

Transition to Electric Mobility in Public Transport

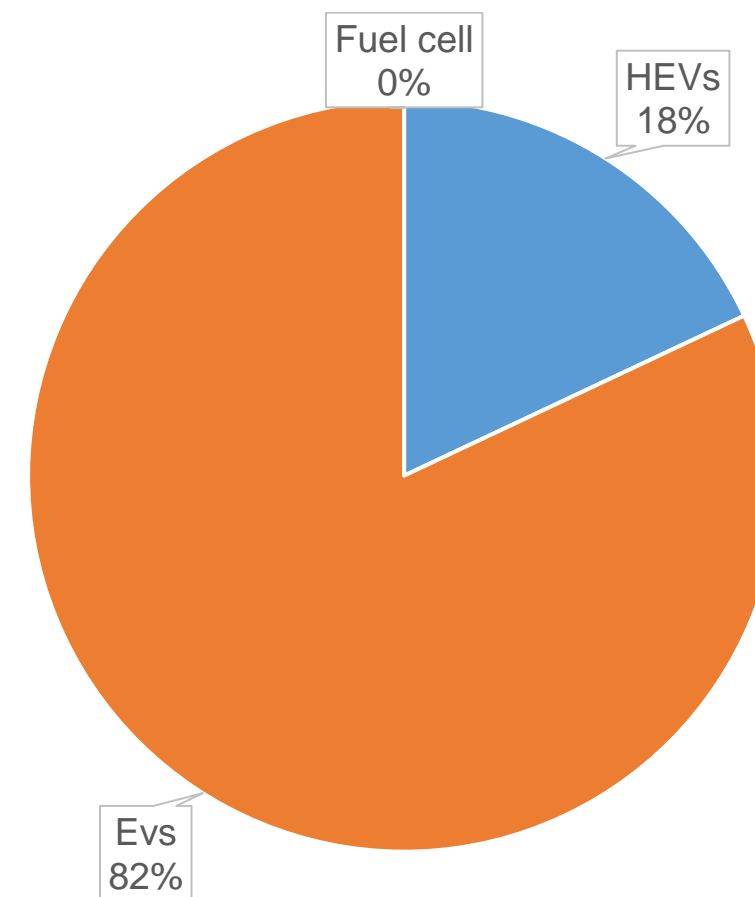
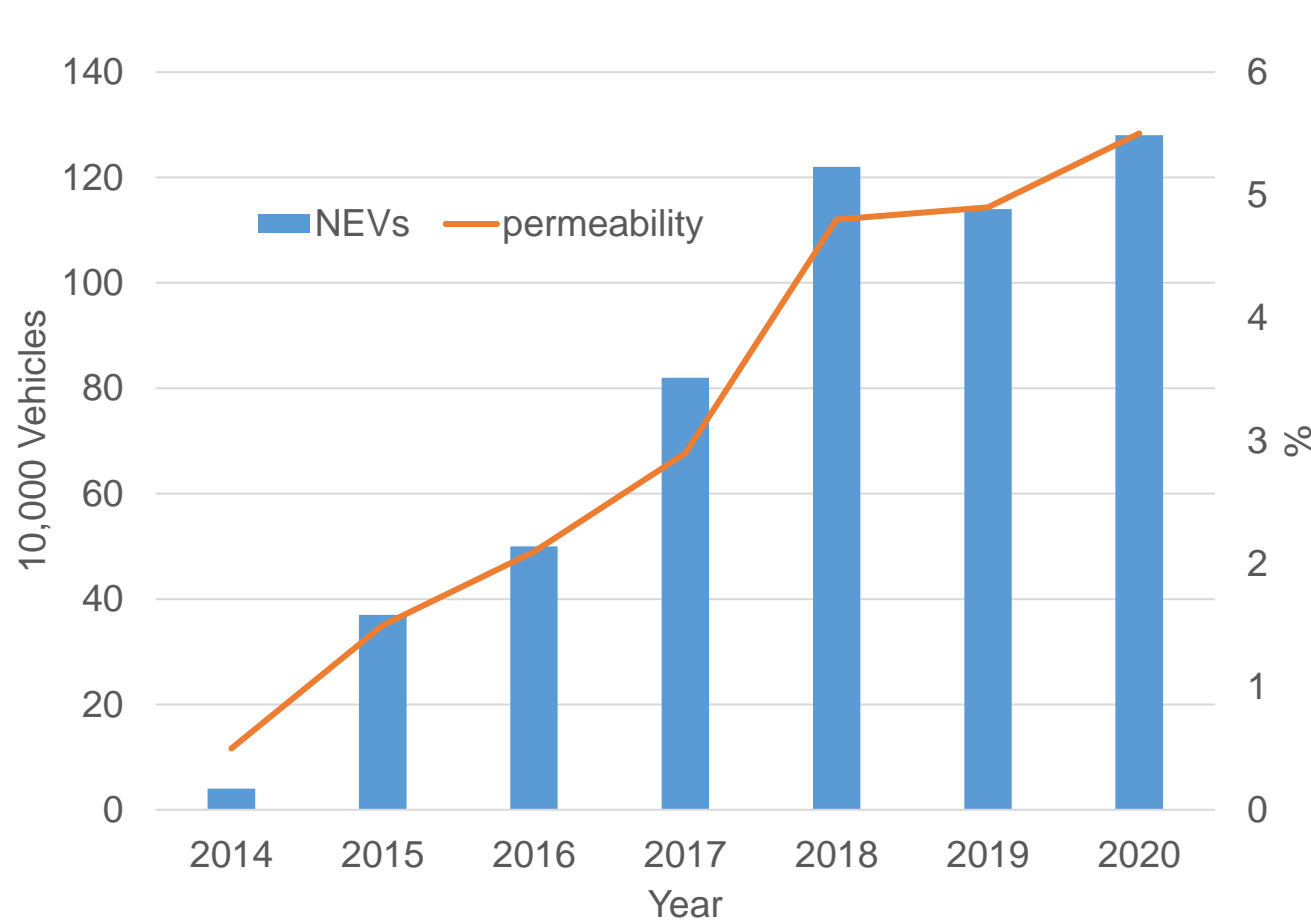
New energy vehicles: Experience from China and Chinese cities

