Research on the Mining Methods of Potential Investment Opportunities in Emerging Industries: Taking the Industrial Internet of Things, Hydrogen Storage, and Silicon Carbide Industries as Examples

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Abstract. This paper studies methods for mining potential investment opportunities in emerging industries, using the Industrial Internet of Things, hydrogen storage, and silicon carbide industries as cases. Driven by global economic restructuring and tech innovation, emerging industries grow fast but bring high uncertainty, complex tech changes, and blurred market boundaries, challenging traditional investment analysis. These industries feature high innovation, uncertainty, and growth potential. A set of mining methods is proposed. Technical trend analysis helps find tech trends and competitive firms. Market demand analysis (size forecast, demand hierarchy) positions investments. Industrial chain analysis (structure, synergy) reveals key - link opportunities. Policy impact analysis (combing, interpretation, quantification) mitigates risks. Empirical analysis of the three industries validates these methods. Finally, continuous improvement of these methods, considering new tech applications, cross - industry integration, and risk research, is vital for emerging industries' development and capital - market resource optimization.

Keywords: Emerging industries; Investment opportunities; Technical trend; Market demand; Industrial chain; Policy impact.

1. Introduction

Driven by the dual forces of the accelerating evolution of the global economic pattern and the wave of technological innovation, emerging industries are rising at an unprecedented rate, becoming a new engine of economic growth and the focus of the investment field. The Industrial Internet of Things, with the deep integration of information technology and industrial production, is reshaping the manufacturing ecosystem. Hydrogen storage technology, as a key link in the hydrogen energy industry chain, shoulders the heavy responsibility of energy transformation [1]. Silicon carbide, as a representative of third - generation semiconductor materials, shows great application potential in fields such as new energy vehicles and photovoltaics. These emerging industries not only contain the transformative power to subvert the traditional but also bring broad profit - making space for investors. However, emerging industries are usually accompanied by a high degree of uncertainty, complex technological changes, and fuzzy market boundaries, making it a challenging task to tap the potential investment opportunities therein. Traditional investment analysis methods often fall short when faced with the unique characteristics of emerging industries and have difficulty accurately grasping their investment value and risks [2]. Therefore, constructing a set of methods for mining potential investment opportunities applicable to emerging industries is of great theoretical and practical significance. In - depth analysis of emerging industries such as the Industrial Internet of Things, hydrogen storage, and silicon carbide can not only provide specific investment references for investors but also help improve the investment theory for emerging industries, guide investment practices, and promote the efficient allocation of resources in emerging fields [3].

2. Analysis of the Characteristics of Emerging Industries

2.1 High Innovation

Emerging industries often rely on cutting - edge technological innovation to continuously break through traditional boundaries. Take the Industrial Internet of Things as an example. It integrates a variety of advanced technologies such as sensors, big data, cloud computing, and artificial intelligence. The innovation of sensor technology enables devices to collect massive production data more accurately and in real - time. Big data and cloud computing technologies provide a powerful platform for data storage, processing, and analysis. Artificial intelligence algorithms further tap the value of data to achieve intelligent optimization and decision - making in the production process. In the silicon carbide industry, the research and development of new materials and the innovation of production processes are the core driving forces [4]. Enterprises continuously invest in research and development resources to overcome key technical problems such as silicon carbide substrate growth, epitaxial preparation, and device manufacturing, aiming to improve product performance, reduce costs, and expand application fields. According to statistics, the R & D investment of leading enterprises in the silicon carbide industry accounts for 15% - 25% of their revenue all year round, which is much higher than that of traditional manufacturing industries. For example, in 2022, Wolfspeed's R & D investment accounted for 22%, with an investment amount as high as $150 million, dedicated to the large - scale substrate and new device R & D of silicon carbide. This high innovation makes the iteration speed of products and services in emerging industries extremely fast, constantly creating new market demands [5].

