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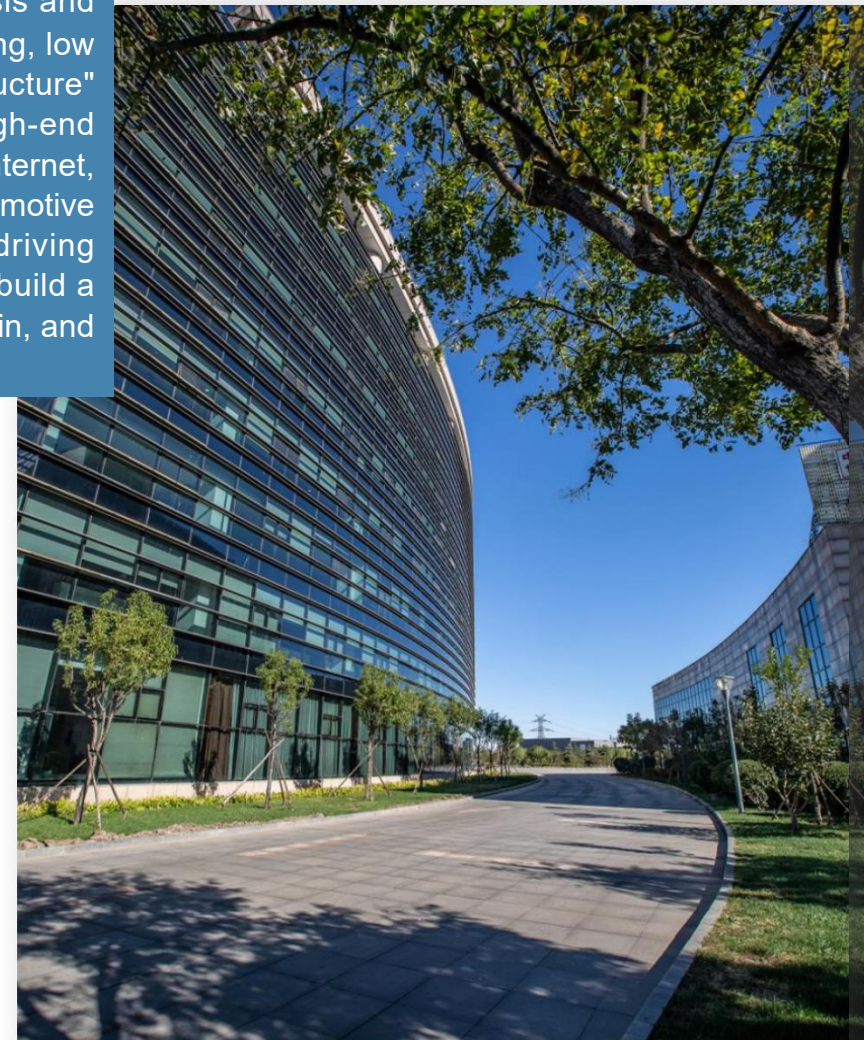
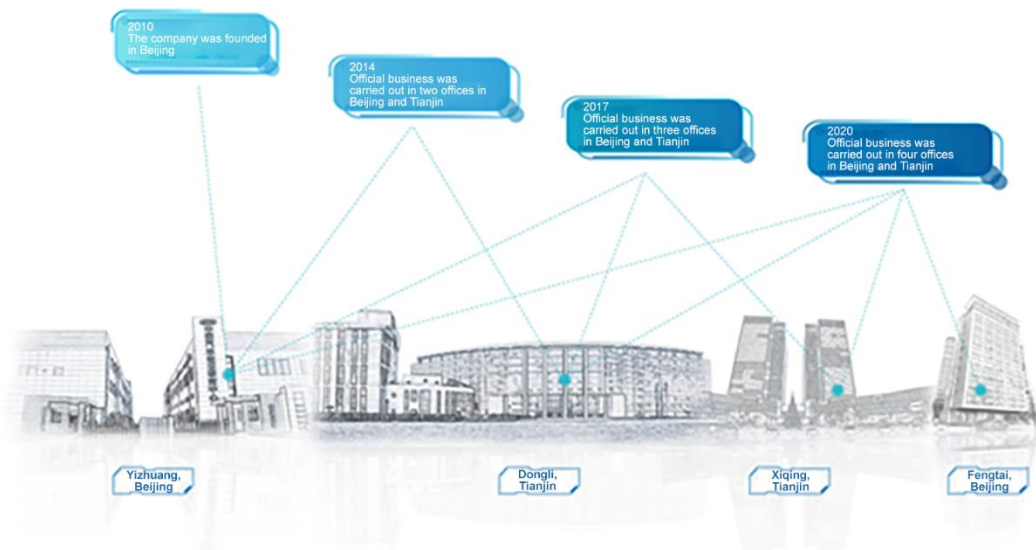
Chinese EV Market Policy Enablers

China Automotive Technology & Research Center
Automotive Data of China Co.,Ltd.

January 2024

Introduction - Automotive Data of China Co., Ltd.

Automotive Data of China Co., Ltd. (ADC) takes the automotive big data as the basis and model algorithms in the automotive sector as the pillar to carry out in-depth research on energy-saving, low carbon and green ecology, and market research, etc. Focusing on the development of "New Infrastructure" and "New Sihua" (Industrial Intelligence, Intelligent Industrialization, Cross-border Integration, High-end Branding), we have made precise efforts in the fields of China Automotive Industry Cloud, Intelligent Internet, Intelligent Cockpit and Industrial Internet (Industrial Software). Through the construction of China's automotive industry data infrastructure and national automotive industry data system, we are committed to driving industrial change with "data" and leading the future of the auto industry with "intelligence" to try to build a "nation-level auto industry data center, nation-level decision support institution for the auto industry chain, and nation-level pan-auto industry digitalization support institution".



Team Introduction - Product and Technology Strategy Department

- The Product and Technology Strategy Department focuses on the national development strategy of energy saving and new energy vehicles and enterprise product and technology planning strategy to carry out research work. Based on the unique automotive lifecycle big data system and rich experience in the researches of industrial policy, and with the interactive impact research of "Policy-Technology-Market-Product" as the featured methodology, it is committed to supporting ADC to grow up to be a first-class government decision-making support organization and enterprise strategy consulting organization in China.

Development Position of Product and Technology Strategy Department



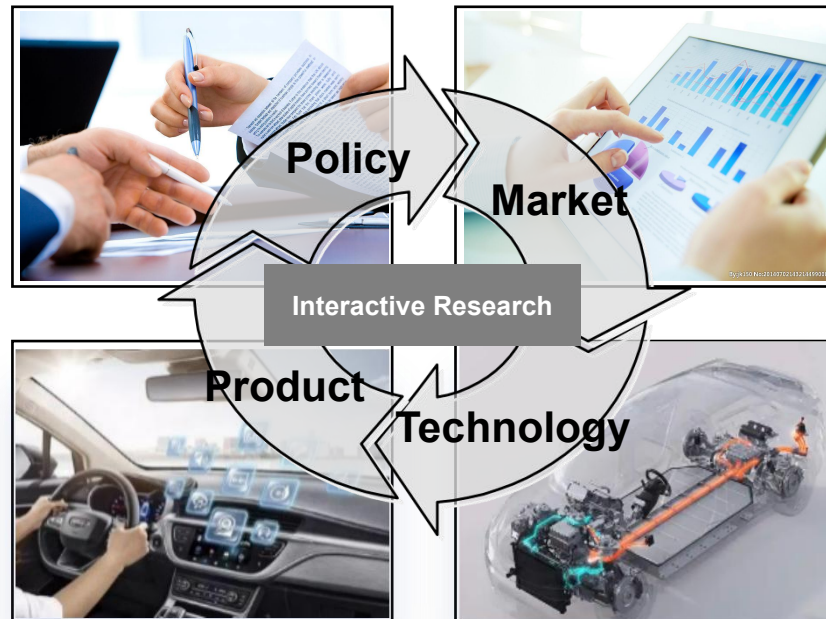
Research on the National Development Strategy of Energy-saving and New Energy Vehicles



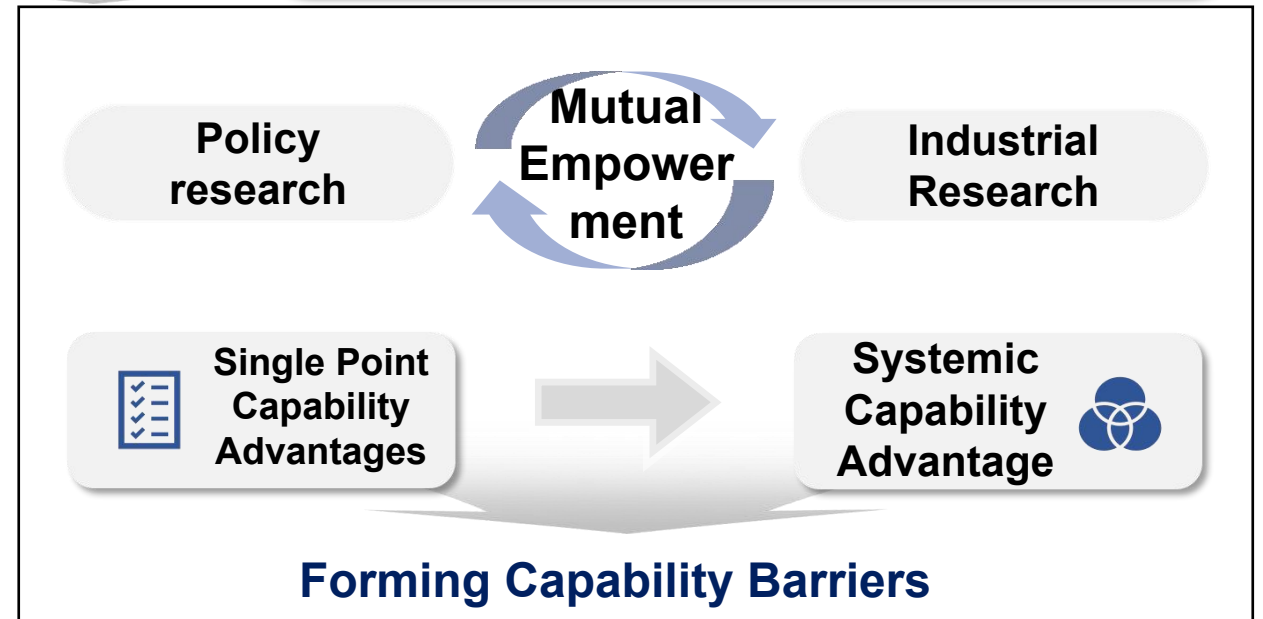
Research on the Corporate Products and Technology Planning Strategy



Featured Research Method



Systemic Advantages



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01 Analysis of Development Situation of the Chinese Passenger Vehicle Market

02 Development Trend of the Chinese NEV Policy System

03 Insight into the Opportunities in the Chinese New Energy Passenger Vehicle Market

1. What is the future trend of China's passenger vehicle market?

How China's vehicle market will develop comprehensively in the 3 to 5 years to come?

Macroeconomic Environment

Industry Cycle

What will changes and opportunities be presented in the new cycle?

