



中国汽车产业碳减排路径及管理方式思考

Carbon Emission Reduction Path and Management Mode of Chinese Automobile Industry

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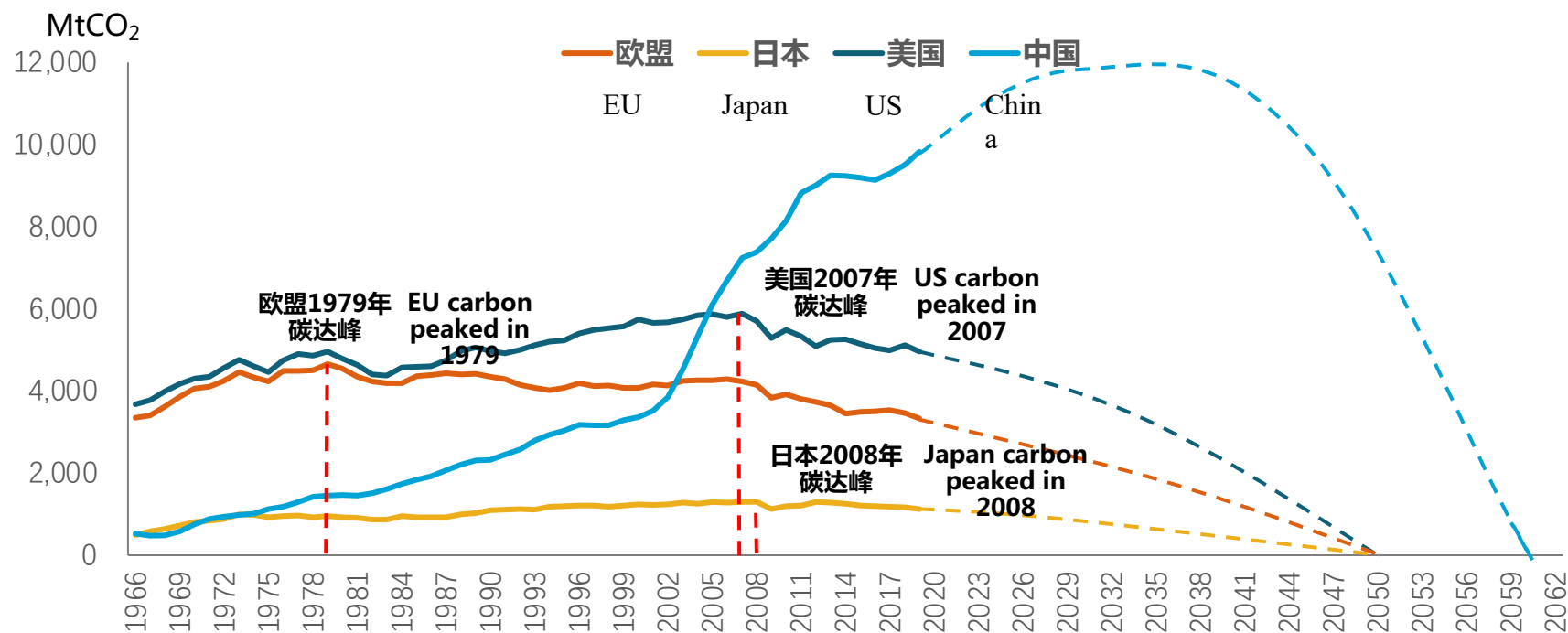
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1. 中国实现“双碳”目标面临挑战

1. China faces challenges in achieving its '30·60' decarbonization goal

- 时间紧：目前中国是全球碳排放量最大的国家，从碳达峰到碳中和的缓冲时间只有30年，而发达国家的间隔在40-70年。
- Time is tight: China is now the world's largest carbon emitter. The buffer time from carbon peak to carbon neutrality is only set to be 30 years, while the interval for developed countries is 40-70 years.
- 任务重：国家碳中和涉及多领域、多层次，须全国上下游统筹推进，同时需兼顾经济发展和社会民生。
- The task is heavy: National carbon neutralization involves many fields and levels, and must be promoted in a coordinated manner between the upstream and downstream, while taking into account both economic development and people's livelihood.