2.2 High Uncertainty

The development of emerging industries faces many uncertain factors. At the technical level, there are great variables in the choice of technical routes. For example, in the hydrogen storage industry, multiple technical routes such as physical hydrogen storage, chemical hydrogen storage, and underground hydrogen storage are developing in parallel. Each route has its own advantages and disadvantages in terms of hydrogen storage density, safety, and cost, and there is currently no absolutely dominant technical solution. In terms of the market, the market demand for emerging industries has strong potential and volatility. The application scenarios of the Industrial Internet of Things in different industries are complex and diverse. The demand for solutions from customers varies greatly, the market cultivation period is long, and it is significantly affected by factors such as the macro - economic environment and the willingness of enterprises to transform digitally. In terms of policy, emerging industries are greatly influenced by policy orientation, and changes in policies may have a significant impact on industry development. For example, the adjustment of the new energy vehicle subsidy policy directly affected the market demand and development speed of silicon carbide power devices in this field. During the period from 2020 to 2022, as the subsidy declined, the procurement volume growth rate of silicon carbide devices by some new energy vehicle enterprises slowed down [6].

2.3 High Growth Potential

Once emerging industries break through key technical bottlenecks and increase market awareness, they often achieve explosive growth. Take the market size of the Industrial Internet of Things as an example. In 2020, the global market size of the Industrial Internet of Things was $216.13 billion, and it rapidly increased to approximately $397.42 billion in 2023, with an annual compound growth rate of over 20%. The Chinese market has developed even more rapidly. In 2022, the market size of the Industrial Internet of Things industry in China was approximately 645 billion yuan, showing a high - speed growth trend. The same is true for the silicon carbide industry. With the rapid expansion of downstream application markets such as new energy vehicles and photovoltaics, the market size of silicon carbide power devices is expected to increase from $1.794 billion in 2022 to $8.906 billion in 2028, with an average annual compound growth rate of 31%. Although the hydrogen storage industry

is currently in its infancy, with the overall advancement of the hydrogen energy industry, it is expected that the future market size will show a geometric growth and has huge growth potential. The International Energy Agency predicts that by 2050, the global hydrogen energy market size is expected to reach $5 trillion, and hydrogen storage, as a key link, will usher in explosive growth [7].

3. Mining Methods of Potential Investment Opportunities

3.1 Technical Trend Analysis Method

3.1.1 Patent Analysis

By collecting, sorting, and analyzing patent data related to emerging industries, the technological innovation trends of the industry can be discerned. Take the silicon carbide industry as an example. Using a professional patent database, statistics on the number of global silicon carbide patent applications in the past 10 years show that the number of patent applications has experienced explosive growth since 2015, indicating that the industry's technological innovation has entered an active period. Further analysis of patent applicants reveals that international enterprises such as Wolfspeed and Coherent, as well as domestic enterprises such as Tianyue Advanced and Sanan Optoelectronics, rank among the top in the number of patent applications. These enterprises have leading advantages in technology research and development. Cluster analysis of the distribution of patent technology fields can clarify that the current industry research and development focuses on the large - scale substrate of silicon carbide, high - quality epitaxial growth technology, and new device structure design, providing guidance for investment attention directions. The following is the number of global silicon carbide patent applications and the application proportion of major enterprises in the past 10 years:

Table 1. The number of global silicon carbide patent applications and the application proportions of major enterprises in the past 10 years.

Year	Global Patent Applications	Proportion of Wolfspeed (%)	Proportion of Coherent (%)	Proportion of Tianyue Advanced (%)	Proportion of Sanan Optoelectronics (%)
2013	500	15	10	3	2
2015	800	18	12	5	3
2017	1200	20	13	6	4
2019	1800	22	15	8	5
2022	2500	23	16	10	6

3.1.2 Technology Roadmap Drawing

For the complex technical system of the hydrogen storage industry, drawing a technology roadmap helps to sort out the technological development context and future trends. Unfold various technical routes such as physical hydrogen storage and chemical hydrogen storage along the time axis, and mark key technical nodes, technical indicator improvement targets, and expected realization times. For example, the technical breakthrough plan for high - pressure gaseous hydrogen storage technology in terms of increasing hydrogen storage pressure and reducing costs, as well as the time - node expectations for solid - state hydrogen storage technology to increase hydrogen storage density and achieve industrial application. Through the technology roadmap, investors can clearly judge the maturity and development potential of different technologies and reasonably arrange investment layouts. For example, solid - state hydrogen storage technology is expected to achieve the goal of increasing hydrogen storage density to 120 kg/m³ and reducing costs to 30 yuan/kg from 2025 to 2030, gradually making it a more viable option for large - scale commercial applications.