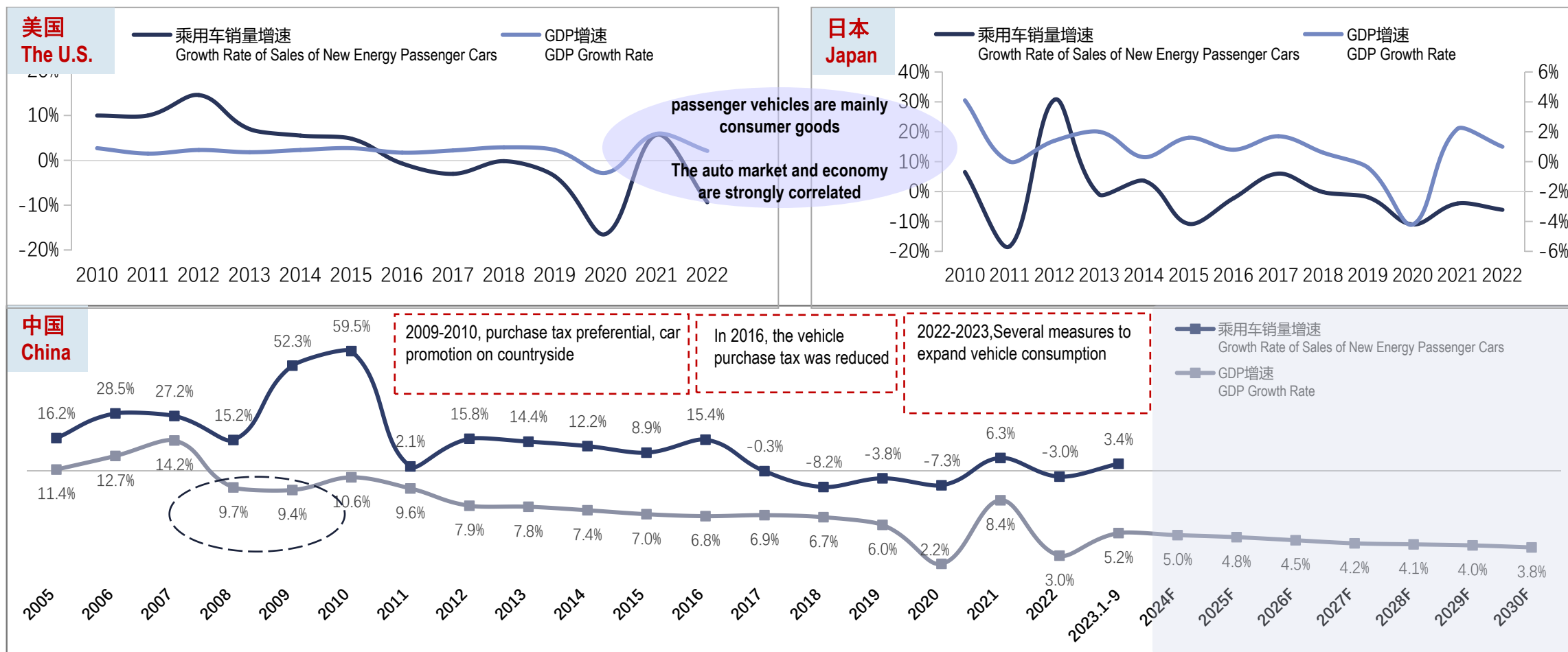
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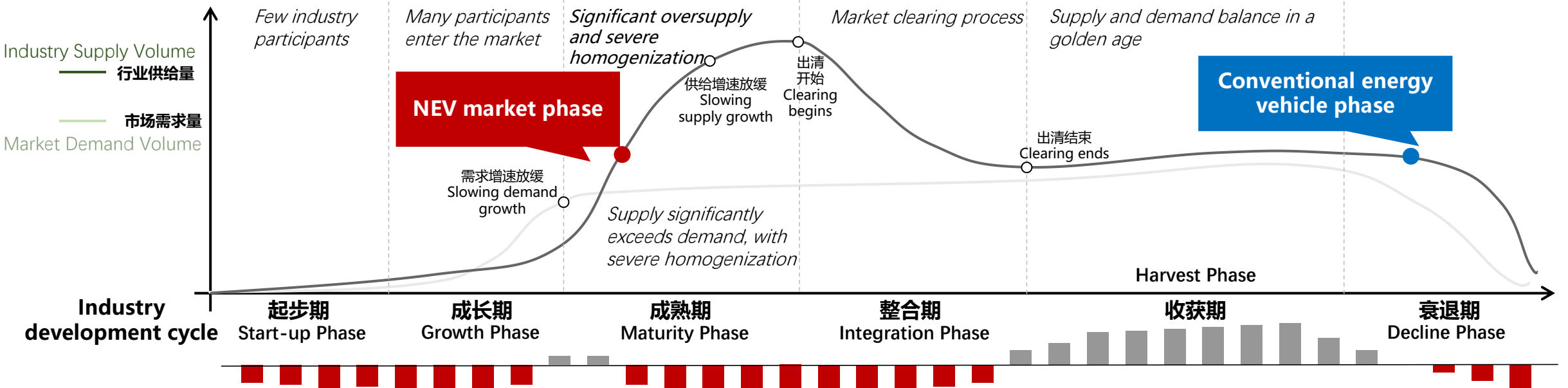
1.1 Macroeconomic Environment – Chinese Economy will continue mild recovery

- China's passenger vehicles boast both consumption and cyclical attributes, which are both strongly correlated with the economy and meanwhile serve as an important area for counter-cyclical adjustment when the economy is under pressure.
- In the long term, driven by scale economy effect, a stable growth of around 4.0% can still be achieved by 2030 since China is an ultra resilient big market which offers sound guarantee. However, in the short term, limited by the long tail effect and scarring effect caused by the epidemic, along with the tough challenges like geopolitical conflicts, China's economy continues to recover moderately but is difficult to grow significantly in 2024.



1.2 Industry Cycle - Competition in the Industry has Turned White Hot, and Participants will Accelerate their Steps to Satisfy both Supply and Demand

- Trend: The cyclical rule of the industry usually goes through 6 cycles as start-up, growth, maturity, integration, harvest and decline.
- When making a general observation of the domestic auto industry, the NEV industry is now under the early stage of maturity, while conventional energy vehicles are showing decline initially, and both of them are stuck in the low-profit competition at the market end. However, with the evolution of the industry cycle, competition is expected to be further intensified, and participants will speed up satisfying supply and demand.



Industry profitability

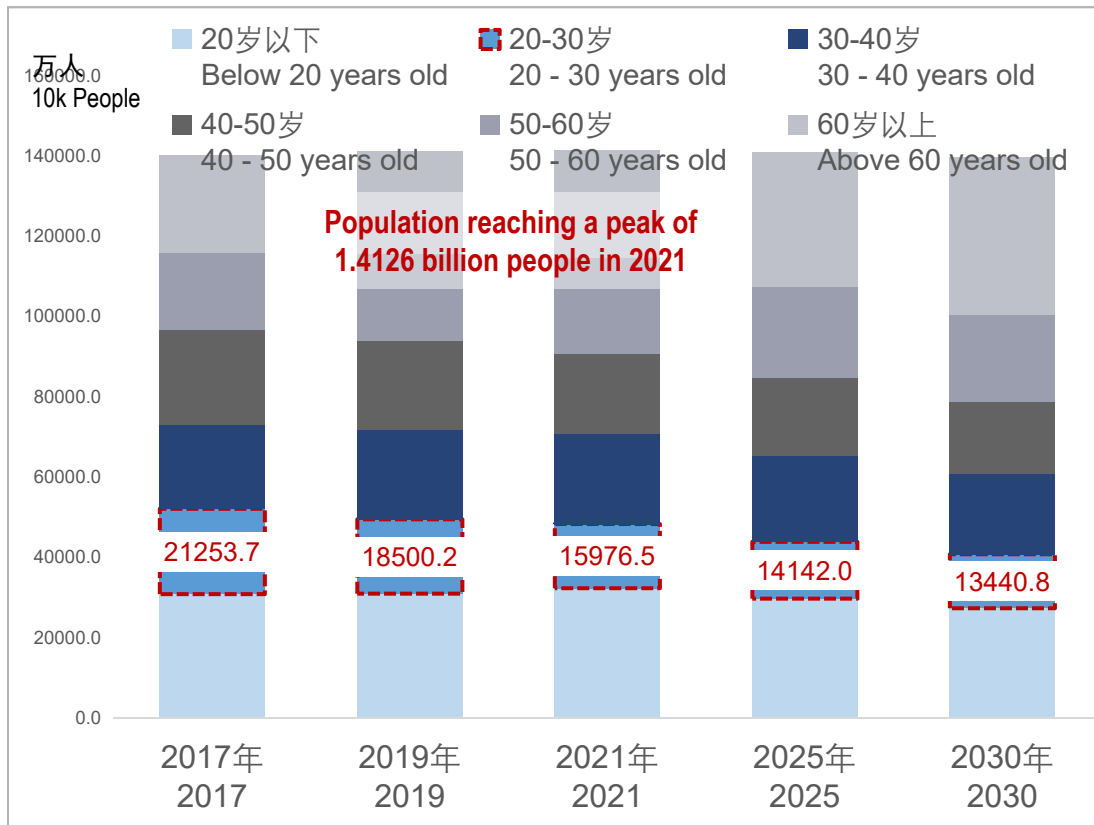
Characteristics of the industry in this period

- Often accompanied by the emergence of new technologies
- **Demand has not yet been created**
- Few industry participants
- **Demand confirmation, rapid consumer acceptance of products, and short supply in this phase**
- **Many participants enter**
- **Slower demand growth, and rapid increase in supply, far exceeding market demand**
- Intensified product homogenization
- A small number of participants are still entering
- Further slowdown in demand growth
- **Decreased supply volume, and many participants exit the market due to long-term losses**
- Profitability of survivors improves
- **Relatively balanced supply and demand**
- Survivors gain **stable income and healthy cash flow**, which can be used for forward-looking technological development, triggering the startup phase of the next promising industry
- **Declining demand, accompanied by the next round of new technologies**
- The majority of participants exit the market

