ability.

Secondly, the team can bring together complementary skills and experience that outweigh those of any individual on the team. This enables the team to be able to meet multiple challenges on a larger scale.

4.2 Company structure

The company has eight functional departments, namely, the administration Department, Planning and Design Department, Automatic Control Department, Contract and Budget Department, Engineering Management Department, Finance Department, Operation and Development Department, and Operation and Maintenance Management Department. The company consists of more than 200 teams, including 74 personnel, 61 with bachelor's degree or above, accounting for 82%; 6 senior management personnel, accounting for 7%; 56 technical personnel, accounting for 77%, and 12 functional personnel, accounting for 16%.

OPERATION PRODUCTION PLAN

(I) Marketing

In the marketing process, we effectively combine seven elements, such as product, price, channel, promotion, personnel, tangible display and service process, to form a seamless connection from scheme design, business negotiation, engineering

construction and operation and maintenance management, to reflect the company's business specialization externally and form a good atmosphere of departmental cooperation internally, so as to fully expand the company's business map.

(II) Operation and maintenance

Strengthen the operation and maintenance team. Build an operation and maintenance team including operation and maintenance management, technical backbone, and duty service personnel, set up a relatively stable operation and maintenance management and technical backbone team, establish a growth channel for excellent duty personnel, and adapt to the requirements of rapid expansion of the company's energy supply business.

Table 2 Financial feasibility analysis

	Number of years		**0**	**1**	**2**	**3**	**4**	**5**	**6**
	Number of years		1610.00	1539.01	1458.34	1369.22	1280.11	1191.01	1106.82
	loan interest		88.55	84.65	80.21	75.31	70.41	65.51	60.88
construction investment	Initial investment difference		2300.00	0.00	0.00	0.00	0.00	0.00	0.00
	Energy supply service fee		1700.00						
	initial cost		4000						
construction investment	Equipment load ratio			60%	65%	70%	75%	80%	90%
	Electricity charge for heating at full load			80.46	80.46	80.46	80.46	80.46	80.46
	Annual electricity bill			48.27	52.30	56.32	60.34	64.36	72.41
	Water charges for heating at full load			0.76	0.76	0.76	0.76	0.76	0.76
	water rate			0.46	0.46	0.53	0.57	0.61	0.68
	Heating at full load and gas cost			16.96	16.96	16.96	16.96	16.96	16.96
	Natural gas fee			10.17	10.17	11.87	12.72	13.56	15.26
	cost of labor used ; labour cost			20.40	20.40	20.40	20.40	20.40	20.40
	Maintenance fee			2.00	2.00	2.00	2.00	2.00	2.00

	Number of years		0	1	2	3	4	5	6
	Annual pay-out-of-cash operating cost			81.30	85.33	91.12	96.03	100.94	110.75
Annual operating income	Check-in ratio			80%	85%	90%	90%	90%	90%
	Commercial heating price (RMB / month m2)			8.3	8.3	8.3	8.3	8.3	8.3
	Commercial heating area (m m2 / month)			3.44888	3.44888	3.44888	3.44888	3.44888	3.44888
	Heating cycle (month / year)			4.0	4.0	4.0	4.0	4.0	4.0
	Heating and annual operating income			98.47	102.48	106.49	106.49	106.49	106.49
	Commercial cooling area (ten thousand m2 / month)			3.44888	3.44888	3.44888	3.44888	3.44888	3.44888
	Commercial cooling price (yuan / month m2)			12	12	12	12	12	12
	Cooling cycle (month / year)			4.0	4.0	4.0	4.0	4.0	4.0
	Cold supply and annual operating revenue			142.37	148.16	153.96	153.96	153.96	153.96
	Total annual operating income			240.84	250.64	260.45	260.45	260.45	260.45
	Annual operating profit			159.54	165.32	169.33	164.42	159.51	149.69
	discount rate	5.50%		1.06	1.11	1.17	1.24	1.31	1.38
	Annual dynamic operating profit			151.22	148.53	144.20	132.72	122.05	108.56
	discounted cash flow rate of return ; internal rate of return (IRR)	4.70%	-2300.00	159.5395446	165.3184879	169.3258712	164.4173176	159.508764	149.6916567

