



Latest China EV news



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1. EV global market information

1.1 Global Top 20 New Energy Vehicle Sales: Chinese Models Account for 18, Model Y Drops by 30% - *First Electric, Li Yanjiao* 2024-12-09 <https://d1ev.com/news/shuju/256605>

Global Sales Growth: In October 2024, global new energy vehicle sales reached 1.74 million units, a month-on-month increase of 2.1%, a year-on-year increase of 36%, with a market share of 26%, of which pure electric vehicles accounted for 16%. **Performance of Chinese Models:** Among the top 20 new energy vehicle sales globally, Chinese models occupied 18 spots, with only Tesla's Model Y and Model 3 being the exceptions. Xiaomi's SU7 and Galaxy's E5 made their debut on the list. **Tesla's Sales Decline:** Tesla's Model Y saw a significant month-on-month drop of nearly 30% in sales, but it remains the world's best-selling new energy vehicle, firmly holding the top position on the list. **BYD's Strong Performance:** BYD occupies 11 spots on the top 20 models list, with 7 models dominating the top ten. The BYD Song, Seagull, and Qin PLUS all sold over 40,000 units each. **Geely Surpasses Li Auto:** Geely's sales jumped by 23% month-on-month, surpassing Li Auto to enter the top five for the first time, and it is expected to be in the top three globally by 2025. **Market Share Changes:** BYD has the highest market share, reaching 24%, while Tesla's market share is 10.5%. Geely-Volvo's market share has grown to 8%. **Growth Momentum of Chinese Brands:** Chinese brands continue to maintain strong growth momentum in the global new energy vehicle market, with traditional brands such as Wuling, Geely, Changan, and Chery achieving steady growth, and new forces like Shenlan, Zero Run, and Xiaopeng beginning to stand out.

1.2 Global New Energy Vehicle Penetration Rates in 2024: Japan at 2.9%, US at 9.5%, India Lags Behind - *Financial Field Creator* 2024-11-09 <https://www.yoojia.com/article/9259148590243290700.html>

Global Automotive Market Growth:

The global automotive market continues to grow steadily, with a particularly strong performance in the field of new energy vehicles.

New Energy Vehicle Market Share:

From January to September 2024, the global market share of new energy vehicles reached 18.3%, a significant increase compared to the same period last year.

China's New Energy Vehicle Market: China's new energy passenger car sales account for 60% of the global total, with production ranking first in the world, demonstrating China's leading position in the global new energy vehicle sector. Domestic and international automotive brands have established research and development centers and production bases in China, leveraging China's supply chain system and market size.

European and North American Markets: The European new energy passenger car market experienced a slight fluctuation in sales, with 2.05 million units sold, a 3% decrease year-on-year. The North American market saw new energy passenger car sales reach 1.25 million units, an 8% increase year-on-year, with the U.S. market showing significant growth.

New Energy Vehicle Penetration Rates: China leads the world with a penetration rate of 45.5%, followed by the UK (22.7%) and France (21.0%). Germany (17.3%), the U.S. (9.5%), and Canada (6.8%) rank fourth, fifth, and sixth, respectively.

Brazil (3.2%), Japan (2.9%), and India (0.2%) have lower penetration rates.

Challenges in the Indian Market: India's low new energy vehicle penetration rate is affected by factors such as insufficient charging infrastructure, unattractive pricing, and limited consumer awareness.

Outlook for the Global New Energy Vehicle Market:

The global new energy vehicle market is expected to flourish further, with active technological innovation, a well-developed industry chain, and a push towards a green, intelligent, and efficient automotive industry direction.

1.3 Yiche Ranking: China's Car Sales in October 2024 Surpass the Combined Total of the US, Japan, and Germany in the Global Top 10 Countries List - SINA Finance 2024-12-10

<https://finance.sina.com.cn/tech/roll/2024-12-10/doc-incyyxsi4707267.shtml>

Top 10 Countries in Global Car Sales:

Yiche Ranking has released the top 10 countries for global car sales in October 2024.

China Tops the List:

China leads with sales of 2.286 million units, far exceeding the combined sales of the United States, Japan, and Germany.

New Energy Vehicle Market Penetration

China's new energy vehicle market penetration rate reaches 52.4%, leading globally by a significant margin.

Sales of Other Countries:

The United States ranks second with sales of 1.3687 million units.

Japan ranks third with sales of 401,900 units.

India, Brazil, Germany, the United Kingdom, France, Canada, and South Korea also make it into the top ten list.

Differences in New Energy Vehicle Penetration Rates Among Countries:

The United States has a new energy vehicle penetration rate of 10.2%.

Japan's new energy vehicle penetration rate is only 2.6%.

Germany's new energy vehicle penetration rate is 21.0%.

The United Kingdom's new energy vehicle penetration rate is 26.7%.

France's new energy vehicle penetration rate is 19.5%.

Canada's new energy vehicle penetration rate is 9.0%.

South Korea's new energy vehicle penetration rate is 6.1%.

Global Market Transformation Trend:

The global automotive market is gradually transitioning towards new energy, with China at the forefront in this domain.

1.4 China's new energy passenger car market accounts for nearly 70% of the global market, with Cui Dongshu revealing the underlying trends Sohu Auto 2024-12-02

https://news.sohu.com/a/832387351_121924584

Global Market Share:

From January to October 2024, China's new energy passenger car market share reached 68.9% globally, demonstrating China's leading position in the new energy sector.

Policy Support:

The Chinese government has implemented a series of policies to support the development of new energy vehicles, including purchase subsidies, tax incentives, and the construction of charging facilities, which have increased consumer willingness to buy.

Technological Progress:

China's new energy vehicle technology has advanced rapidly, with improved battery performance enhancing the range of electric vehicles and alleviating consumer concerns about new energy vehicles.

Market Response:In 2024, new energy vehicle models launched by various brands have been warmly received in the market, driving market competition.

Smart Mobility:New energy vehicles have integrated smart technology elements, such as autonomous driving assistance systems and vehicle networking technology, enhancing the user's travel experience.

Price Democratization:

The price of new energy vehicles is gradually becoming more affordable, allowing more ordinary consumers to bear the cost and stimulating market demand.

Economic Structure Adjustment:

The expansion of China's new energy passenger car market is an important reflection of China's economic structure adjustment and a major trend in the global automotive market transformation.

International Opportunities and Challenges:

Chinese new energy vehicle manufacturers face international opportunities and challenges and need to create products with global competitiveness.

Future Outlook:

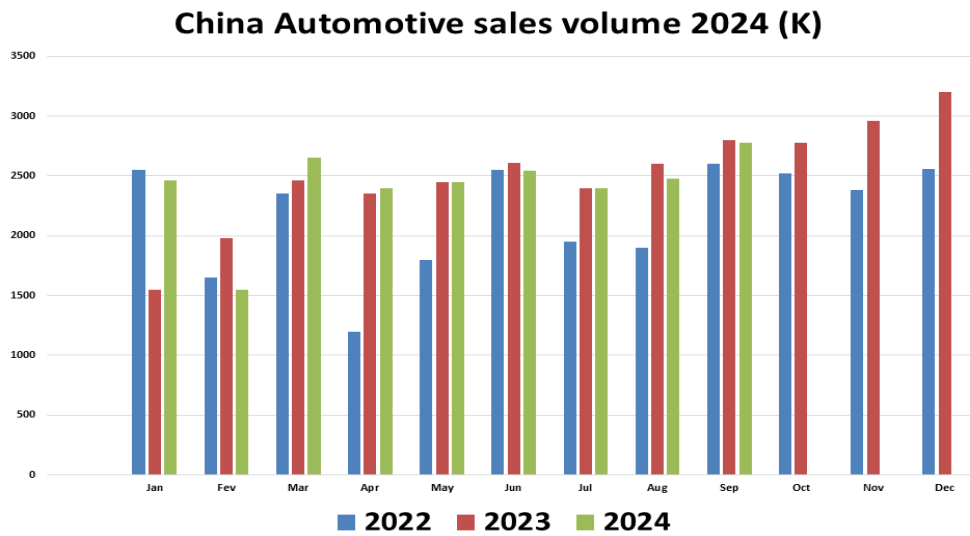
With increasing global attention to sustainable development, the development of new energy vehicles is bound to welcome a broader market space.

Consumer Choice:

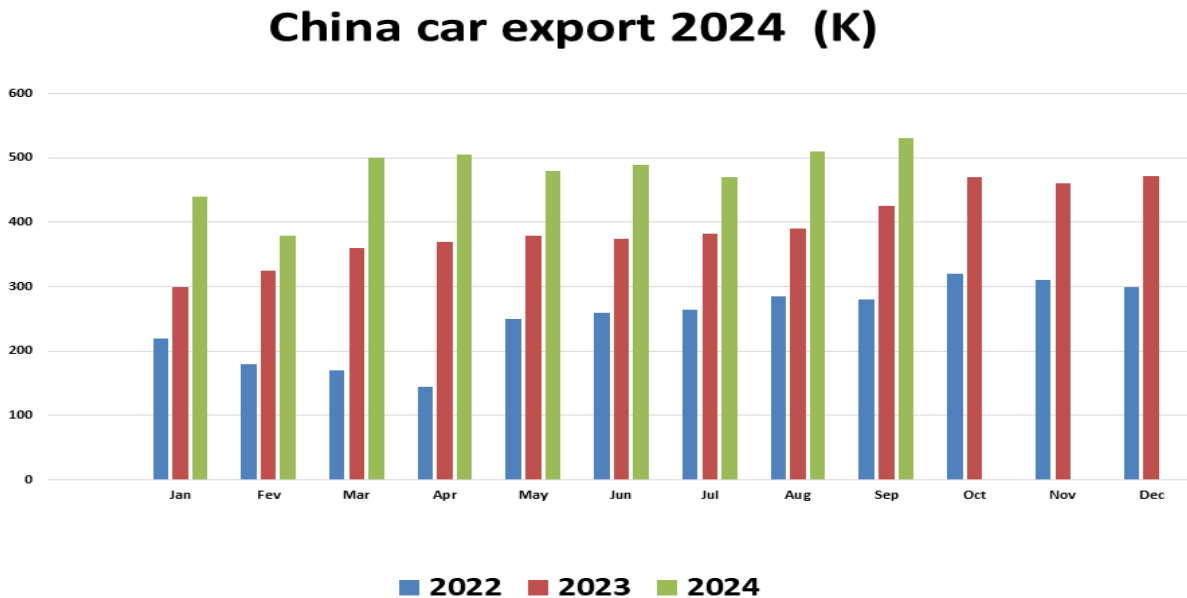
Choosing new energy vehicles is a practice of future environmental protection concepts, and as technology improves and the market matures, consumers will have more choices and purchase incentives.