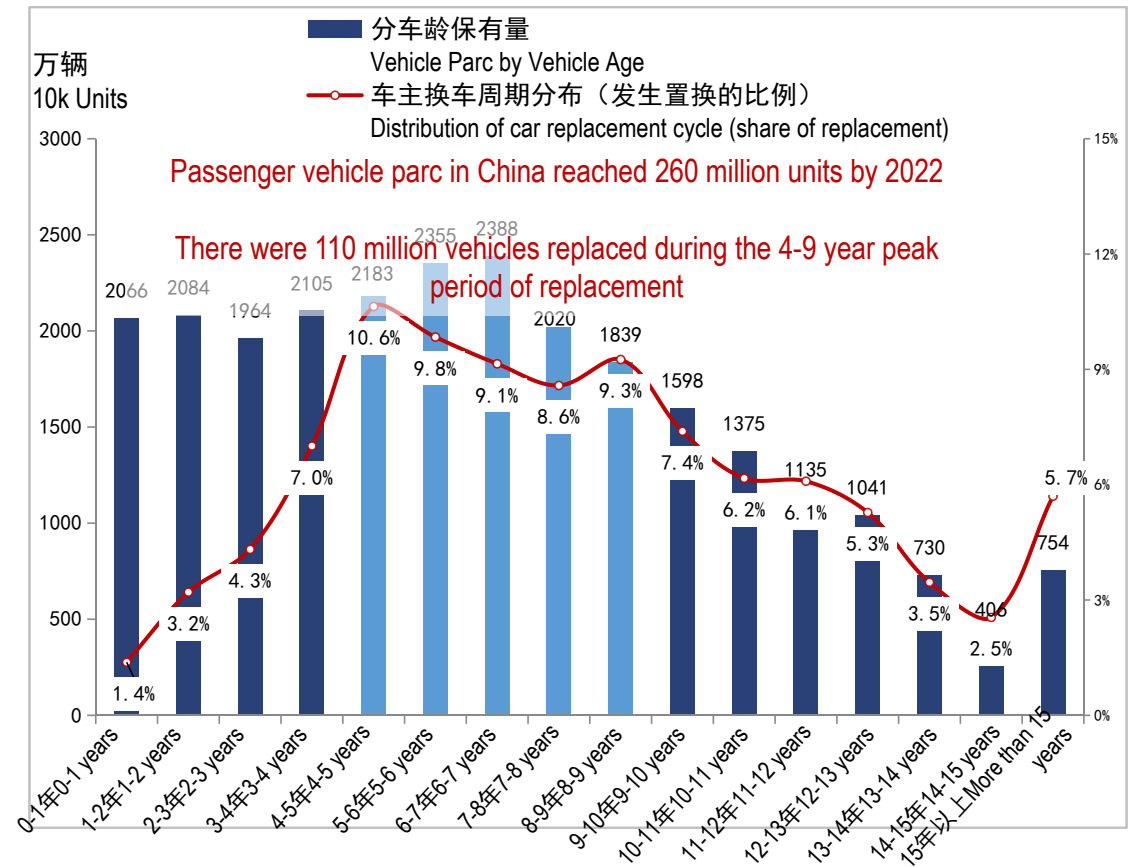
1.3 Conversion of Old and New Kinetic Energy 1 - Additional Purchase and Trade in of Vehicles is on an Upward Trajectory

- China's population peaked in advance in 2021, leading to a sustained fall in the size of the main first car buyer group. Meanwhile, as of 2022, the additional purchase and trade-in size in the 4-9 year peak period of vehicle replacement is up to 110 million vehicles, further promoting the rapid growth of the additional purchase and trade-in market.

The size of first vehicle purchaser group under 30 years old continues to decline



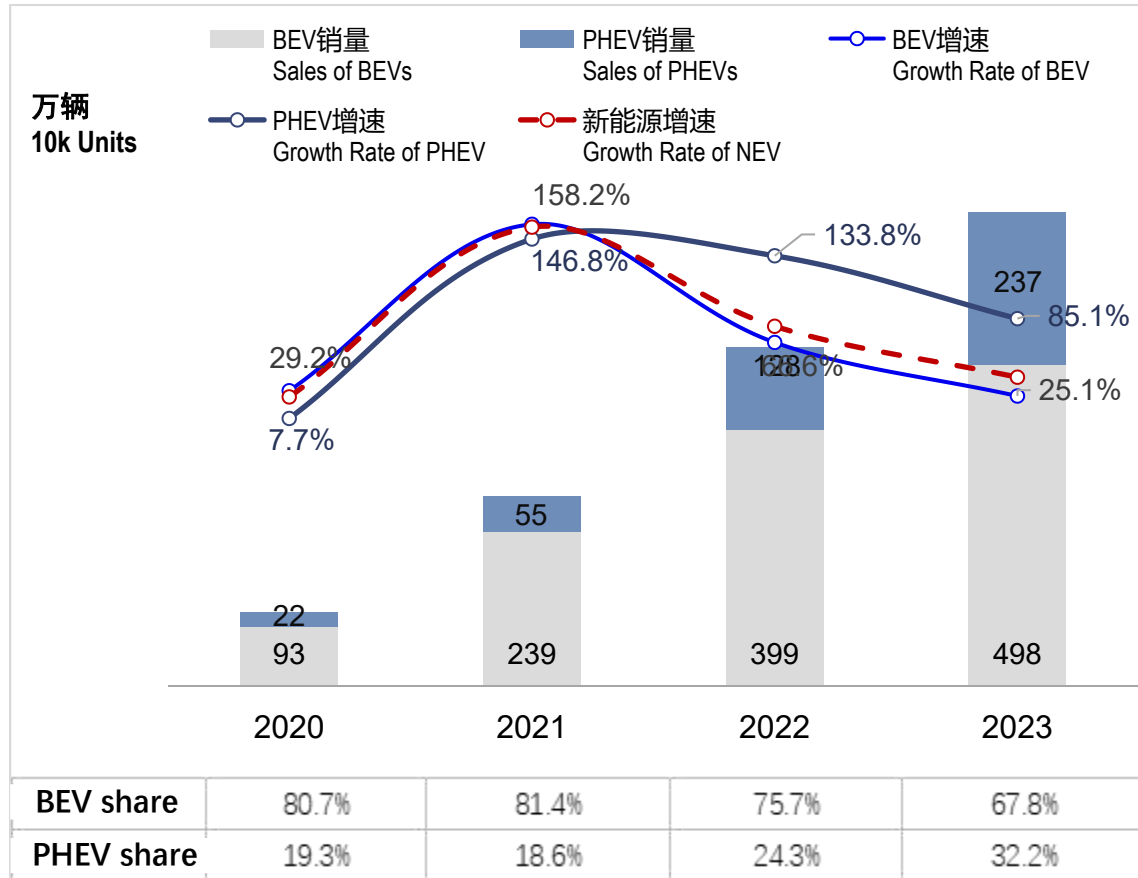
Large number of potential users will provide considerable demand for the replacement of new vehicles



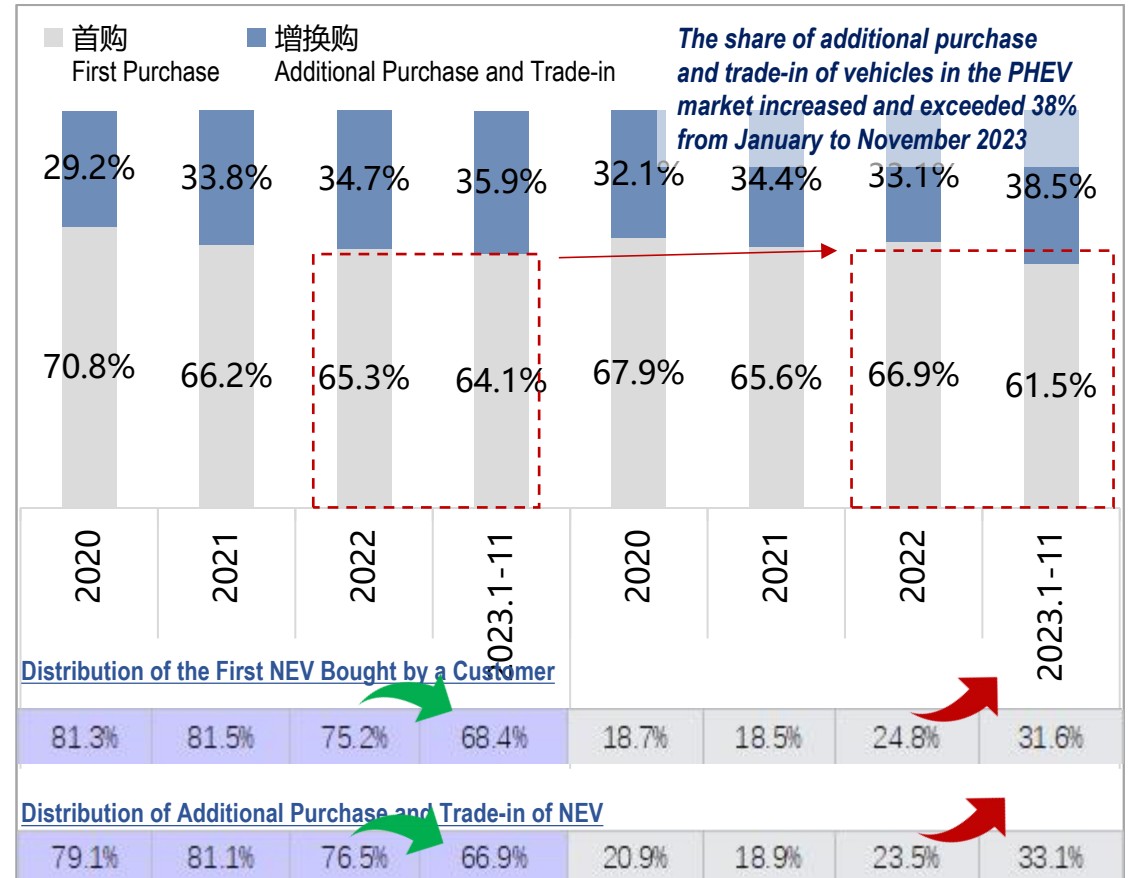
1.3 Conversion of Old and New Kinetic Energy 2 - NEVs Serve a Key Driver for Growth, and PHEV Stands out by Their Vigorous Growth

- As far as the NEV market is concerned, the growth rate of BEV is slowing down day by day, with the accumulative growth rate in 2023 dropping to 25.1%, while PHEV has continued to grow at a high rate of nearly 90%, and its share in the additional purchase and trade-in market has increased significantly. Among the users who seek for additional vehicles or trade in of vehicles, the share of users choosing PHEV is also increasing with rapidity, highlighting the great development potential of the PHEV market.

Trend of New Energy passenger vehicle Market by Energy Type from 2020 to 2023



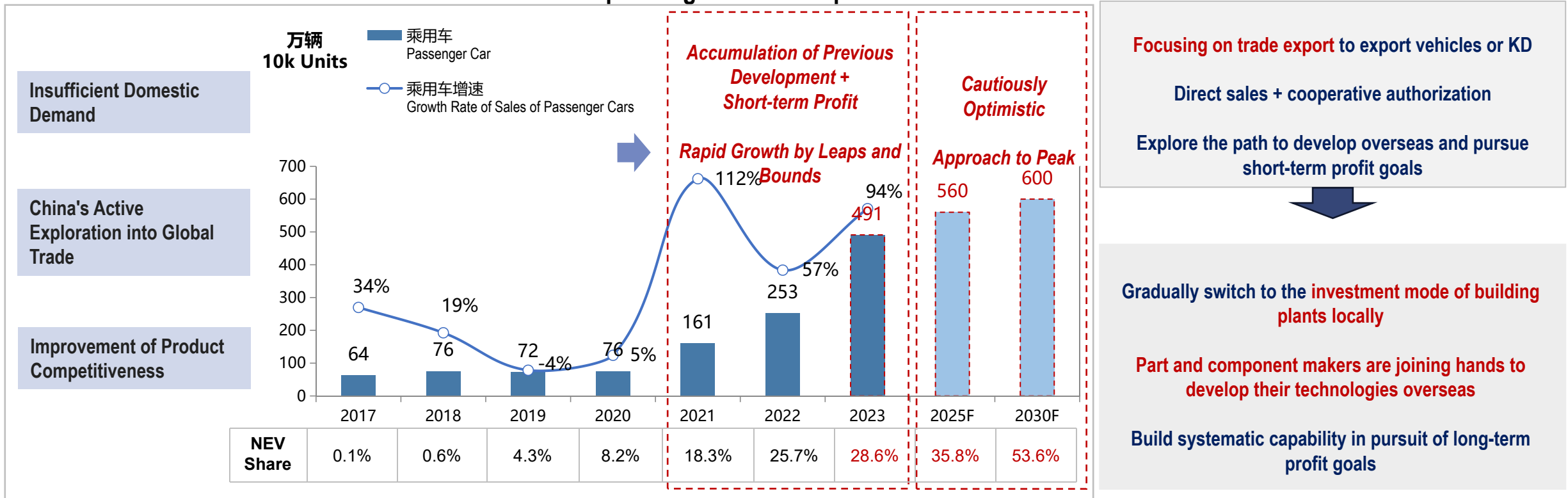
Rate of BEV & PHEV in the Additional Purchase and Trade-in Market from 2020 to 2023 and Their Distribution



1.3 Conversion of Old and New Kinetic Energy 3 - The Scale of Exports will Gradually Approach the Peak Value, and Expansion of Industry and Technologies Overseas will be Paid Special Attention to

- Against the backdrop of the lack of domestic demand, as well as the national policy support and active promotion of OEMs, China's vehicle exports have achieved leapfrog growth. However, due to the stringent overseas market regulations and trade protection risks, it is necessary to be cautiously optimistic when seeking development overseas. There is a gradual trend that the part and component makers will join hands when making inroads into the overseas market, and the export scale may stabilize at about 6 million vehicles.

