



# Establishing Factories Overseas: A New Route for China's Electricity Meter Industry to Expand International Trade

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**Abstract.** With the continuous escalation of global trade barriers, China's electricity meter industry is facing challenges in entering international markets. This paper explores overseas factory establishment as a new approach to addressing these challenges, analyzing its necessity, favorable conditions, benefits, successful cases, reasonable implementation steps, and future prospects. The article points out that trade barriers, including tariff and non-tariff barriers, have caused direct losses to the electricity meter industry and affected the layout of the global supply chain. The "Belt and Road" initiative provides favorable conditions for the overseas factory establishment of China's electricity meter industry, including strengthening economic and trade exchanges, facilitating logistics, and financial support. Overseas factory establishment can not only effectively avoid trade barriers but also improve the layout of the global supply chain. Hexing Electrical Co., Ltd serves as a successful case, demonstrating how to leverage the "Belt and Road" strategy for overseas market expansion. The paper also discusses the risks and implementation strategies of overseas factory establishment, including factors such as market demand, regulatory policies, technological level, investment costs, and cultural differences. Finally, the article looks forward to the prospects of overseas factory establishment in the electricity meter industry, believing it has good market potential and growth opportunities.

**Keywords:** Overseas Factory Establishment; Electricity Meter Industry; Trade Barriers; Belt and Road; Global Supply Chain; Hexing Electrical Co., Ltd; Risk Assessment; Market Research; Development Prospects.

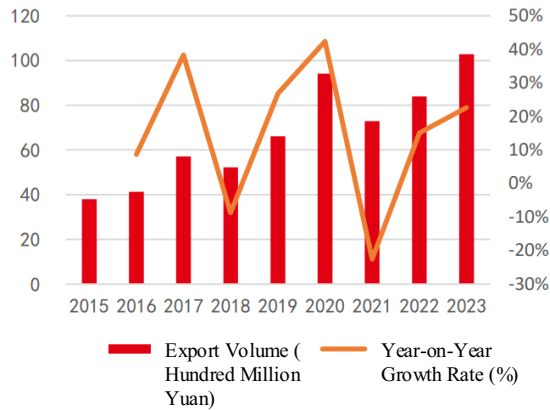
## 1 Introduction

At present, the domestic smart meter product market has a large number of participants, high marketization, and intense market competition. From 2017 to 2022, in the two batches of smart meter bidding projects by the State Grid, the market share of the top five winning companies was basically maintained at 4%-5%. However, in 2023, the market share of the top five winning companies dropped to 3%-3.33%, indicating a more fragmented market structure. With the implementation of new standards for smart energy meters, the industry threshold has been raised, leading to increasingly fierce domestic competition. Therefore, foreign trade has become an important option for manufacturers in the energy meter industry to obtain profits.

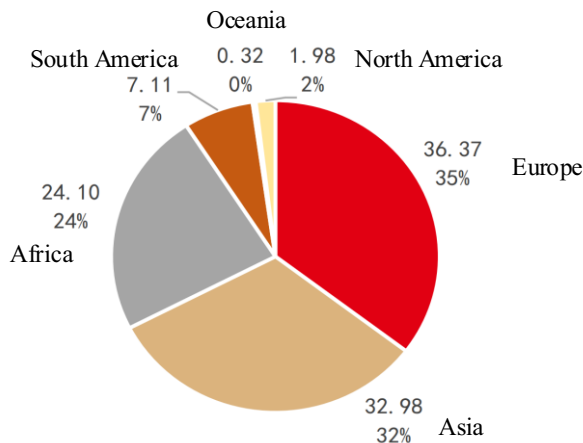
As global trade barriers escalate, the electricity meter industry is also affected accordingly. The rise in global trade barriers has significantly hindered the entry of electricity meter manufacturing companies' products into international markets, resulting in direct trade losses for the industry. This direct loss stems from both the impact of high tariffs and various non-tariff barriers such as technical standards. Tariff barriers directly increase the selling price of products in the international market, reducing their market competitiveness, while non-tariff barriers may prevent products from meeting the market access requirements of the importing country, leading to a complete loss of market. The escalation of global trade barriers has also affected the global supply chain layout of the electricity meter industry, with profound changes in factors such as raw material supply, production costs, logistics costs, and market demand that manufacturers need to consider [1]. Against this backdrop, if electricity meter manufacturers continue to adhere to traditional foreign trade models, they may face greater challenges. This requires them to try to find and develop new foreign trade models to effectively counter the negative impact of trade barriers. Establishing factories overseas is one such option.