2. Key players observed through drawings

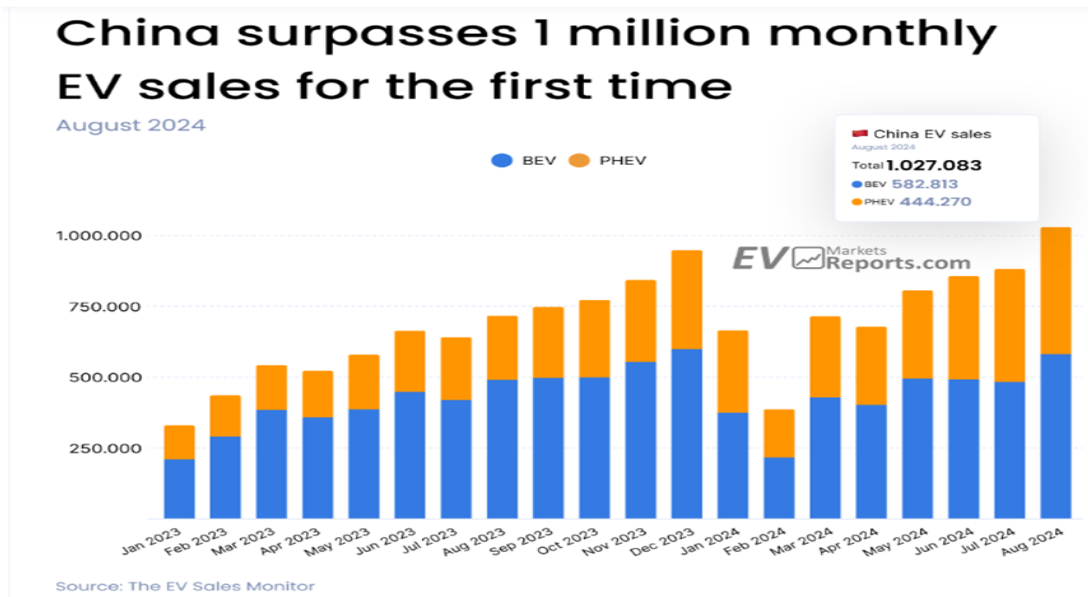
2.1 China Automotive sales volume 2024



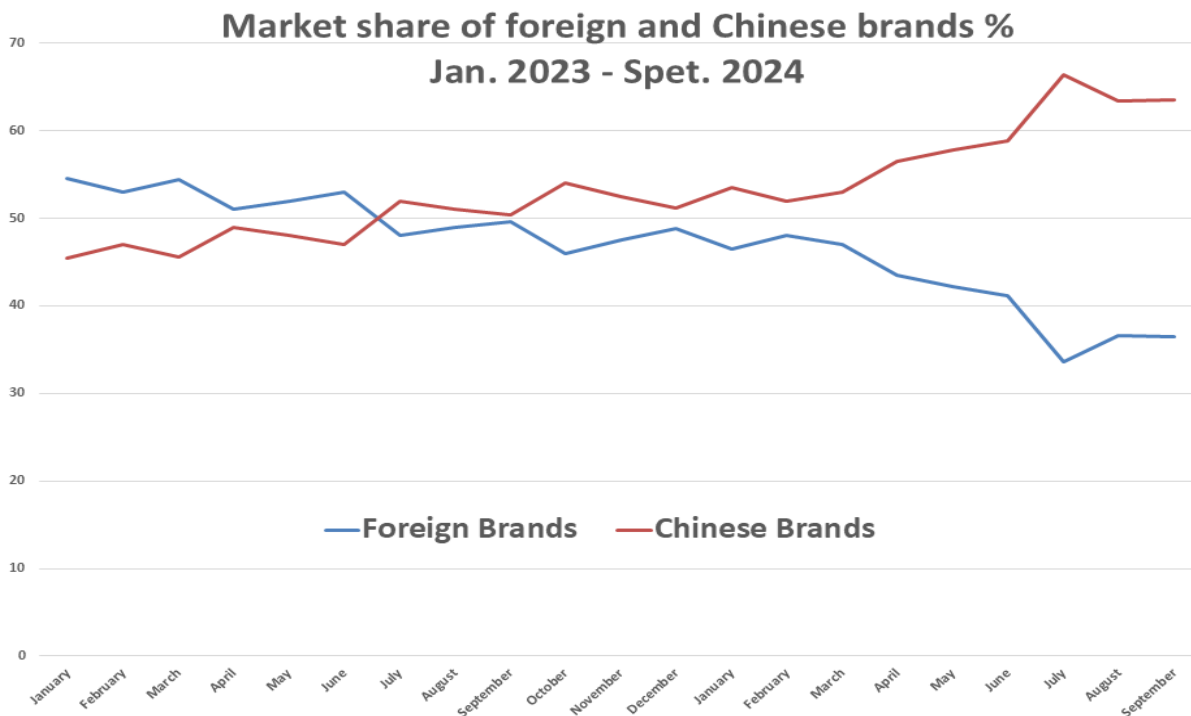
2.2 China car export 2024



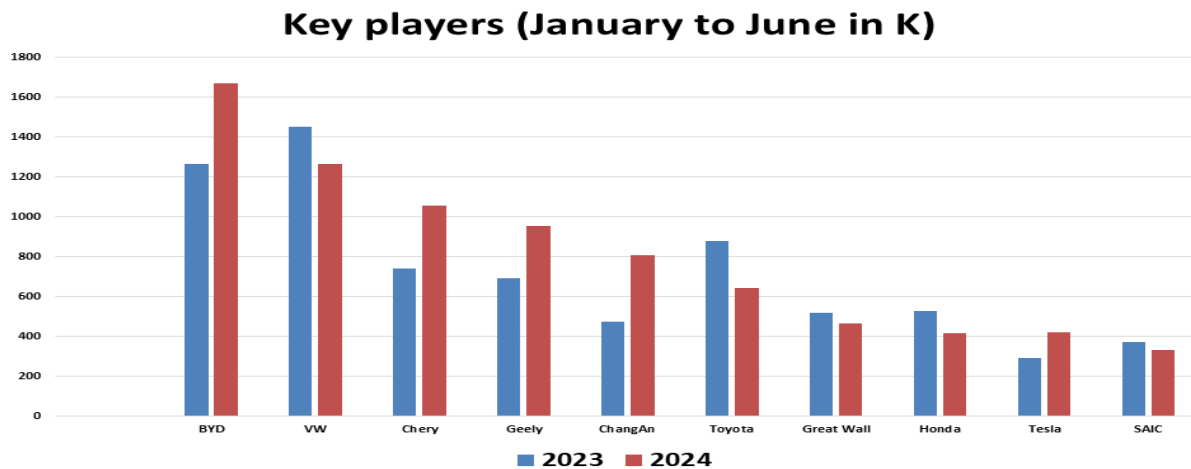
2.3 China BEV & PHEV sales 2024



2.4 Market share of foreign and Chinese brands 2024



2.5 Key car players in China 2024



3. Chinese EV carmakers and suppliers in Europe

3.1 CATL Investment Exceeds 30 Billion Yuan! CATL' Third European Battery Factory Settles in Spain. *The Paper* 2024-12-10

https://www.thepaper.cn/newsDetail_forward_29607441

CATL plans to establish its third battery factory in Europe in Spain, in a joint venture with Stellantis Group, with a total investment of approximately €4.038 billion (about 30.9 billion yuan), and an expected annual capacity of 50GWh. The factory is expected to start production by the end of 2026, primarily to supply batteries for the Stellantis Group.

3.2 European Automakers Call on Chinese Supply Chain: Let's Form a Dynamic Duo!

China Automotive news 2024-11-02

<https://news.qq.com/rain/a/20241102A05UKJ00>

Collaboration Trend: With China's advancements in electric vehicles, battery technology, and software, some European car companies are seeking cooperation with Chinese enterprises to become more competitive.

Specific Cooperation Cases:

- Volkswagen Group collaborates with Chinese startup Xpeng Motors to accelerate the development of electric vehicles and reduce costs.
- Renault partners with Geely to jointly develop advanced internal combustion engine technology.
- Stellantis Group invests in Leap Motor to gain access to electrification and intelligent technology.

Technology and Supply Chain Cooperation: In addition to cooperation between vehicle manufacturers, multinational automakers and suppliers are also cooperating with local Chinese supply chain companies, especially in the era of smart electric vehicles, where Chinese suppliers have greater influence in the core "three electric" technologies and intelligent connectivity technologies.

Investment in High-Tech: Multinational companies invest in Chinese high-tech enterprises in the fields of smart electric or smart driving to make up for their own business shortcomings and prepare for the future.

Attitude Towards Chinese Competition: Although some within the EU attribute the challenges faced by European automakers to competition from Chinese automakers and support increased tariffs, the Chairman of BMW Group and the German Chancellor have both stated that European automakers should not fear competition from China but should improve their own strength through competition.

Affordable Electric Vehicle Models: At the 2024 Paris Motor Show, European brands showcased affordable and even low-priced electric vehicle models, planning to launch them in the next one to two years, with prices as low as 20,000 euros.

3.3 From Southeast Asia to the European continent, China's automotive supply chain takes root globally. *Sina News 2024-08-03*

<https://news.sina.com.cn/zx/gj/2024-08-03/doc-inchihqi3029609.shtml>

Expansion in the European Market: Chinese automobile manufacturers such as BYD, Geely, SAIC, and NIO are expanding their sales and production networks globally, particularly by establishing factories in Europe to avoid EU tariffs.

Overseas Layout of Power Battery Enterprises: Several Chinese power battery manufacturers are investing in Europe, such as CATL's investments in Germany and Hungary.

Investment Advantages in Southern and Eastern Europe: Chinese companies are increasing their investments in Southern and Eastern Europe due to the low energy prices and relatively low labor costs in these regions. Additionally, local governments hope to promote the development of their own electric vehicle industries through investments from Chinese enterprises.

Participants in Green Transition: Chinese manufacturers, by cooperating with European companies, are involved in creating a complete electric vehicle supply chain, becoming important participants in Europe's green transition.

3.4 China Reshaping the Global Electric Vehicle Market, Automakers in the US and Europe Face Huge Challenges. *ESM China - Pablo Valerio 2024-12-02*

<https://www.esmchina.com/news/12554.html>

Intensified Market Competition: Chinese manufacturers dominate the global electric vehicle market and power battery production, accounting for over 60% and 70%, respectively.

Cooling European Market Demand: EU electric vehicle sales have declined year-on-year, indicating a potential shift in consumer attitudes.

US Market Growth: Despite a surge in electric vehicle sales in the United States, new government policies may impact sales volumes.

Challenges for European Automakers: Ford is laying off workers in Europe and reducing the production of electric SUVs, while Volkswagen's profits have plummeted, considering plant closures.

Northvolt's Collapse: Europe's leading battery industry player, Northvolt, has declared bankruptcy, increasing European automakers' reliance on Chinese battery suppliers.

China's Dominance in the Supply Chain: China leads the global electric vehicle power battery supply chain, manufacturing over 70% of the world's lithium-ion batteries.

Forecasts from Chinese Enterprises: Leaders in China's electric vehicle battery industry predict massive industry expansion, despite challenges of overcapacity.

Dependence of Western Manufacturers: Western manufacturers are heavily reliant on components produced in China, facing risks of supply chain disruptions and price fluctuations.

Threat of Trump's Second Term: Trump may significantly increase tariffs on Chinese exports to the US, affecting the cost of electric vehicle production.

The article emphasizes that European automakers and policymakers need to increase R&D investment, develop differentiated battery technologies, reduce dependence on expensive materials, and establish partnerships with resource-rich countries to counter China's dominance in the global electric vehicle market.

3.5 From Components to Complete Vehicles, the China-Europe Automotive Industry Chain Deepens Integration and Cooperation –

Sina Finance 2024-07-04

<https://finance.sina.com.cn/jjxw/2024-07-04/doc-incayume7203954.shtml>

Brilliance BMW Tiexi Factory: Showcases the pure electric vehicles produced by the factory that are about to be delivered to global users, as well as the layout of surrounding automotive parts suppliers.

European Investment in China: European automotive companies, represented by BMW, are increasing their investment and expanding production in China, attracting supporting suppliers to set up factories in China.

New Energy Vehicle Transition: The Chinese automotive market is accelerating its transition to new energy, driving European car companies to invest and expand production in China.

Introduction of Technology and Products: European companies, such as Gestamp, are introducing European technology and products to China, serving Chinese OEM customers.

Growth in Market Demand: China's new energy vehicle production and sales maintain a relatively fast growth rate, attracting foreign investment to continue to increase in China's new energy automotive industry chain.

Chinese Investment in Europe: Chinese automotive companies and supply chain enterprises are beginning to invest and set up factories in Europe, and carry out technical cooperation.

Contemporary Amperex Technology Co. Limited (CATL) Technology Licensing: Chinese power battery company CATL provides technology licensing services to European and American automotive manufacturers and battery manufacturers.

3.6 Chinese Automakers Shift Export Strategy to Europe: If Electric Vehicles Are Taxed, Then Sell Hybrids - *The Paper* 2024-12-10

https://www.thepaper.cn/newsDetail_forward_29593645

How Chinese automakers are adjusting their export strategies to Europe in the face of new tariffs imposed by the European Union on Chinese-made electric vehicles.

Impact of Tariffs: The EU, in an effort to protect its domestic automotive industry, has begun to impose tariffs of up to 45.3% on electric vehicles made in China, prompting Chinese automakers to adjust their export strategies.

Strategy Shift: Since the tariffs only apply to pure electric vehicles, Chinese automakers are shifting their focus from pure electric to hybrid vehicles (hybrids) in their exports to Europe to avoid the impact of tariffs.

Hybrids Gaining Popularity: Hybrid vehicles are becoming increasingly popular in Europe, seen as a compromise between internal combustion engines and pure electric vehicles, with advantages in terms of convenience and price.

Export Data: According to data from the China Passenger Car Association, from July to October 2024, China's hybrid vehicle exports to Europe tripled compared to the previous year, reaching 65,800 units. In the third quarter, hybrid models accounted for 18% of China's vehicle exports to Europe, an increase of 9 percentage points compared to the first quarter.

Price Competition: Chinese automakers have launched competitively priced hybrid models in the European market, such as BYD's Seal U DM-i (known as Song PLUS DM-i in China), with a starting price lower than competitors.

Prudent Pricing: Chinese automakers are no longer engaging in excessive "price wars" in the European market and may price more cautiously to prevent the EU from imposing a new round of tariffs.

Japanese Automakers' Moves: Japanese automakers, such as Honda, are also increasing hybrid vehicle exports to Europe from China to alleviate overcapacity and declining sales in China.

Market Potential: Market research firms predict that as Chinese car manufacturers offer more affordable options for the European market, the hybrid segment may show greater growth potential.

Global Trend: Both domestically and overseas, the growth of hybrid vehicles has exceeded that of electric vehicles, becoming the main force in the growth of new energy vehicles.

4. BEV, PHEV and REEV

4.1 Global New Energy Vehicle Market: Hybrid Technology Becomes the New Favorite, Pure Electric Vehicles Face Challenges - Reported by Auto K-line 2024-12-10

[https://www.msn.cn/zh-](https://www.msn.cn/zh-cn/autos/%E7%94%B5%E5%8A%A8%E6%B1%BD%E8%BD%A6/%E5%85%A8%E7%90%83%E6%96%B0%E8%83%BD%E6%BA%90%E6%B1%BD%E8%BD%A6%E5%B8%82%E5%9C%BA-%E6%B7%B7%E5%8A%A8%E6%8A%80%E6%9C%AF%E6%88%90%E6%96%B0%E5%AE%A0-%E7%BA%AF%E7%94%B5%E8%B7%AF%E7%BA%BF%E9%81%87%E6%8C%91%E6%88%98/ar-AA1vze3r?ocid=BingNewsSerp)

[cn/autos/%E7%94%B5%E5%8A%A8%E6%B1%BD%E8%BD%A6/%E5%85%A8%E7%90%83%E6%96%B0%E8%83%BD%E6%BA%90%E6%B1%BD%E8%BD%A6%E5%B8%82%E5%9C%BA-%E6%B7%B7%E5%8A%A8%E6%8A%80%E6%9C%AF%E6%88%90%E6%96%B0%E5%AE%A0-%E7%BA%AF%E7%94%B5%E8%B7%AF%E7%BA%BF%E9%81%87%E6%8C%91%E6%88%98/ar-AA1vze3r?ocid=BingNewsSerp](https://www.msn.cn/autos/%E7%94%B5%E5%8A%A8%E6%B1%BD%E8%BD%A6/%E5%85%A8%E7%90%83%E6%96%B0%E8%83%BD%E6%BA%90%E6%B1%BD%E8%BD%A6%E5%B8%82%E5%9C%BA-%E6%B7%B7%E5%8A%A8%E6%8A%80%E6%9C%AF%E6%88%90%E6%96%B0%E5%AE%A0-%E7%BA%AF%E7%94%B5%E8%B7%AF%E7%BA%BF%E9%81%87%E6%8C%91%E6%88%98/ar-AA1vze3r?ocid=BingNewsSerp)

1. Market Trend:

- The development path of pure electric vehicles (EVs) is facing unprecedented challenges globally, while hybrid technology is becoming the new favorite.

