

Research on the Electric Surfboard Equipment Industry——Taking "Zhejiang Yiwei Intelligent Technology Co., Ltd." as an Example

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Abstract: As the core of the real economy and modern industrial system, the manufacturing industry has been its progress towards high-end, intelligent, and green development in recent years. The power surfboard equipment industry in China is actively following the trend and exploring new models in the aspects of digitalization and intelligence. Taking Zhejiang Yiwei Intelligent Technology Co., Ltd. as a typical example, the industry has been continuously innovating. In the future, enterprises should focus on key links such as equipment manufacturing, sales, and project popularization and development, improve the adaptability of the supply system, overcome the "bottleneck" technical problems, drive industrial development with technological innovation, build a collaborative innovation industrial pattern, and promote the power surfboard equipment industry to move towards high-end, intelligent and green development.

Keywords: Electric surfboard equipment industry; High-end; Intelligentization; Greening

1. Introduction

With the continuous growth of the national economy, the steady acceleration of industrialization and urbanization processes, and the rapid increase in the demand for health, entertainment, and leisure among the people, China's water sports industry has developed rapidly in recent years, making significant contributions to enhancing the comprehensive production capacity of sports and ensuring the health of all citizens. It has played a crucial role in the deepening of the outdoor leisure sports industry[1]. Firstly, the scale of the industry is gradually expanding. At present, there are more than 300 major watercraft manufacturers in China, with nearly 20000 berths for various types of watercraft and nearly 200 professional clubs. The industry categories of water leisure and fitness, competition and performance, tourism experience, venue design, and industry information have been expanding year by year, and the market demand categories and quantities continue to increase. The industrial potential is further released and the space is huge. Secondly, the industrial system is becoming increasingly perfect. The water sports industry has initially formed a good trend of rapid development driven by professional, amateur, and commercial events, supported by water sports clubs, and featuring the manufacturing, sales, and training of water sports equipment and sports projects. Water sports are increasingly integrated with Internet, health, pension, tourism, culture, education and other related industries and industries. Thirdly, the social foundation has been consolidated year by year. The number of people who regularly participate in water sports has reached a certain scale, and various water sports activities carried out by sports associations, enterprises and institutions, and various sectors of society are becoming increasingly rich. Enterprises and society are investing in water fitness clubs to enter a healthy track.

Overall, the scale and level of water sports development in China cannot fully meet the consumption needs of the people. The degree of water openness is not high, the infrastructure for water sports is weak, the effective supply of products is insufficient, and the innovation of services is not enough. The industrial concentration is low, and the legal and policy system that adapts to the development laws of water sports needs to be improved. International competitiveness needs to be further enhanced, and there is an urgent need to strengthen top-level design and overall planning. With the deepening of supply side structural reform, the continuous promotion of the Belt and Road Initiative and the building of a maritime power development strategies, and the gradual implementation of the Nationwide Fitness Initiative and Healthy China Initiative, China's water sports ushered in an

unprecedented trend of development. With the improvement of residents' income and living standards, more and more people are pursuing stimulation and entertainment consumption. Water sports have become popular in public life, and the water sports industry has ushered in new opportunities for development.

2. The Development Status and Characteristics of Power (Electric) Surfboard Sports in China

The power surfboard originated in the Czech Republic and became one of the officially promoted sports events at China Water Sports Administration in 2018. This project integrates multiple elements such as sports, leisure, entertainment, and competition, and is also an ideal choice for summer alternative training snowboarding[2]. The competition format of the power surfboard is innovative and exciting, equipped with fashionable and portable equipment, so it is deeply loved and sought after by fashionistas and teenagers.

The predecessor of electric surfboards, the "surfing skateboard", was introduced in Australia in 1935. Through exterior design updates and technological improvements, various forms of mobile surfboards emerged in the 1960s. Until 1994, the Czech Republic produced high-performance JetSurf power surfboards that were both lightweight and low emission. Nowadays, the lightest and fastest water powered surfboard developed by JetSurf weighs only 15 kilograms and can reach a top speed of 58 kilometers per hour. In 2015, the Fédération Internationale du Surf Motorisé (FIDSM) entered China. In 2019, the sport of power surfboard was included in the jurisdiction of the Union Internationale Motonautique (UIM). In the same year, the first Power Surfboard China Open and International Motorcycle Federation Electric Surfboard Asian Championship were held in Huangshi, Hubei. In the preparation and training for the 2022 Beijing Winter Olympics, in order to solve the problem of limited ski training ground conditions, power surfboard has been used as important training methods for cross sports project selection by the teams such as the National Snowboarding Training Team, and striving to achieve overtaking on curves, and have achieved positive results.