[1] Initial investment difference (ten thousand yuan)	[2] Number of years	[3] Profit of the current year (ten thousand yuan)	[4] Cumulative initial investment difference of the current year (ten thousand yuan)
[5] -2300.00	[6] 0	[7] ￥0.00	[8] ￥0.00
	1	159.5395446	￥-2,140.46
	2	165.3184879	￥-1,975.14
	3	169.3258712	￥-1,805.82
	4	164.4173176	￥-1,641.40
	5	159.508764	￥-1,481.89
	6	149.6916567	￥-1,332.20
	7	149.6916567	￥-1,182.51
	8	149.6916567	￥-1,032.82
	9	149.6916567	￥-883.12
	10	149.6916567	￥-733.43
	11	149.6916567	￥-583.74
	12	149.6916567	￥-434.05
	13	149.6916567	￥-284.36
	14	149.6916567	￥-134.67
	15	149.6916567	￥15.03
	16	149.6916567	￥164.72
	17	149.6916567	￥314.41
	18	149.6916567	￥464.10
	19	149.6916567	￥613.79
	20	149.6916567	￥763.48
	21	149.6916567	￥913.18
	22	149.6916567	￥1,062.87
	23	149.6916567	￥1,212.56
	24	149.6916567	￥1,362.25
	25	349.6916567	￥1,711.94
[9] Note: The construction period is 0.5 years, and the static payback period is more than 25 years.			

CONCLUSION AND FUTURE WORK

7.1 conclusion

The main conclusions of the study of this project are as follows:

(1) The construction of this project is in line with the requirements of relevant national industrial policies and the overall planning requirements of Shaanxi and even Xi'an City.

(2) Based on the market research, the project is scientifically planned based on the principle of a reasonable planning scheme. The construction of the project

fully utilizes the enterprise's advantages and the seven advantages of Xi'an City, and the project has a large market demand and good prospects for the development of the industry. After the preliminary demonstration, the planning scheme of the project is scientific, reasonable, and feasible

(3) The project can provide a large number of jobs during the construction period and after the construction and operation, which is conducive to the promotion of employment and the development of related industries and has positive practical significance for the comprehensive promotion of the economic and social development of Xi'an City.

From the viewpoint of construction conditions and engineering technology, the project area has good geological conditions, superior supply of water, electricity, heating, gas, and building materials, relatively simple construction content, mature and reliable engineering technology, and low risk of construction conditions affecting engineering technology.

(4) The social benefits of the project are significant. After the project is completed, it can not only increase local financial revenue, but also improve the service level of the heating industry, save energy and reduce consumption, promote the transformation of traditional industries, create basic conditions for government departments to improve supervision and work efficiency, shape the image of government services for the people, and improve the convenience of residents' lives.

(5) From the perspective of economic benefits, the project has good financial evaluation indicators, high return on investment, and more significant economic benefits.

Therefore, the economic benefits of this project are outstanding, the social benefits are significant, and the construction of the project is necessary and feasible.

7.2 Recommendations

(1) The prerequisite for the construction of the project on time, therefore, in addition to the financing measures mentioned in the financing plan, there should be alternate financing channels to ensure the construction of the project.

(2) Coordination and cooperation among various units to ensure the implementation schedule of the project, ensure the quality of the project, and minimize the project cycle; at the same time, a material procurement and supply plan should be developed, and a fund supply plan should be implemented to ensure the smooth implementation of the project.

(3) build a single recognition of the project period of preparation to step up the relevant procedures to do a good job in the organization and management of the project to speed up the progress of the project, for early completion and operation, to bring more benefits to the enterprise and society.

(4) for uncertainty factors promptly to track and analyze and develop a set of contingency measures for unforeseen events, increase the intensity of prior control, to minimize the risk to ensure the steady development of the project.