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By the end of 2020, annual growth and proportion of NEVs in China



By the end of 2020, urban public in China

- Total NEVs exceeded 1.2 million
 - Urban public bus: 466,000
 - Taxis: 132,000
 - Urban logistics distribution : 430,000
 - natural gas operating vehicles: 180,000.
- Carbon emissions reducing about 50 million tons per year.



Nation

Provide the general direction for the planning of the whole new energy industry and specify the specific objectives of each stage of development .

Ministry

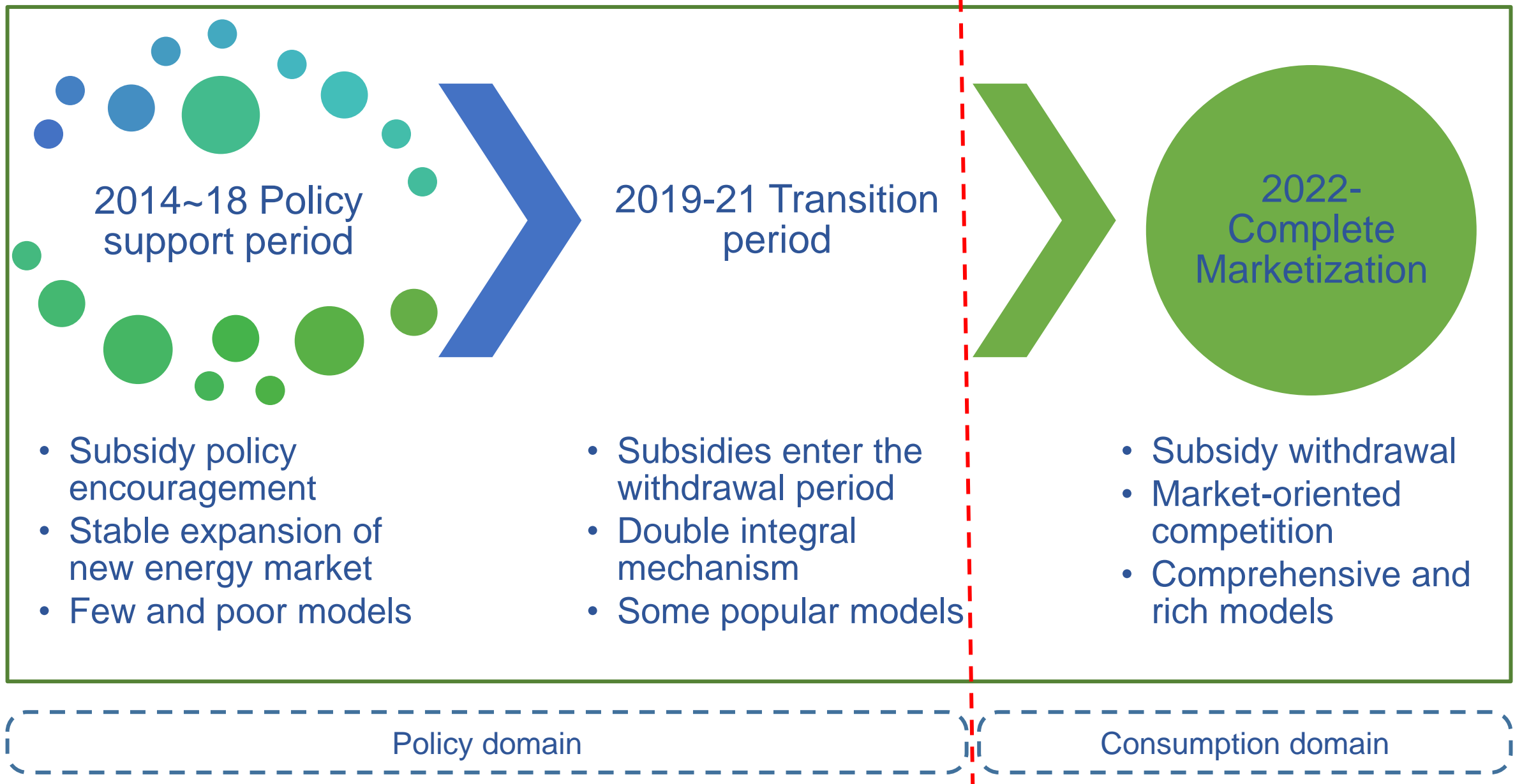
The policies issued by the ministries are a specific supplement to the implementation of national policies. The ministries standardize the subdivided fields under the new energy industry according to their responsible fields.