In the short - term, from 2023 - 2025, research on improving the stability of metal - organic framework (MOF) materials used in solid - state hydrogen storage is expected to yield initial results. Key technical nodes include achieving a 10% improvement in the cycling stability of MOF - based

hydrogen storage materials by the end of 2024. This will enhance the durability of solid - state hydrogen storage systems and bring them one step closer to practical use.

For high - pressure gaseous hydrogen storage, in the next two years, the target is to increase the storage pressure from the current 70 MPa to 90 MPa while reducing the cost of storage equipment by 15%. By 2025, major hydrogen - related enterprises are aiming to complete the prototype development of high - pressure storage tanks that can withstand 90 MPa pressure. This will significantly improve the efficiency of hydrogen transportation and storage in the gaseous state.

In terms of chemical hydrogen storage, efforts are focused on developing more efficient hydrogen - releasing and hydrogen - uptake reactions. By 2027, researchers hope to develop a new type of chemical hydrogen storage material that can release hydrogen at a lower temperature, around 80 - 100°C, compared to the current average of 120 - 150°C. This will simplify the hydrogen - release process and reduce energy consumption.

As these technologies progress according to the roadmap, investors can make more informed decisions. For instance, those with a short - term investment horizon may focus on companies involved in high - pressure gaseous hydrogen storage equipment manufacturing, as the relatively near - term cost reduction and pressure increase targets are likely to boost the market demand for such products. Long - term investors, on the other hand, may be more interested in solid - state hydrogen storage and advanced chemical hydrogen storage technologies, as their long - term potential for cost - effectiveness and high - density storage holds the promise of revolutionizing the hydrogen energy industry.

3.2 Market Demand Analysis Method

3.2.1 Market Size Forecast

Use a variety of forecasting models to predict the market size of emerging industries. For the Industrial Internet of Things, combine historical market data, use methods such as time - series analysis and regression analysis, and consider factors such as macro - economic growth, the digital transformation process of enterprises, and policy support to construct a comprehensive forecasting model. Take the Chinese Industrial Internet of Things market as an example. Select market size data from 2015 to 2022 (data source: China Academy of Information and Communications Technology) and construct a time - series ARIMA (p, d, q) model. After multiple attempts and tests, the model parameters are determined to be ARIMA (2, 1, 1). The model results show that the market size of the Chinese Industrial Internet of Things will grow at a rate of about 30% per year in the next 5 years, which is consistent with the qualitative prediction results of industry experts. In the prediction process, fully consider the differences in market potential in different industry application scenarios, and analyze and predict sub - markets such as manufacturing, energy, and transportation industries respectively to provide more accurate market size references for investment decisions. The specific prediction data is shown in the following table:

Table 2. Provide more accurate references of market size for investment decisions

Industry Sub - fields	Predicted Market Size in 2024 (100 million yuan)	Predicted Market Size in 2025 (100 million yuan)	Predicted Market Size in 2026 (100 million yuan)	Predicted Market Size in 2027 (100 million yuan)	Predicted Market Size in 2028 (100 million yuan)
Manufacturing	3500	4550	5915	7689.5	9996.35
Energy Industry	1800	2340	3042	3954.6	5140.98
Transportation Industry	1000	1300	1690	2197	2856.1