Trend of passenger vehicle Export Market



数据来源：协会、中汽数据有限公司预测
Source: associations, prediction by Automotive Data of China Co., Ltd.

Generally speaking, in the next 3-5 years, China's auto market is expected to be characterized by slow recovery.

Macroeconomic Environment

As for the economic foundation, mild recovery may be felt in the future

Industry Cycle

The whole market is under the low-profit competition stage, with price wars continuing and participants accelerating to satisfy the demand and supply

Behind the overall stable development, the auto market is fueled by the transformation of old and new kinetic energy, which is embodied in the three main trends of NEVs, overseas development seeking, and additional purchases and trade-ins.

Additional Purchase and Trade-in

Demographic structure and vehicle parc structure will support the upward demand for additional purchase and trade-in of vehicles and users tend to ask for large and personalized vehicles.

NEV

NEV will maintain growth and contribute to the main increment. The growth rate of NEV will surpass that of BEV to enter a rapid development period.

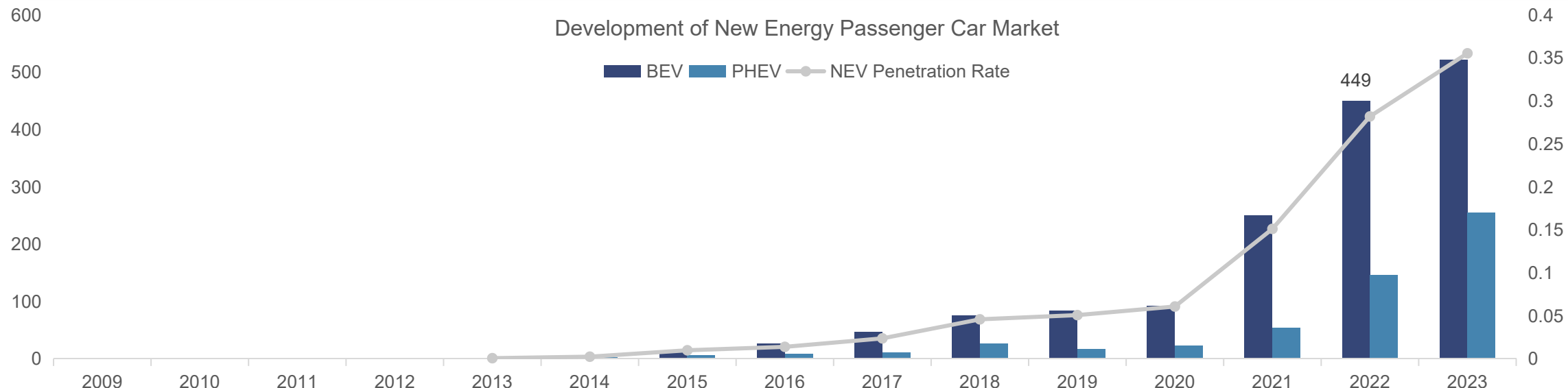
Exporting

Multiple factors have encouraged enterprises to develop overseas for leapfrog development. In the future, they will gradually join forces to explore the overseas market with technologies.

Retrospect of Development of the Chinese NEV Market

- After the policy support period and industry cultivation period during the early stage of development is passed, China's new energy vehicle (NEV) industry has been ushered into a new stage of development driven by both policy and market, with the penetration rate of NEV reaching 33.5% in 2023.

Retrospect of Development of New Energy Passenger Cars



The production and sales of NEVs have ranked first for 8 consecutive years

Focusing on the Government-led pilot demonstration project of "promoting 1,000 NEVs in each of 10 cities", NEVs will be gradually promoted among the public

The NEV subsidy policy encourages car manufacturers to produce NEVs and meanwhile guide customers to use NEVs, thus enabling the stable expansion of production capacity of NEVs

With the subsidy policy being gradually withdrawn, the CAFC and NEV Credit Management Policy is introduced to guide the development of the NEV market

Policy Support

2009-2014

Industry Incubation

2015-2020

2 Wheel-Drive

In and After 2021

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2.1 National Strategy: NEV Industry has Become a Necessary Requirement under the Guidance of Multiple National Strategies

- Relying on China's national policy for energy conservation and emission reduction and the implementation of vision of a beautiful China, it has become an industry consensus for the auto industry to achieve low-carbon transformation.

Implement Dual-Carbon Goals

Dual-carbon Strategy "1+N" Policy System

- ✓ Strive to achieve carbon peaking before 2030 and carbon neutrality before 2060.
- ✓ In China, the carbon emissions generated by transport sector has reached 12%, and 90% of them are contributed by vehicles

Country/Region	Transport Sector (%)	Other Sectors (%)
美国 US	28%	72%
欧盟 EU	26%	74%
中国 China	12%	88%

Guarantee Energy Security

Law of the People's Republic of China on the Conservation of Energy Resources

- ✓ Conservation of resources has been one of the basic national policies in China.
- ✓ At present, oil dependence on foreign countries has reached 70%

Category	Consumption (million tons)	Percentage
汽车行业 (Vehicle Industry)	245	83%
乘用车 (Passenger Vehicle)	1.12	38%
商用车 (Commercial Vehicle)	1.33	45%

Based on the data of National Bureau of Statistics), in 2021, the total national consumption of gasoline and diesel registered 294 million tons, and the total fuel consumption for vehicles in that year was 245 million tons, accounting for 83%. Among them, 38% and 45% were consumed by passenger vehicles and commercial vehicles respectively.

Build a Beautiful China

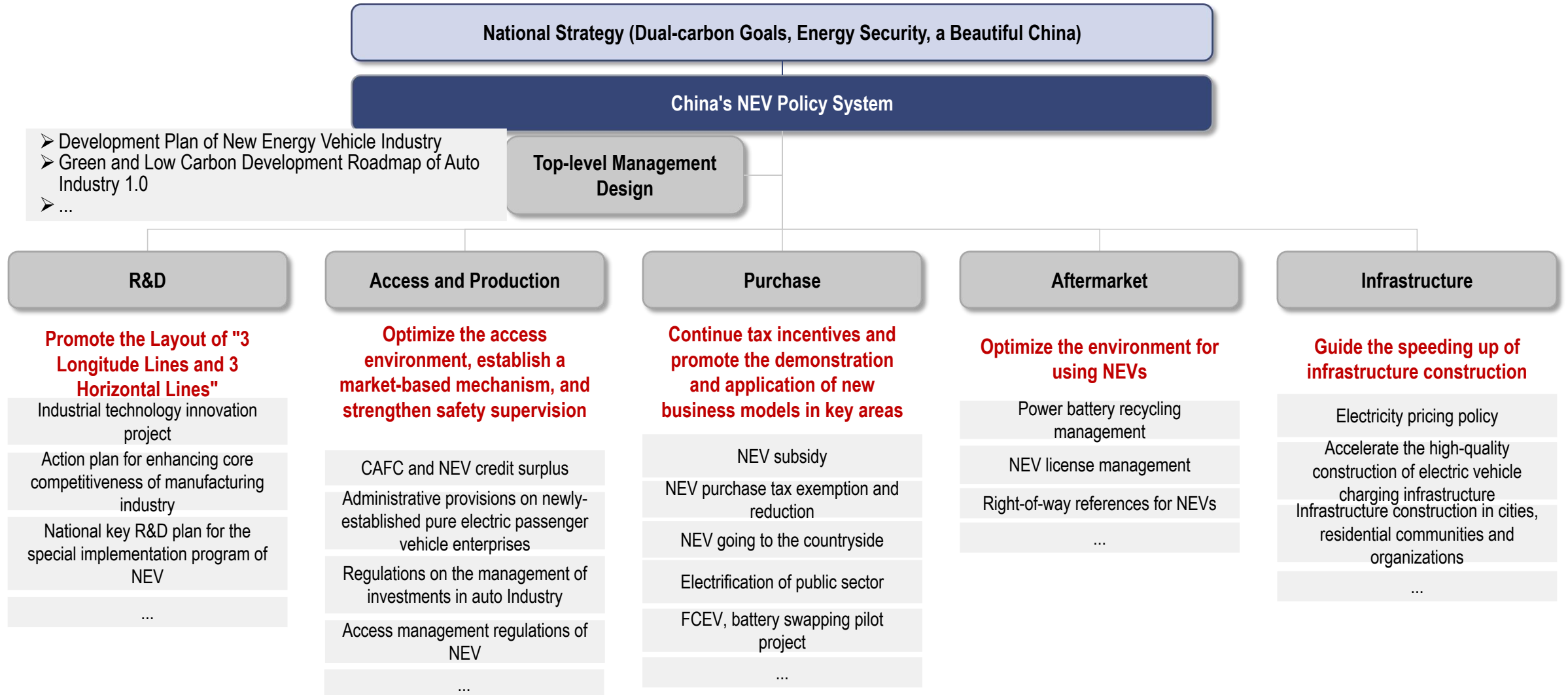
Opinions on Comprehensively Promoting the Construction of a Beautiful China

- ✓ Building a beautiful China is an important goal for the comprehensive construction of a great modern socialist country. Some of the important gaseous pollutants are produced by motor vehicles, therefore requiring strengthened control.

Pollutant	Commercial Vehicle (%)	Passenger Vehicle (%)
CO	32.1%	67.9%
VOCs	29.5%	70.5%
NOx	95.4%	4.6%
PM	97.9%	2.1%

2.2 NEV Policy System: The System Covering Various Links of the Vehicle Life Cycle has been Gradually Improved

- Under the guidance of the national strategy, the top-level design for NEVs has been continuously improved, with the medium- and long-term development goals and blueprint of the industry getting clear;
- The system of guidance and management policies has been officially established and continuously improved around various links of the NEV life cycle.