NDRC National Development and Reform Commission	National policies and development plans
MOF Ministry of Finance	Subsidies for new energy vehicles
MOST Ministry of science and technology	Standards and technologies of new energy vehicles
MIIT Ministry of Industry and Information Technology	Provide opinions and specifications on the layout and construction of the whole new energy vehicle industry, and put forward plans for related industrial chains
MOT Ministry of transport	Focuses on the norms of new energy vehicles in the public domain, such as new energy taxis, public transportation, etc
NEA National Energy Administration	Planning and specifying charging piles /stations
STA State Taxation Administration	Regulations on the taxation of new energy vehicles
.....	

Development Stages



Time	Stage	Action
1991~2005	R & D layout	<ul style="list-style-type: none">● New energy vehicle and EV● Fuel cell● Hydrogen energy and fuel cell technology
2006~2010	Industrialization preparation	<ul style="list-style-type: none">● 2008, The first electric began mass production in China.● In about 3 years, 10 cities every year, and 1000 NEVs each city● Pilot work of subsidies for purchase of NEVs in 5 cities (Shanghai, Changchun, Shenzhen, Hangzhou and Hefei)
2011~2015	Demonstration and promotion	<ul style="list-style-type: none">● NEVs industrialization goal● 2012, NEVS preferential policy and vessel tax● 2015, China's production and sales of NEVs ranked 1st in the world.
2016~now	Industrialization development	<ul style="list-style-type: none">● 2017, NEVs subsidies continued decline.● 2017, Establish NEVs as the strategic breakthrough.● 2020, Established NEVs high-quality development mode in the future.



1. Planning and layout of R &D system at the initial stage of government support

- Science and technology projects.
- Cooperate with different cities, scientific research institutions, universities and enterprises.

2. Development purpose of scientific research projects and clarify the target product orientation

- All links of scientific research and development serve the development of final vehicle products.
- Give play to advantages of each participating unit.

3. Connection between supporting policies in various stages of industrial formation

- R&D stage: China government provided continuous support for NEVs.
- Industrial cultivation stage: support and promoting industrial formation and development.
- One-time quota subsidies : NEVs such as hybrid electric vehicles, pure electric vehicles and fuel cells .

Top-level design

- 2020.10, **New Energy Vehicle Industry Development Plan (2021-2035)**.
- national strategy, new energy vehicles.
- Develop, electrification, networking and intelligence.

Standards and regulations

- National standards 49, industry standards 16.
- Automobile safety, automobile energy saving, electric vehicle, intelligent Internet connection, key components

Fiscal and tax policies

- Financial subsidies, optimize the purchase restriction policy of automobiles, support the consumption of new energy automobiles, encourage automobiles to go to the countryside, and improve the policy of automobile consumption environment.

Promotion

- Promote the application of new energy vehicles in rural areas
- 2020, Carry out the preparation of the action plan to promote the electrification of vehicles in the public domain

Market access

- Optimize market access
- Strengthen access supervision
- Continuously improve government service capacity

	Before 2020		After 2021	
Government	<ul style="list-style-type: none">● Leading by ministers● Short term plan	✓	<ul style="list-style-type: none">● 30 60 double carbon target● Multi-ministerial collaboration	✓
Enterprises	<ul style="list-style-type: none">● Low pressure of fuel● Technology prospects Uncertain	✗	<ul style="list-style-type: none">● Fuel consumption pressure● Clear technical route● Profit sharing EV consumers	✓
Supply chain & Infrastructure	<ul style="list-style-type: none">● The market is cold● Difficult to profit	✗	<ul style="list-style-type: none">● Terminal demand explosion● Tight capacity supply	✗
Consumer	<ul style="list-style-type: none">● EV price is high● EV consumer distrust	✗	<ul style="list-style-type: none">● Rich EV products● Increased cost performance● EV recognition enhancement	✓

Major Enterprises

Transferring profits

Consumer experience

Growth opportunities

Low gross profit

Low price

High cost performance

Cost sharing

Low premium

Simple choice

Capital appeal

Energy supplement guarantee

Low use cost

Positive public praise

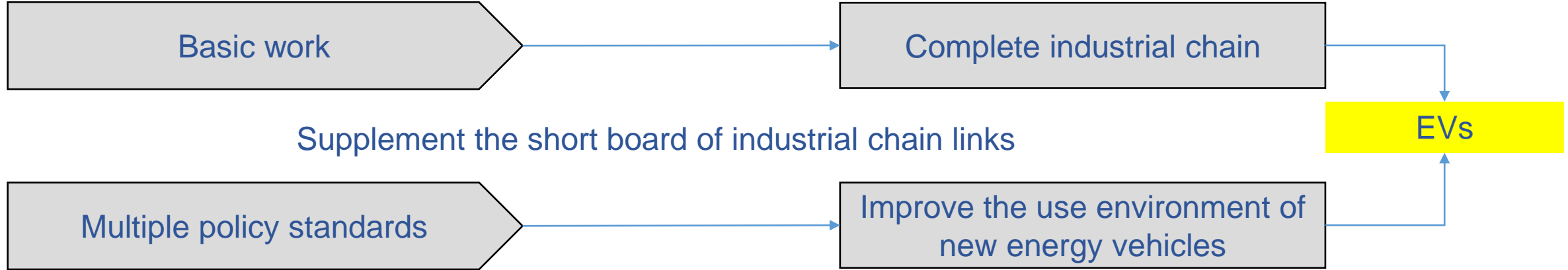
Final consideration

Quality assurance

Quality assurance



- ◆ Principle: infrastructure first, construction moderately ahead, overall planning and comprehensive layout
- ◆ Policies: financial support, consumption stimulation, scientific and technological R&D, promotion and application, charging technology construction and layout, all-round chain