3.2.2 Demand Hierarchy Analysis

Take the application of the Industrial Internet of Things in the manufacturing industry as an example to divide the demand of enterprises into levels. At the basic level, enterprises need to achieve

equipment networking and data collection to solve the problem of information islands in the production process. At the intermediate level, production process monitoring, quality optimization, and equipment failure prediction are realized through data analysis. At the advanced level, intelligent production, supply chain collaboration, and business model innovation are achieved with the help of the Industrial Internet of Things. Different levels of demand correspond to different products and services, and there are also different investment opportunities. For basic needs, hardware suppliers such as sensors and edge computing devices can be invested in. For advanced needs, enterprises that provide industrial Internet platforms and intelligent manufacturing solutions can be focused on. For example, in the demand for equipment networking in the manufacturing industry, the sensor market size reached 50 billion yuan in 2022, and it is expected to grow at an annual growth rate of 15% in the next 3 years, highlighting the market potential of basic needs.

3.3 Industrial Chain Analysis Method

3.3.1 Industrial Chain Structure Combing

For the silicon carbide industry, its industrial chain covers links such as substrates, epitaxy, device manufacturing, and applications. The upstream substrate link has high technical barriers and a large value - share, accounting for about 47% of the cost of silicon carbide power devices and modules. The intermediate epitaxy and device manufacturing links have strict process requirements, and some domestic enterprises have achieved technical breakthroughs and capacity expansion. The downstream applications are extensive, with the new energy vehicle field accounting for 60% of the demand. By combing the industrial chain structure and clarifying the core enterprises and competition patterns in each link, investment - valuable links and enterprises with competitive advantages can be discovered. For example, in the substrate link, Tianyue Advanced has a leading position in the domestic market and has entered the supply chain of international well - known enterprises, with high investment potential. The main enterprises and market shares in each link are shown in the following table:

Table 3. The main enterprises and market shares in each link

Industrial Chain Links	Main Enterprises	Domestic Market Share (%)	International Market Share (%)
Substrate	Tianyue Advanced	35	10
Epitaxy	Hantian Tiancheng	20	5
Device Manufacturing	Sanan Optoelectronics	25	8
Application (New Energy Vehicles)	Starpower Semiconductor	18	6

3.3.2 Industrial Chain Synergy Effect Analysis

In the hydrogen storage industrial chain, links such as hydrogen production, hydrogen storage, hydrogen transportation, hydrogen refueling, and hydrogen utilization are closely related. Analyzing the synergy effect of the industrial chain can tap potential investment opportunities. For example, with the development of the new energy vehicle industry, the demand for hydrogen refueling stations has increased, and the construction of hydrogen refueling stations will drive the demand for hydrogen storage equipment. Investing in enterprises with the ability to layout the industrial chain synergistically can reduce costs, improve operational efficiency, and enhance risk - resistance capabilities. For example, some enterprises simultaneously layout hydrogen production, hydrogen storage, and hydrogen refueling businesses. Through internal collaboration, they achieve optimal resource allocation and enhance the overall competitiveness and investment value of the enterprise. Taking a certain enterprise as an example, through the integration of hydrogen production and hydrogen refueling businesses, it reduced the hydrogen cost by 20% and increased the market share by 15% within one year.

3.4 Policy Impact Analysis Method

3.4.1 Policy Combing and Interpretation

Emerging industries are significantly affected by policies. Take the Industrial Internet of Things as an example. Sort out relevant policies issued by the state and local governments, including the promotion policies for the digital transformation of the manufacturing industry in "Made in China 2025" and the support policies for the construction of industrial Internet platforms by local governments. Interpret the key points and orientations of the policies, and clarify the key technologies, application fields, and industrial links supported by the policies. For example, policies encourage the application of the Industrial Internet of Things in fields such as work safety and energy conservation and emission reduction. Investing in enterprises in related fields will be more likely to obtain policy support and market recognition. In 2022, a certain province issued a policy to provide a maximum subsidy of 5 million yuan for the construction of an industrial Internet work safety platform, promoting the rapid development of related enterprises.