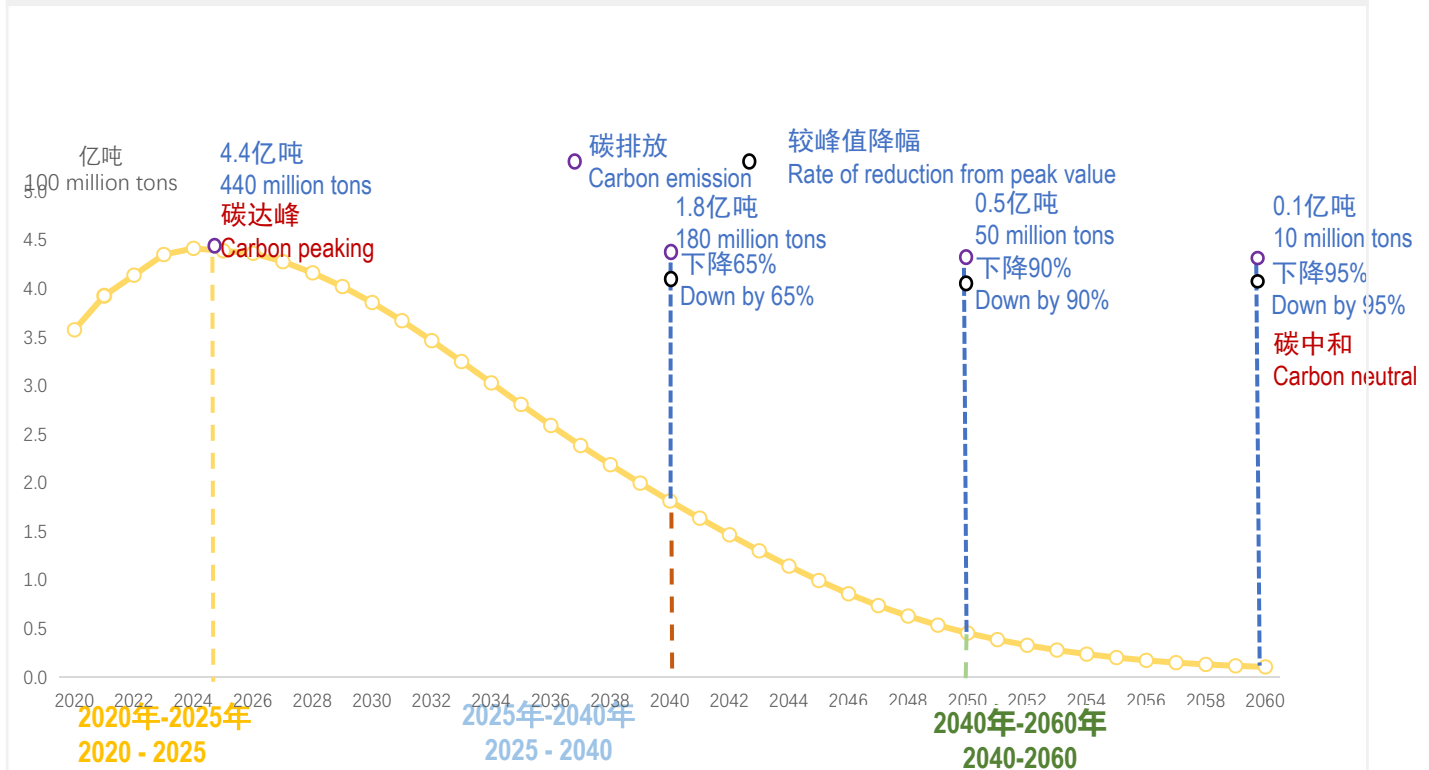
2.3. Top-level Design: the Roadmap 1.0 for Green and Low Carbon Development of Auto Industry is Released, Proposing Guiding Goals for NEV

- The Roadmap 1.0 for Green and Low Carbon Development of Auto Industry puts forward the general thoughts of green and low-carbon management transformation of the auto industry. Moreover, it also clarifies the promotion path and safeguard measures for the achievement of the low-carbon development goals of automobiles and proposes the policy solutions for the implementation and continuous improvements of purchase subsidy and tax incentives around the promotion of low-carbon and zero-carbon vehicles, low-carbon manufacturing of automobiles and industrial co-operation in carbon reduction, as well as the policy suggestions on the cultivation of the market to advance the promotion and application of NEVs.

《Roadmap 1.0 for Green and Low Carbon Development of the Automotive Industry》

- ◆ Clarified the **carbon emission accounting boundary** of the auto industry for the first time at the industry level
- ◆ Suggested that the importance will be attached to the reduction of **carbon emissions from vehicles** in the future
- ◆ Put forward the **overall goal** of green and low-carbon development of the auto industry
- ◆ Planned the **key path** for the green and low-carbon development of the auto industry.
- ◆ Proposed the **safeguard measures** to support the green and low-carbon development of the auto industry

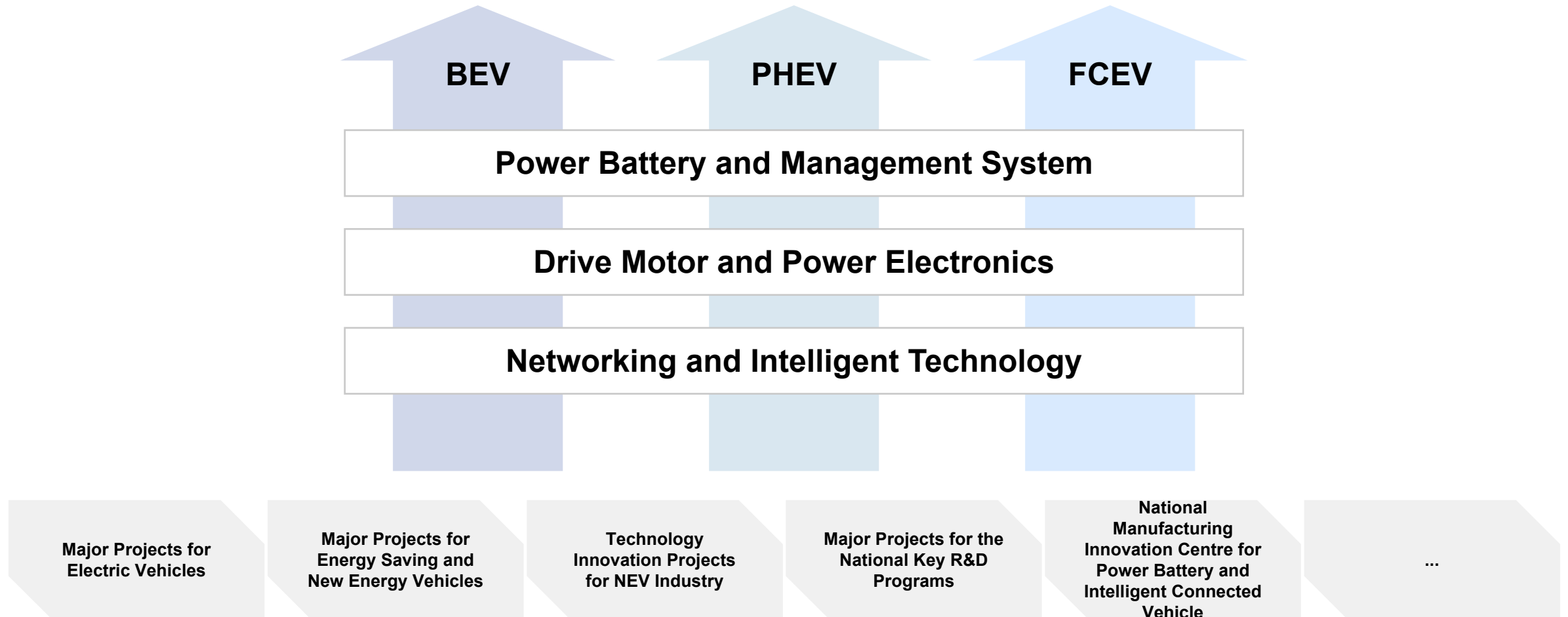
Variation Trend of Carbon Emissions Generated by passenger vehicles Under the Dual Carbon Goals



2.4 R&D: Deepen the Layout of "3 Verticals and 3 Horizontals" Technology R&D System

- Planning for the Development of the New Energy Vehicle Industry (2021 - 2035) proposes to deepen the "3 Verticals and 3 Horizontals" R&D layout.

The Layout and Support System of China's "3 Verticals and 3 Horizontals" Technology R&D System for NEV



2.5 Access and Production: a long-term mechanism to guide the coordinated development of energy conservation and new energy vehicles is established through dual credit policy

Research Process and Key Nodes of Measures for the Parallel Administration of CAFC Credit and NEV Credit for Passenger Car Enterprises

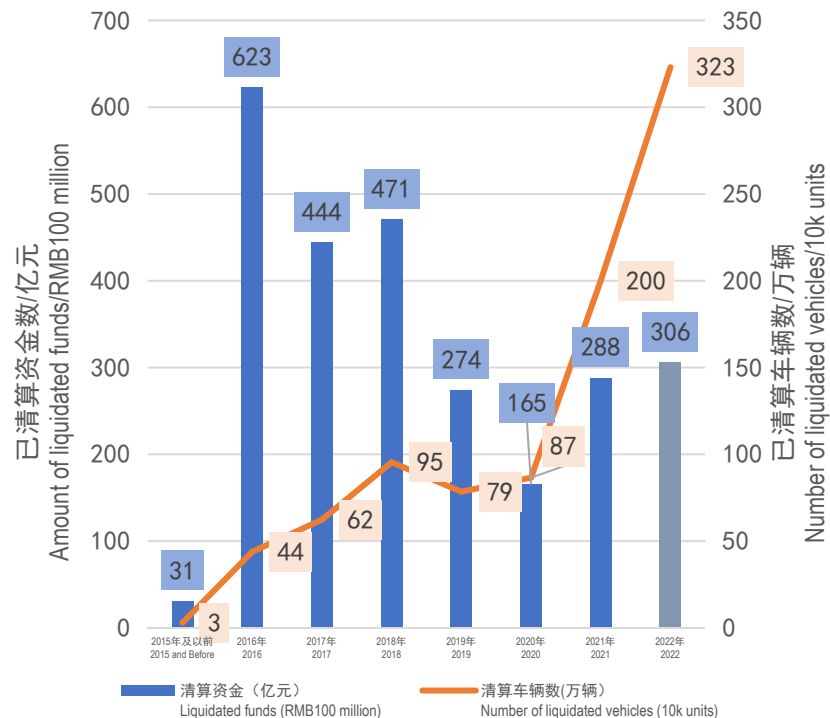


2.6 Purchasing Link: Subsidy is Withdrawn, but Tax Incentives and Diversified Demonstrations and Applications will Propel the Sustainable Development

- Fiscal subsidies played a very important role during the early stages of NEV promotion, but now they have been withdrawn;
- It has been confirmed that the purchase tax exemption policy for NEVs will continue until 2027, with a view to cultivating the market and advancing the promotion and application of NEVs.

Purchase subsidy for NEV plays an important role

Purchase subsidies for NEVs, which played a very important role during the early stage of NEV promotion in China, was officially withdrawn at the end of 2022.