Industrial chain	Vehicle Enterprises	BYD, KaVo, Baoneng and Hengchi
	Key parts and core materials	BIC battery, Hangsheng electronics, Xingyuan materials, DIHE electric, blue ocean Huateng electronic control, Putian charging, beiteri, Changhe and Huichuan
	High tech companies	Huawei, Tencent, Qingzhou Zhihang, auto X

Shenzhen: Public transport 100% EVs



Develop Path



Policy

- Financial subsidy
- Right of way
- Parking discount
- Limited fuel vehicles



Planning

- production
- recovery
- Retention target
- Charging network
- infrastructure



Management

- Management mechanism
- Standardization of charging pile
- Standardization of power battery



Industry

- New energy vehicles (BYD)
- Power battery
- Drive motor
- solar energy
- New material



Technology

- R & D Center
- Talent subsidy
- Testing Center
- Research Institute
- University

NEVs related Companies

Rapid growth. 2019: 1807; 2020: 2347;
2021: 3875

NEVs Ownership

2021: 544400, 1st in China. 14.7% of the
total number of vehicles in Shenzhen.

Public transport

Bus & Taxi 100% EVs

Market

circulation mechanism and professional NEVs
trading market

Charging facilities

The average charging service radius is less
than 0.9 km

Stakeholder	Gain	Pain
Government	<ul style="list-style-type: none"> Adjust the national energy structure Reduce fossil dependence protect the environment Reduce carbon emissions Transformation and upgrading of automobile industry 	<ul style="list-style-type: none"> Consume financial resources Take certain risks
supplier	<ul style="list-style-type: none"> Have the opportunity to lead position Improve their competitiveness Government support in the early stage 	<ul style="list-style-type: none"> Facing the risks brought by market uncertainty A large amount of R & D investment is required
Operator	<ul style="list-style-type: none"> The new market has great potential Government support and help can develop rapidly 	<ul style="list-style-type: none"> Consumer acceptance Imperfect market rules
consumer	<ul style="list-style-type: none"> The license plates of NEVs need not be regulated Low exhaust pollution and noise It is cheap to buy a car and charge after subsidies 	<ul style="list-style-type: none"> range anxiety Few charging points Long charging time

- Shenzhen has strong economic strength
- The new energy vehicle industry chain is relatively perfect
- Strong government support

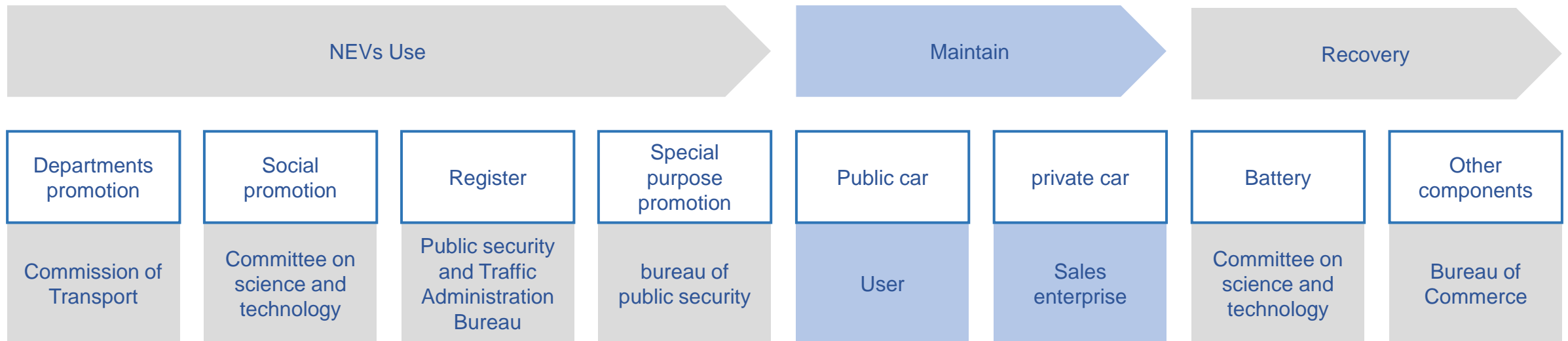
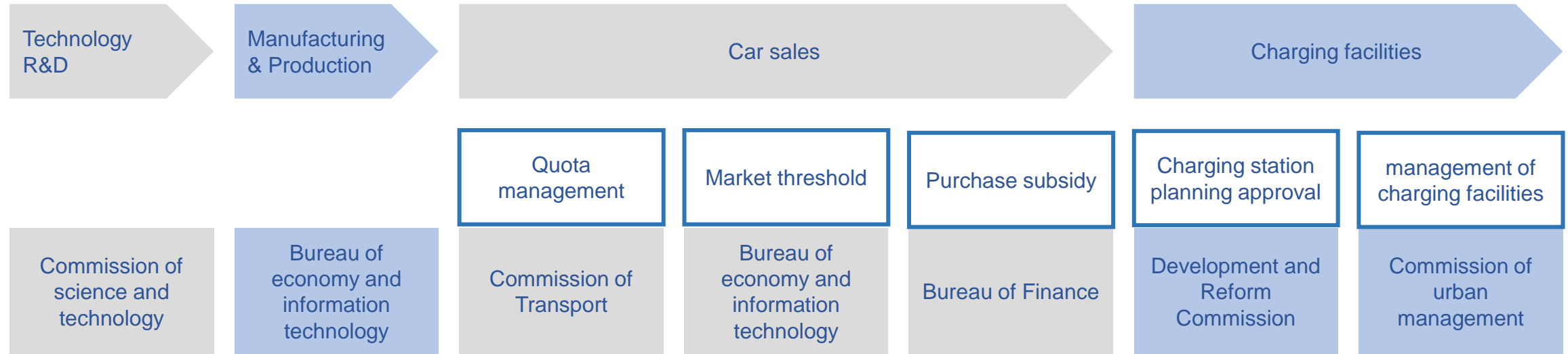
- The foundation of traditional automobile industry is weak
- The competitiveness will weaken after the policy dividend disappears
- The cost of production factors is high
- The NEV industry chain is uneven