## 2 Overseas Market Demand and the Belt and Road Initiative Provide Favorable Conditions for Overseas Factories in the Electric Meter Industry

The current demand for overseas energy meters is strong. According to data from Berg Insight, it is projected that a total of 106 million smart meters will be deployed in the European Union from 2022 to 2027. Countries in South Asia and Southeast Asia are expected to experience rapid growth in smart meter penetration rates, especially India, which aims to install 250 million smart meters by 2026. In North America, the annual shipment volume of smart meters is also expected to grow rapidly from 10.7 million units in 2021 to 17.3 million units in 2027 [2].



**Fig. 1.** Domestic Electricity Meter Export Volume (Billion Yuan) from 2015 to 2023



**Fig. 2.** Domestic Electricity Meter Export Distribution in 2023 (Unit: Hundred Million Yuan)

As shown in Figures 1 and 2, since 2015, China's exports have been steadily increasing and have spread globally. The strong overseas market has provided the necessary conditions for overseas factory establishment.

The "Belt and Road," officially known as the "Silk Road Economic Belt" and the "21st Century Maritime Silk Road," is a global economic cooperation and development strategy initiated by the Chinese government in 2013 and has since gained widespread international attention and participation.

Firstly, the Belt and Road policy has strengthened economic and trade exchanges between Chinese enterprises and countries along the route in the electricity meter industry, providing broader opportunities for companies to expand overseas markets [3]. This enhancement of economic ties has promoted the international development pace of China's electricity meter industry, bringing more business opportunities and cooperation possibilities, and advancing the industry's globalization process.

Secondly, the Belt and Road initiative has provided unprecedented convenience for the overseas factory establishment of the electricity meter industry. Through the "green channel" of countries along the Belt and Road, companies can accelerate the speed of goods transportation, extend the shelf life of products, and reduce transportation costs, thereby enhancing international competitiveness. This logistical convenience offers companies greater flexibility in laying out production bases overseas, helping to meet local market demands and strengthen international competitive strength.

Finally, the Belt and Road strategy has provided strong financial support for the overseas factory establishment of China's electricity meter industry. Through the strategy of financial integration, companies can obtain project funding support, accelerate the internationalization layout of the industry, and enhance global competitiveness.

### **3 The Significance of Overseas Factory Establishment for Electricity Meter Enterprises to Overcome Trade Barriers**

Establishing a factory" encompasses more than just the physical construction of a facility; it is a comprehensive aspect of a company's international strategic layout that includes branding, research and development, sales, and customer service. Compared to the conventional export model, establishing factories overseas offers distinct advantages, particularly in overcoming trade barriers [4].

By establishing production bases in target markets, companies can circumvent tariff barriers that would typically be encountered in traditional export models. Instead of facing the increased costs associated with importing goods, these companies can sell their products directly as "local products," significantly reducing the financial impact of tariffs. Moreover, overseas factories also help to navigate around non-tariff barriers, which may include stringent technical standards and complex administrative regulations that can hinder market entry.

Furthermore, establishing factories overseas enhances a company's global supply chain strategy, which is crucial in the context of global trade barriers and economic globalization. This approach allows companies to source raw materials directly from the target market, thereby reducing dependency on international supply chains and the associated risks. It also leads to decreased logistics costs and an accelerated delivery timeline for products, enabling companies to respond more swiftly to market demands and thereby bolster their competitive edge in the global marketplace.

In summary, the strategic establishment of overseas factories is a multifaceted approach to international business expansion. It not only helps in mitigating the challenges posed by trade barriers but also strengthens a company's supply chain and overall market competitiveness on a global scale. This strategic move is indicative of a forward-thinking business model that is well-equipped to thrive in the dynamic landscape of international trade.

## 4 Successful Cases of Electricity Meter Industry's Overseas Factory Establishment Supported by the Belt and Road

The deep and open international cooperation of the "Belt and Road" undoubtedly provides a solid strategic support for the overseas factory establishment of the electricity meter industry. The global development of Hexing Electrical Co., Ltd is an excellent example. Riding the wave of the "Belt and Road," it has rapidly emerged and played an important role in reshaping the global competitive landscape of China's electricity meter industry. Its overseas factory establishment strategy shows that the "Belt and Road" is an effective way for the power industry to explore overseas markets. Hexing Electrical Co., Ltd's Market Expansion in Belt and Road Countries

Firstly, Hexing Electrical Co., Ltd has achieved rapid development in market expansion in countries along the Belt and Road. Currently, Hexing Electrical Co., Ltd has established dozens of subsidiaries and agents in countries along the Belt and Road, mainly as shown in Table 1, and has secured a certain market share in the local markets. Hexing Electrical Co., Ltd's products cover various fields such as electricity meters and smart grids, providing high-quality products and services to the local power industry and promoting its development.