In recent years, the power surfboard project has developed rapidly in China and has become one of the popular "new three board sports" among the public. The participation of the masses, the effectiveness of competition organization, and the development of related industries in this project all show enormous growth potential. In 2023 alone, China Water Sports Administration hosted a total of 14 national electric surfboard leagues, championships, and 4 "Running Youth" U series events, with a significant increase in the number of participating teams and athletes.

China has reached an international leading level in the research and manufacturing of power surfboards, becoming an important driving force for China's manufacturing to support the development of the sports industry. At present, China has nearly 30 professional manufacturers that target the coastal areas along the river and cooperate with water sports clubs and teams to promote more people's participation in water sports and power surfboard projects.

3. Overview and Trends of the Development of Electric Surfboard Equipment Industry in China

The data analysis is shown in Table 1.

Table 1. Technical parameters of power surfing board equipment in China in 2023

order number	Manufacturer name	The panels	Battery capacity (mAh)	ultimate run (Km)	maximum speed of a ship or plane (Km/h)	Motor				outline dimension (mm)		overall unit quality (Kg)
						Motor peak power (KW)	Motor peak current (A)	Motor rated power (KW)	rated voltage (V)	long	wide	
1	Saab Motion Technology (Nanjing) Co., LTD	The panels	50000	30km	55	13	160	10	72/7500	1800	610	40
2	Suzhou Water Star	The panels	3.1--3.9(KWh)	-	51	12	180	8	72/8000	1780	600	40
3	Zhejiang Yiyi Intelligent Technology limited company	The panels	60000	-	56	13.524	230	9.75-9.8	58.8/6000	1780	610	45
4	Liuzhou Wuling Automobile Technology limited company	The panels	32000	28	54	12	200	6	72	1700	590	38
5	Zhe Xian	The panels	93000	20	55	17	350	9.6	51.8/7500	180	600	50

	(Ningbo) Technology limited company	The panels	45000	13	49	12	250	7.5	72/8300	180	600	45
		The panels	-	-	-	-	-	15	72	1750	650	76
6	Ling Shang Technology Co., LTD liability company	The panels	74000	15	55	-	100A	5	6800	1803	633	46
7	Shanghai Youlang Intelligent Technology limited company	The panels	36000	26	42	-	-	9.5	57.6	2330	700	43-48
8	Shenzhen Tianyun Geek	The panels	51000	29	65	20	235	7	72/7000	1800	600	44
		The panels	51000	29	65	20	235	7	72/7000	1800	600	44
		The panels	51000	29	65	14	235	7	72/7000	1800	600	44
		The panels	51000	15	50	12	200	6	60/7000	1750	600	38
		The panels	51000	15	30	8	160	4	48/7000	1900	600	35
		The panels	-	-	-	-	-	20	72	1820	620	45.2
9	Hainan small shark water New Energy Technology Co., LTD	The panels	71400	17	60	12.5	320	10	50.4/7500	1800	615	26
10	Jiangsu Youmu Technology Co., LTD company	The panels	55000	40	55	-	170	-	72/11000	1820	616	38
11	Hainan Haicreatfly Technology limited company	The panels	72×50V	35km	60	14kw	180	10	72/8000	1800	620	42
12	Surfing	The panels	-	-	-	-	-	10	48	1800	630	46
13	pirate	The panels	-	-	-	-	-	12	72	1800	610	44
14	There are two kinds of water floating in life	The panels	-	-	-	-	-	10	-	1800	600	-
		The panels	-	-	-	-	-	10	-	2300	700	-
15	Spain Onean	The panels	-	-	-	-	-	5	44.4	2400	700	34
		The panels	-	-	-	-	-	7.5	44.4	2300	900	31
		The panels	-	-	-	-	-	10	44.3	2400	700	37
16	Shanghai Yujet	The panels	-	-	-	-	-	-	67.2	2330	700	43
17	awkae	The panels	-	-	-	-	-	11	-	1790	610	52
18	Foshan Bluefin Sports Technology limited company	The panels	50000	-	-	10	-	9	72	1680	580	38
19	Guangxi Weipai Chao play sports Culture Limited	The panels	50000	-	-	10	-	9	72	1680	580	38
20	Zhejiang Fenghui Technology Co., LTD company	The panels	67000	-	-	12	-	10	48	1723	612	45

Note: Some data are replaced by a "-" symbol in the questionnaire because the enterprise has not measured or is not involved.