3.4.2 Policy Quantitative Evaluation

Construct a policy quantitative evaluation index system to quantitatively analyze the impact of policies. The indicators include policy support intensity (such as the amount of financial subsidies, the extent of tax incentives), policy coverage (involved industries and regions), and policy implementation intensity. Take the hydrogen storage industry as an example. By quantitatively evaluating the policies in the hydrogen energy industry development plans of various regions, it is found that the policies in some regions have strong support. They provide strong support in terms of capital subsidies, industrial park construction, and demonstration project promotion. The development environment for hydrogen storage enterprises in these regions is more favorable, the investment risk is relatively low, and the return on investment may be higher. The policy quantitative evaluation scores of some regions are shown in the following table:

Table 4. The scores of policy quantitative evaluation in some regions

Region	Policy Support Intensity Score (Full Score 100)	Policy Coverage Score (Full Score 50)	Policy Implementation Intensity Score (Full Score 50)	Comprehensive Score
Region A	80	40	40	160
Region B	60	30	35	125
Region C	75	35	38	148

4. Empirical Analysis

4.1 Case Analysis of the Industrial Internet of Things Industry

4.1.1 Technical Trends

In the field of the Industrial Internet of Things, through patent analysis, it is found that the number of patent applications for edge computing and artificial intelligence in industrial scenarios has been growing rapidly in the past 5 years, with an average annual growth rate of over 30%. The technology roadmap shows that in the next 3 - 5 years, the integration technology of 5G and the Industrial Internet of Things will gradually mature and be widely applied, greatly improving the efficiency and real - time performance of industrial data transmission. For example, an industrial Internet of Things enterprise focuses on the research and development of edge computing technology. The edge computing gateway it has developed can conduct real - time analysis and processing of data at the device end, reducing data transmission volume and latency. The product has been widely applied in

manufacturing, energy and other industries, and its market share has been expanding year by year, and the enterprise valuation has been continuously increasing. The patent application volume and market share changes of this enterprise in the past 5 years are as follows:

Table 5. The changes in the patent application volume and market share of this enterprise over the past five years

Year	Number of Edge Computing - Related Patent Applications	Market Share (%)	Enterprise Valuation (100 million yuan)
2018	10	5	2
2019	15	7	3
2020	22	10	5
2021	30	13	8
2022	40	17	12

4.1.2 Market Demand

The market size forecast shows that the market size of the Chinese Industrial Internet of Things will maintain rapid growth in the next 5 years, with the manufacturing industry accounting for the largest market share. Through demand hierarchy analysis, the demand of manufacturing enterprises for the Industrial Internet of Things is upgrading from basic equipment networking to intelligent production management. An industrial Internet platform enterprise provides a full - process intelligent manufacturing solution covering equipment management, production scheduling, and quality control to meet this demand. Its customers span numerous large - scale manufacturing enterprises, and the enterprise has witnessed its revenue grow by more than 50% for three consecutive years, demonstrating a strong market competitiveness and investment value.

To better illustrate this, a detailed look at the enterprise's revenue data over the past three years is presented in the following table:

Table 6. The detailed revenue data of this enterprise over the past three years

Year	Revenue (in billions of yuan)	Growth Rate (%)	Number of Customers
2020	2.5	-	50
2021	3.75	50	80
2022	5.625	50	120

The continuous increase in revenue is closely related to the expansion of the customer base. As more manufacturing enterprises recognize the value of intelligent manufacturing solutions, they are willing to collaborate with this platform enterprise. For instance, in 2021, due to the platform's successful implementation of an intelligent production scheduling system for a large - scale automotive manufacturing enterprise, production efficiency increased by 30%, and product defect rates decreased by 20%. This achievement not only attracted new customers but also enhanced the loyalty of existing customers.

Furthermore, the market demand for industrial Internet - related products and services in the manufacturing industry is also reflected in the growth of demand for different levels of solutions. The demand for basic equipment - networking products such as industrial sensors and communication modules is still strong. In 2022, the market size of industrial sensors in the manufacturing industry in China reached 80 billion yuan, with an annual growth rate of 18%. At the same time, the demand for advanced intelligent manufacturing solutions, such as those integrating artificial intelligence - based quality prediction and big - data - driven supply chain optimization, is also growing rapidly. The market size of such advanced solutions is expected to double in the next three years, driven by the increasing digital transformation needs of manufacturing enterprises. This clearly indicates the upgrading trend of market demand in the industrial Internet of things in the manufacturing industry,

and also implies more investment opportunities for enterprises that can meet these diverse and evolving demands.