2. Policy and Market Response:

- Developed countries in Europe and America have slowed down or even paused the promotion of pure electric vehicles, while China adopts a strategy of developing both pure electric and hybrid vehicles in parallel.

3. Market Share:

- Although the retail penetration rate of new energy vehicles exceeds 50%, traditional fuel vehicles, plug-in hybrids, and extended-range hybrids still dominate the market with a share of over 70%.
4. **Sales Growth:**
 - The growth in pure electric vehicle sales mainly relies on A0 and A00 class mini and small electric vehicles, while the sales of plug-in hybrids and extended-range vehicles have increased by more than 80% year-on-year.
 5. **Consumer Preference:**
 - Consumers prefer new energy vehicles with engines and fuel tanks, considering them more reliable.
 6. **Corporate Challenges:**
 - Multinational car companies face significant pressure in the transition to electrification, with some experiencing a substantial decline in net profits.
 7. **Chinese Market:**
 - Chinese new energy vehicle companies face profitability issues, but BYD has achieved profit growth through the successful application of hybrid technology.
 8. **Technological Advantage:**
 - Hybrid technology is the optimal solution for the development of new energy vehicles at this stage, which can alleviate energy security pressure and promote sustainable development.

4.2 China's Pure Electric Vehicle Industry Report: Industry Definition, Policies, Industry Chain, Existing Issues, Current Status, and Prospects for Development and Trends. *Sohu News* 2024-11-25

https://news.sohu.com/a/829984641_120815556

1. **Industry Definition:**
 - Battery Electric Vehicles (BEVs) are a type of transportation that relies entirely on battery power for propulsion, offering zero emissions, no fuel consumption, low noise, and high energy efficiency.
2. **Industry Policy:**
 - The Chinese government will adjust financial subsidies for new energy vehicles in a timely manner to optimize the market structure and enhance industrial competitiveness, as well as support the construction of charging infrastructure.
3. **Industry Chain:**
 - The BEV industry chain includes raw materials, key component production and supply, charging services, after-sales maintenance markets, and end consumers.
4. **Existing Problems:**

- These include short driving range, incomplete charging infrastructure, high power consumption for heating, and cost efficiency issues.
5. **Development Status:**
 - From 2019 to 2023, both production and sales of BEVs in China have seen significant growth.
 6. **Competitive Landscape:**
 - Leading companies such as BYD, Tesla, NIO, and XPeng hold a dominant position in the market.
 7. **Development Trends:**
 - Technological breakthroughs, accelerated construction of charging piles, and an increase in the number of applicants for new energy vehicle licenses.
 8. **Production Forecast:**
 - It is expected that the production of BEVs in China will rise steadily from 2025 to 2031.
 9. **Prospective Outlook:**
 - By 2060, it is anticipated that BEVs will account for more than 70% of the global automotive market.

4.3 Range-Extended Technology Becomes a Hot Commodity? Joint Venture Automakers Increase Their Bets, How Will the Market Landscape Change? *Sohu Auto* 2024-11-29

https://www.sohu.com/a/831736301_362225

1. **Market Trend:**
 - The extended-range electric vehicle (EREV) market continues to heat up, attracting the attention of many automakers, including joint venture car companies.
2. **Beijing Hyundai:**
 - Beijing Hyundai plans to launch an extended-range electric vehicle with a range over 900 kilometers by 2026, as a key step in its long-term strategy.
3. **SAIC Volkswagen:**
 - SAIC Volkswagen announced that it will launch 18 new models, including two EREVs, between 2026 and 2030, accelerating its layout in the new energy field.
4. **SAIC General Motors:**
 - SAIC General Motors plans to launch 12 new energy vehicle models by 2025, including extended-range power models.
5. **Changan Mazda:**
 - Changan Mazda has launched the extended-range power new car Mazda EZ-6, with a maximum comprehensive range of over 1300 kilometers.
6. **Market Change:**

- Extended-range technology was once considered "backward technology" by some joint venture car company executives, but with market trends changing, joint venture car companies are re-evaluating its value.
7. **Sales Decline:**
 - Beijing Hyundai's sales in the Chinese market have been declining year after year since the peak in 2016, with only 134,000 vehicles sold in the first 10 months of this year.
 8. **New Energy Vehicle Penetration Rate:**
 - In the first 10 months of this year, the penetration rate of new energy vehicles of mainstream joint venture brands was only 6.2%, far lower than the 74.6% of domestic brands.
 9. **Extended-Range Electric Vehicle Growth:**
 - The growth rate of extended-range electric vehicles is as high as 99.2%, showing a particularly significant performance in the new energy vehicle market.
 10. **Market Competition:**
 - Joint venture car companies are adjusting their strategies, making extended-range electric vehicles an important direction for future development, and market competition is becoming increasingly fierce.

4.4 Pure Electric and Range-Extended, 'China's Top Ten Powertrains' Face a Major Test, Who is the True King? PCAUTO 2024-11-29

<https://www.pcauto.com.cn/hj/article/2669007.html>

1. **Market Growth:**
 - In the first three quarters of 2024, China's new energy vehicle market maintained double-digit growth, with production and sales increasing by 31.7% and 32.5% year-on-year, respectively, and the market share reaching 38.6%.
2. **Top Ten Power System Test:**
 - The "China Heart" 2024 Top Ten New Energy Vehicle Power System Real Car Test event was held at the Gaoyou Jialian Automobile Test Field, with 14 models shortlisted.
3. **Technological Progress:**
 - The event reflects the technological progress of Chinese automotive brands in the new energy field, especially in range-extended systems and high-voltage platform pure electric systems.
4. **Range-Extended Vehicle Market:**
 - In the first eight months of 2024, the cumulative sales of range-extended vehicles reached 749,000 units, a year-on-year increase of 167%.
5. **Real Car Test:**

- The test not only examines technical data and performance indicators but also comprehensively evaluates the driving experience, including power, acceleration, handling, and comfort.

6. **Market Trend:**

- Despite the impact of range-extended and plug-in hybrid markets, the pure electric market has made significant technological innovations, with the application of high-voltage platforms and oil-cooled flat winding motors showing technological progress.

7. **Market Share:**

- The market share of Chinese brand passenger cars continues to rise, with September sales reaching 1.709 million units, a year-on-year increase of 21.9%, and the market share reaching 67.7%.

4.5 CATL Launches Super Hybrid Battery, Far Exceeding Traditional PHEV Pure Electric Range *MOTO* 2024-10-28

<https://news.qq.com/rain/a/20241028A05BL500>

1. **New Product Launch:**

- Chinese company CATL (Contemporary Amperex Technology Co., Limited) has launched the Freevoy super hybrid battery, providing plug-in hybrid electric vehicles (PHEVs) with an impressive pure electric range of up to 400 kilometers.

2. **Performance Comparison:**

- The battery's pure electric range far exceeds the 48-64 kilometers of traditional PHEVs, approaching or surpassing the range of some pure electric vehicle models.

3. **Fast Charging Technology:**

- The Freevoy battery supports 4C ultra-fast charging technology, allowing for an increase of about 280 kilometers in range after just 10 minutes of charging.

4. **Technical Advantages:**

- The battery uses an anode material surface modification technology and a high-pressure electrolyte formula, forming a nano protective layer to reduce side reactions and enhance lithium-ion transmission efficiency.

5. **Intelligent Management:**

- Employing CATL's self-developed all-scenario high-precision SOC model and upgraded BMS intelligent algorithms, the accuracy of SOC control is increased by 40%, and the utilization rate of pure electric mode is increased by over 10%.

6. **Sodium-ion Battery Technology:**

- The Freevoy battery incorporates sodium-ion battery technology and a multi-gradient layered electrode design, further enhancing the range capability.

7. **Market Application:**

- CATL plans to launch 30 hybrid models equipped with the Freevoy battery next year, involving brands such as Chery, GAC, Geely, and VOYAH.

4.6 With the longest range exceeding 2200km, Roewe DMH Super Hybrid Dual Models Launched Simultaneously. Gasgoo 2024-11-10 22:20:39

<https://auto.gasgoo.com/news/202411/10I70410100C107.shtml>

1. New Car Launch:

- SAIC Roewe has launched the iMAX8 DMH New Lucun and D7 DMH World Champion Edition, introducing the DMH Super Hybrid System technology.

2. Market Growth:

- The plug-in hybrid market is growing rapidly, with a year-on-year increase of 69.0% from January to September, far exceeding the 17.7% growth of pure electric vehicles.

3. Competitive Advantage:

- The Roewe D7 DMH World Champion Edition has achieved a Guinness World Record with a range of over 2208.719 km and an average fuel consumption of 2.49L/100km.

4. High Cost Performance:

- The Roewe D7 DMH World Champion Edition offers configurations such as long wheelbase, smart cockpit, and double-layer sound insulation glass, priced between 99,800 yuan and 119,800 yuan.

5. Warranty Services:

- SAIC Roewe offers "zero spontaneous combustion three-electric lifelong warranty" and a 6-year/150,000 km original factory warranty.

6. Another New Car:

- The Roewe iMAX8 DMH New Lucun is positioned as an MPV, with a tested range of 1536KM and a CLTC power loss fuel consumption of 4.71L/100KM, priced between 199,900 yuan and 249,900 yuan.

7. Technical Features:

- The DMH Super Hybrid System has technologies such as "energy domain" full-domain thermal management, powertrain brain PICU, and engine + P1 motor co-axial structure.

8. Technical Advantages:

- PICU achieves "five-in-one" functions such as motor control and engine control, increasing computing speed by 50% and reducing 70% of redundant components.

9. Future Development:

- SAIC plans to enhance the performance of the DMH Super Hybrid technology in the next three years across key areas such as engines, transmissions, batteries, motors, and energy control brains.

4.7 Hybrid passenger cars are accelerating the replacement of fuel-powered vehicles. QQ NEWS 2024-11-21

<https://news.qq.com/rain/a/20241121A0231V00>

China's hybrid passenger car market is witnessing an explosive growth, with both oil-electric hybrid, plug-in hybrid, and range-extended electric vehicles playing significant roles.

Hybrid vehicles offer carbon reduction and economic value, with a 20% lower carbon footprint throughout their lifecycle compared to conventional fuel vehicles.

Due to the greening of electricity, the carbon emissions during the production phase of hybrid vehicles will be further reduced.

At the same time, hybrid vehicles complement pure electric vehicles, jointly promoting consumption and filling gaps in regional markets.

In the next 5-10 years, hybrid vehicles will continue to develop rapidly, with traditional fuel vehicles being replaced by hybrid and pure electric vehicles.

5. Minerals : lithium, nickel, manganese and cobalt

5.1 Energy Metal Market Analysis: The Supply and Demand Pattern of Lithium and Nickel is Reaching a Turning Point *Future Think Tank 2024-12-11*

<https://www.vzkoo.com/read/20241211de30fa8abee5655d6ee7a9fb.html>

Lithium:

1. **Price Pressure Leads to Capacity Adjustment:** Lithium prices have been under pressure since 2024, leading to losses in external lithium concentrate smelting capacity and recycling smelting capacity, with the industry entering a period of adjustment.
2. **Supply Contraction and Demand Improvement:** Lithium salt production has declined, while the production of power batteries has increased, with the lithium salt industry chain inventory being healthy and downstream enterprises holding low inventory levels. If demand continues to improve, it will support lithium prices.
3. **Long-Term Demand Growth:** Although capital expenditure in the lithium industry has decreased in the short term, the long-term outlook for lithium battery demand growth remains optimistic, and lithium prices are expected to rebound after supply clearance.

Nickel:

1. **Price Fluctuations and Corporate Profitability:** Nickel prices rose and then fell in 2024, with integrated MHP enterprises maintaining profitability, while external enterprises face losses.

2. **Production Structure Changes:** China's electrolytic nickel production has grown rapidly, while the production of sulfuric acid nickel has decreased, reflecting the price premium difference between electrolytic nickel and sulfuric acid nickel.
3. **Indonesia Production Growth:** Indonesia's MHP has become the main source of low-cost supply increments, with stainless steel and batteries being the main demand areas for nickel.
4. **Supply Overhang and Policy Impact:** The global primary nickel is in a phase of oversupply, and Indonesia's mining policies have a significant impact on nickel supply.

Summary:

The energy metal market is at a critical turning point, and the supply and demand patterns of lithium and nickel may undergo significant changes. Although the market faces challenges in the short term, the long-term outlook for energy metal demand growth remains optimistic, and the industry is expected to see a price reversal after supply clearance.

5.2 Lithium Battery Industry Research Report: Industry Bottom Awaits Reversal, Technological Change Drives Growth - Sina Mobile 2024-11-30

<https://finance.sina.cn/2024-11-30/detail-incxvaww7957678.d.html>

Lithium Battery Industry Overview:

- **New Energy Vehicles Drive Growth:** New energy vehicles drive the rapid development of the lithium battery industry.
- **Significant Decline in Lithium Battery Sector:** From the beginning of 2024 to July 26, the lithium battery sector experienced a significant decline.
- **Battery Sector Holding Value Decline:** Q2 battery sector holding value declined on a quarter-over-quarter basis, while consumer battery holding increased.

Battery Sector Valuation and Holdings:

- **Valuation at Low Level:** The battery sector's valuation is at a low level, and the industry's prosperity is expected to bottom out and rebound.
- **CATL as the Heavyweight Stock:** CATL remains the top-heavy stock in the battery industry.