- Technical advantages of traditional automobile enterprises
- Subsidy decline

- State support
- Strategic planning and development objectives
- Double carbon development requirements



2009, Beijing established the New Energy Vehicle Association



By the end of 2020:

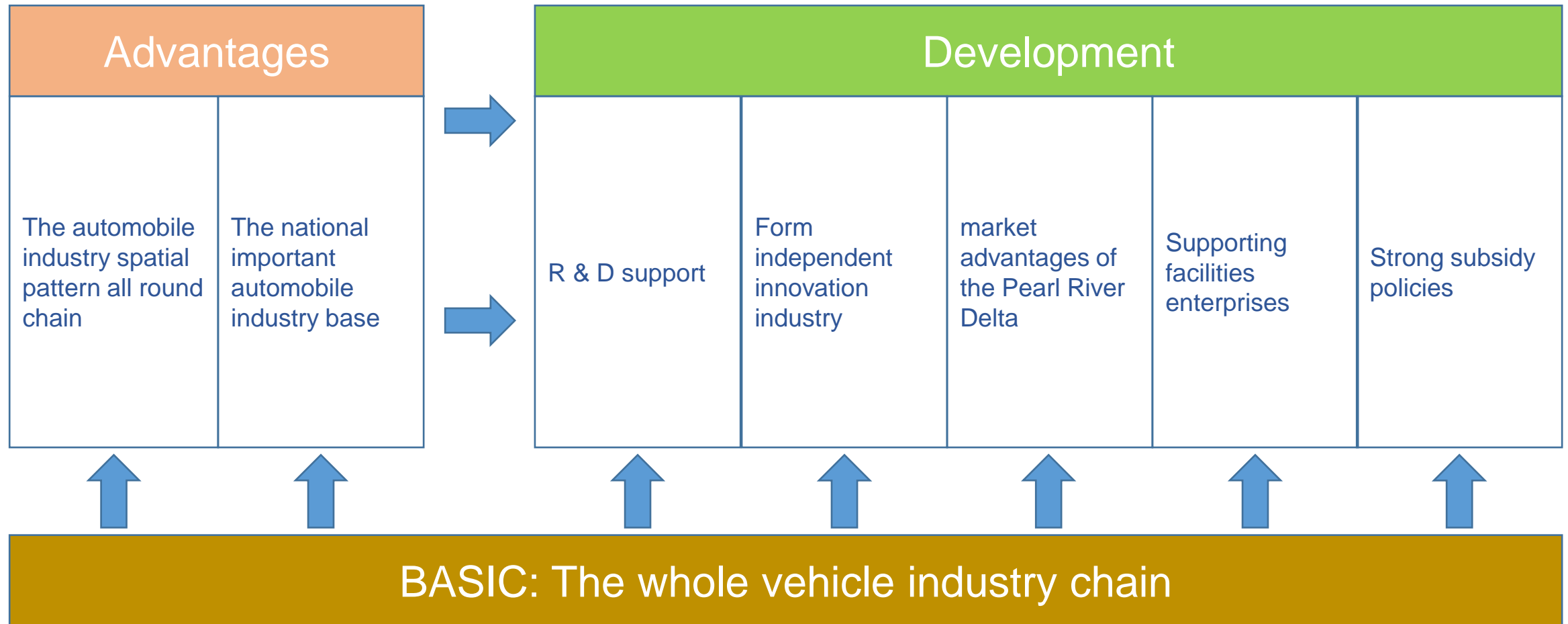
- Purchase subsidy more than 6.4 billion yuan for 128,000 NEVs
- Built more than 229,600 charging piles
- 412,000 NEVs

