

The Marketing Strategies of New De-icing Robot

Chan LU¹, Li-Yan WANG^{2,a,*}, Hui-Ping LIANG³, Guo-Xiong RUAN⁴,
Li-Hua NING⁵

¹School of Art and Design, Guilin University of Electronic Technology, China

^{2,5}School of Business, Guilin University of Electronic Technology, China

³School of Art and Design, Guilin University of Electronic Technology, China

⁴School of Material Science and Engineering, Guilin University of Electronic Technology, China

^awangliyan9726@163.com

*Corresponding author

Keywords: Transmission line, De-icing robot, Marketing strategy.

Abstract. With the acceleration of economy globalization and industrialization process and the growth of knowledge- economy, high-tech products are becoming the major impetus of economic development. Industrial robots are considered as the best tools to produce and solve problems for Government and many companies. The high tension transmission line de-icing robot is a kind of industrial robots. This article would review the existing state of de-icing robots technology and the market of industrial robots, at the same time, the high tension transmission line de-icing robot made by Guilin University of Electronic Technology would be compared with the existing de-icing robots among their advantages to point out the problems in the market, and then came up with the reasonable programs of market development ,popularization and marketing strategies in order to catch the attention of the governments and China Southern power grid companies and go into service, meanwhile ,it's helpful to draw lessons from these marketing strategies for the other kind of robots.

The Development and Marketing Situation of Industrial Robots

The Marketing Situation of Industrial Robots

Chinese robots technology started from early 1970s but limited to the inappropriate industrial structure though it had experienced several technological development climaxes before. Now, the future development of Chinese industrial robots is becoming better, Chinese science and technology boom has promoted the development of power systems and robots industries especially the industrial robots, and supported the development of Chinese de-icing robots by technology and funds so that there are great advances in the national economy and society development, many companies are looking for or have applied industrial robots to work [4]. Although the number of annual installation of industrial robots in China surging to 30% in recent years and ranking the first in the world[2], Chinese people still pursue mastering core technology and leading the market.

The Marketing Situation of Industrial Robots

Industrial robots prospects in various industries in China but the high tension transmission line de-icing robots' market is blank[2]. It's easy to find out many problems of industrial robots according to the industrial robots market, for example, it's difficult to guarantee the technological content of products and understand the market's needs accurately, inflexible products price, distribution channels are not perfect ,lack of advertisement strategies, pay little attention to national brands and so on[1]. So, it's important to do the marketing analysis for the new high tension transmission line de-icing robots (new de-icing robots) which made by Guilin University of Electronic Technology with these existing problems.

Marketing Strategies

Target Market Management

Measurement and Prediction of Market Demand. The weather gets worse than ever because of the environmental pollution in recent years, the high tension transmission lines covered by ice during the winter in the north, as a result, the transmission lines were threatened by the ice[3]. Although it's useful to take some specific measures for de-icing, the potential harm and uncertainty has plagued the icing areas. But at present, the high tension transmission lines de-icing robot has never been brought to market, so the market is growing. There would be few similar rivals and press after putting to market. However, it's necessary to pay attention that the scope of the audience of new de-icing robots is small because it's mainly sold to China Southern power grid companies and water companies. Therefore, the product's market prospects are limited, it's important to find out the right position in order to increase sales as much as possible and gain advantageous position in the market.

Market Segments. High tension transmission line is able to generate heat during transmission process, however, with the extreme worsen weather in winter, high humidity of the south often rain with snowing, it's easy to freeze for high tension transmission lines in the south but the heat that generated by high tension transmission line isn't enough to reduce water vapor. In contrast, it's not easy to freeze for the lines in the north because of dry weather. Therefore, the major market contracts in the south. For the first time, marketing target locking in Guangxi Province where belongs to the south of China but there are serious icing conditions in the winter. There would be some appropriate strategies analyzed for Guangxi Southern Power Grid Company and Water Company in terms of 4 aspects like price, product improvement, sales, and distribution. Figure 1 shows up the statistical table of ice condition of Guangxi that provided by China Southern power grid of Guilin power supply Bureau. Therefore, it's clear that the market of new de-icing robot is good.