**Table 1.** Introduction to Some of the Company's Global Channels

<i>Region</i>	<i>Company</i>	<i>Introduction</i>
Asia	Hexing Bangladesh	Hexing Bangladesh subsidiary is located in Dhaka, the capital of Bangladesh. Its main business includes the sale of electronic meters, the general contracting of prepaid smart meter projects, and the development of distribution network projects. Currently, there are 17 Chinese employees, 58 local employees, and approximately 500 construction workers for project implementation.
Latin America	Eletra	Eletra is located in the city of Eusebio and is currently the largest electricity meter manufacturer in the state of Ceara. It is also the largest electricity meter supplier in Brazil. It has a full range of products with more than 25 types, ranging from single-phase to three-phase and from industrial to residential.
Africa	Hexing Kenya	The business of Hexing Kenya subsidiary covers five countries: Kenya, Ethiopia, Tanzania, Uganda, and Rwanda, with business scope covering the group's five main business areas. The assets of Haixing Kenya subsidiary include a local electricity meter factory, two offices totaling about 170 square meters, and several commercial vehicles. The staff is composed of 5 Chinese employees and 50 local employees.
Africa	Hexing Senegal	The French-speaking Africa regional headquarters is located in Dakar, the capital of Senegal. The region covers 26 French-speaking countries and regions including Senegal, Burkina Faso, Morocco, Mali, Guinea, etc., with business covering the company's five main business areas. It has successfully carried out Hexpay business in Senegal, becoming the largest electricity sales service provider in the area.

Secondly, Hexing Electrical Co., Ltd has also made positive progress in international cooperation. As an outstanding enterprise in countries along the Belt and Road, Hexing Electrical Co., Ltd actively participates in various international cooperation projects, achieving win-win cooperation with local governments and enterprises, and promoting cooperative development in the energy field. These cooperation projects not only expand the market for the company but also contribute to the development of the local society and economy.

Utilizing the strong momentum of the "Belt and Road," the overseas factory establishment business of the electricity meter industry has been rapidly launched, laying a solid foundation for China's electricity meter industry to go global and successfully achieving the continuous and healthy development of China's electricity meter industry in the process of global economic integration.

## **5 Risks and Implementation Strategies of Overseas Factory Establishment for Electricity Meter Enterprises**

The choice of overseas factory establishment by Chinese electricity meter enterprises involves various factors [5].

First and foremost, market demand is one of the key factors for a company to decide on overseas factory establishment.

Secondly, local regulations and policies also have a significant impact on a company's overseas factory establishment. There are differences in regulations and policies across different countries and regions, and companies must understand and comply with the relevant regulations and policies of the target location to ensure the project operates compliantly [6]. Technical level and talent reserves are another critical factor for companies to consider in the process of overseas factory establishment. The electricity meter industry is in a stage of rapid technological development, and companies need to possess advanced technical levels and excellent talent teams to maintain a competitive edge. Investment costs and return rates are important indicators for companies to consider the feasibility of overseas factory establishment projects. Overseas factory establishment requires a substantial investment, and companies must assess investment risks and ensure the project has a good return rate to guarantee long-term profitability.

In addition, brand reputation and cultural differences are also factors that companies need to pay attention to in the process of overseas factory establishment. Understanding local culture and consumer habits and establishing a good brand image can help companies better adapt to the local market environment and enhance competitiveness.

The aforementioned factors bring uncertainty to the company's operations [7]. Therefore, when choosing to establish a factory overseas, companies need to conduct comprehensive risk assessments and market research to reduce potential risks. The electricity meter industry can also implement strategies through overseas factory establishment to further mitigate risks.

The strategic implementation of overseas factory establishment is a well-considered and phased process, requiring companies to not only have forward-looking planning but also the flexibility to respond to various market changes. In the initial Local 1.0 phase, companies will focus on product sales in the target market, gaining an in-depth understanding of local business rules, consumer behavior, and competitive landscape through direct market contact. This phase is crucial for companies as it not only helps lay a solid foundation for overseas expansion but also serves as a key period for collecting valuable market data and accumulating local operational experi-

ence. Companies need to invest time and resources to establish brand recognition, understand consumer needs, and gradually build cooperative relationships with local distributors and retailers.