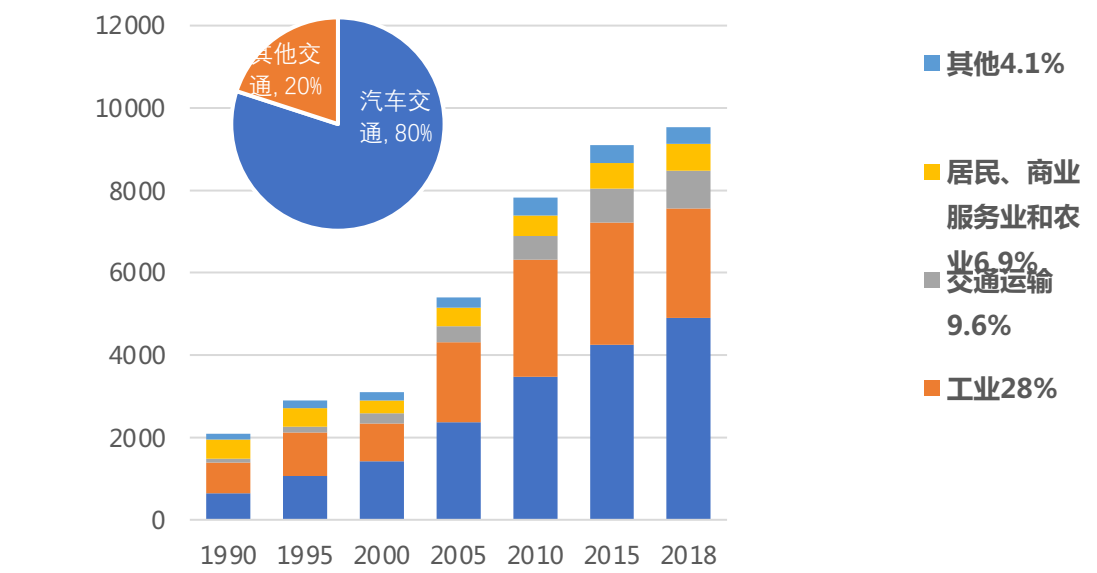
2. 汽车产业碳减排对实现中国“双碳”目标具有重要意义

2. CO₂ reduction in the auto industry is important to the realization of '30·60' decarbonization goal

- 2018年我国汽车交通领域碳排放占比仅为8%左右，参考欧美等已实现碳达峰的国家，其汽车交通碳排放占比达到30%。
- In 2018, automobile transportation sector in China accounted for only about 8% of carbon emissions. Referring to countries that have achieved carbon peaks such as Europe and the United States, their automobile transportation carbon emissions accounted for 30%.
- 长期看，汽车保有量随着社会发展仍在增加，预计碳排放占比将大幅提升，对落实我国双碳目标发挥重要作用。
- In the long run, the number of cars is still increasing , and the proportion of its carbon emissions is expected to increase significantly, which will play an important role in the implementation of China's '30·60' decarbonization goal.

中国能源类碳排放行业构成 (MtCO₂/年)

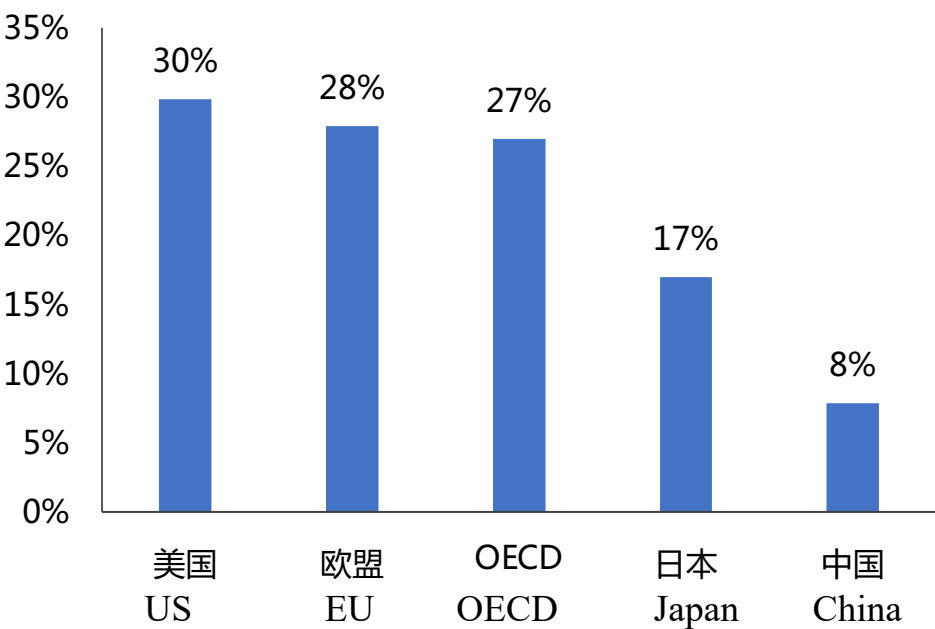
China's carbon emissions composition by industry (MtCO₂/year)