Power surfing is currently recognized as a new type of sport both domestically and internationally, and it is rapidly gaining popularity in China. In particular, the National Water (Sea) Leisure Sports Center Work Conference on March 10, 2023 emphasized the timeliness and importance of power surfing, hoping to achieve "Made in China" in the field of electric surfing and establish a production standard for Chinese electric surfboards, providing Chinese made product support for the General Administration of Sport to create electric surfing competitions.

Since August 2022, China Water Sports Administration has vigorously promoted the reform and development of the power surfboard project, achieving multiple breakthroughs. In the process of reform and development, China Water Sports Administration has always adhered to the development concept of the Four-sphere Confidence and three orientations (market-oriented, Chinese manufacturing oriented, and youth oriented), supported the power surfboard made in China to go global, established Chinese brands, and created rules formulated by China[3]. After more than half a year, China Water Sports Administration and Beijing National Sport Quality Certification Center jointly developed the group standard "Safety Requirements and Experimental Methods for Power Surfboards".

From April to May 2023, China Water Sports Administration launched the certification of power surfboards and the admission of league equipment. This has laid a solid foundation for the development of the National Power Surfboard League. The new league system will follow the idea of the F1 competition system with front teams and back factories to further promote innovation in the water sports industry and the development of Chinese manufacturing. According to research, by the end of 2023, there will be over 20 manufacturers in China that produce and sell power (electric) surfboard equipment. "Made in China" has become synonymous with the power (electric) surfboard project in China, and it is precisely because these equipment manufacturers have joined in that our project has developed rapidly and become one of the new water sports loved by the people.

Power surfboards are divided into two categories: fuel powered and electric powered. The electric

surfboard uses pure electricity as its energy source, achieving zero emissions, no noise, and no pollution. The board is made of high-strength carbon fiber material and is powered by a water-cooled brushless DC motor to drive a spray pump, with a top speed of up to 55 kilometers per hour. The tail section below the board component is equipped with a main tail fin, with left and right wings on both sides of the main tail fin.

The power surfboard uses a mixture of gasoline and engine oil as fuel, and there is a throttle switch on the operating handle. The overall structure includes a surfboard, a power device, a control handle, and a tail wing assembly, characterized in that the surfboard is a flat, elongated, elliptical streamline hollow structure. The middle position of the surfboard is equipped with an engine compartment cover, and the power unit is located in the hollow part of the board body. The head of the surfboard is equipped with an intake pipe, and the control handle is connected to the intake pipe through a handle cable. The tail section below the surfboard is equipped with a main tail fin, with left and right wings on both sides of the main tail fin.

4. Introduction to Electric Surfboard Equipment of Zhejiang Yiwei Intelligent Technology Co., Ltd

Zhejiang Yiwei Intelligent Technology Co., Ltd. has been developing electric surfboards since early 2016. After more than four years and iterative updates of twelve generations of products, the trial production of V2-6000 electric surfboards was basically completed in early 2020. The V2-6000 electric surfboard technology, characterized by its "green", "fast", "light", and "easy" features, is mainly suitable for the fields of experiential training and competition, tourism and leisure, and water emergency rescue. It can be used in Rivers and Lakes and sea with a length of 200 meters, a width of 40 meters, and a depth of more than 1.5 meters.

After passing preliminary product testing and performance testing by Chinese national team athletes, the electric surfboard was recognized by the Union Internationale Motonautique(UIM) in 2019 and became the only electric surfboard that can meet competitive standards. On June 4, 2020, it signed a five-year "Strategic Cooperation Agreement" with China Water Sports Administration to cooperate comprehensively in international event bidding, product promotion, product standard formulation, and product upgrade research and development. Subsequently, the V2-6000 electric surfboard from Yiwei Company was applied in the Asian Championships, National Championships, and China Open held at China Water Sports Administration. After the extreme use of the product by athletes in the competition, Yiwei Company has made improvements to the exposed problems and applied for more than 50 patents.

The "EWAVE" brand electric surfboard has become an international mainstream brand, and its product has been rated as the "Product of the Year" at Surf Expo. It is the only electric surfboard product in China that has passed the national sports certification and the United States Coast Guard certification.

5. Opportunities and challenges faced by Zhejiang Yiwei electric surfboard in the field of sports equipment research and market development

According to the "2024 Power Surfboard Rules" released by the Union Internationale Motonautique (UIM), the electric surfboard produced by Zhejiang Yiwei is currently the only equipment in China that meets the international competition technical standards for electric surfboards (voltage less than 60V), and can leverage its equipment advantages to help Chinese athletes achieve excellent results in international competitions. As is shown in Table 2.