As companies gain a deeper understanding of the local market and accumulate resources, they will transition to the Local 2.0 phase. In this phase, companies begin to seek deeper cooperation with local manufacturers, moving beyond mere product sales. Through technology exchange, joint research and development, or production cooperation, companies can achieve localized production of their products. This not only helps to reduce logistics and production costs and improve response speed to market changes but also enhances the adaptability of products to local consumer needs, thereby increasing market competitiveness. In addition, localized production can help companies better comply with local regulatory requirements and reduce potential trade risks.

To achieve deeper market integration and gain larger economic benefits, companies will move towards the Local 3.0 phase. At this advanced stage, companies will adopt more proactive strategies, establishing closer cooperation with local enterprises through joint ventures or mergers and acquisitions. This cooperation model can not only help companies quickly expand production scale to meet growing market demand but also utilize the resources and networks of local companies to further deepen market share. Moreover, through close cooperation with local enterprises, companies can also enhance their brand influence and establish a more positive corporate image, thereby establishing a more solid competitive position in the target market.

Throughout the process of establishing factories overseas, companies need to continuously evaluate and adjust their strategies to ensure they can adapt to the ever-changing market environment. This includes ongoing monitoring of market trends, in-depth insights into consumer needs, careful selection of partners, and continuous optimization of operational efficiency. For instance, markets such as Brazil and the Middle East have high requirements for localization, necessitating the establishment of localized teams; whereas the European market has high brand stickiness and entry barriers, where showcase projects can have a positive impact on business development. In addition, companies also need to focus on communication and cooperation with local governments, communities, and stakeholders to establish good social relations, enhance corporate social responsibility, and lay the foundation for long-term sustainable development.

## **6 Conclusions**

The electricity meter industry possesses immense potential for overseas factory establishment.

Firstly, regardless of the twists and turns in the process, development is the main theme at all times. With the anticipated growth of the global economy and the rise in electricity demand, the international market for electricity meters is showing an increasingly growing demand trend. Against this backdrop, by establishing production bases overseas, electricity meter companies can not only effectively circumvent trade

barriers but also significantly reduce production costs. This enhances the competitiveness of their products in the international market and fully meets market demands.

Secondly, as the "Belt and Road" initiative continues to deepen and advance, an increasing number of countries and regions are gradually opening up their electricity markets. This provides new opportunities and platforms for the international development of electricity meter enterprises. This trend of openness aids electricity meter enterprises in expanding into overseas markets and achieving a broader market layout.

Upon comprehensive consideration, through overseas factory establishment, electricity meter enterprises can directly respond to the demands of the global market and make full use of international resources. This optimizes production structures and improves operational efficiency. Overseas factory establishment has become a vital strategic choice for China's electricity meter industry to expand foreign trade and enhance international competitiveness. Looking ahead, as global economic integration continues to deepen, the path of overseas factory establishment for electricity meter enterprises will inevitably widen, revealing an even broader development prospect.

## References

1. Li Yujie, Liu Shengti. A Study on the Manufacturing Industry's Overseas Investment Strategy under the Background of Sino-American Trade Friction [J]. *Logistics Science and Technology*, 2022, 45 (19): 124-127. DOI:10.13714/j.cnki.1002-3100.2022.19.029.
2. Hui Bo Investment Research Information. (2024). *Zhongyou Securities - Samsung Medical - 601567 - Domestic leader in power distribution and usage, benefiting from the major trend of power equipment going global*. [https://m.hibor.com.cn/wap\\_detail.aspx?id=f1696decaa0213874d3b5bbe7b247152](https://m.hibor.com.cn/wap_detail.aspx?id=f1696decaa0213874d3b5bbe7b247152).
3. Zhou Wenwen, Dai Wei. Building a Regional Value Chain under the "Belt and Road" to Enhance the Competitiveness of Chinese Enterprises [J]. *China Foreign Investment*, 2024, (08): 50-52.
4. Qu Jie. Strategic Choice of Chinese Automobile Enterprises' Overseas Factories [J]. *Automotive Industry Research*, 2015, (11): 4-10.
5. Ma Yewei. Location Selection for Overseas Investment Projects Based on the "Belt and Road" Initiative [J]. *Metallurgical Economy and Management*, 2024, (04): 35-37+41.
6. Lin Lin, Zhang Lei, Song Mingdi. Intellectual Property Management in Overseas Factory Activities [J]. *China Invention & Patent*, 2019, 16(05): 76-81.
7. Zou Changsheng, Wang Ping. Risk Identification and Prevention of "Overseas Factory Establishment" for Petroleum Equipment Manufacturing Enterprises from the Perspective of the "Belt and Road" - Backgrounded by Kazakhstan [J]. *Reform and Strategy*, 2015, 31(05): 168-172. DOI:10.16331/j.cnki.issn1002-736x.2015.05.030.



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