Process and Technical Barriers:

- **Complex Cell Manufacturing Process:** The cell manufacturing process is complex with high technical barriers.

- **Module and PACK Process:** Involves steps such as cutting cell tabs, stacking, assembly, and testing.

Demand Analysis:

- **Growth in Domestic Electric Vehicles:** Domestic electric vehicle sales maintain steady growth, and the old-for-new policy is expected to boost sales.
- **Slowdown in US Electrification Process:** Relaxation of core link assessments leads to a slowdown in the short-term electrification process.

Supply and Material Prices:

- **Global Demand for Power Batteries Increases:** Domestic manufacturers dominate the global power battery market.
- **Material Prices May Be at the Bottom of the Cycle:** The supply-demand pattern is expected to gradually improve.

New Technology Development:

- **Solid-State Battery Industrialization Accelerates:** Semi-solid-state batteries have achieved mass production and loading, and the industrialization process of all-solid-state batteries accelerates.
- **High-Voltage Fast Charging Technology Development:** A dense release of 800V models, and the acceleration of liquid-cooled supercharging pile layout.

New Demand Areas:

- **AI High Computing Power Drives Consumer Battery Upgrade:** AIPC is expected to rapidly popularize.
- **High-Speed Growth in Energy Storage Demand:** Global

5.3 Manganese, Cobalt, and Nickel Lithium Export Volumes: China's Manganese, Cobalt, and Nickel Lithium Exports, Export Data of Manganese, Cobalt, and Nickel Lithium from Various Countries - Shanghai Metals Market.

https://www.smm.cn/mpdb/1705473672393_export-amount_Chile

- **Global Status of Chile:** Chile is the world's largest producer of manganese and lithium carbonate, and the fourth-largest producer of nickel.
- **Manganese Exports:** Chile's manganese is mainly exported to Asia, particularly China and India, with annual exports reaching hundreds of thousands of tons, primarily used in the steel industry and battery production.

- **Cobalt Exports:** Chile's cobalt is mainly exported to the United States and Europe, with annual exports amounting to thousands of tons, used mainly in battery manufacturing and aerospace.
- **Nickel Exports:** Chile's nickel is mainly exported to Asia, particularly China and Japan, with annual exports reaching hundreds of thousands of tons, primarily used in stainless steel and battery manufacturing.
- **Lithium Carbonate Exports:** Chile's lithium carbonate is mainly exported to Asia, particularly China and South Korea, with annual exports reaching millions of tons, used in battery production and new energy fields.
- **Market Reputation:** Chile's manganese, cobalt, nickel, and lithium carbonate products are highly regarded in the global market for their high purity and excellent quality.
- **Growth Potential:** With the increasing global demand for manganese, cobalt, nickel, and lithium carbonate, Chile's position in these areas is expected to continue to be consolidated and enhanced.

5.3 New Energy Metals: Nickel, Cobalt, and Lithium Resource Security Situation and Policy Recommendations - *China Energy Storage Network*. 2023-12-03

<https://www.escn.com.cn/20231203/ae59ad05f74a4d7aa871a78abe798d3d/c.html>

The Importance of New Energy Metals:

Nickel, cobalt, and lithium are the three most critical minerals in the field of new energy, having a significant impact on energy transition, electrification, and intelligence. Basic situation of global nickel, cobalt, and lithium industries:

Nickel: Indonesia has become the world's largest producer of primary nickel, while China is the largest consumer of nickel. Cobalt: Most of the global cobalt raw materials come from the Democratic Republic of Congo, and Indonesia is expected to become the second-largest producer of cobalt raw materials. Lithium: Global lithium raw materials mainly come from Australia, Chile, Argentina, and China, with China being the largest producer and consumer of lithium salts. China's role in the global supply chain:

China possesses a complete new energy mineral industry chain, especially with advantages in smelting and processing. Chinese enterprises actively participate in global mining development, enhancing the security of the industry and supply chains. Risks and challenges faced:

High dependence on external resources, especially nickel and cobalt. Poor domestic resource endowment and difficult mining. The risk of overcapacity throughout the entire industry chain. International geopolitics affect the stability of the supply chain. Policy recommendations:

Strengthen domestic resource development, balancing primary resources and recycled resources. Cooperate in technology and management to reduce reliance on the import-export model. Value international trade and maintain cooperative relations with resource-supplying countries. Take advantage of low-price periods for strategic reserves to stabilize the market.

6. Cathode & anode, membrane and electrolyte

6.1 Lithium Battery Cathode Raw Materials: Lithium, Cobalt, Nickel, Manganese Resource Stocks Review - *Sina Finance 2024 -11-19*

<https://finance.sina.com.cn/roll/2024-11-19/doc-incwqzvn2827875.shtml>

Composition of Lithium Batteries:

Lithium batteries consist of four main components: cathode materials, anode materials, separators, and electrolytes.

Cathode materials are the source of lithium ions in lithium batteries and directly determine the energy density of the battery.

The mainstream cathode materials are lithium iron phosphate and ternary materials (NCM/NCA).

Preparation materials include lithium carbonate, lithium hydroxide, cobalt sulfate, nickel sulfate, manganese sulfate, etc., with raw material costs accounting for 90% of the total battery cost.

Upstream Resources:

Lithium Resources:

Lithium is an ideal battery metal, and lithium carbonate and lithium hydroxide are the main raw materials for manufacturing the cathodes of lithium batteries.

Global lithium resource supply is concentrated, with South America accounting for 58%, Australia 19%, and China 7%.

79% of domestic lithium resources are stored in salt lakes, which are difficult to develop.

Major suppliers include Ganfeng Lithium and Tianqi Lithium Industries, among others.

Cobalt Resources:

Cobalt is a silver-white ferromagnetic metal, with global cobalt resource reserves estimated at about 8.3 million tons, of which the Democratic Republic of Congo accounts for 48.2%.

80% of domestic cobalt is used for the precursors of power battery ternary materials.

Major suppliers include Huayou Cobalt and Hanrui Cobalt, among others.

Nickel Resources:

Global nickel resources are mainly distributed in Australia, Brazil, Indonesia, and other places.

Nickel, cobalt, and manganese can be mixed in any proportion, and high-nickel ternary materials are the mainstream choice for solid-state battery manufacturers.

Major suppliers include Huayou Cobalt and Green American, among others.

Manganese Resources:

Global manganese resource production is concentrated, with the top three supplying countries being South Africa, Gabon, and Australia.

China accounts for about 5% and mainly relies on imports from overseas.

Major suppliers include Xiangtan Electrochemical and Sinosteel Tianyuan, among others.

6.2 Technological Innovation and Alternative Materials for Cobalt in Lithium Battery Cathode Materials *North America Intellectual Property Official Website*

http://cn.naipo.com/Portals/11/web_cn/Knowledge_Center/Research_and_Innovation/IPND_241127_1002.htm

The article "North American Intellectual Property News, Issue 171: Technological Innovation and Alternative Materials for Cobalt in Lithium Battery Cathode Materials":

Strategic Resource Export Control:

China is implementing strategic resource export controls. Cobalt, as a key mineral, is as important in the manufacturing of electric vehicle batteries as crude oil.

Challenges with Cobalt:

Lithium-ion batteries contain cobalt metal, which performs well in terms of stability and energy density. However, cobalt is expensive and has high environmental and social costs. Cobalt deposits are often located in politically unstable countries, and the extraction process is associated with poor working conditions and toxic waste.

Alternative Technologies for Cobalt-Free Cathode Materials:

Scientists are searching for alternatives to cobalt, especially for use in lithium battery cathode materials.

Trends in the Development of Cobalt-Free Battery Cathode Materials:

The development of cobalt-free battery cathode alternatives, such as lithium manganate (LMO), lithium manganate (LiMnO_2), spinel-type lithium nickel manganese oxide (LNMO), lithium nickel manganese oxide (NMx), and lithium iron phosphate (LFP).

Specific Technological Advances in Cobalt-Free Materials:

Lithium manganate: It has high power density and good thermal stability. Chinese patent CN 101964428B discloses its manufacturing method.

Lithium manganate: Chinese patent CN 117613221A discloses an invention of a surface-modified layered lithium-rich manganese oxide cathode material.

Spinel-type lithium nickel manganese oxide: Toshiba of Japan has developed a new type of lithium-ion battery with a cobalt-free 5V high-voltage cathode.

Lithium iron phosphate: Chinese patent CN 116443840B involves a lithium iron phosphate cathode material and its preparation method, optimizing particle distribution and increasing packing density.

Organic Materials as New Alternatives:

MIT in the United States has successfully developed a new type of lithium-ion battery cathode based on organic materials, which is nickel and cobalt-free, has lower manufacturing costs, and has a conductivity rate comparable to cobalt-containing batteries.

6.3 The Application and Breakthroughs of New Manganese-Based Cathode Materials: Entering the Main Arena. *General News 2024-11-19*

<https://www.163.com/news/article/JHBL5JVE00019UD6.html>

Market Importance:

Power and energy storage are the two broadest trillion-dollar application markets in the new energy sector, regarded as the main battlefield for new energy companies.

Boshi Gaoke's Goal:

Boshi Gaoke focuses on new manganese-based cathode materials, particularly high-voltage nickel manganese acid lithium and lithium manganese iron phosphate, instead of traditional ternary materials and lithium iron phosphate.

Lithium Manganese Iron Phosphate (LMFP):

LMFP is an upgraded version of lithium iron phosphate, formed by doping with manganese elements, and has higher energy density. It has a similar structure to lithium iron phosphate, featuring an olivine structure. It has advantages in energy density, safety, low-temperature performance, and cost, and has been applied in the power market, such as in the Chery Xingji Yuan ES and Zhiji S7 models.

High-Voltage Nickel Manganese Acid Lithium (LNMO):

LNMO material has a stable structure, high voltage platform, high specific energy density, and good cycle performance. It obtains high working voltage characteristics by replacing some Mn elements with Ni, with energy approaching 650Wh/kg. It is expected to replace some of the ternary cathode material market share in the consumer battery product field and is suitable for high power density lithium-ion batteries used in electric vehicles.

Advantages of High-Voltage Nickel Manganese Acid Lithium:

It does not contain the expensive cobalt element, has a simple preparation process, is cost-effective, and is suitable for large-scale applications. Compared to ternary materials, it has a price advantage; the price of 6-series ternary materials is 2.2 times that of LNMO, and the price of 8-series ternary materials is 2.5 times that of LNMO.

Market Prospects:

As the performance development of ternary and lithium iron phosphate approaches the theoretical limit, high-voltage nickel manganese acid lithium and lithium manganese iron phosphate are expected to become the main cathode materials for the next generation of power and energy storage markets.

6.4 BYD Obtains Patent for Lithium Iron Phosphate Cathode Material and Its Preparation Method, as well as Lithium-Ion Battery *Financial World 12, 11, 2024*

<https://www.163.com/dy/article/JJ55OGQ10519QIKK.html>

Financial World reported on December 11, 2024, that according to the information from the China National Intellectual Property Administration, BYD Co., Ltd. has obtained a patent titled "Lithium Iron Phosphate Cathode Material and Its Preparation Method and Lithium-Ion Battery," with the authorization announcement number CN 115332530 B. The application date for the patent was May 2021.

6.5 Lithium Iron Phosphate Market Remains Hot, but Corporate Profits Still Face Pressure | Energy Storage | Cathode | New Energy Vehicles - *NetEase Subscription 2024-12-12*

<https://www.163.com/dy/article/JJ720NK40514R9OJ.html>

Market Heat: Entering December, the lithium iron phosphate market continues to show a hot trend, with most companies having full orders, indicating strong market demand.

Profit Pressure: Despite the favorable market situation, most lithium iron phosphate companies still find it difficult to escape the situation of profit squeeze.

Demand Factors: The strong demand from the new energy vehicle and energy storage markets is the main factor driving the heating up of the lithium iron phosphate market.

Raw Materials and Competition: The rise in raw material prices, weak product bargaining power, and intense industry competition affect corporate profits.

Capacity Utilization Rate: There are differences in the capacity utilization rates of different companies, with some facing insufficient capacity utilization.

Output Forecast: It is expected that China's lithium iron phosphate production will reach 279,400 tons in December 2024.

Demand Growth: The new energy vehicle market, supported by subsidy policies, continues to have a favorable demand, and overseas energy storage orders remain stable in the short term.

Price Fluctuations: The significant fluctuations in lithium iron phosphate prices have led to the resumption of production capacity that was previously halted, offsetting the unexpected growth in demand at the end of the year.

Market Concerns: The market has begun to re-examine the sustainability of demand, leading to concerns about future supply and demand balance.

Product Structure Optimization: Against the backdrop of intensifying market competition, companies have started to focus on optimizing and upgrading their product structures to increase product value and competitiveness.

Seeking Growth Opportunities: Many lithium iron phosphate companies have begun to seek new growth opportunities, including expansion and targeting overseas markets.

Market Concentration and Industry Chain Integration: With the acceleration of the globalization layout of domestic lithium iron phosphate companies, market concentration may further increase, and industry chain integration will also accelerate.

Profit Improvement Expectations: Experts believe that with technological progress and market expansion, the profitability of lithium iron phosphate companies is expected to improve.

Global Market Share: The share of Chinese companies in the global lithium iron phosphate market is expected to continue to expand.

7. LNMC & LPF & Sodium battery

7.1 Riding the Winds and Waves, the Future is Promising: The Future Blueprint for Battery Material Enterprises – McKinsey Greater China

<https://www.mckinsey.com.cn/%e4%b9%98%e9%a3%8e%e7%a0%b4%e6%b5%aa%ef%bc%8c%e6%9c%aa%e6%9d%a5%e5%8f%af%e6%9c%9f%ef%bc%9a%e7%94%b5%e6%b1%a0%e6%9d%90%e6%96%99%e4%bc%81%e4%b8%9a%e6%9c%aa%e6%9d%a5%e5%9b%be%e6%99%af/>

China's "3060" dual carbon goals and the global 2050 net-zero vision are driving rapid expansion in new energy vehicles and energy storage. The demand for lithium battery materials has surged, with Chinese companies accounting for up to 60% of the global market share.