The Statistic Report of Line Ice-covered Warning System(January 06,2013)

Serial Number	Jurisdictions	Voltage Grade(kV)	Line's Name	Tower's Number	The data of ice monitoring								Artificial Measured Icing Observations(m)				Meteorological Information			The Measure of De-icing and Melt Ice		
					Design-Icing(m)		Ice Coating Thickness of Wire	Ice Coating Thickness of Ground Wire	Icing Ratio		Ice Coating Thickness of Wire	Ice Coating Thickness of Ground Wire	Icing Ratio		Days of Ice-Covering	Expected Days of Ice-Covering	Weather Condition	The Style of Ice	Planning Manual de-ice or not	Planning de-icing time	Planning to start the de-icing mechanism or not	Planning melt ice time
					Wire	Ground Wire			Weekly maximum of ice-covering	Weekly maximum of ice-covering			Wire	Ground Wire								
1	Guilin Power Supply Bureau	220	Shadong Line	260#	20	20	No	No	No	No	0	0	0.00%	0.00%	0	0	Light Rain		Not	Not		
2	Guilin Power Supply Bureau	220	Dake Line	49#	15	15	0	0	0.00%	0.00%	4	4	26.67%	26.67%	0	0	Light	Mixed	Not	Not		
3	Guilin Power Supply Bureau	220	Chengtian Line1	144#	15	15	No	No	No	No	0	0	0.00%	0.00%	0	0	Light		Not	Not		
4	Guilin Power Supply Bureau	220	Guizao Line1	136#	15	15	No	No	No	No	0	0	0.00%	0.00%	0	0	Light		Not	Not		
5	Guilin Power Supply Bureau	220	Guizao Line2	136#	15	15	No	No	No	No	0	0	0.00%	0.00%	0	0	Light		Not	Not		
6	Guilin Power Supply Bureau	220	Nankai Line	180#	20	20	No	No	No	No	6	6	30.00%	30.00%	0	0	Light	Mixed	Not	Not		
7	Guilin Power Supply Bureau	220	Guikai Line	315#	20	20	No	No	No	No	6	6	30.00%	30.00%	1	2	Light	Mixed	Not	Not		
8	Guilin Power Supply Bureau	220	Guinan Line2	55#	20	20	No	No	No	No	6	6	30.00%	30.00%	1	2	Light	Mixed	Not	Not		
9	Guilin Power Supply Bureau	110	Bora Line	101#	15	15	1	1	6.67%	6.67%	4	4	26.67%	26.67%	1	0	Light		Not	Not		
10	Guilin Power Supply Bureau	110	Nanwang Line2	72#	25	25	2	2	8.00%	8.00%	5	5	20.00%	20.00%	1	0	Light		Not	Not		
11	Guilin Power Supply Bureau	110	Mudashou Line	202#	10	10	0	0	0.00%	0.00%	2	2	20.00%	20.00%	2	0	Light	Mixed	Not	Not		
12	Guilin Power Supply Bureau	110	Nanwang Line1	61#	25	25	1	1	4.00%	4.00%	1	1	4.00%	4.00%	3	2	Light	Mixed	Not	Not		
13	Guilin Power Supply Bureau	110	Nanwang Line2	75#	25	25	1	1	4.00%	4.00%	4	4	16.00%	16.00%	2	2	Light	Mixed	Not	Not		
14	Guilin Power Supply Bureau	110	Nankai Line1	221#	15	15	0	0	0.00%	0.00%	2	2	13.33%	13.33%	3	0	Light	Mixed	Not	Not		
18	Guilin Power Supply Bureau	110	Nankai Line2	210#	20	20	No	No	No	No	2	2	10.00%	10.00%	3	0	Light	Mixed	Not	Not		
15	Guilin Power Supply Bureau	110	Jinchongwang Line	49#	30	30	4	4	13.33%	13.33%	5	5	16.67%	16.67%	3	2	Light	Mixed	Not	Yes	January 6th	
16	Guilin Power Supply Bureau	110	Jinchongwang Line	11#	30	30	7	7	23.33%	23.33%	10	10	33.33%	33.33%	3	2	Light	Mixed	Not	Yes	January 7th	
17	Guilin Power Supply Bureau	110	Wangnai Line	30#	20	25	No	No	No	No	0	0	0.00%	0.00%	3	0	Light		Not	Not		
19	Guilin Power Supply Bureau	110	Taiping Line	70#	25	25	No	No	No	No	0	0	0.00%	0.00%	0	0	Light		Not	Not		