数据来源：IEA

各国汽车交通领域碳排放占比 (2018年)

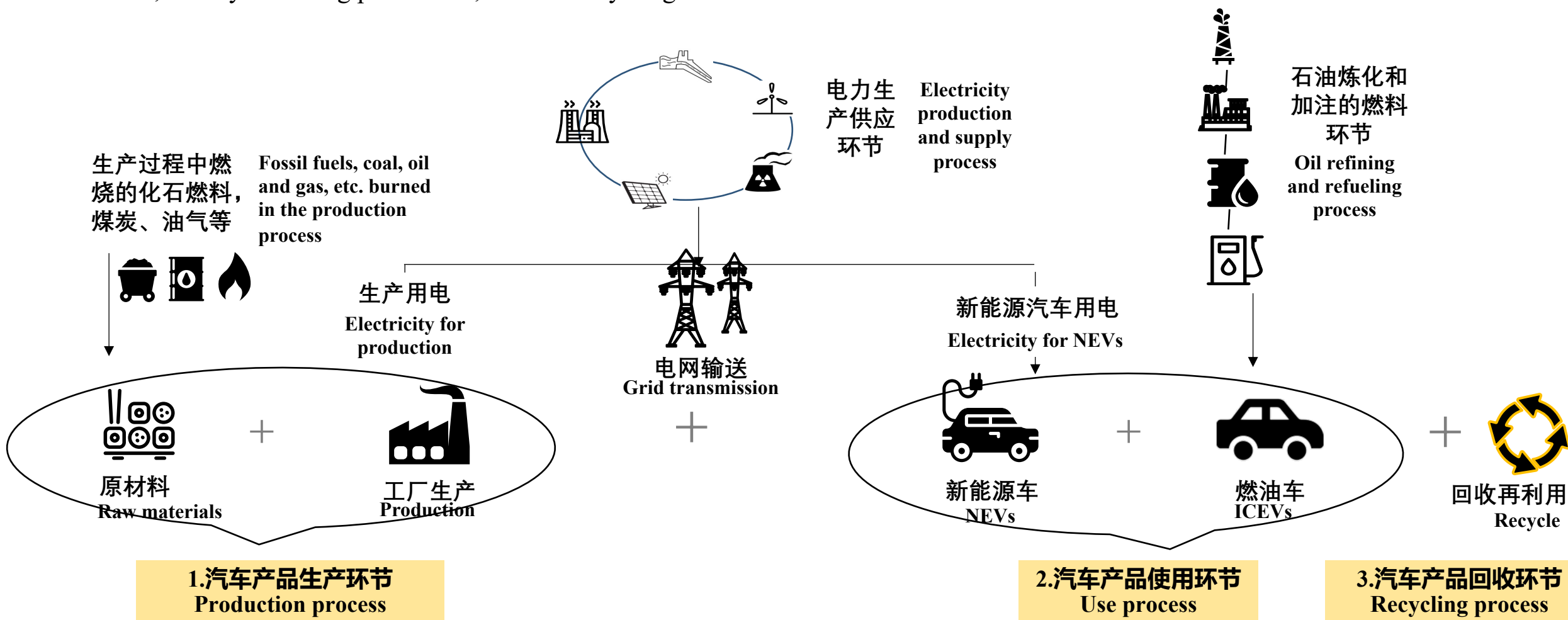
Percentage of carbon emissions from automobile transportation in various countries (2018)



3. “双碳”目标下要求汽车产业全链条实现低碳转型

3. The whole chain is required to realize low-carbon transformation under the '30·60' decarbonization goal

- 汽车产业作为制造业中的集大成者，具有产业链条长、涉及领域广的特点，主要包含生产、使用、回收三大环节。
- The auto industry, as a comprehensive manufacturing industry, has the characteristics of a long industrial chain and a wide range of fields, mainly including production, use and recycling.