Future Outlook:

Over the next decade, global battery demand is expected to expand at a compound annual growth rate of about 30%. By 2030, the total global market size will exceed 4,000 gigawatt-hours (GWh), with the total value chain value exceeding 30 trillion yuan, of which China will account for 40%.

Seven Major Trends:

- Explosive Demand: The battery and raw materials market is booming.
- Supply Assurance: Raw material shortages lead companies to seek sources overseas.
- Technological Iteration: Upgrades in the smelting technology of battery raw materials.
- Policy Constraints: Trade regulation impacts the material supply chain.
- Cooperation Expansion: Diverse models aid in the development of the industry chain.
- Green Decarbonization: Sustainability aids in supply chain reform.
- Resource Recycling: Supply gaps stimulate the circular value chain.

Five Major Strategies:

- Actively participate in the expansion of the value chain.
- Establish a global governance system.
- Promote green and sustainable development.
- Manage corporate capital across cycles.
- Combine lean management with digitalization.

Conclusion:

Chinese companies have achieved significant results in the battery materials race, facing challenges such as tight supply and stricter overseas regulation. Companies need to demonstrate strategic thinking, enhance core capabilities, and maintain a leading position.

7.2 New Study Challenges Industry Consensus: Fully Charged Lithium Iron Phosphate Batteries Also Accelerate Aging - IT Home 2024-08-26

<https://news.qq.com/rain/a/20240826A0102L00>

New research challenges the industry consensus, indicating that Lithium Iron Phosphate (LFP) batteries can also accelerate aging even when fully charged. The study found that frequently charging at a high state of charge can damage LFP batteries because high voltage and temperature can produce harmful compounds within the battery, leading to battery aging. The research suggests that a charging cycle of 0-25% can extend battery life, but the authors do not recommend users change their charging habits as it would result in capacity waste. In short, although being fully charged may affect the lifespan of LFP batteries, modern battery technology is advanced enough to travel hundreds of thousands of miles even with poor charging habits.

7.3 Contemporary Amperex Technology Co. Limited (CATL)'s second-generation sodium-ion batteries can operate even at minus 40 degrees Celsius. HIGHMOTOR

<https://www.highmotor.com/zh-CN/segunda-generacion-baterias-iones-sodio-catl-opera-incluso-40-grados-bajo-cero.html>

CATL has launched its second-generation sodium-ion battery, which can operate under extreme temperatures, particularly emphasizing that it can function normally even at minus 40 degrees Celsius. Compared to lithium batteries, sodium-ion batteries are lower in cost and have a reduced risk of overheating, but they have a lower energy density. It is expected that these batteries will primarily be used in low-end electric vehicles and may replace about 20%-30% of lithium iron phosphate battery applications in the coming years.

7.4 CATL Introduces Lithium-Sodium Super Hybrid Technology, Upgrading Competition in the New Energy Vehicle Battery Industry Shanghai Securities News 2024-10-25

<https://fund.eastmoney.com/a/202410253216808287.html>

CATL has launched a super hybrid battery named "Xiao Yao," which integrates sodium batteries with lithium batteries. This battery boasts a pure electric range of over 400 kilometers and a 4C supercharging capability, allowing for a charge that exceeds 280 kilometers in just 10 minutes. The technology has seen technological innovation in endurance, energy replenishment, safety, and low-temperature resistance, and is expected to lead a transformation in new energy power. The Xiao Yao battery has been applied to brand models such as AITO and Deep Blue, with plans to equip nearly 30 new energy vehicle models by 2025. The development of this technology also reflects the high demand and escalating competition in the extended-range hybrid new energy vehicle market.

8. Semi-solid and solide

8.1 Wanxiang 123 Launches Solid-State Battery Technology, Attracting Market Attention *Sohu Auto 2024-12-02*

https://news.sohu.com/a/832435950_121924584

Wanxiang 123 Company has made significant progress in the field of solid-state battery technology, having obtained more than 50 patents. This battery technology is highly regarded for its high safety and energy density, and is expected to drive the development of the electric vehicle and smart device industries. Solid-state batteries use solid electrolytes, reducing the risk of leakage and combustion, increasing energy density, extending range, and accelerating charging speeds. Wanxiang 123's technology also includes designs and material innovations that maintain stability under extreme temperatures, which is particularly important for applications with high safety requirements. As the electric vehicle market grows, Wanxiang 123's solid-state battery technology is poised to meet market demands for battery range, enhance its competitiveness in the new energy market, and potentially alter consumer purchasing decisions.

8.2 Solid-State Batteries Reach a Commercial Inflection Point, 1500km Range Expected to be Achieved by 2026 *Sohu Auto 2024-11-21*

https://www.sohu.com/a/828994957_121798711

Multiple companies are accelerating the research and development and commercialization of solid-state battery technology. GAC Group expects to apply all-solid-state batteries to the Haobo series models by 2026, with an energy density exceeding 350Wh/kg. Changan Automobile, in cooperation with Tai Lan New Energy, expects to start demonstration applications of diaphragm-free solid-state lithium batteries in 2026 and mass production in 2027. CATL has entered the 20Ah sample trial production phase, while Huawei has solved the side reaction issues of sulfide solid-state batteries. Beijing Pure Lithium New Energy Technology Co., Ltd. has started production on its all-solid-state lithium battery mass production line, and Chery Automobile's Liefeng model supports 800V high-voltage fast charging with a range exceeding 1500 kilometers. It is anticipated that by 2026, solid-state batteries will be applied in vehicles, enhancing the range capabilities of electric vehicles and promoting environmentally friendly and sustainable transportation development.

8.3 Solid-State Batteries Heat Up, Another Lithium Company Increases Investment in Core Materials for Low-Cost Mass Production! | Lithium Battery | Anode | Cathode | Metal - *NetEase 2024-12-12*

<https://www.163.com/dy/article/JJ7CUQNP0553XZF1.html>

Daoshi Technology collaborates with University of Electronic Science and Technology, investing 3 million yuan to develop ultra-thin metallic lithium anodes, aiming to reduce the production costs of solid-state batteries and enhance mass production capabilities. The collaboration will develop new low-cost mass production processes, targeting the production of ultra-thin lithium anode active layers with a thickness not exceeding 20 μ m, at a cost significantly lower than traditional methods. Additionally, Dao Shi Technology has signed a cooperation agreement with Anwa New Energy to jointly develop materials for solid-state batteries. These efforts could enhance Dao Shi Technology's competitiveness in the solid-state battery materials market.

9. Motor, BMS and platform

9.1 Xiaomi's Automobile Secures 7 Electric Motor Patents! Conducting In-Depth Research on Core Components of Electric Motors! *Electric Vehicle Conference 2024-12-10*

<https://www.eet-china.com/mp/a368136.html>

Xiaomi Auto Technology Co., Ltd. holds 7 patents in the field of electric motors, covering in-depth research on core components such as stators and rotors. These patents include:

1. Winding assembly, stator assembly, axial flux motor, and vehicle: A winding patent that enhances the space utilization within the motor.
2. Method and system for locating stator insulation defects in flat-wound motors: A method for detecting insulation defect points in motor stators through PDIV values, enhancing motor safety.
3. Stator core, drive motor, and vehicle: A structure of the motor stator core that aids in cooling.
4. Motor control parameter calibration method, device, and vehicle: Determining motor control parameters based on torque and speed to optimize motor efficiency.
5. Liquid-cooled radiator, motor controller, and vehicle: A liquid-cooled heat dissipation module for motors and electronic controls.
6. Axial flux motor and vehicle: Enhancing the synergy between two motor rotor assemblies to improve manufacturing efficiency.
7. Motor rotor, rotor assembly, motor, and vehicle: A possible structure for the rotor of Xiaomi's electric motors, enhancing strength and torque at high speeds.

9.2 The electric motor's speed of 30,000 rpm leads the industry, and Haobo Quark Drive 2.0 will reshape the legend of V8 engines. *36Kr 2024-12-11*

<https://www.36kr.com/p/3073901003469705>

Haobo HL is equipped with the Quark Drive 2.0 system, whose electric motor speed has reached 30,000 rpm, leading the global new energy vehicle industry. This technology not only provides powerful horsepower surpassing V8 engines but also brings a quiet and environmentally friendly driving experience. The mass-produced motor efficiency of Quark Drive 2.0 has reached 98.5%, with a power density as high as 13 kW/kg, which is twice the industry average. This technology has been awarded the "Premium Drive High-Quality Electric Drive" certificate by the New Energy Vehicle Test Center of the China Automotive Technology and Research Center. The breakthrough performance of Quark Drive 2.0, especially the use of amorphous alloy materials, has brought motor efficiency close to the level of room-temperature superconducting motors while reducing iron loss. This technological advancement of the Haobo brand not only enhances product competitiveness but also contributes to the development of electric drive technology for new energy vehicles in China.

9.3 New energy vehicles are rapidly developing, propelling the drive motor industry onto a fast track. *ChinaIOL 2024-12-09*

http://www.chinaiol.com/News/Content/202412/78_55523.html

The rapid development of new energy vehicles has driven the growth in the installation volume of drive motors. In the first three quarters of 2024, the cumulative installation volume of drive motors for new energy vehicles in China reached 9.884 million units, a year-on-year increase of 38.2%. Among them, the installation rate of plug-in hybrid vehicles has increased quarter by quarter, with market share approaching 30%. In terms of motor types, permanent magnet synchronous motors dominate the market with a market share of about 94.5%, although it has declined, it still holds an absolute dominant position. With governments around the world introducing incentives to reduce carbon emissions, it is expected that the domestic new energy market will continue to grow in 2025, and the drive motor industry will also usher in new growth opportunities.

9.4 The Smart Chassis Market: Current Status, Trends, and Outlook

Automotive Electronics Design 2024-12-04

<https://www.eet-china.com/mp/a366730.html>

The definition of intelligent chassis technology: It integrates electronic control, sensor technology, and mechanical systems to achieve real-time monitoring and precise control of the vehicle's driving state, enhancing maneuverability, stability, and safety.

Wireless control technology: It replaces traditional mechanical and hydraulic systems, achieving precise control through electronic signals, such as Electronic Hydraulic Braking (EHB) and Electro Mechanical Braking (EMB) systems for braking, and Steering By Wire (SBW) systems for steering.

Acceleration of domestic substitution: The rise of domestic intelligent chassis technology has ushered in a golden period for domestic substitution, promoting a comprehensive upgrade of the industrial chain.

Braking system: The wireless braking system has changed the way braking systems work, improving braking safety.

Steering system: The steering system has evolved from mechanical to wireless steering. Wireless steering technology is applied less in mass production vehicles but has the potential to enhance handling performance and autonomous driving experience.

Suspension system: The suspension system has transitioned from passive to semi-active and active suspension, with air suspension systems offering superior performance. As costs gradually decrease, the market penetration rate is expected to increase.

Chassis domain controller: Original equipment manufacturers (OEMs) collaborate with Tier 1 suppliers to develop chassis domain controllers, and it is becoming a trend for OEMs to develop their own chassis domain controllers.

Supply chain domestic substitution: Domestic suppliers have made breakthroughs in key technologies, offering cost-effectiveness and rapid response capabilities, ensuring supply chain security.

Market outlook: Intelligent chassis will play a more important role in the new energy vehicle and autonomous driving markets. Chinese companies have made significant progress in technology accumulation, promoting the implementation of new technologies.

9.5 Electric Vehicle Integrated Chassis CTC Development Trends and Key Technology Research *Tencent New 2024-12-06*

<https://news.qq.com/rain/a/20241206A03TMA00>

The development of Electric Vehicle (EV) Integrated Chassis CTC (Cell to Chassis) technology aims to achieve decoupling development of the vehicle chassis and body, enhancing development efficiency and reducing costs. Here are some key points about this technology:

Advantages of Skateboard Chassis:

- **Fast Market Launch:** Skateboard chassis can significantly shorten the time to market for new vehicles, with the CATL (Contemporary Amperex Technology Co., Limited) general manager stating that OEMs can launch new models within 18 months.
- **Low Cost:** The integrated and modular design of the skateboard chassis can reduce development and manufacturing costs. CATL claims that the price of its skateboard chassis products is about 1/3 of the cost that OEMs would incur for self-development.
- **Strong Scalability:** The high integration of the skateboard chassis allows for vehicle development according to different needs, offering flexibility in size and components.

Deep Integration of CIIC Integrated Intelligent Chassis:

- Based on CATL's power battery technology and using CTC technology, it achieves direct integration of battery cells into the chassis, improving pack efficiency and enabling a driving range of over a thousand kilometers.
- Highly integrates batteries, electric drive, and thermal management systems, saving space in the upper part of the vehicle body and improving system efficiency.

Mechanical Decoupling Hydraulic Solutions:

- CIIC Integrated Intelligent Chassis showcases a series of solutions independently developed by Era Intelligent (a subsidiary of CATL), including wire braking, wire steering, rear-wheel steering, electronic suspension, and four-wheel drive control.

- The wire braking system is the industry's first mechanical decoupling hydraulic solution, eliminating the mechanical connection between the brake pedal and the electronic control unit. It ensures system safety and robustness through software redundancy strategies, safety monitoring, and fault handling mechanisms.

The development of CTC technology will provide higher flexibility and performance for electric vehicle design and also promotes the importance of intelligent chassis technology in the new energy vehicle and autonomous driving markets.

10. Car chips

10.1 2024 China Automotive Chip Industry Chain Research and Analysis *China Business Industry Research Institute 2024-04-08*

<https://www.seccw.com/Document/detail/id/29104.html>

Industry Chain Composition:

Upstream: Includes semiconductor materials, wafer manufacturing, and semiconductor equipment.