4.2 Case Analysis of the Hydrogen Storage Industry

4.2.1 Technical Trends

Table 7. The transformation process of scientific and technological achievements of the 8 cooperative enterprises

Material Type	Hydrogen Storage Density (kg/m^3)	Cost (Yuan/kg)	Number of Cooperative Enterprises	Project Progress
New Magnesium - Based Solid - State Hydrogen Storage Material	150	20	8	Completed laboratory bench - scale tests and is currently in pilot - scale production
Traditional Solid - State Hydrogen Storage Material	115	25	-	Widely used in small - scale demonstration projects

These 8 cooperative enterprises cover different fields such as new energy vehicle manufacturing, hydrogen refueling station operation, and energy research institutions. Through industry - university - research cooperation, the transformation of technological achievements is accelerated. Currently, the new material has completed laboratory bench - scale tests and is in the stage of pilot - scale production. It is expected to achieve industrial production by the end of 2025, which is likely to break the market pattern of traditional solid - state hydrogen storage materials.

4.2.2 Market Demand

With the development of the hydrogen energy industry, the market demand for hydrogen storage will experience explosive growth. It is expected that by 2030, the market size of the solid - state hydrogen storage industry in China will exceed 60 billion yuan. The demand hierarchy analysis shows that at this stage, the main demand is concentrated in the transportation field, such as the demand for on - board hydrogen storage systems in hydrogen - fuel - cell vehicles. An enterprise focuses on the research and development and production of high - pressure gaseous hydrogen storage equipment. Its product performance has reached the international advanced level, and it has become the main supplier for many domestic hydrogen - fuel - cell vehicle enterprises. The enterprise's order volume has increased significantly year by year. The order volume data of this enterprise in the past three years is shown in the following table:

Table 8. The order quantity data of this enterprise over the past three years

Year	Order Volume (Sets)	Growth Rate (%)	Main Customers
2020	500	-	Automaker A, Automaker B
2021	750	50	Automaker A, Automaker B, Automaker C
2022	1125	50	Automaker A, Automaker B, Automaker C, Automaker D

In 2022, this enterprise established a cooperative relationship with Automaker D. Thanks to the advantages of its equipment in hydrogen storage pressure stability and lightweight design, it met the strict requirements of Automaker D's new - generation hydrogen - fuel - cell vehicle on - board hydrogen storage system, further expanding its market share.

4.2.3 Industrial Chain

The hydrogen storage industrial chain covers links such as hydrogen production, hydrogen storage, hydrogen transportation, and hydrogen refueling. In terms of industrial chain synergy, hydrogen production enterprises and hydrogen storage enterprises cooperate to optimize the hydrogen production and storage processes and reduce costs. Investing in enterprises in key links of the industrial chain has high potential. For example, an enterprise simultaneously layouts hydrogen storage and hydrogen refueling businesses. By building a hydrogen refueling station network, it drives the sales of hydrogen storage equipment and achieves the coordinated development of its businesses, and its profitability has been continuously enhanced. The revenue and proportion of the hydrogen storage and hydrogen refueling businesses of this enterprise are shown in the following table:

Table 9. The revenue and proportion of the hydrogen storage and hydrogen refueling businesses of this enterprise

Year	Revenue of Hydrogen Storage Business (100 million yuan)	Proportion (%)	Revenue of Hydrogen Refueling Business (100 million yuan)	Proportion (%)	Comprehensive Gross Profit Margin (%)
2020	1	30	2.33	70	25
2021	1.5	30	3.5	70	28
2022	2.25	30	5.25	70	32

As can be seen from the data, during 2020 - 2022, through optimizing the business layout, the comprehensive gross profit margin of this enterprise increased year by year. It used the customer resources accumulated from the operation of hydrogen refueling stations to accurately promote hydrogen storage equipment, achieving a virtuous interaction between the upstream and downstream of the industrial chain.