New in 2020

- ◆ NEWs buses:1200
- ◆ Tourist buses:31
- ◆ Taxis:7006

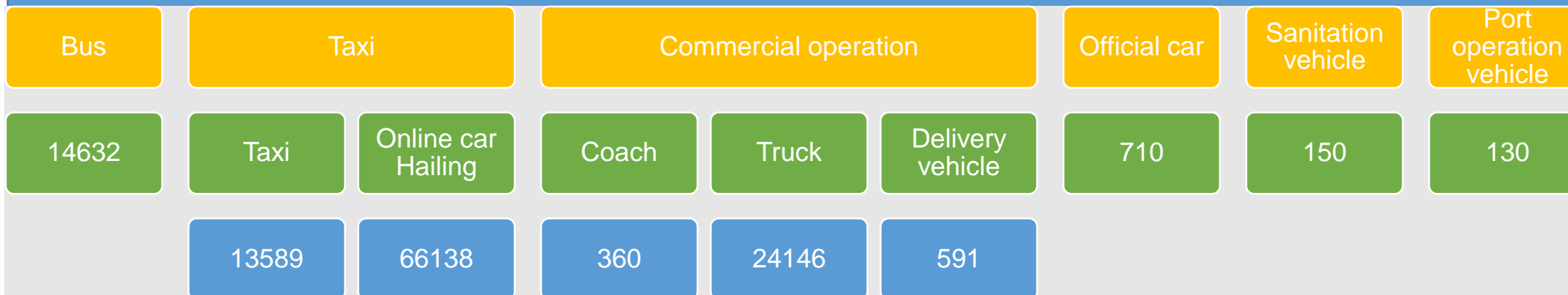
In public areas

- ◆ charging stations:5213
- ◆ charging piles :47400



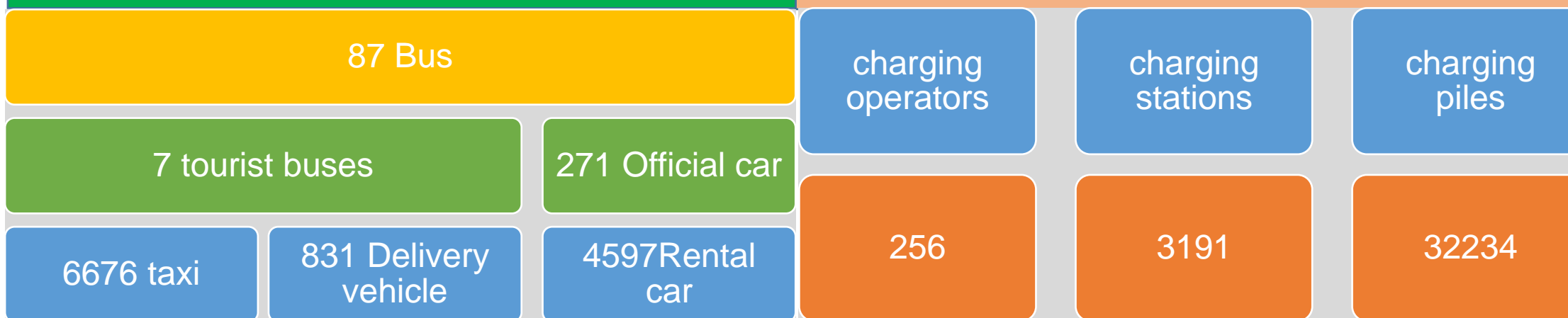
- ◆ Guangzhou is one of the major automobile industry bases in China.
- ◆ In recent years, the output of automobiles has exceeded 1.8 million, accounting for about 8% of the total output of automobiles in China, while the output of cars has remained at about 11%.
- ◆ The main vehicle enterprises include GAC Honda, Dongfeng Nissan, GAC Toyota, GAC Hino and GAC passenger cars