Source: Ministry of Industry and Information Technology, Announcement of Liquidation of Subsidies for the Promotion and Application of NEVs

Trend 1: Purchase Tax Relief Policy for NEVs is Extended to 2027



Announcement on the Continuation and Optimization of Purchase Tax Reduction and Exemption Policies for New Energy Vehicles

- Vehicle purchase tax will be exempted for NEVs purchased between January 1, 2024 and December 31, 2025. During which, the exemption vehicle purchase tax will be applicable for NEVs, and the amount of tax exemption shall not exceed RMB30,000 per new energy passenger vehicle;
- For NEVs purchased between January 1, 2026 and December 31, 2027, a 50% reduction in vehicle purchase tax will be applied, and the tax reduction amount shall not exceed RMB15,000 per new energy passenger vehicle.

Trend 2: Release Several Guiding Policies for Demonstrations and Applications

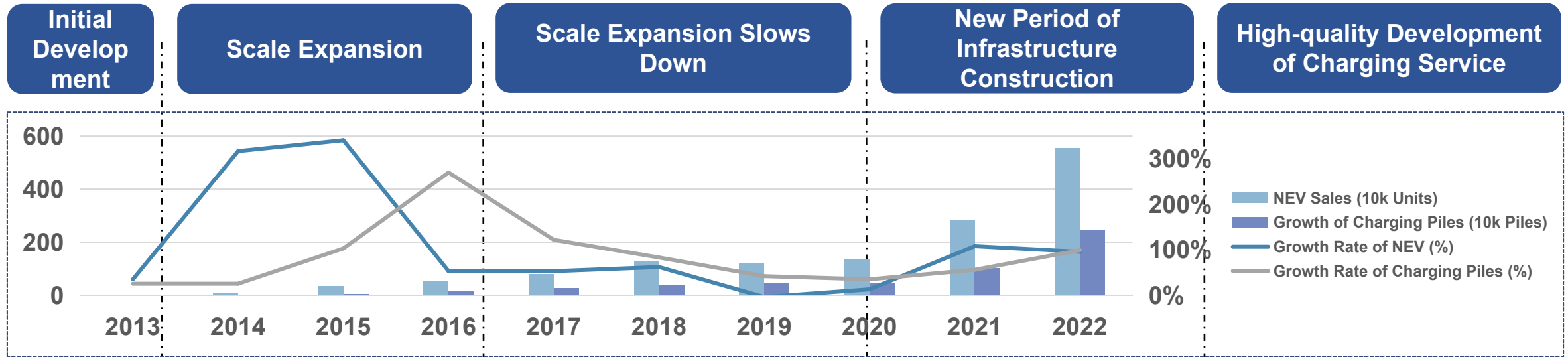
NEV going to the countryside

Electrification of public sector

Demonstration and application of fuel cell vehicles

Pilot application of battery swapping mode

2.7 Infrastructure: The Policy has been Developed in 5 Stages Over 10 Years, With Top-Level Design Framework Basically Complete



Date	Policy/Event
2012.06	The State Council officially issued the Planning for the Development Plan of Energy-saving and New Energy Vehicle Industry (2012 - 2020), which started paying special attention to charging mode.
2015.10	General Office of the State Council officially issued the Guiding Opinions on Further Accelerating the Construction of Electric Vehicle Charging Infrastructure. It proposed to build the charging infrastructure system which is smart and highly efficient and appropriately advanced with balanced layout by 2020, with a view to meeting the charging demand of more than 5 million electric vehicles
2015.10	4 ministries, including National Development and Reform Commission, jointly issued the Guideline on the Development of Electric Vehicle Charging Infrastructure (2015-2020), which explicitly proposed to build 4.8 million charging piles by 2020, in order to meet the charging demands of 5 million NEVs.
2016.7	National Development and Reform Commission, National Energy Administration, Ministry of Industry and Information Technology and Ministry of Finance jointly issued the Notice on Accelerating the Construction of Electric Vehicle Charging Infrastructure in Residential Areas, which put forward 10 relevant work requirements.
2018.12	National Development and Reform Commission, National Energy Administration, Ministry of Industry and Information Technology and Ministry of Finance jointly issued the Action Plan on Enhancing the Charging Support Capability of New Energy Vehicles. They attempted to spend 3 years to significantly enhance the level of charging technology, improve the quality of charging facilities, accelerate the improvement of charging standard system, comprehensively optimize the layout of charging facilities, with a view to greatly enhancing the interconnection and interoperability capacity of charging network, quickly upgrading the quality of charging operation service, and further optimizing the charging infrastructure development environment and industrial pattern as the objectives of the action plan.
2020.3	CCTV introduced the 7 major areas of new infrastructure, including the NEV charging piles ; then, the new infrastructure plan was more widely known among the public.
2021.1	The General Office of the State Council issued the Planning for the Development of the New Energy Vehicle Industry (2021 - 2035), proposing to vigorously promote the construction of battery charging and swapping networks, accelerate the construction of battery charging and swapping infrastructure, improve the service level of charging infrastructure, and encourage the innovation of business models.
2022.1	10 ministries and commissions, including National Development and Reform Commission and National Energy Administration jointly issued the Implementation Opinions on Further Improving the Service Guarantee Capability of Electric Vehicle Charging Infrastructure. It proposed to meet the charging demand of more than 20 million electric vehicles.
2023.6	The General Office of the State Council issued the Guiding Opinions on Further Constructing the High-quality Charging Infrastructure System ; by 2030, a high-quality charging infrastructure system with wide coverage, appropriate scale, reasonable structure and complete function will be basically built
2023.9	7 ministries, including National Development and Reform Commission jointly issued the Working Plan on Stabilizing the Growth of Auto Industry (2023 - 2024); it proposed to improve infrastructure construction and operation. Promote the construction and deployment of charging facilities and expansion and transformation of supporting power grid in an orderly manner.

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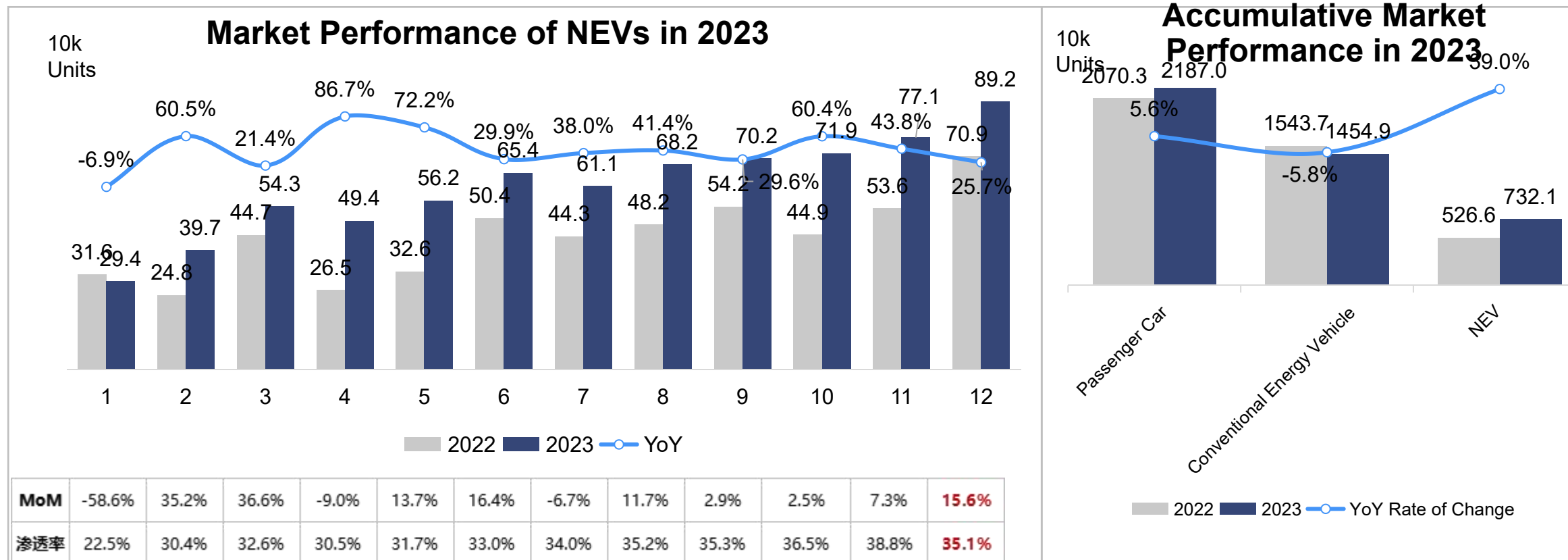
01 Analysis of Development Situation of the Chinese Passenger Vehicle Market

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3.1 China's New Energy Vehicle Market in 2023: Maintain High Growth, with Penetration Rate Further Increasing

- In 2023, 7,321k new energy commercial vehicles were sold accumulatively, up by 39.0% year-on-year; the penetration rate of NEVs was 33.5%, up by 8.1 percentage points from the level of the previous year.

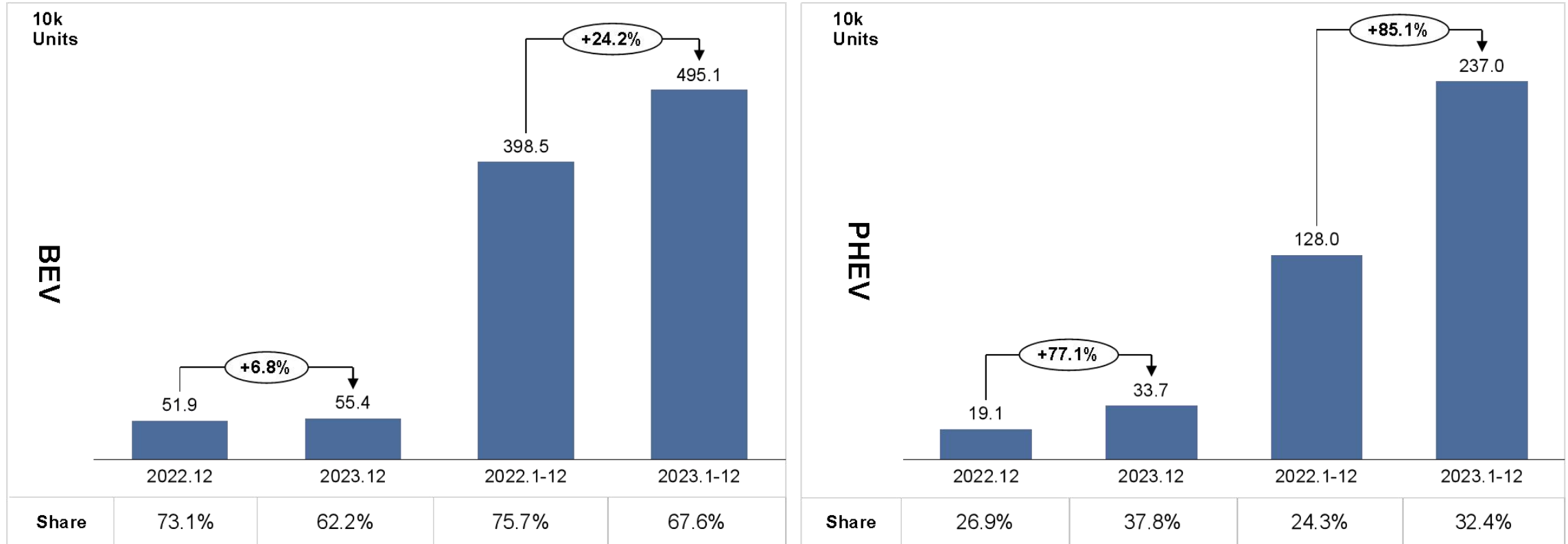


Source: Terminal Retail Data of Automotive Data of China

3.2 Market Performance by Fuel Type: PHEV Market Share Grew to 32.4%, Becoming the Main Driver Behind the Development of NEVs

- In December, the total sales of BEVs registered 554k vehicles, down by 6.8% year-on-year. The main reason is that the window of opportunity of last year's national subsidies would soon be withdrawn, leading to a high base for the same period.
- In December, the PHEV market saw 337k vehicles sold in the market, still maintaining a year-on-year growth rate of 77.1%. It mainly thanks to the outstanding effects of year-end promotion of some car manufacturers, as well as the launch of some cost-effective new arrivals such as the Wuling Starlight and Roewe D7, which triggered a stampede of customers. The annual growth of PHEV exceeded that of BEV, which was the main contributor to the growth of NEVs.