Fig. 1 The statistical table of ice condition

Market Positioning. New de-icing robot's function is mainly reflected in applying anti-icing coating for transmission line with its own, not just complete the de-icing work. Designing like this could enhance the capability of de-icing and increase the service life for the high tension lines, at the same time, such an approach could also reduce the times of de-icing, save cost and improve efficiency of high tension transmission lines. New de-icing robot would not just be a tangible product, the most important is that it means the concepts of energy conservation, environmental protection and green and low-carbon living[6].

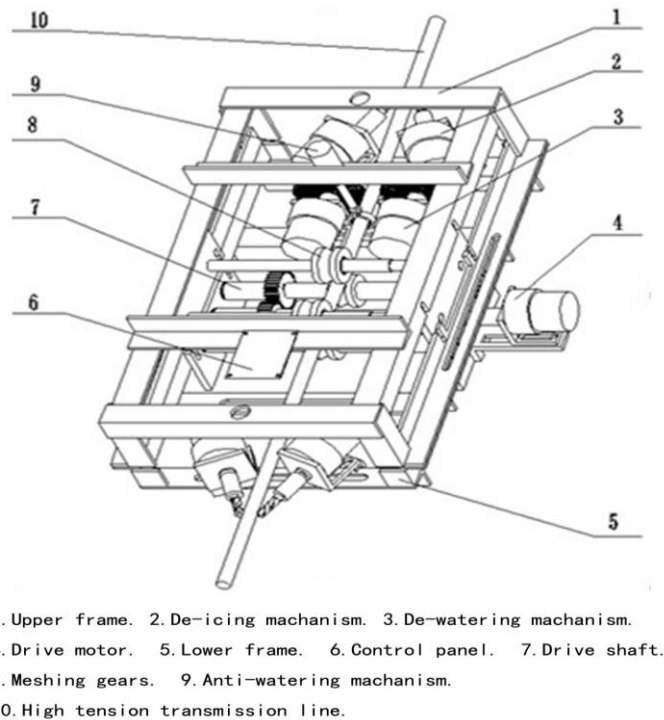


Fig. 2 internal mechanism

Product Marketing Advantages

The Advantages about the Anti-icing Mechanism of New Transmission Line. New de-icing robots keep pace with the de-icing robot development because it presents the new concept of “anti-icing first, both de-icing” and makes out its internal mechanism—new anti-icing mechanism of transmission line, at the same time, R&D team of Guilin University of Electronic Technology has designed and made out the whole structure of the robot, running gear, anti-ice mechanism, de-icing mechanism and Controlling and sensing system for this robots[5]. As shown in figure 2. The usage methods and advantages of new transmission line equipment include the following aspects:

(1) The painting device of this mechanism is able to paint hydrophobic coatings to transmission lines to prevent drops from transmission line. The de-watering mechanism is able to clear the water that gluing on transmission line automatically in order to keep the line dry and prevent it from freezing before dropping in temperature.

(2) This de-icing mechanism is able to work with low temperature and high-humidity environment. Furthermore, the de-icing knife is flexible, it's able to adjust the length of de-icing knife according to the size of high tension transmission line, so as to adjust different sizes of high tension transmission lines and ice block.