Midstream: Automotive chip manufacturing, covering main control chips, power chips, analog chips, sensor chips, memory chips, communication chips, and information security chips.

Downstream: In-vehicle systems and 整车 manufacturing, including the internet of vehicles, automotive cockpits, HUDs, central control panels, and smart cars.

Upstream Analysis:

- The market size of semiconductor materials is expected to reach 114.499 billion yuan in 2024.
- The market size of semiconductor silicon wafers is expected to reach 18.937 billion yuan in 2024.
- The market size of photoresists is expected to reach 11.44 billion yuan in 2024.
- The market size of sputtering targets is expected to reach 47.6 billion yuan in 2024.
- The market value of the semiconductor equipment industry is growing, with the photolithography machine market size expected to increase to 29.57 billion USD in 2024.

Midstream Analysis:

- The automotive chip market size is expected to reach 90.54 billion yuan in 2024.
- Control chips and sensor chips have a higher share in the automotive chip market.

- The market size of MCU chips is expected to reach 61.95 billion yuan in 2024.
- The market size of IGBT for new energy vehicles is expected to reach 17.8 billion yuan in 2024.
- The top five global automotive chip manufacturers account for nearly 50% of the market, with Infineon leading with a 13.2% market share.

Downstream Analysis:

- Automotive production maintains a growth trend, with an 8.1% year-on-year increase in output from January to February 2024.
- The internet of vehicles market size is expected to reach 543 billion yuan in 2024, with increased penetration rates in autonomous driving systems, connected systems, in-vehicle information systems, and smart central control areas.
- The autonomous driving market size is expected to reach 383.2 billion yuan in 2024.
- The market size of LiDAR is expected to reach 13.96 billion yuan in 2024.

10.2 China Auto Chip Alliance Whitelist" 2.0 Version Released, Covering Over 1800 Products from More Than 300 Manufacturers *Observer Network 2024-12-05*

<https://user.guancha.cn/wap/content?id=1342978>

Release Background: In order to provide more accurate product information and promote the widespread application of domestic automotive chips, the China Automotive Chip Industry Innovation Strategic Alliance has released this version.

Data Update: The 2.0 version, based on the 1.0 version, integrates the latest situation of chip applications from 12 vehicle manufacturers as of the end of October 2024, covering over 2000 application cases, more than 1800 products, from more than 200 suppliers.

Development of Domestic Automotive Chips: Before 2020, the proportion of domestic automotive chips in the automotive industry was very low, but the "chip shortage" wave doubled the market share of domestic automotive chips, increasing from 5% to 10%.

Policy Support: Several national-level policies have clarified the core position of chips in smart and new energy vehicles and increased support for industry development.

Industry Rise: China has been the world's largest automobile production and sales country for 14 consecutive years, with rapid growth in new energy vehicle production and sales, increasing the demand for domestic automotive chips.

Product Coverage: The 2.0 version covers ten major categories of chips used in various application areas such as body, chassis, power, cockpit, intelligent driving, and 整车 control.

Representative Products: The domestic automotive chip market is valued at 85 billion yuan, and it is expected to reach 90.54 billion yuan in 2024. Products from BYD Semiconductor, Naxin Micro, GigaDevice, and other companies represent the development of domestic automotive chips.

Market Outlook: Domestic automotive-grade chips have covered all categories, and in the future, the high-end automotive market will see more domestic chips.

10.3 China-US Chip Industry Reaches a Critical Juncture: China's Four Major Associations Call for Cautious Procurement of US Chips *Gasgoo 2024-12-10*

<https://auto.gasgoo.com/a/70412424.html>

Summary of the current situation of China-US chip industry cooperation narrowing down and the call from China's four major associations for the procurement of US chips.

China-US Chip Industry Cooperation Restricted: The US government has imposed trade restrictions on 140 Chinese chip-related companies, leading to a decreasing cooperation space between China and the US in the chip industry.

Statement from China's Four Major Associations: The China Association of Automobile Manufacturers, the China Internet Association, the China Semiconductor Industry Association, and the China Communications Enterprises Association jointly issued a statement advising Chinese companies to be cautious when purchasing US chips, as US chip products are no longer considered reliable and secure.

Impact on US Chip Companies: This statement may have a profound impact on the business of US chip companies such as Intel, Nvidia, AMD, and Qualcomm in China.

Welcome Global Cooperation: Despite the call for cautious procurement of US chips, the four major associations also expressed their willingness to welcome global chip companies to cooperate with China's automotive, chip, and other industries in various aspects.

New Round of US Export Restrictions: The US government announced a new round of export restrictions against China, restricting the export of 24 types of chip manufacturing tools and three types of software tools, as well as the export of advanced high-bandwidth memory (HBM) to China.

Enterprises on the Restriction List: Approximately 136 Chinese domestic enterprises and four foreign enterprises have been added to the trade restriction list, most of which are associated with domestic companies.

Purpose of the Restriction Measures: The main purpose of these restriction measures is to strike at China's chip production and manufacturing capabilities, especially targeting semiconductor companies and chip manufacturing tool manufacturers.

Impact on US Hardware Already Procured: The restricted entities can continue to use and process the US hardware that has already been procured; US software that has already obtained a License can continue to be used within the authorized period.

Impact of the Entity List: The Entity List does not prohibit customers from purchasing equipment or services from entities on the list, but US controlled hardware cannot continue to be procured; US controlled software cannot continue to be extended, updated, or procured; services from the original US manufacturers cannot be provided.

10.4 Another European Chip Maker Bets on the Chinese Market, Too Important for American Chips to Regret *163 news 2024-12-07*

<https://www.163.com/dy/article/JIQQOV5505118AAI.html>

NXP and World Advanced Collaboration: European chip company NXP has announced the establishment of a joint venture with World Advanced in Singapore to set up a wafer fab, primarily targeting the Chinese market.

STMicroelectronics' Cooperation: STMicroelectronics, the last IDM chip company in Europe, recently announced cooperation with Chinese chip foundries, handing over the production of automotive chips sold in China to Chinese companies.

The Importance of the Chinese Market: The Chinese automotive chip market is developing rapidly, especially in the new energy vehicle market. In 2023, China sold nearly 60% of the world's new energy vehicles, making it the largest new energy vehicle market globally.

Decline in the European Market: European automotive chip companies are facing a decline in their domestic market, with a significant drop in European car sales in August, forcing European chip companies to explore the Chinese market.

Restrictions on American Chips: The United States restricts American chip companies from selling the most advanced chips to China, leading to difficulties for American chip companies, such as Intel's consecutive losses and Texas Instruments' high inventory.

Chinese Chip Substitution: In the face of American restrictions, Chinese chip companies actively seek domestic alternatives and have achieved a significant proportion of domestic substitution in the server chip market.

European Chips Seizing Market Share: European chip companies take the opportunity to seize the market share of American chips in China, which may make American chip companies regret.

The complementarity of the global economy, and in the field of automotive chips, American chips no longer have a monopoly advantage, as European and Chinese chips are actively competing for market share.

10.5 Infineon CEO: Localizing Chip Production in China to Meet Customer Demands. *IT Home* 2024-12-11

<https://www.ithome.com/0/816/895.htm>

Infineon CEO Jochen Hanebeck's Remarks on Localizing Chip Production in China to Meet Customer Needs:

Localization Production Plan: Infineon's CEO stated that the company is accelerating the localization of mass-produced products, planning to shift more production processes to China to better serve local customers.

Customer Demand: Chinese customers increasingly prefer local production for some critical components due to their low substitutability.

Cooperation and Supply Chain: Infineon plans to have some products manufactured by Chinese contract manufacturers and relies on its backend factories in China to significantly enhance the security of the supply chain in response to customer concerns.

No Specific Targets Mentioned: Jochen Hanebeck did not mention specific targets for production in China, only indicating that it would depend on product categories and market development.

Company Background: Infineon, headquartered in Germany, originated from Siemens' semiconductor division and became independent in 1999. The company provides semiconductors and system solutions for automotive and industrial power devices, chip cards, and security applications.

Chinese Market: Infineon officially entered the Chinese mainland market in 1995 and has had a presence in China since establishing its first enterprise in Wuxi in October 1995, with approximately 3,000 employees in China.

Financial Status: In the fiscal year 2024 (from October 1, 2023, to September 30, 2024), Infineon's revenue was €14.955 billion, a decrease of 8% year-on-year; profit was €3.105 billion, with a profit margin of 20.8%.

10.6 De-Americanization of Automotive Chips: A Golden Development Period for Domestic Cockpit and Autonomous Driving Chips *QQ News* 2024-12-05

<https://news.qq.com/rain/a/20241205A040BK00>

Joint Statement by Four Associations: The China Semiconductor Industry Association, China Association of Automobile Manufacturers, China Internet Association, and China Communications Enterprises Association have jointly issued a statement opposing U.S. export restrictions on China. They advise enterprises to purchase U.S. chips cautiously, expand cooperation with chip companies from other countries and regions, and actively use chips produced by both domestic and foreign-funded enterprises in China.

Automotive Chip Demand: According to data from the China Association of Automobile Manufacturers, traditional fuel vehicles require 600-700 chips per vehicle, electric vehicles need 1,600, and smart cars require 3,000. The Chinese automotive industry requires approximately 48 billion chips annually.

Types of Chips: Automotive chips are categorized into control chips, computing chips, memory chips, sensor chips, communication chips, analog chips, and power chips.

Progress in Domestication: After 3-4 years of development, China has achieved a high rate of domestication in the fields of power chips, sensor chips, and memory chips. However, in the areas of computing, analog, and memory chips, U.S. manufacturers still hold a significant share.

Development of Domestic Smart Chips: Domestic smart chips are developing rapidly. For example, Horizon Robotics' Journey 5 chip has received positive reviews in the field of autonomous driving chips, offering up to 128 TOPS of computing power and supporting the integration of multiple sensors. Xingchi's Cabin Core X9 series processor performs well in the field of smart cockpit chips, integrating high-performance CPUs, GPUs, and AI accelerators.

Application of Domestic Chips: Domestic chips such as Horizon Robotics' Journey 5 have been adopted by several automotive brands, and Xingchi's Cabin Core X9 series is also mass-produced and installed in multiple car models.

Opportunities for Domestic Chips: The call from the four associations provides a greater opportunity for the development of domestic automotive chips in China. It is expected that in the next few years, the fields of smart cockpit and autonomous driving chips will give birth to world-class enterprises and brands.

11. Charging system

11.1 Quantum New Energy: Comprehensive Analysis of New Energy Vehicle Charging Station Manufacturers *163 News 2024-12-07*

<https://www.163.com/dy/article/JIQ7E9TK05568XAK.html>

Industry Overview: In 2023, the global market for electric vehicle charging stations and piles reached 12.2 billion yuan, with an expected increase to 87.4 billion yuan by 2030. The Chinese market accounts for about 41% of the global share, indicating significant growth potential.

For more information : contact@chinform.com

Analysis of Major Manufacturers:

Chaoxiang Technology: Focuses on the development of charging pile technology, providing efficient, intelligent, and secure charging services.

Lv Chong Chong: Combines IoT, big data, and other technologies to offer smart charging system solutions.

Te Laidian: A pioneer in charging network technology, introducing a two-layer protection technology for safe charging.

Quantum New Energy: Emphasizes the construction of its own brand, implementing 6S management and multiple international certifications.

Southern Power Grid: Actively promotes the construction of charging piles in the southern region and improves service quality.

Aote Xun: Focuses on charging technology research and development, providing high-power charging solutions.

Ewei Energy: Establishes a nationwide charging station network, offering charging services to various customers.

Wanma Ai Chong: Covers a variety of types of charging piles, focusing on technological innovation and operation.

eCharging: A subsidiary of the State Grid, with an extensive charging network.

Xiaoju Charging: Under Didi Chuxing, committed to providing convenient charging services.

Market Trends and Challenges: Although the growth rate of charging piles cannot keep up with the growth of new energy vehicles, the issue of charging anxiety is becoming increasingly prominent, there are still huge opportunities in the market. The application of intelligent and digital technologies will drive industry development.

Future Outlook: With the expansion of the new energy vehicle market and the increase in charging demand, the charging station industry will continue to develop. Major manufacturers will increase their investment, promoting technological innovation and optimizing market layout.

11.2 Driving and Charging Simultaneously: No More Range Anxiety *Gasgoo 2024-12-10*

<https://auto.gasgoo.com/a/70412330.html>

Technological Advancements: Wireless charging technology for electric vehicles (EVs) is rapidly evolving, aiming to provide a convenient charging experience without the need for manual plugging and unplugging of charging cables.

Industry Collaboration: U.S.-based InductEV and Norway's ENRX have announced a collaboration to advance global wireless charging technology development, focusing on establishing technical standards to ensure compatibility within the global wireless EV charging ecosystem.

Technical Advantages: Wireless charging technology offers advantages such as time savings, convenience during adverse weather conditions, and reduced range anxiety for EV users.

Technical Applications: InductEV and ENRX specialize in high-power wireless induction charging, which is crucial for alleviating range anxiety among EV users.

Tesla's Involvement: Tesla has unveiled its Cybercab, a Robotaxi with a low-power wireless charging system, planned for production starting in 2026.

Technical Standards: The two companies will support the development of the SAE J2954 standard, promoting compatibility and interoperability testing, and advocating for the benefits of standardization within the industry.

Dynamic Wireless Charging: InductEV's system can be installed during vehicle manufacturing, providing power output ranging from 75 kilowatts to 450 kilowatts. ENRX has already applied dynamic charging in practice, such as on a bus route in Brunswick, Germany.

Global Developments: Other companies like Electreon are also piloting dynamic wireless charging technology in Germany, Sweden, and the United States.