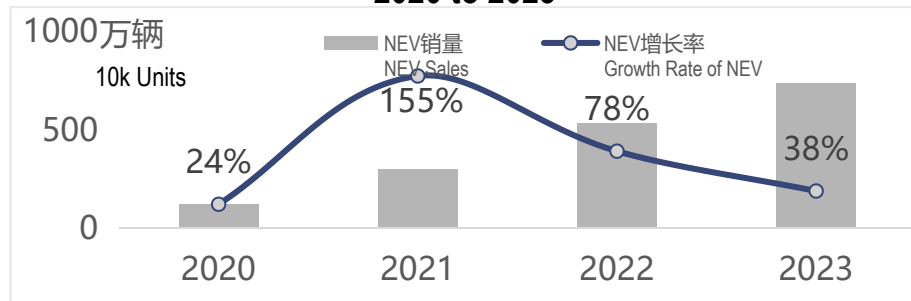
Trend of New Energy Passenger Cars by Technology Type in 2023



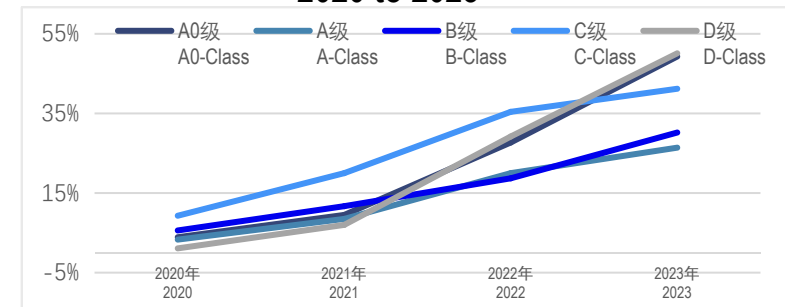
3.3 Analysis Logic and Recognition of Opportunities in Various Segments

- The domestic NEV market continues to grow, but the penetration rates in various segments are greatly different, which is essentially due to the difference in user groups and vehicle scenarios of each segment.
- The technical characteristics of different technical routes can meet users' needs in various segments.

Sales and Growth Rate of New Energy passenger vehicles from 2020 to 2023



Penetration Rate of New Energy passenger vehicles of Different Classes from 2020 to 2023



Advantage Characteristics of Different Technical Routes

Convenience of ICE/HEV



Convenience, Economy, and Experience of PHEV



Short E-range Economy and Long E-range Experience of BEV



Factors of Concern for Each Segment

Economy of A00-/A0-Class Vehicles Driving the Market



Multi-factors like Economy, and Convenience of A-Class Vehicles Driving the Market



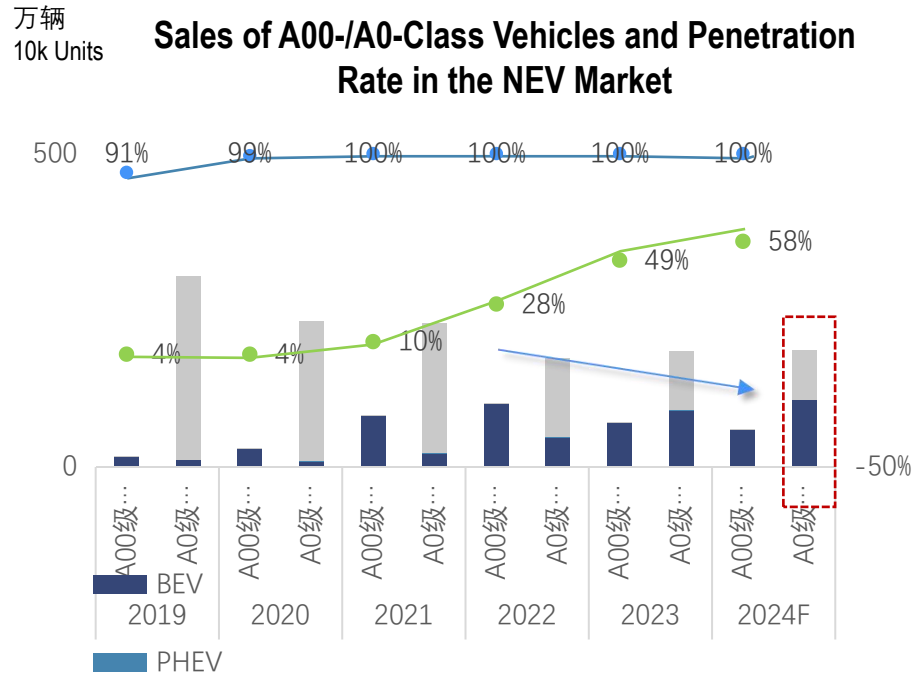
Multi-factors like Experience and Convenience of B-/C-Class Vehicles Driving the Market



3.4 A00-/A0-Class Vehicle Market: It Is Expected that the A00-Class Vehicle Market will Fall to the Scale of 500k Vehicles in 2024, and the A0-Class Vehicle Market Will See Opportunities

- Affected by the maturity of the NEV supporting system and decline of power battery price, the advantage of A00-Class vehicles in price is gradually weakening, and users' demand is turning for more cost-effective A0-Class vehicles. This, along with the purchase tax exemption policy which imposes purchase tax for vehicles with an e-range of less than 200km, in the next 2 years, the A00-Class market will fall back to the scale of 500k vehicles.

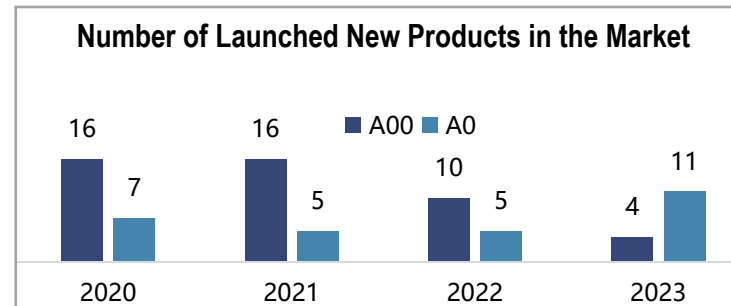
Market Trend and Opportunity Recognition of A00-/A0-Class Vehicle Market



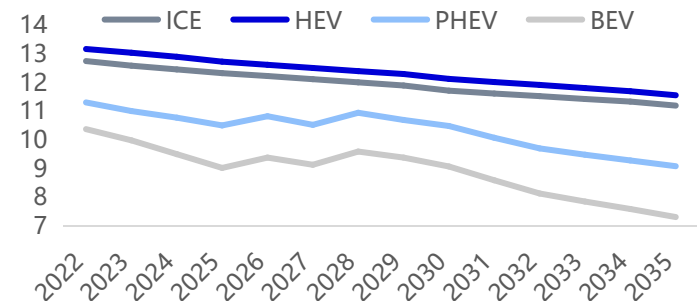
市场同比增长率 Market YoY Growth Rate

	2019	2020	2021	2022	2023F	2024F
A00级	-56%	77%	176%	23%	-30%	-17%
A0级	-14%	-24%	-1%	-25%	6%	2%

Supply: Decline in the Number of Launched A00-Class Models/Abundant Supply of A0-Class Models

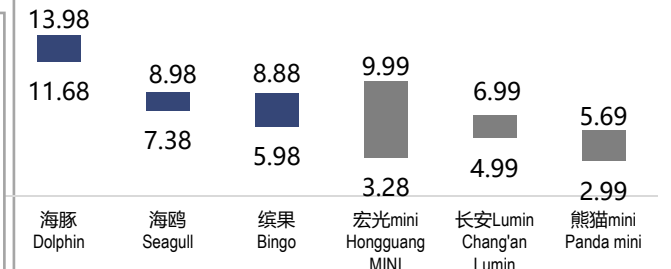


TCO of different routes in A0-class



Demand: Demand is Shifting to A0-Class Market

Comparison of typical A00 and A0 level vehicle price ranges



Policy: Purchase tax reduction is not conducive to the development of the A00-Class vehicle market

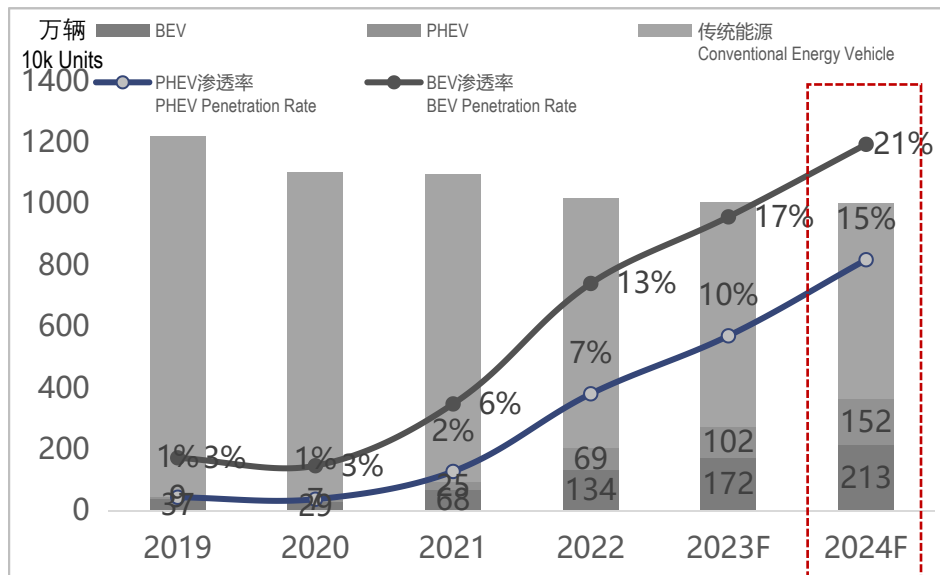
BEV Technology Requirement	Current	Revision
E-Range (km)	≥100	≥200
Energy Density (Wh/kg)	≥95	≥125

The vast majority of A00 level models find it difficult to meet technical requirements

3.5 A-Class Vehicle Market: With Larger Base, Private BEV Market hasn't been Mature, while PHEV will Accelerate the Replacement of Conventional Energy Vehicles

- The prices of A-Class NEVs continues to decline, and their price gap from the ICE products of same level is also gradually narrowing. Among them, the leading products have enabled the same price between fuel and electricity, driving the market to grow rapidly.
- The private BEV market hasn't yet been mature, and PHEV exceeds BEV in market share and seems more cost-effective in the short term, therefore still a major contributor in the growth. The rental and leasing market has become saturated, difficult to support sustained rapid growth.