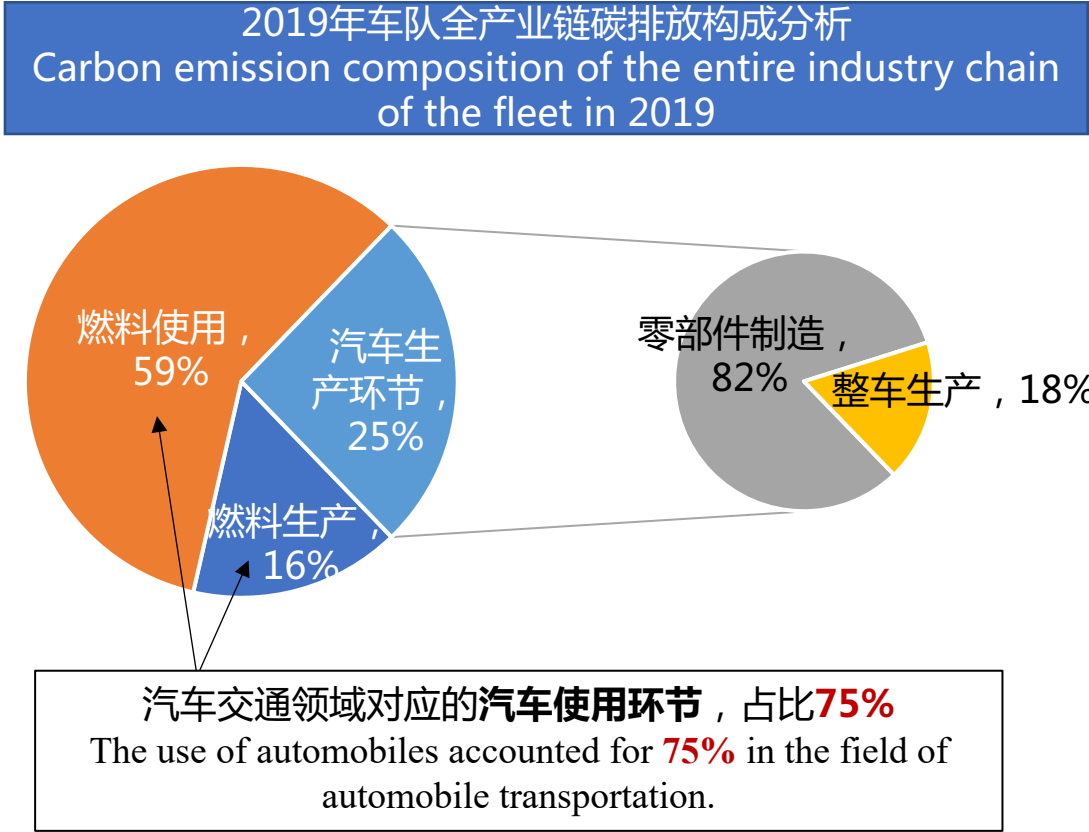


4. 使用环节是汽车产业实现碳中和目标的关键

4. The use process is the key to achieve '30·60' decarbonization goal in the auto industry

- 车队层面碳排放目前有多种统计口径，按照全产业链测算，2019年我国车队使用环节占据产业碳排放总量的75%，是实现汽车产业“双碳”目标的关键。
- There are various statistical caliber of carbon emissions at the fleet level. According to the calculation of the whole industry chain, in 2019, the use process of fleet in China accounted for 75% of the total industrial carbon emissions, which is the key to achieve '30·60' decarbonization goal in the auto industry.

| 车队层面碳排放国际上三种主要统计口径 Three major statistical calibers for fleet-level carbon emissions in the world | | | |
|--|--|---------------------------------|-------------------------------------|
| | 口径一 汽车运行使用 Car operation and use | 口径二 燃料周期 Fuel cycle | 口径三 全产业链 whole industry chain |
| 汽车生产环节 (当年度新生产汽车) Automoblile production process | | | <div>零部件制造</div> <div>整车制造</div> |
| 汽车使用环节 (当年度行业汽车保有量) Automoblile use process | <div>燃料使用</div> | <div>燃料生产</div> <div>燃料使用</div> | <div>燃料生产</div> <div>燃料使用</div> |