Table 2. Technical parameters of electric surfboard equipment in China in 2024

order number	Manufacturer name	product model	product name	class	appearance size	The plate body material	electric motor specified power	peak value voltage	cell energy	maximum bear the weight of quality	control hand shank
1	Guangdong Weipai Chaohua Sports Culture Co., LTD	LQ/07	Competitive electric surfboards	Competitive/ electric I class (no more than 10kW)	1680mm×580mm×370mm	carbon fibre	3.5kW	58.8V	2.4kWh	100kg	Wired connection
2	Shenzhen Tianyun Geek Technology Co., LTD	JF02	Geek electric surfboard	Competitive/electric class I (no more than 10kW)	1830mm×600mm×380mm	carbon fibre	6.5kW	84V	3.7kWh	120kg	wireless connections

3	Liuzhou Wuling Automobile Technology Co., LTD	P1	Electric surfboard	Competitive/electric type I	1800mm×610mm×430mm	carbon fibre	10kW	84V	3.2kWh	100kg	Wired connection
4	Zhejiang Fenghui Technology Co., LTD	MMR10SV1-10kW50 V.01	Electric surfboard	Competitive/electric class I (no more than 10kW)	1734mm×618mm×340mm	carbon fibre	10kW	58.8V	3.2kWh	100kg	wireless connections
		MMR14SV1-14kW72 V.01	Electric surfboard	Competitive/electric II (greater than 10kW)	1832mm×598mm×450mm	carbon fibre	14kW	84V	3.5kWh	100kg	Wired connection
		CN-UNTF2DL1K324	Electric surfboard F2 (International version)	Competitive/electric II class	1820mm×615mm×380mm	carbon fibre	14kW	58.8V	4.0kWh	100kg	Wired connection
		CN-UNTF2DL2K324	Electric surfboard F2 (domestic version)	Competitive/electric II class	1820mm×615mm×380mm	carbon fibre	14kW	84V	4.2kWh	100kg	Wired connection
		CN-UNTF2DL0K324	Electric surfboard F2 (low pressure version)	Competitive/electric class I (no more than 10kW)	1820mm×615mm×380mm	carbon fibre	9kW	58.8V	4kWh	100kg	Wired connection
5	Zhejiang Yiyi Intelligent Technology Co., LTD	R7000	Electric surfboard	Competitive / electric	1800mm×620mm×376m	carbon fibre	13kW	60V	3.5kWh	100kg	Wired connection
		V2-6000	Electric surfboard	Competitive/electric type I	1800mm×620mm×376m	carbon fibre	9kW	60V	3.5kWh	100kg	Wired connection

In 2024, the production of electric surfboards in Zhejiang Yiwei is gradually achieving industrialization, and the V-6000 electric surfboard technology achievements are being promoted in the competitive sports field and club leisure tourism market, with significant market development results. In terms of the competitive sports market, with the promotion of projects and the introduction of the "Athlete Technical Level Evaluation Standards", the General Administration and various provinces, cities, and local clubs have focused on increasing athlete training. The "EWAVE" brand electric surfboard has entered the competitive sports market through government bidding and procurement. In terms of mass market promotion, existing water sports clubs, especially specialized surfing clubs, related motorboat clubs, paddleboarding clubs, etc., have become agents. More extreme sports enthusiasts, including outdoor skiing, unpowered surfing, and off-road enthusiasts, are transforming into electric surfboard customers.

Comparing the national research on electric surfboard equipment in 2023 and 2024, it can be seen that the research and development and updating speed of electric surfboard technology in China is relatively fast, and domestic manufacturers in the same industry are investing rapidly in technology and manufacturing. Based on the daily training and competition performance of athletes this year, the battery endurance of Zhejiang Yiwei electric surfboard is relatively short, and the maximum speed performance of the equipment during use is poor. The board design has not been optimized and upgraded since 2019, and the maneuverability needs to be improved.

6. Conclusion

Manufacturing is the mainstay of the real economy and the core of the modern industrial system. In recent years, China's manufacturing industry has accelerated on the path of high-end, intelligent, and green development, providing a continuous source of power for high-quality economic and social development. China's power surfboard equipment industry is constantly exploring new models in digitalization, intelligence, and intelligence. In the future, relevant enterprises should continue to explore innovation and actively promote the power surfboard equipment industry to move towards high-end, intelligent, and green development. Focusing on key links such as equipment manufacturing, sales, and project popularization and development, we aim to enhance the adaptability of the supply system to actual needs, identify bottlenecks and weaknesses, and continue to use technological innovation as a breakthrough point to guide enterprises to tackle core technologies, accelerate industrialization processes, and build an innovative and coordinated industrial development pattern.

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