(3) This de-icing mechanism equipped with controlling system, it's able to choose anti-icing, de-icing and automatically cross the electric power fittings to de-ice depending on temperature and humidity sensor signals. Then combine drilling with scraping to de-ice in order to guarantee the sustainable, safe, stable operation of high tension transmission line.

Factors Analysis of Product Market. The new de-icing robot is one of the innovative and pioneering products of college students, it has the state standing behind it, which helps to reduce the

costs of the product and increase its competitive advantages in the market, gain more economic benefits. Besides, in recent years, the weather of winter in the south is changeable, which creates a great deal of huge security problems for high tension transmission lines but also brings a good sale opportunity for new de-icing robots. Therefore, the market of new de-icing robot is stable.

Marketing Objectives

The sales price of the products is estimated on the basis of manufacturing costs and labor costs, management fees, transport packaging fee, about 7400/set. Ideal annual sales are more than 1000 sets of de-icing robots and expected to revenue of 7.4 million Yuan a year. The fifth year is expected to sell 4000 de-icing robots and to revenue of 29.6 million Yuan, expected to net profit of 4862543 Yuan. As shown in figure 3, the payback period is expected to 2.34 years.

Marketing Strategies

Marketing Purposes. Firstly, using the power of its advantages. Highlight the new de-icing robot's advantages. Secondly, regard power grids companies and water companies as the marketing focus and the customer groups would be locked in the power companies of the southern provinces. Finally, establish markets from South to North to expand sales territory and facilitate the extension of sales.

	First year	Second year	The third year	The forth year	The fifth year
Sales revenue	1480000	3700000	7400000	14800000	29600000
Outlay cost	1193224	2983059	5966118	11293509	22546409
Depreciation	171400	171400	171400	171400	171400
Profit before tax	252496	631241	1262482	3335091	6882191
Income tax	63124	157810	315621	833773	1720584
Net profit after tax	189372	473431	946862	2501318	5161643
Net operating cash flow	1118262	1964448	2672718	4114233	5333043

Fig.3 The expected statement of the cash of project

Products Strategies. Through the analysis of product market opportunities and problems above, raise the reasonable suggestions to form the effective 4Ps for the best effect. Here are the proposals of product policy:

(1) This product mainly highlights the concept of "anti-icing, deicing both", especially in marketing and advertising, this helps rapidly opening up market with novel and unique.

(2) Make a product quality standard, ensure the quality of product by the materials procurement and product portfolio, form a production line as soon as possible and check every production line strictly.

(3) In order to establish the brand in the minds of consumers and make them have a strong brand consciousness, new de-icing robot chooses English name "DEICING" and Chinese name "Dexing" as a brand name, the English name was taken from the meaning of "de-icing", the Chinese name was derived from its English homophonic. Its Chinese name also means the good moral of "prosperous and thriving". The reason why choose both of the brand names is that they are easy to remember and it's conducive to build brand impact.

(4) Design corresponding package for robot, accomplishing the function of shatter-resistant and waterproof and printing unified logo.

(5) This contains product delivery, professional installation, guide, and guarantee the product for 1 year and so on. Besides, the anti-icing coating for high tension transmission line would be cheaper than market price.

Price Strategies. At present, taken opening market into account, the price of new de-icing robot would be priced at 7400 Yuan/set based on product materials, costs and combination with the price

of similar products. In order to attract customers, it's considerable to give some commercial discount according to the market situation in the future, for example, two-tenths and N/30, that is: customers would get 80% commercial discount if one-time purchase amount is greater than or equal to 30 sets. The purchaser must pay off within 30 days. The purchaser would get 2% discount for cash if they pay off within 10 days. However, the staff in China Southern power grid of Guilin power supply Bureau informed that price is not the most important aspect as long as the new de-icing robot could really applied to practice.