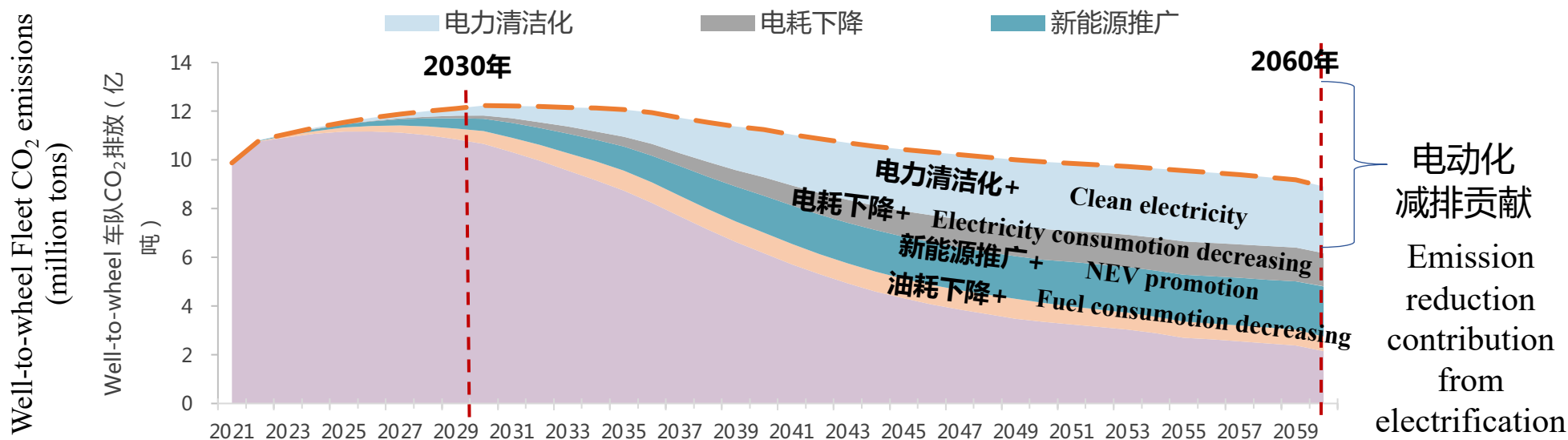


5. 使用环节碳减排：重点推进低碳产品发展，加速推实现电动化替代

5. Use process: promote the development of low-carbon products and accelerate electrification transformation

- 据测算，到2050年不同减排措施可实现减排约9.2亿吨，其中新能源推广、节能技术升级的碳减排贡献为66%。
- It is estimated that by 2050, 920 million tons of carbon emission will be reduced by different measures, of which 66% will be contributed by the promotion of NEVs and the upgrading of energy-saving technologies.
- 降低汽车使用环节碳排放，重点在于传统车节能水平提升，加快汽车产品电动化替代，实现汽车产业低碳发展。
- To reduce the carbon emission of automobile use process, the key is to improve the energy saving level of traditional vehicles and accelerate the electrification transformation.

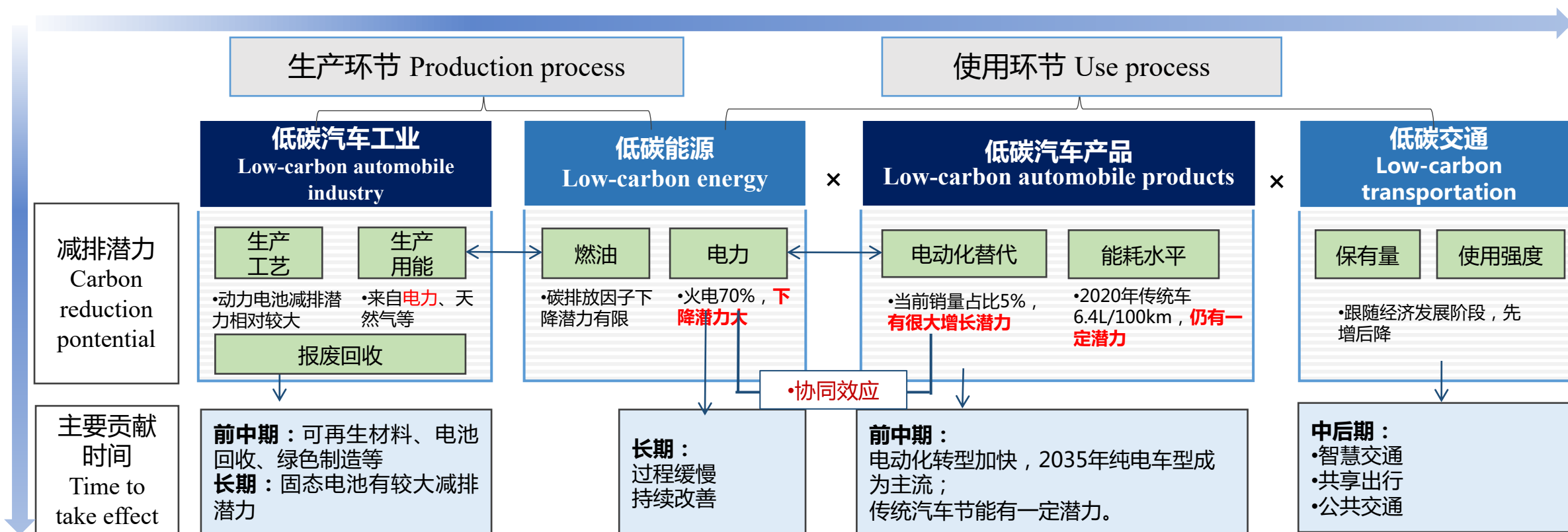
汽车使用环节减排潜力分解测算 Decomposition and calculation of emission reduction potential of automobile use