Sales of A-Class Vehicles and Penetration Rate in the NEV Market



➤ YoY Growth Rate of passenger vehicle Market

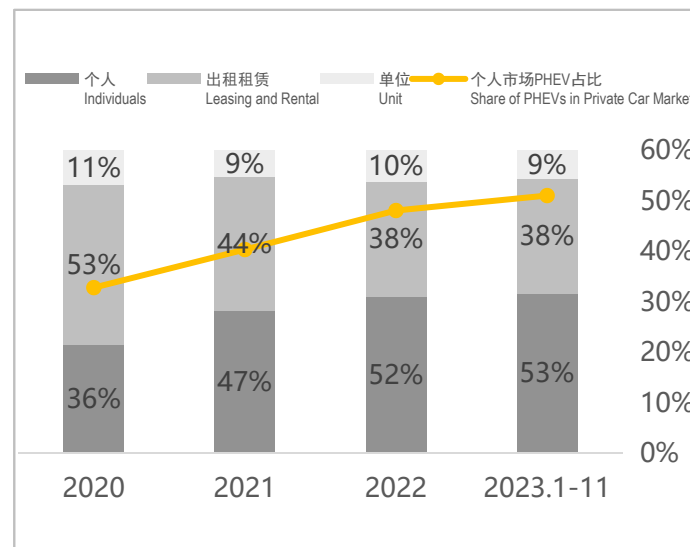
2019	2020	2021	2022	2023F	2024F
-1%	-10%	-1%	-7%	-1%	0%

Market Trend and Opportunity Recognition of A-Class Vehicles

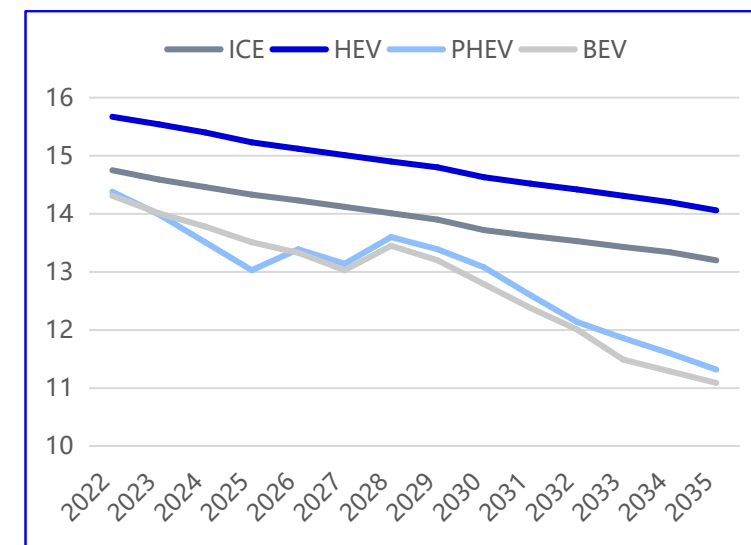
BEV market hasn't yet been mature, while PHEV exceeds BEV in market share in private car market

PHEV still has advantages in TCO in the short-term, but BEV seems more advantageous in the long term

Change in the Sales Share of A-Class BEVs by Purpose of Car Use



TCO of different routes in A-class

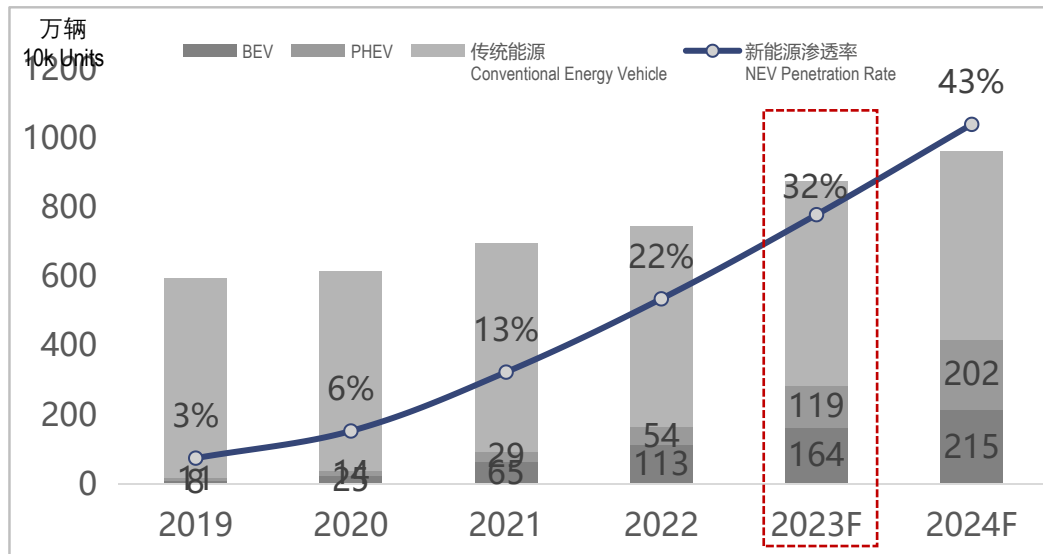


Source: Terminal Retail Data of Automotive Data of China Co., Ltd.

3.6 B-/C-Class Vehicle Market: Consumption Upgrading Gradually Drives the Steady Growth of the Overall Market, and Technological innovation improves user experience

- Driven by consumption upgrading, the B-/C-Class market has shown a trend of steady growth, with the penetration rate into the NEV market reaching 32%, slightly lower than the industry average of 33%.
- Technology: Under the trend of strong electrification of PHEVs, electronically controlled suspension and electric 4WD can optimize the driving experience, which is expected to enhance the application rate in C-Class vehicle market. Enhancing the convenience of energy replenishment is the primary contradiction to be resolved for C-Class BEVs, and the importance should be mainly attached to the application of solid-state batteries and high-voltage platforms.x

Sales of B-/C-Class Vehicles and Penetration Rate in the NEV Market



YoY Growth Rate of passenger vehicle Market

2019	2020	2021	2022	2023F	2024F
0%	3%	13%	7%	17%	10%

Source: Terminal Retail Data of Automotive Data of China Co., Ltd.

Key Technologies

P
H
E
V

It is the key to optimize driving experience and sharing platform and electronic and electrical architecture with BEV

- Increase in the application rate of electronically controlled suspension
- Accelerated popularity of electric 4WD

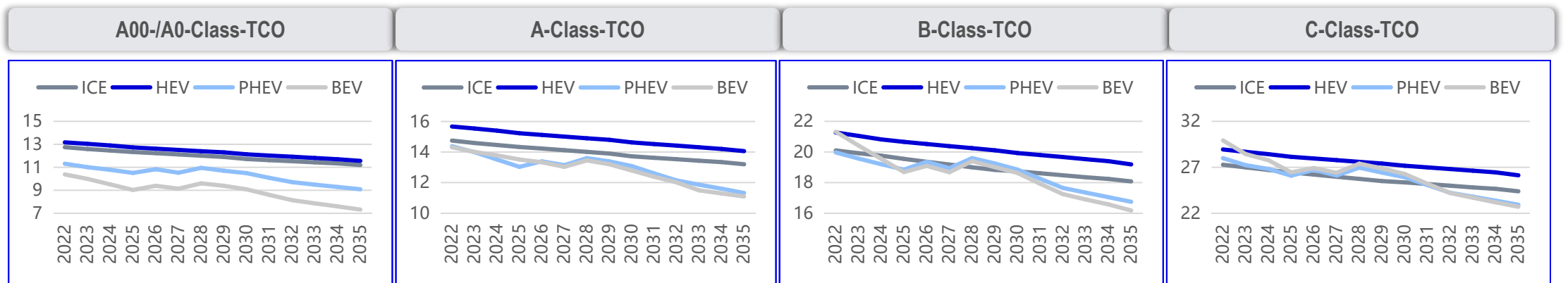
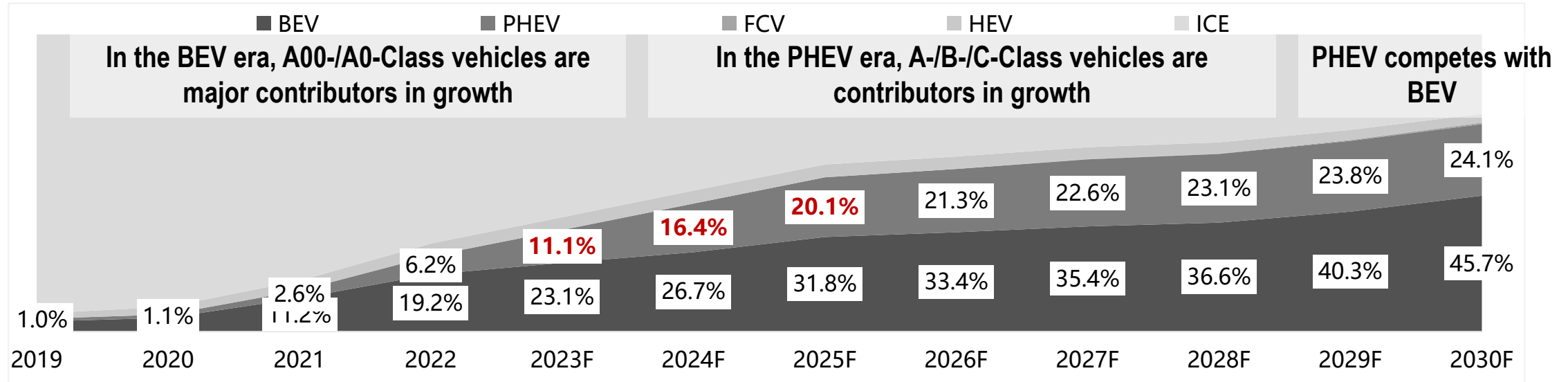
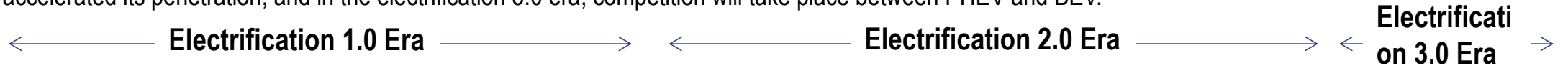
B
E
V

It is key to improve the convenience of energy replenishment and focus on new battery type and high-voltage fast charging

- Solid-state batteries improve e-range
- High-voltage platform improves charging speed

Conclusion: Electrification Solutions Began to Enter the 2.0 Stage, and PHEV (Including REEV) has been Ushered into the 3-5 Years High-Speed Growth Period

- In the electrification 1.0 era, the small BEV had the best TCO and accelerated penetration. However, in the electrification 2.0 era, PHEV route boasted the optimal TCO and accelerated its penetration, and in the electrification 3.0 era, competition will take place between PHEV and BEV.





中 汽 数 据 有 限 公 司

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