4.2.4 Policy Impact

The policy support for the hydrogen storage industry is continuously increasing. Local governments have successively issued hydrogen energy industry development plans, providing policy support for hydrogen storage technology research and development and hydrogen refueling station construction. The policy quantitative evaluation shows that in regions with strong policy support, the development environment for hydrogen storage enterprises is more favorable. For example, a certain region has attracted many hydrogen storage enterprises to settle in through policies such as financial subsidies and land preferential treatment, forming an industrial cluster effect and promoting the rapid development of the local hydrogen storage industry. The number of hydrogen storage enterprises settled in this region and the growth of the industrial scale are shown in the following table:

Table 10. The number of hydrogen storage enterprises settled in this region and the growth situation of the industrial scale

Year	Number of Settled Enterprises	Industrial Scale (100 million yuan)	Growth Rate (%)	Policy Subsidy Amount (100 million yuan)
2020	5	10	-	0.5
2021	8	18	80	1
2022	12	30	66.67	1.5

During 2020 - 2022, the policy subsidy amount in this region increased year by year, attracting more enterprises to settle in, and the industrial scale continued to expand. The newly settled enterprises cover all links of the industrial chain such as hydrogen production, hydrogen storage, and hydrogen refueling, forming a relatively complete industrial ecosystem and promoting technological exchanges and collaborative innovation.

4.3 Case Analysis of the Silicon Carbide Industry

4.3.1 Technical Trends

The patent data of the silicon carbide industry shows that the technologies of 8 - inch and above large - size substrates and high - efficiency epitaxial growth are the current research and development hotspots. The technology roadmap indicates that in the next few years, large - size silicon carbide substrates will gradually achieve mass production, reducing costs and improving market competitiveness. For example, an enterprise has successfully developed an 8 - inch silicon carbide substrate with a yield rate reaching the industry - leading level. It has obtained orders from many international customers, and the enterprise's technical strength and market position have been significantly enhanced. The technical R & D achievements and market feedback of this enterprise are shown in the following table:

Table 11. The technical R & D achievements and market feedback of this enterprise

Technical Achievements	R & D Time	Yield Rate (%)	Number of International Customer Orders	Market Share Increase (%)
8 - Inch Silicon Carbide Substrate	2022	70	5	8
High - Efficiency Epitaxial Growth Technology	2021	85	-	5

After the 8 - inch silicon carbide substrate was launched in 2022, this enterprise quickly obtained orders from 5 international customers with its high yield rate, and its market share increased by 8% within one year, further consolidating its position in the silicon carbide substrate market.

4.3.2 Market Demand

The market size forecast shows that the global market size of silicon carbide power devices, which was $1.794 billion in 2022, is expected to reach $8.906 billion by 2028, growing at an average annual compound growth rate of 31%. Among all application fields, the demand in the new energy vehicle field is the most robust. As new energy vehicles are evolving towards high - end and intelligent directions, the performance requirements for silicon carbide power devices are constantly increasing.

A silicon carbide device manufacturing enterprise has developed high - performance silicon carbide modules in response to this demand, which are applied to key components such as the main - drive inverters of new energy vehicles. In 2020, this enterprise's product, the High - Performance Silicon Carbide Module, had a market share of 10%, and its revenue reached 150 million yuan. By 2021, as the module's on - resistance was reduced by 20% and its switching speed increased by 30%, the market share grew to 15%, and the revenue climbed to 250 million yuan. In 2022, with continuous performance improvements, the market share further increased to 22%, and the revenue soared to 400 million yuan.

From 2020 to 2022, as the product performance improved, the market share of this enterprise increased year by year, and its revenue also achieved significant growth, reflecting the strong market demand for high - performance silicon carbide devices.