6. 汽车产业落实“双碳”目标路径与阶段性管理重点识别

6. Path and phased management focus of the auto industry to the realization of '30·60' decarbonization goal

- 坚持系统推进汽车产业碳减排观念，处理好发展和减排、整体和局部、短期和长期的关系。
- Adhere to the systematic promotion of carbon emission reduction in the auto industry, and handle the relationship between development and emission reduction, overall and partial, short-term and long-term.
- 前中期需做好电动化替代、降低能耗水平，长期需关注低碳能源发展、绿色低碳交通转型。
- In the early and mid-term, electrification and fuel consumption reduction is necessary. In the long term, attention needs to be paid to the development of low-carbon energy and green and low-carbon transportation.



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1. 汽车产业碳减排政策工具的比较与分析

1. Comparison and analysis of policy instruments for carbon emission reduction in auto industry

- 综合对比汽车产业三种碳管理机制，评估认为均具有一定的适用场景，现阶段评估通过行政性管理政策实现强制性约束，对于促进汽车产业低碳发展效果更为直接和显著。
- Compared with the three carbon policy instruments of the auto industry, it can be seen that all of them have certain applicable scenarios. At the present stage, implementing mandatory restrictions through administration has more direct and significant effects on promoting the low-carbon development of the auto industry.

| | (1) 碳交易市场 Carbon emission trading market | (2) 碳税和补贴机制 Carbon taxes and subsidies | (3) 限值标准和行政管理 Limit standards and administration |
|--|---|--|---|
| 管控变量 Control object | 碳排放总量 Total carbon emission | 碳排放成本 Carbon emission cost | 汽车能耗水平 Car fuel consumption level |
| 适用范围 Scope of application | 适用于汽车生产环节 Production process | 适用于汽车使用环节 Use process | 直接作用在产品端 Directly impact on the product side |
| 减排效果 Carbon reduction effect | 优，减排目标由政府通过发 放配额制定 Good. Emission reduction targets are set by the government by issuing quotas. | 中，非约束性政策，减排主 动权在于管控主体 Medium. It is a non-binding policy, and the initiative of emission reduction lies with the controlling body. | 优，直接实现汽车产品节能 水平提升，促进电动化转型 Good. It can directly improve the energy saving level of automobile products and promote the electrification transformation. |
| 我国汽车产业实践 现状 China's auto industry practice status quo | 前期实施地方试点，2021年 起建立全国碳市场（发电行 业先行） Local pilot projects will be implemented in the early stage, and a national carbon market will be established from 2021, and power generation industry will take the lead. | 目前我国尚无碳税政策立法 计划，预计出台周期5-10年 At present, there is no legislative plan for carbon tax policy in China, which is expected to take 5-10 years. | 2005年起实施，显著提升节 能水平，促进新能源车发展 Since 2005, it has significantly improved the level of energy saving and promoted the development of new energy vehicles |