By the end of 2020: NEVs

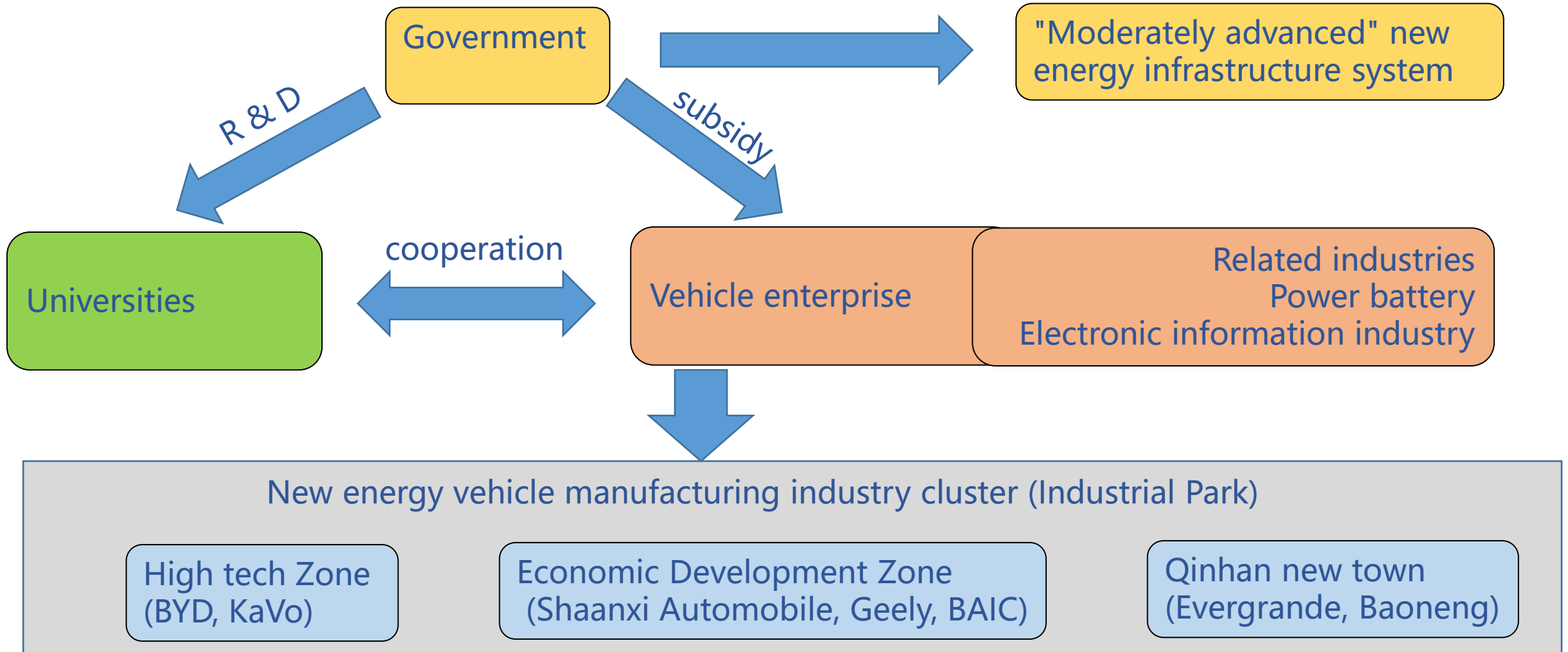


New in 2020: NEVs

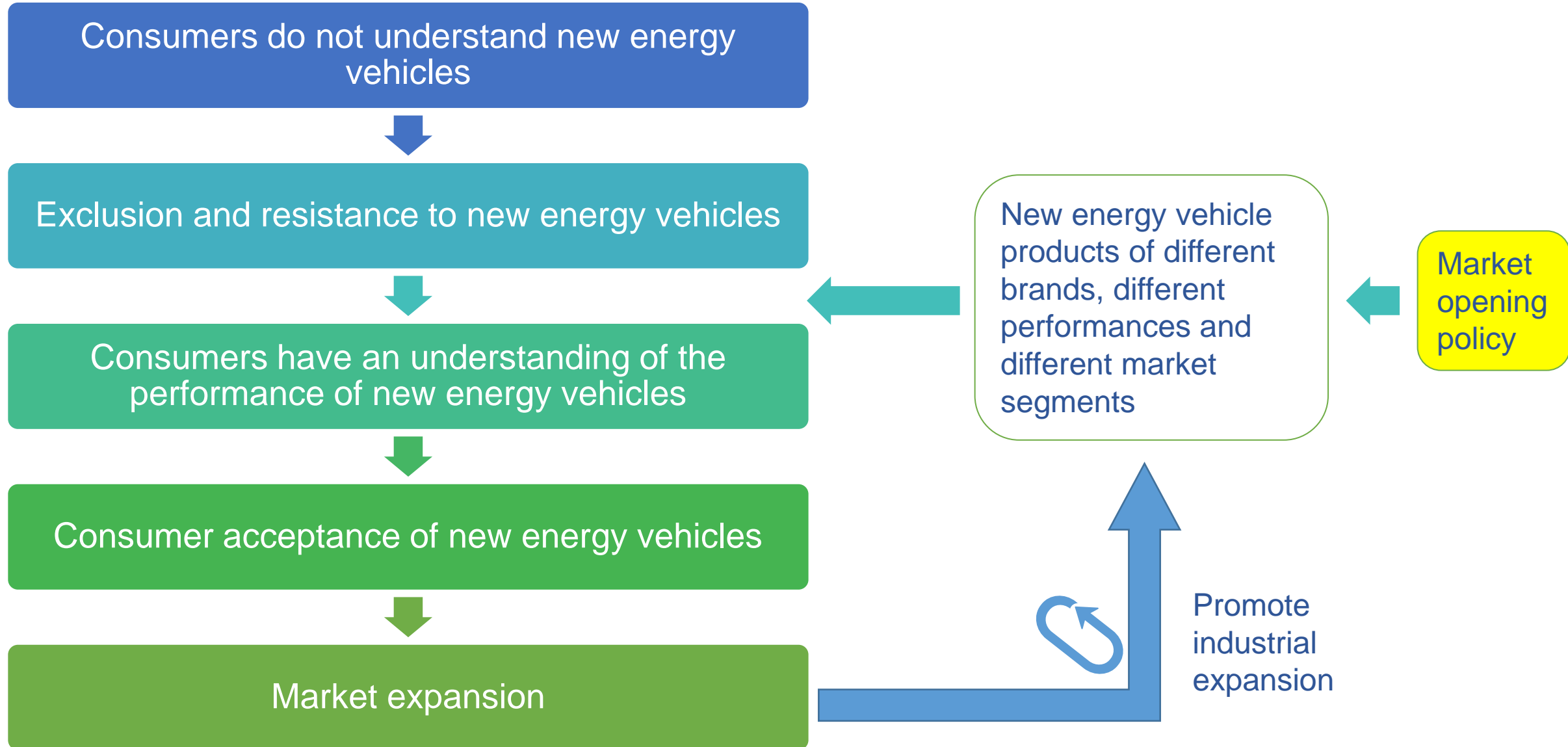
Charging piles:

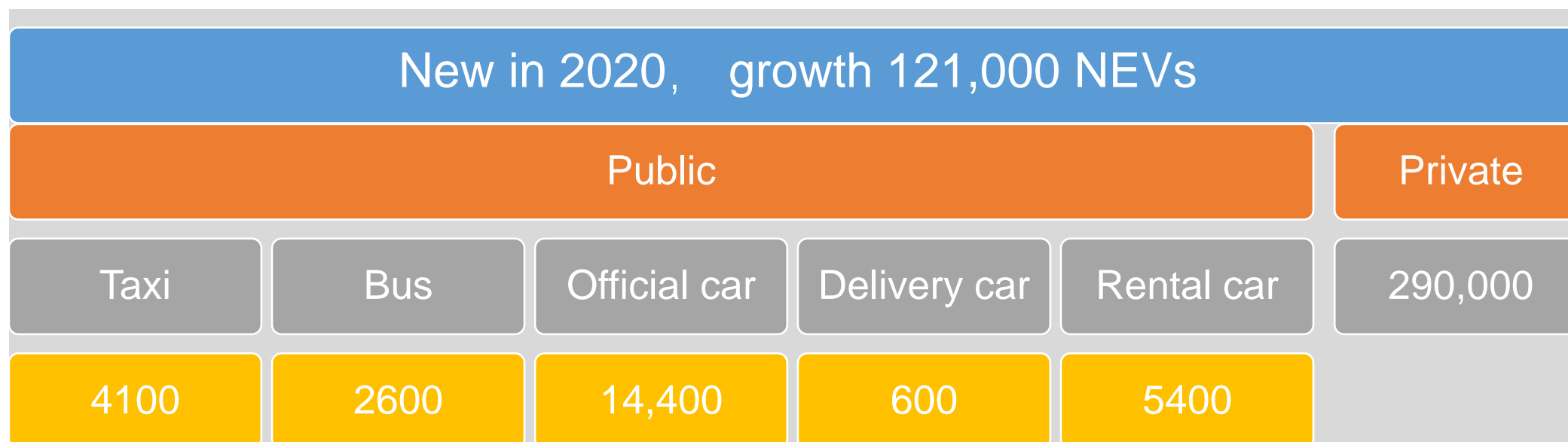
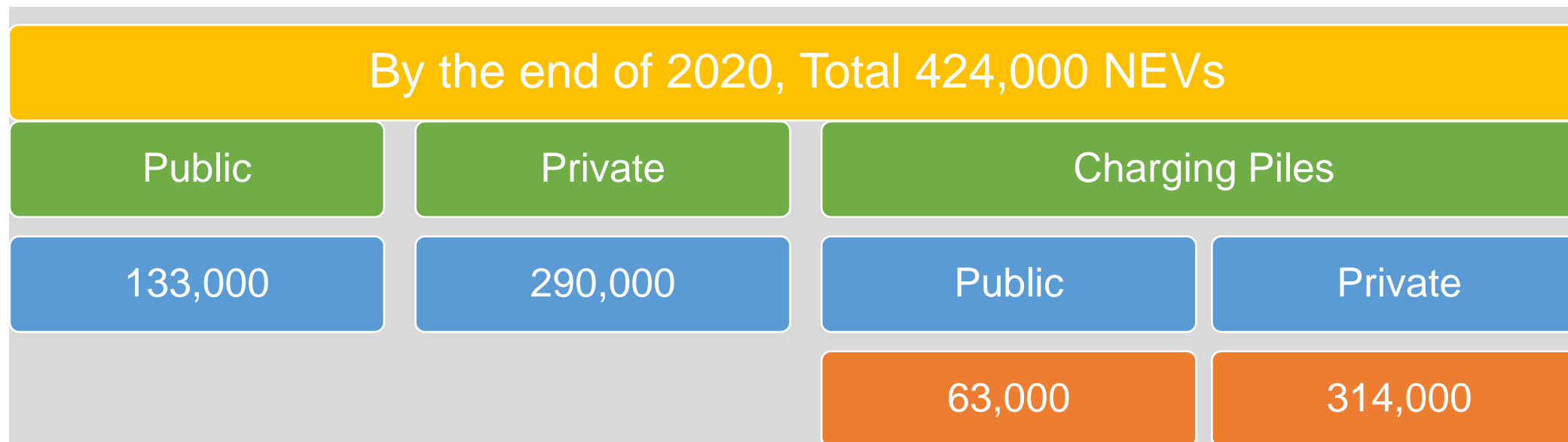


Build a national new energy vehicle industry and industry cluster in China



Private new energy vehicles will have a penetration rate of 50% in 2025 and strive to be fully electrified in 2030





1. The Chinese government leads the development of new energy vehicles.
2. Vigorously solve the problem of charging difficulties.
3. Improve the subsidy policy system for new energy vehicles.
4. Research institutions and enterprises jointly develop competitive innovative products.
5. Formulate unified technical standards.
6. Build a complete new energy vehicle industry chain.
7. Actively study the recovery process of power battery and establish the recovery mechanism of battery.



Thanks for your Attention