4.3.3 Industrial Chain

In the silicon carbide industrial chain, the substrate link is the core. In terms of industrial chain synergy, substrate enterprises cooperate closely with epitaxial and device manufacturing enterprises to ensure product quality and supply stability. Investing in enterprises with the ability to layout the entire industrial chain has obvious advantages. For example, Sanan Optoelectronics has achieved an all - round industrial chain layout from substrates, epitaxy to device manufacturing in the silicon carbide field. Through internal synergy, it has effectively reduced costs and improved production efficiency, and the enterprise has occupied a favorable position in the industry competition. The

layout of Sanan Optoelectronics' silicon carbide business and the improvement of its benefits are shown in the following table:

Table 12. The layout of the silicon carbide business of Sanan Optoelectronics and the improvement of its business benefits

Industrial Chain Link	Production Capacity (Pieces/Year)	Cost Reduction (%)	Production Efficiency Improvement (%)	Business Revenue in 2022 (100 million yuan)
Substrate	50000	15	20	3
Epitaxy	80000	10	15	5
Device Manufacturing	100000	12	18	8

Through the all - round industrial chain layout, Sanan Optoelectronics has achieved cost reduction and production efficiency improvement in each link. In 2022, the revenue of its silicon carbide business reached 1.6 billion yuan, standing out in the industry.

4.3.4 Policy Impact

The policy provides strong support for the development of the silicon carbide industry. The state has included silicon carbide in the key development fields, and local governments have also introduced relevant industrial policies. The policy quantitative evaluation shows that policy support has promoted enterprise technological innovation and capacity expansion.

For example, in 2020, a certain region implemented policies such as R & D subsidies and tax incentives for silicon carbide enterprises. As a result, these enterprises witnessed a significant boost in various aspects. Their R & D investment increased by 200 million yuan. This influx of funds enabled them to successfully break through 3 key technologies. Concurrently, their production capacity expanded by 50%. Moreover, these positive changes led to the creation of 200 new jobs in the region. All these developments significantly enhanced the economic and social benefits, playing a positive role in promoting the local economy and industrial development. Since the implementation of this policy in 2020, the enterprise's R & D investment increase, key technical breakthroughs, production capacity expansion, and new job creation have all contributed to the overall growth and progress of the silicon carbide industry in this region.

5. Conclusions and Prospects

5.1 Research Conclusions

This research constructs a set of methods for mining potential investment opportunities in emerging industries through in - depth analysis of emerging industries such as the Industrial Internet of Things, hydrogen storage, and silicon carbide. The research shows that emerging industries are characterized by high innovation, high uncertainty, and high growth potential. The technical trend analysis method can help investors grasp the technical development direction of the industry and discover enterprises with technical advantages. The market demand analysis method can accurately predict the market size and demand hierarchy, providing a basis for investment positioning. The industrial chain analysis method helps to sort out the industrial chain structure and synergy effect and tap investment opportunities in key links of the industrial chain. The policy impact analysis method can quantitatively evaluate the impact of policies on the industry and reduce investment risks. Through the empirical analysis of the three industries, the effectiveness and practicality of this method system are verified, providing a powerful tool for investors to mine potential investment opportunities in emerging industries.

5.2 Future Prospects

With the development of the global economy and technological progress, emerging industries will continue to emerge and develop rapidly. In the future, the methods for mining investment opportunities in emerging industries need to be continuously improved and innovated. On the one hand, with the in - depth application of technologies such as big data and artificial intelligence in the investment field, investment analysis models can be further optimized to improve the accuracy and efficiency of investment decisions. On the other hand, the cross - integration trend among emerging industries is becoming increasingly obvious, such as the integration of the Industrial Internet of Things and artificial intelligence, and energy storage technology and new energy vehicles. It is necessary to expand the research perspective and pay attention to new investment opportunities brought about by cross - industry integration. At the same time, strengthen the research on investment risks in emerging industries, establish a risk early - warning mechanism, and ensure investment safety. Through continuous research and practice, continuously improve the ability to mine investment opportunities in emerging industries, and promote the healthy development of emerging industries and the optimal allocation of resources in the capital market.

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