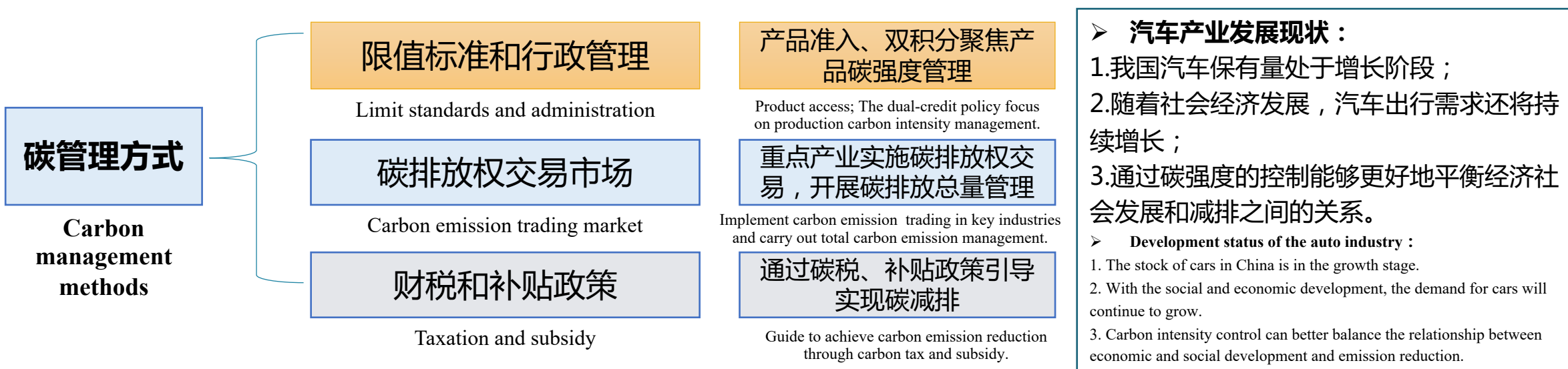
2. 汽车产业政策趋势：碳强度管理是前期政策重点

2. Auto industry policy trends: carbon intensity management is the focus of the early policy

- 汽车产业使用环节为碳减排管控重点，前期以基于汽车产品碳强度管控为主要政策导向，通过产品节能水平提升和电动化促进产业低碳发展。
- Focus on carbon emission reduction control in the use process of the auto industry. In the early stage, focusing on the control of product carbon intensity in the auto industry, the low-carbon development of the industry should be promoted through the improvement of energy-saving level and the electrification transformation.

“实施以碳强度控制为主、碳排放总量控制为辅的制度，支持有条件的地方和重点行业、重点企业率先达到碳排放峰值。”
——《“十四五”规划和2035年远景目标纲要》

“Implement a system that focuses on carbon intensity control, supplemented by total carbon emission control, and support places with the conditions to take the lead in reaching peak carbon emissions.” —— 14th Five-Year Plan and Long-Rang Objectives for 2035



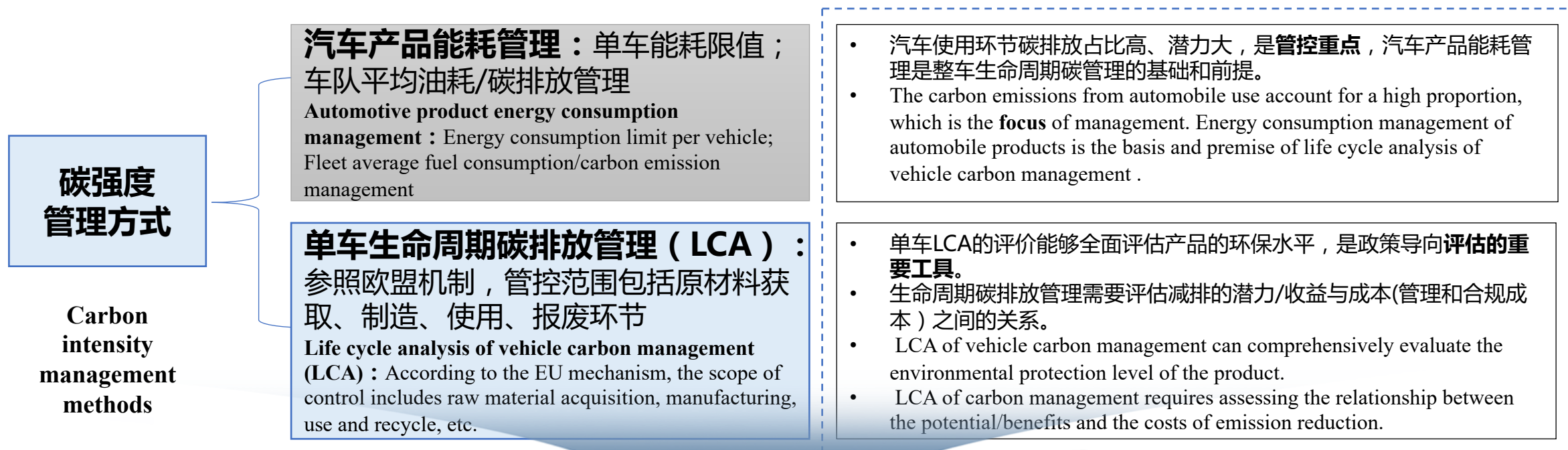
汽车行业前期以产品碳强度管控为主，通过产品节能水平提升和电动化替代推动产业低碳发展

In the early stage, focusing on the control of product carbon intensity in the auto industry, the low-carbon development of the industry should be promoted through the improvement of energy-saving level and the electrification transformation.