Project Examples: In Sweden, Elonroad and Kalmar have collaborated to construct an electric road for wirelessly charging electric vehicles, reducing the need for large batteries in vehicles and grid capacity requirements.

11.3 Huawei Unveils "Ju Jing" Battery Platform! Over 800km Range and 400km Charge in 15 Minutes! 163 news 2023-11-11

<https://www.163.com/dy/article/IJ9H7PI205560PW6.html>

"Ju Jing" Battery Platform Launch: Huawei has launched the "Ju Jing" 800V high-voltage battery platform, with the first model to feature this battery pack being the Zhijie S7.

Battery Pack Features:

Ultra-thin design: The thickness of the battery pack has been reduced by 16.4%, to just 117mm, ensuring ample interior space. Minimalist circuitry: Employs an ultra-high integration minimalist circuit, reducing wiring by 80%. Safety features: Equipped with automatic early warning, millisecond 断电, active cooling, and barrier-free exhaust functions, achieving single cell thermal runaway without propagation. Safety protection:

13 layers of hardcore safety protection measures, including 10 layers of battery protection and 3 layers of special protection on the bottom. Range and Fast Charging:

Range capability: The Zhijie S7 has a pure electric range of over 800km. Fast charging capability: Supports ultra-high pressure fast charging, allowing for a 400km charge in 15 minutes. Energy efficiency comparison: The Zhijie S7's combined energy consumption is 12.4kWh per 100km, which is lower than that of Tesla Model 3 and Model S dual-motor versions, as well as the Porsche Taycan.

Price and Pre-sale: The pre-sale price of the Zhijie S7 starts at 258,000 yuan, and it will officially go on sale on November 28.

Technology and System: The Zhijie S7 will also debut with the HarmonyOS 4 system, supporting the use of game controllers on the car's screen and displaying drone-captured footage.

Intelligent Driving System: Equipped with Huawei ADS 2.0 intelligent driving system, supporting autonomous valet parking functions.

Power Performance: The Zhijie S7 can accelerate from 0 to 100km/h in just 3.3 seconds, with a braking distance of 33.5 meters for 100km.

11.4 VOYAH Auto's First Smart Supercharging Station Completed: Peak Charging Power of 1000kW, Energy charge 1.7km per Second - IT Home 2024-09-26

VOYAH Auto's first smart supercharging station has been completed, featuring the following characteristics:

Megawatt Charging Piles: Capable of supplementing 1.7km of range per second, with a peak charging power of 1000kW, peak current of 1000A, and maximum voltage of 1000V, and can quickly start within 20 seconds after plugging in.

Ultra-light Liquid-cooled Gun Line: Equipped with a 2.8cm ultra-light liquid-cooled gun line, weighing less than half of conventional fast-charging guns, making it easy to operate with one hand.

Low Noise Design: The noise level at full load is no higher than 55dB, equivalent to the noise level of a desktop computer in a study room.

Wide Voltage Coverage: Achieves voltage coverage from 200V to 1000V.

Photovoltaic Storage Charging and Discharging Inspection Microgrid: Supports photovoltaic storage charging, V2G (Vehicle-to-Grid), 5C rate charging, charging robots, and other technologies.

Sun-tracking Photovoltaic Panels: Photovoltaic panels can track the position of the sun in real-time, maximizing the conversion of sunlight into electrical energy.

Energy Storage System: Stores energy during off-peak hours and releases it during peak hours to alleviate electricity pressure and reduce costs.

Super Charging and Discharging: Can quickly replenish "green electricity" and has the capability to output "green electricity" to the grid via V2G equipment.

Charging Robot: Achieves full-process automation of charging through a 7-degree-of-freedom mechanical arm and an automatic robot intelligent control system, quickly and accurately identifying and positioning vehicles and their charging ports.

12. Other EV linked technologies

12.1 Electric Vehicle Charger Control Welcomes New Progress: Typhoon HIL Technology Aids Real-Time Simulation *SOHU News 2024-12-06*

https://news.sohu.com/a/833848089_121850794

The importance of electric vehicle charger control: With the rapid development of the electric vehicle industry, new demands are being placed on testing technology, especially for the control of fixed chargers and on-board chargers (OBC).

Advantages of C-HIL technology: Controller Hardware-in-the-Loop (C-HIL) technology, also known as signal-level Hardware-in-the-Loop, is becoming increasingly important in the development and testing of electric vehicle charger control due to its ease of use, extensive automated test coverage, and lower costs.

Challenges of FPGA simulators: In the field of power electronics real-time simulation, FPGA simulators play a significant role, but designing an FPGA simulator that meets the complexity requirements of switch models while achieving a reasonable time step and ease of use presents challenges.

Typhoon HIL platform: The Typhoon HIL platform provides an efficient and user-friendly power electronics simulation solution, simplifying the design process and improving simulation accuracy through a graphical schematic editor, ideal switch models, and GDS oversampling technology.

Simulation challenges of DC-DC converters: Real-time simulation of high-switching-frequency DC-DC converters, such as dual active bridge (DAB) and resonant (LLC, CLLLC) converters, faces challenges because high switching frequencies demand higher simulation time steps and power transfer fidelity.

Typhoon HIL's solution: Typhoon HIL has collaborated with industry partners to develop specialized DC-DC converter solvers to address these challenges.

12.2 Automotive Intelligent Driving: Understanding the Working Principle of HDI Circuit Boards to Enhance the Reliability of In-Vehicle Electronic Systems *Sohu Auto 2024-12-06* https://news.sohu.com/a/832919163_121978890

Definition of HDI Circuit Boards: HDI (High-Density Interconnect) boards are circuit boards manufactured using microvias technology, featuring finer line widths and spacing, achieving higher circuit density, and allowing for the integration of more electronic components within a limited space.

Working Principle of HDI Circuit Boards: HDI boards enhance the performance of the circuit board through their high integration, reducing size and enabling more delicate conductive patterns.

Applications of HDI Circuit Boards in Intelligent Driving:

Autonomous Driving Systems: Process large amounts of data from sensors to ensure the real-time and accuracy of autonomous driving systems. **Driver Assistance Equipment:** Provide high precision and reliability for precise vehicle control, enhancing safety. **In-Vehicle Entertainment Systems:** Offer high transmission speeds and low latency characteristics, improving the operating speed and stability of entertainment systems.

Enhancing the Reliability of In-Vehicle Electronic Systems:

High Signal Integrity: Reduce signal interference and loss, ensuring stable signal transmission. **Excellent Thermal Performance:** Possess excellent heat dissipation capabilities, enabling stable operation in high-temperature environments. **High Mechanical Strength:** High mechanical strength and durability, capable of withstanding harsh environments, extending the service life of equipment.

12.4 The rapid development of the new energy vehicle industry in 2024, with key technologies accelerating their implementation *Sina Technology - Sina.com 2024-12-09* <https://finance.sina.com.cn/tech/roll/2024-12-09/doc-incyvxp2677882.shtml>

Rapid Development of the New Energy Vehicle Industry: In 2024, China's new energy vehicle industry has ushered in unprecedented rapid development, with core technology breakthroughs and the accelerated implementation of intelligent technologies.

Breakthroughs in Solid-State Battery Technology: Breakthroughs have been made in solid-state battery technology, replacing flammable electrolytes with solid-state electrolytes to enhance safety and energy density, and some products have begun mass production.

Intelligent Applications and Vehicle Networking: Innovative technologies such as intelligent driving and intelligent chassis are gradually maturing, with 5G+AI technologies empowering vehicle networking to achieve the integration of vehicles, roads, and the cloud.

Intensified Competition in Intelligent Chassis: The intelligent chassis integrates suspension, steering, and braking systems, enhancing safety, stability, and handling, becoming a focus of competition among major manufacturers.

Development of Autonomous Driving Technology: High-level autonomous driving technology has become a focus of industry competition, with multiple companies positioning themselves to transition from basic driver assistance to high-level intelligent driving.

5G+AI Empowering Vehicle Networking: 5G vehicle networking technology provides high-speed, low-latency communication capabilities, and AI large models enhance driving safety and traffic efficiency through deep analysis and intelligent decision-making.

Realization of Vehicle-Road-Cloud Integration: With the joint efforts of the industry, vehicle-road-cloud integration is becoming a reality, improving user experience and promoting the continuous development of the new energy vehicle industry.

12.5 2024 Electric Vehicle Technology Outlook: Continuous Improvement in Charging and Range Technology, Accelerated Industry Integration - 36Kr 2024-01-03

<https://www.36kr.com/p/2588648515920001>

Global Sales Growth: S&P Global Mobility forecasts that global sales of pure electric passenger cars will reach 13.3 million units in 2024, accounting for approximately 16.2% of global passenger car sales.

Improvement in Charging and Range Technology: Wide Band Gap (WBG) semiconductor materials such as Silicon Carbide (SiC) and Gallium Nitride (GaN) will revolutionize electronics, leading to faster charging speeds, longer driving ranges, and lower operating costs.

Expansion of Charging Infrastructure: The number of global charging stations is expected to grow from 3 million in 2019 to 70 million by 2030, with improved charging availability being key to the widespread adoption of electric vehicles.

Supply Chain Security: Electric vehicle manufacturers are turning to in-house development of electric drive components, and competition for integrated electric drive systems will become more intense. Meanwhile, the US and the EU are both seeking to establish autonomous and diversified rare earth supply chains.

Thermal Management Focus: With the growth in electric vehicle sales, thermal management may become a new focus for the industry, with Chinese automakers and Tesla maintaining a leading position in the integration of thermal management modules.

Threats to Upstream Mining Projects: Declining prices for raw materials used in power batteries may impact upstream mining companies, causing them to suspend or delay new mining projects.

Accelerated Industry Integration: The development of electric vehicle technology will encourage broader partnerships between automakers and suppliers. At the same time, new force automakers and emerging business suppliers in the Chinese market are attractive to foreign automakers and suppliers, prompting them to engage in deep cooperation with China's industrial chain.

13. Info entertainment & connectivity

13.1 Seres applies for a patent for in-car projection control, enhancing the audio-visual experience of in-vehicle entertainment systems. *Financial Circle Automobile* 2024-12-10

<https://www.msn.cn/zh-cn/%E6%8A%80%E6%9C%AF%E7%A1%AC%E4%BB%B6%E5%92%8C%E8%AE%BE%E5%A4%87%E8%B5%9B%E5%8A%9B%E6%96%AF%E7%94%B3%E8%AF%B7%E8%BD%A6%E8%BD%BD%E6%8A%95%E5%BD%B1%E6%8E%A7%E5%88%B6%E4%B8%93%E5%88%A9-%E6%8F%90%E5%8D%87%E8%BD%A6%E8%BD%BD%E5%A8%B1%E4%B9%90%E7%B3%BB%E7%BB%9F%E8%A7%86%E5%90%AC%E4%BD%93%E9%AA%8C/ar-AA1vA1qT?ocid=BingNewsSerp>

Chongqing Seres New Energy Automobile Design Institute Co., Ltd. has applied for a new patent titled "Vehicle Projection Control Method, Device, Electronic Equipment, and Storage Medium." Here is a brief summary of the article:

Patent Content: The patent applied for by Seres involves a vehicle projection control technology that can intelligently generate matching projection content based on the music content played by the in-vehicle multimedia system.

Technical Implementation: By collecting the currently playing music and extracting musical features, the system selects corresponding projection materials from a preset library of projection materials to generate content ready for projection.

Synchronized Playback: The patented technology can control the synchronized playback of projection content with music content, achieving accurate matching of in-vehicle projection content with music.

Enhanced Experience: The application of this technology can enhance the audio-visual experience of in-vehicle entertainment systems, strengthen the immersion and interactivity of in-car entertainment, and meet the visual enjoyment and usage experience of drivers and passengers.

13.2 5G-A Vehicle Internet End-to-End Full-Element Innovation Base Lands in Yizhuang Yi City Times 2024-12-11

https://kfggw.beijing.gov.cn/zwgk/fq/yzxw/fq/202412/t20241211_3962891.html

China Unicom and Huawei have collaborated to establish the country's first 5G-A Vehicle Internet End-to-End Full-Element Innovation Base in Yizhuang, Beijing. Here is a summary of the situation:

Base Establishment: China Unicom and Huawei have partnered to establish a 5G-A Vehicle Internet End-to-End Full-Element Innovation Base in Yizhuang, Beijing, signifying the in-depth application of 5G-A technology in the vehicle-road-cloud integrated industry.

Technical Cooperation and Verification: The collaboration focuses on new features of 5G-A vehicle networking, AI perception, and vehicle-grade RedCap terminals, jointly incubating applications for intelligent driving and smart parking.

Infrastructure Upgrade: The base has added roadside perception systems, 5G-A pole stations, multi-modal fusion engines, and integrated communication and sensing base stations, and has completed technical verifications for multi-carrier aggregation, supplementary uplink, and deterministic low latency.

Network Construction: The base has fully deployed a 5G-A communication network, establishing a "double 20" performance benchmark with a whole-area latency below 20 milliseconds and an uplink rate exceeding 20 Mbps.

Exploration of 5G-A Features: Leveraging the high-speed transmission, low latency, and high reliability of 5G-A, the base enables real-time data exchange and intelligent collaboration between vehicles, roads, and the cloud.

Road Perception Technology: In key scenario verifications, the base achieves comprehensive real-time perception of the road environment with an end-to-end average latency of less than 10ms.

Terminal Ecosystem Construction: Unicom Zhineng Technology and Huawei have jointly conducted tests on vehicle-grade RedCap modules, promoting the accelerated development of the vehicle-road-cloud integrated industry.

Demonstration Zone Role: Located within the China Unicom 5G Intelligent Connected Demonstration Zone in Yizhuang, Beijing, the base undertakes the development and testing of new 5G vehicle networking technologies and scenarios, playing a significant role in industry cooperation and exchange, demonstration, and application.