Advertising Strategies. Obey company's overall marketing strategies, set up the good image of product and company, focus on long-term and a wide range of advertisement.

(1) Long-term advertisement: In order to ensure customer's acquaintance for the new de-icing robot, it's necessary to emphasize the function of "anti-icing first, both de-icing" while opening market.

(2) A wide range of advertisement: Choose multiple styles of advertising media like television, Internet, newspaper and other public ways, especially some TV shows about high-tech innovation and de-icing information to get the best effect of publicity.

Carry out periodical promotional activities irregularly with flexible and timely. For example, display the products in major holidays, serious weather of winter or the commemorative activities of new de-icing robot's company. In addition, seize the opportunity to carry out some public relations activities in order to make the new de-icing robot's brand known.

Distribution Ways. Distribution ways include the several following aspects: Make out some corresponding benefits policies ,for example, buying a certain amount of robots would get award or some free gifts .Organize the sales team to conduct propaganda with products door-to-door .Directly go to gird companies or power companies to negotiate with customers. Provide customers with free technical supports and the 30-day return policy. Cooperate with a famous company and make it become the specific products agent. Give some commercial discount in the important days for consumers. Showing and selling the products to consumers in the relative deicing or advanced technological achievements shows . Sell online on the basis of offline.

Publicity and Promotion Strategies. (1) Return to "tradition", deliver new product information by postcards .Handmade postcards could deliver new product information, get closer to customers psychologically, surprise customers and make customers feel respected by manufacturer.

(2) In order to ensure that the customers have confidence in the product's quality and trust in the product in the beginning of sale of product, sales staff would provide door-to-door service, for example, guidance, demonstration and answer questions.

(3) Use the highlight of combinative marketing policy to publicize to the distributor with the concept of "no risk management and growing with company's brand" .

(4) Publicize the different concept of "anti-icing first, both de-icing", distinguishing the new de-icing robot with others and putting distance between the new de-icing robot and others to improve the image of company.

(5) To eliminate the buyers' doubts for product, some influential areas would be made to publicize the product.

(6) Adopt network marketing mode the mode to publicize and collect customers' opinions.

Summary

China is one of the countries with transmission line covered with ice seriously, the probability of the line ice disaster accident ranked among the top of the world. Therefore, the ways of taking measures to avoid such major natural disasters are de-icing, anti-icing in time and reduce lines loading, not just de-ice. The new de-icing robot that invented by Guilin University of Electronic Technology is the first one to suggest the de-icing concept of "anti-icing first, both de-icing", and also convey concepts of energy conservation and environmental protection and green and low carbon living, which keeps pace with modern life pursuit, it would be praised if the product put into market. After all, the market of De-icing robots is blank, so, de-icing robot's market has unlimited potential and cannot be ignored.

Acknowledgement

In this paper, the marketing strategies research of new de-icing robot was sponsored by The College Students' Innovation and Entrepreneurship Training Project of Guangxi Zhuang Autonomous Region in 2014. (Project No. 201410595161)

References

- [1] Huang Zhangquan, E Corporation Industrial Robots Marketing Strategy Research, Shanghai: East China University of Science and Technology, 2013.
- [2] Li laixi, A Corporation Service Robots Marketing Strategy Research, Yunnan: Kunming University of Science and Technology, 2011.
- [3] Wang Yaonan, Review on Key Technology of De-icing Robot Running on Overhead Transmission Line, Journal of Mechanical Engineering. 2011,47(23) 31-38
- [4] Liu Yuanjiang, Marketing Research of Chinese Industrial Robot, Robot Technique and Application. 2005, 02.24-26.
- [5] Li Hepeng, Science and Technology innovation of China and Canada Promotes intelligent construction machinery products, Robot Technique and Application. 2005, 02. 42-46.
- [6] Zhang Wenchao, Feasibility Research on Overcurrent Ice-Melting Operation Mode of Power Grid, Power System Technology. 2009,33(20) 54-58.