3. 碳强度管理中产品能耗管理与产品生命周期碳管理的关系

3. Relationship between energy consumption and life cycle analysis in product carbon intensity management

- 以汽车产品能耗管理为主要政策导向，单车生命周期碳排放作为政策导向和技术路线评估工具。
- Energy consumption management of automotive products is the main policy orientation, and carbon emission per vehicle is the technology route evaluation tool.



汽车产品能耗管理是整车生命周期碳管理的基础，二者之间不是替代的关系；从国际已有经验来看，对零部件碳足迹管理快于对整车全生命周期管理的评估。

Automotive product energy consumption management is the basis of LCA of vehicle carbon management, the relationship between them is not substitution. Referring to the international experience, the carbon footprint management of parts is faster than the evaluation of the whole vehicle life cycle management.

4. 前期已开展双积分与碳市场衔接的研究评估

4. Connection between the dual-credit policy and carbon market has been evaluated in the early stage

- 目前双积分政策与碳交易市场直接衔接还存在诸多障碍。
- 下一步，将继续从两种制度衔接的必要性和可行性两方面开展研究，以及其他可能的衔接方案。
- At present, there are still many obstacles in the connection between the dual-credit policy and the carbon emission trading market.
- Next , studies will continue on the necessity and feasibility of linking the two systems, as well as other possible linking schemes.

国际上尚未有汽车产品纳入碳市场的先例

There is no international precedent for automotive products being included in carbon

- **国际未有汽车产品纳入碳市场先例：**欧洲、美国、澳大利亚等国家碳市场起步早，发展较为成熟，但都没有纳入汽车产品端的碳排放。
- **出台标准法规进行强度管理是国际主流做法：**国际上欧美日等国家都采用强度管理的方式，促进汽车产品的节能减排。
- **Lack of precedent for automobile products to be included in the carbon market:** Europe, the United States and other countries did not include the carbon emissions of automobile products.
- **Standards and regulations for strength management is the international mainstream:** Europe, America and Japan have adopted the way of carbon strength management.

中国碳交易市场尚处于发展初期

China's carbon market is in its early stages of development

- **制度保障缺失：**碳条例尚未出台，相关规章制度和法律监管体系有待完善。
- **碳市场建设不成熟：**全国碳市场刚启动，仍处于初级阶段。
- **Lack of institutional guarantee:** Carbon regulations have not been issued, and relevant regulations and legal supervision system need to be improved.
- **Immature carbon market construction:** The national carbon market has just been launched and is still in its early stages.

4. 前期已开展双积分与碳市场衔接的研究评估

4. Connection between the dual-credit policy and carbon market has been evaluated in the early stage

双积分政策与碳交易市场衔接主要障碍 Obstacles in the connection between double points policy and carbon trading market

- 1、交易标的不同：**双积分-碳强度 (g/100km) , 碳市场-碳排放量(吨) ；
- 2、交易价格差异：**2019年积分交易均价1204元/分，碳价约20元/吨；
- 3、交易规模差异：**2019年NEV积分交易量为400万分左右，碳市场交易量3.95亿吨。

1. **Differences in trading objects:** double points - carbon intensity (g/100km), carbon market - carbon emissions (ton);

2. **Differences in transaction price:** in 2019, the average transaction price of credits is 1204 yuan/point, and the carbon price is about 20 yuan/ton;

3. **Differences in transaction scale:** In 2019, NEV credit trading volume was about 4 million, and carbon market trading volume was 395 million tons.

其他可能的衔接方案研究 Other possible linking schemes

进一步细化研究，探索基于新能源汽车使用环节碳减排奖励的一种碳交易机制。

- Further refine the research, and explore a carbon trading mechanism based on carbon emission reduction incentives for the use of new energy vehicles.



中 汽 数 据 有 限 公 司