Autonomous Driving Test Miles: The demonstration zone has accumulated over 30 million kilometers of autonomous driving test mileage, with nearly 900 deployed vehicles, promoting comprehensive demonstration across various application scenarios.

13.3 Ceiling Screens Lead the Trend, Rear Entertainment Systems Become the Focus of Innovation in Smart Cars - *Smart Car Resource Network 2024-11-26*

<https://www.smartautoclub.com/p/93172/>

The Origin of In-Car Large Screens: The development of in-vehicle information systems began with the in-car telephone in 1910, followed by the emergence of in-car radios and navigation systems. By the end of the 1970s, display technology began to enter the automotive field.

Tesla's Innovation: The launch of the Tesla Model S in 2012 marked a shift towards large central screens in vehicles, with its 17-inch display integrating vehicle control functions, and touch interaction replacing physical buttons.

Popularization of Large Screens: With the development of new energy vehicles and the evolution of in-vehicle systems, large screens have become a characteristic feature inside cars, and automakers have started to experiment with display technologies beyond LCDs, such as OLED.

Contribution of Domestic New Forces: Domestic new forces like Li Auto have popularized in-car large screens, enhancing viewing and interactive experiences by covering different functional areas with multiple large screens.

The Double-Edged Sword Effect of Large Screens: While in-car large screens have brought better navigation and entertainment experiences, they have also increased operational complexity and learning costs, with some users concerned about the impact on driving safety.

Coexistence of Physical Buttons and Large Screens: As the industry recognizes the potential dangers behind "mindless large screens," the evolution of in-car large screens has slowed, and the industry has started to consider practicality, with more and more automakers recognizing the necessity of physical buttons.

Future Development of Large Screens: The potential for the development of large screens lies in the efficiency of human-computer interaction and multi-device interconnectivity. In the future, they may evolve into the "fourth space" of cars, carrying more functions.

13.4 Vivo Smart Car 5.0 Launched, Entering a New Dimension of Car-Machine Integration QQ News 2024-10-11

<https://news.qq.com/rain/a/20241011A08UIZ00>

Evolution of Vivo's Smart In-Car: Vivo began with the Jovi Interconnect plan in 2018, gradually evolving to the Smart In-Car 5.0 version, covering a wide range of car brands and models through an open protocol access design.

Vivo's Ecological Openness: Vivo adopts the "1+X+N" connectivity ecosystem concept, where "1+X" refers to Vivo's self-developed devices, and "N" is aimed at all ecosystem partners, covering multiple life scenarios.

New Features of Vivo Smart In-Car 5.0:

Unfair Scheduling: Transferred from the OriginOS, the unfair scheduling technology enhances the response speed of applications.

AI Feature Updates: Including Xiao V's cross-device capabilities, allowing the car machine to access Vivo's voice AI model, providing a more natural voice interaction experience.

Xiao V's Reminder: During driving, important call voices can be converted into text and synchronized to the atomic notes on the mobile phone.

Atomic Island: Allows users to drag address text from the phone to the Atomic Island for processing, sending it to the car machine in advance for one-click navigation.

Connection Convenience: Vivo has added a "Quick Car Control Button" in the mobile phone system, supporting the pull-down to call out the connection center, view car conditions, and control the vehicle.

Industry Recognition: Vivo Smart In-Car 5.0 has met the "Outstanding" requirements of the "Smartphone Car Machine Interconnection Performance Certification" by the Telecommunication Laboratory and has obtained the corresponding certification.

14. Autonomous driving

14.1 "Luobo Kuaibao" Obtains First Batch of Autonomous Driving Test Licenses, Testing to Begin Around Hong Kong Airport *SOHU News 2024-11-30* https://www.sohu.com/a/831998065_121924584

Technology company "Luobo Kuaibao" has obtained the first batch of autonomous driving test licenses in Hong Kong and will conduct autonomous vehicle tests around the roads near Hong Kong International Airport to promote the development of intelligent transportation. This test aims to verify the performance of the autonomous driving system under actual traffic conditions, which is of great significance for improving urban traffic efficiency and safety.

14.2 A Comprehensive Review of 2024 Autonomous Driving Technology Progress, Market Landscape, and Future Outlook - *Tencent News 2024-10-08* <https://news.qq.com/rain/a/20241008A01AHS00>

"The Inception Year of Intelligent Driving: 2024 is regarded as the inaugural year for whole-vehicle intelligent driving, with technology transitioning from the high-end market to the mainstream market."

Technical Progress:

End-to-End Large Model Applications: By training with large-scale data, directly generating control commands from sensor data to enhance system performance. Lightweight Sensor Solutions: Reducing reliance on expensive sensors to lower costs and promote technology affordability. Big Data and Algorithm Improvements: Optimizing the perception, decision-making, and control capabilities of intelligent driving systems through data collection and training. Manufacturer Investment: Manufacturers such as Tesla, NIO,

XPeng, and Li Auto are increasing their investment in the field of intelligent driving, driving technological development and market competition.

Challenges:

Computational Power and Algorithm Challenges: The need to improve the reliability and safety of algorithms, especially in complex urban traffic environments. **Data Privacy and Cybersecurity:** Protecting user data from illegal infringement and ensuring secure communication. **Regulatory and Standardization Issues:** Promoting the global standardization of intelligent driving technology and the improvement of laws and regulations. **Rapid Industry Development:** The popularization of intelligent driving technology will drive the rapid development of intelligent transportation systems, smart city infrastructure, and V2X communication technology.

Market Outlook: It is expected that by 2025, a large number of intelligent driving vehicles will be introduced to the market, becoming a new growth point in the automotive industry.

Policy Support: Governments including the Chinese government have introduced policies to support the development of intelligent driving technology and encourage commercial applications.

Change in Investment Logic: Intelligent driving system providers will gradually gain market leverage, with data and algorithms becoming the core elements of competition.

14.3 AI's Technological Progress and Challenges in Autonomous Driving - Cloud Community - Huawei Cloud 2024-11-16

<https://bbs.huaweicloud.com/blogs/439654>

Technological Progress:

- Autonomous driving technology is rapidly advancing, enhancing the automation and intelligence levels of vehicles.
- The industry and market size continue to expand, with an increase in sales of vehicles with autonomous driving features.
- Different countries and regions are exploring various development models for autonomous driving.

Challenges Faced:

- The technology maturity is insufficient, and stability and reliability need to be improved.
- High costs of hardware and software limit large-scale commercialization.
- There is a need for corresponding road and communication infrastructure support.
- Data acquisition and processing face challenges.
- There is a lack of laws and regulations that need further improvement.

Future Development Directions:

- Data-driven self-learning systems to optimize the performance of autonomous driving.
- V2X technology (Vehicle-to-Everything) to improve traffic efficiency and safety.
- Level 4 autonomous driving may first be commercialized in specific areas.
- Exploring general intelligence to enhance AI's decision-making capabilities and adaptability.

14.5 Global Wave of Technological Innovation, What Challenges Does Autonomous Driving Face? - China News Service 2024-12-09

<https://www.chinanews.com/cj/2024/12-09/10333129.shtml>

Market Forecast: Production of L2 level autonomous vehicles is expected to reach 45.13 million units, while production of L3 level autonomous vehicles is expected to reach 300,000 units.

Technical Challenges: Autonomous driving technology faces challenges such as technological bottlenecks, regulatory improvements, infrastructure construction, and societal acceptance.

Future Trends: Technological innovation is the core driving force behind the development of autonomous driving, and it is anticipated that autonomous driving will bring revolutionary changes to transportation.

International Cooperation: The importance of autonomous driving technology is increasingly recognized globally, and international cooperation will become a significant force in driving industry development.

Expert Opinion: Achieving full autonomous driving, may take 5 to 10 years, and China is expected to take a leading position globally in the field of autonomous driving.

15. Battery recycling

15.1 Lithium Battery Vehicles Surpass 50 Million: Where to Go with Recycling? - Guangming Net 2024-12-11

<https://baijiahao.baidu.com/s?id=1818113432970019192&wfr=spider&for=pc>

"Lithium Battery Vehicle Ownership: China's lithium battery electric bicycle ownership exceeds 50 million units."

Recycling and Utilization: The recycling industry for new energy batteries is showing scaled and diversified development, but lacks overall planning and a closed-loop system.

Policies and Cooperation: It is necessary to strengthen the policy system, and manufacturing enterprises must implement the extended producer responsibility system, actively participating in the recycling of waste batteries.

Green Development: The China Bicycle Association will cooperate with relevant departments to promote the construction of a waste battery recycling and utilization system, fostering the green and sustainable development of the industry.

15.2 Where Do 'Out-of-Warranty' New Energy Vehicle Batteries Go? *Guangming Net 2024-12-08*

https://m.gmw.cn/toutiao/2024-12/08/content_1303917298.htm

Battery Life: New energy vehicle batteries typically have a lifespan of 8 to 10 years.

Range Degradation: As the battery ages, its range capability tends to diminish.

Battery Inspection: Owners can check the battery status by fully discharging and then recharging the battery, or through professional testing by specialized institutions.

Battery Repair: The repair of power batteries requires replacement with the same model parts and should be carried out through legitimate and professional channels.

Second-hand Vehicle Considerations: The price of used new energy vehicles is greatly affected by the condition of the battery, with vehicles 7 to 8 years old being worth about 20% of the new car price.

Policy Subsidies: The government offers subsidies for scrapping and updating vehicles, making it potentially more cost-effective to trade in old models for new ones.

Battery Recycling: Retired batteries can be recycled through cascading use and regeneration, but the standardized recycling rate is less than 25%.

Industry Recommendations: It is recommended to improve the recycling and disassembly utilization rates of power batteries from the source and encourage more enterprises to participate in battery recycling and utilization.

15.3 Ensuring the Standardized Recycling of Waste Power Batteries

Digital Energy Storage News 2024-12-06

<https://www.desn.com.cn/news/show-1730682.html>

Recycling Methods:

Cascade Utilization: When the battery capacity degrades to 50%-80%, it can be used for emergency power supplies, energy storage equipment, etc. Regeneration Utilization: When the battery capacity falls below 40%, the battery is dismantled to extract high-value metals such as lithium, cobalt, and nickel.

Recycling Challenges:

The inconsistency of batteries affects cascade utilization. The recycling network is not well-established, and technical capabilities vary.

Policy Support: The government has introduced policies requiring companies to consider environmental recycling during research and development, promoting cascade and regeneration utilization.

Future Development: It is necessary to establish a three-tier recycling system, promote technological innovation, increase the resource recovery rate, and achieve a win-win situation for economic and ecological benefits, aiding the "dual carbon" goals.

15.4 Tesla Co-founder Establishes Electric Vehicle Battery Recycling Company, Anticipates Annual Revenue of \$200 Million - Sina Finance 2024-12-02

<https://finance.sina.com.cn/stock/relnews/us/2024-12-02/doc-incxzras8861528.shtml>

Tesla co-founder JB Straubel's electric vehicle battery recycling company, Redwood Materials, is expected to achieve annual revenue of about \$200 million. The company focuses on extracting raw materials from waste batteries and reprocessing them for production, enhancing the sustainability of the electric vehicle industry. Redwood Materials aims to produce enough battery materials for 1 million electric vehicles annually.

15.5 How to Ensure Waste Lithium Batteries 'Retire Without Being Wasted' - Public Observation 2024-08-09

https://sd.dzwww.com/sdnews/202408/t20240809_14625390.htm

Battery Disassembly: Precisely disassemble retired lithium batteries to separate cathode and anode materials.

Material Recycling: Extract valuable metal elements such as lithium, nickel, cobalt, and manganese from batteries through processes like crushing, leaching, extraction, purification, and separation.

Resource Utilization: Remanufacture the recovered metal elements into battery-grade salt products and reintroduce them into the battery material production line to achieve recycling and regeneration.

Technological Innovation: Develop efficient recycling technologies and equipment to improve the purity and recovery rate of battery powder, reducing recycling costs.

Policy Support and Regulation: Governments introduce relevant policies to encourage and regulate the recycling and utilization of lithium batteries, raising industry standards.

Establishing a Recycling Network: Build a comprehensive lithium battery recycling network, including community recycling points, transfer stations, and sorting centers, to improve recycling efficiency.

Green Development: Promote the lithium battery industry towards green, efficient, and intelligent development, achieving sustainable industry growth.

15.6 Analysis of Lithium, Cobalt, and Nickel Resource Demand and Recycling Potential under Energy Transition — From the Perspective of Electric Vehicles — *Bulletin of the Chinese Academy of Sciences* 2024-07-29

https://mp.weixin.qq.com/s?__biz=MzkwODMxMTE5Mw%3D%3D&mid=2247508637&idx=1&sn=6d171666c0d944277634133af24b0a81&chksm=c18abd1866c8baaec067a8d208f005a53e5d1d57a454900e2b6d19deaec7a340156346a49f02&scene=27

Growth in Demand for Lithium, Cobalt, and Nickel Resources in the Electric Vehicle Industry and the Recycling Potential of These Metals.

Resource Demand Growth: With the rapid development of the electric vehicle industry, the demand for lithium, cobalt, and nickel is increasing rapidly.

Resource Security Challenges: The geographical distribution of lithium, cobalt, and nickel is highly concentrated, with a high degree of supply concentration, leading to global concerns about the security of these resources.

Recycling Potential: As the wave of electric vehicle battery retirement arrives, the recycling volume of lithium, cobalt, and nickel will significantly increase, helping to alleviate supply pressure.

Policy Recommendations:

Strengthen cooperation in the development of overseas mineral resources and enhance the protection of overseas assets and rights and interests. Accelerate the construction of a circular recycling system for electric vehicle batteries, and ensure the supply security of lithium, cobalt, and nickel by deploying battery recycling networks and regulatory systems.