China New Energy Vehicle Market and Policies

March 10, 2020
Webinar for MOVE
In 2018, China sold 1.16 million light-duty EVs, or 56% of the world total.
China’s EV share has doubled the global average and other major markets

- The global average EV share of new light-duty vehicle sales is around 2% (including all-electric and plug-in hybrids)
Policies in a snapshot

- **Macro planning and goals**
  - Five-year plans and industry strategic plans: 25% of new sales by 2025
  - Sectoral goals (e.g. for buses)
  - Provincial/local goals driven by air quality needs

- **National policies**
  - Central subsidy – 2009~2020
  - NEV mandate (dual credit) – For LDVs 2019-2020

- **Subnational policies**
  - Pilot EV cities
  - Innovative local measures

- **Charging infrastructure**
### Historical timeline of major policies and market

<table>
<thead>
<tr>
<th>Five-Year Plan</th>
<th>10th FYP</th>
<th>11th FYP</th>
<th>12th FYP</th>
<th>13th FYP</th>
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<tbody>
<tr>
<td>Number of Pilot cities</td>
<td>4</td>
<td>8</td>
<td>25</td>
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#### Electric Vehicle Market

- **2001-2002**: Small pilot projects under “863”
- **2003-2004**: Ten Year Thousand Vehicle Pilot
- **2005-2006**: Central and local subsidy programs
- **2007-2008**: World-class China IV standard for new cars
- **2009-2010**: World-class China IV standard for new trucks
- **2011-2012**: Made in China 2025
- **2013-2014**: Mid-to-long term auto industry plan
- **2015-2016**: Auto industry revitalization plan
- **2017-2018**: Energy-saving and NEV development plan
- **2019**: Auto pollution control plan

Key strategic plans:
- Energy-saving and NEV development plan
- Auto pollution control plan
- Made in China 2025
- Mid-to-long term auto industry plan
- Auto industry revitalization plan

Pilot programs:
- Small pilot projects under “863”
- Ten Year Thousand Vehicle Pilot

Subsidy programs:
- Central and local subsidy programs

General notes:
- Millions of sales
- Five-Year Plans:
  - 10th FYP
  - 11th FYP
  - 12th FYP
  - 13th FYP
- Key strategic plans
- Pilot programs
- Subsidy programs
- Regulations
Central Subsidy Policy
On March 26, 2019, China’s Ministry of Finance, Ministry of Industry and Information Technology (MIIT), Ministry of Science and Technology, and National Development and Reform Commission jointly released *A Notice of Further Adjusting Fiscal Subsidies for Promoting New Energy Vehicles* (hereafter “the Notice”).

A new energy vehicle (NEV) is a battery electric, plug-in hybrid, or fuel cell vehicle, and the Notice provides a detailed formula to determine the subsidy due to consumers who buy a new battery electric or plug-in hybrid vehicle in 2019. (Unlike prior adjustments, the Notice does not apply to fuel cell vehicles or new energy buses—those are left for future policy amendments.)

This is the 2019 annual adjustment to China’s decade-long central subsidy program for NEVs, which was introduced initially as the Ten Cities, Thousand Vehicles project in 2009. The historical evolution of this program is illustrated in Figure 1. The most recent major adjustment was detailed in ICCT’s policy update published in May 2017.

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**Figure 1. Timeline of China’s central subsidy program for new energy vehicles**

- **2009**: NEV pilot city subsidy program initiated
- **2010**: Expansion to include private NEVs
- **2011**: Extension to cover hybrid city buses
- **2012**: First phase-down of central subsidy 2014-2015
- **2013**: Extension of central subsidy to 2013-2015
- **2014**: Extension and second major phase down 2016-2020
- **2015**: 2017 annual adjustment with tightened qualification
- **2016**: 2018 annual adjustment with tightened qualification
- **2017**: 2019 annual adjustment with tightened qualification
- **2018**: 2019 annual adjustment with tightened qualification
Examples of changing subsidy overtime
### Design of central subsidy overtime (car)

#### VEHICLE TYPE | TECHNOLOGY | YEAR | DESIGN PARAMETERS
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**EF** = Energy Efficiency, measured in Wh/100-km for passenger cars, or Wh/km kg for buses, coaches, trucks and vocational vehicles

**ER** = Electric range, measured in km

**LH** = Length of vehicle

**BS** = Battery size, measured in kWh

**BD** = Battery energy density, measured in Wh/kg

**BM** = Battery mass as a percentage of vehicle curb mass, measured in %

**CS** = Charging speed of batteries

**SP** = Maximum vehicle speed

**FS** = Fuel saving compared with conventional vehicles

**RP** = Rated power

- **X** Threshold
- ■ Scaling factor
- ☒ Threshold and scaling factor
Driven by the requirement on battery energy density and electric range, the market share of high-density battery technologies NMC increased substantially.
EV Mandate Policy
China’s New Energy Vehicle mandate is integrated into its existing fuel economy standards, an excellent first step but in need to substantial improvement in the next iteration of the standards.

California forecasts only 8% EV penetration in 2025 due to credit multipliers which needs substantial enhancements to achieve a ~ 30% target by 2030.

Quebec’s policy is nearly identical to California’s but with fewer credits.
### Current compliance status

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<th>CAFC Credit 2018</th>
<th>NEV Credit 2018</th>
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Original data source: MIIT
Local Policies
Thirteen of top 25 global EV city markets are in China

- 42% of world’s passenger EV sales are in 25 cities
  - 13 of the top-25 global markets by EV market size are in China
  - The path to a mainstream market: Regulation, incentives, infrastructure, local actions

**Local policy catalog**

<table>
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<th>Country</th>
<th>Metropolitan area</th>
<th>Planned zero-emission area</th>
<th>Exemption from vehicle licensing restriction</th>
<th>Purchase Incentive</th>
<th>Charging station incentives</th>
<th>EV-ready building and parking codes</th>
<th>Priority road access</th>
<th>Parking benefits</th>
<th>Electric taxi promotion</th>
<th>Electric car-sharing</th>
<th>City fleet electrification goal</th>
<th>100% zero emission bus target</th>
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</table>

*×* = action by local government; *( ○ )* = action by state or national government; *( ☑ )* = action at multiple levels
Impact of local policies

Monetized Benefits (thousand CNY)

- Beijing
- Shanghai
- Shenzhen
- Tianjin
- Xi'an
- Hangzhou
- Chongqing
- Qingdao
- Wuhan
- Xiamen
- Zhuzhou
- Xiangtan
- Changsha
- Nanchang
- Taiyuan
- Ningbo
- Linyi
- Haikou
- Lanzhou
- Chengdu
- Nanjing
- Shijiazhuang
- Nantong
- Hefei
- Wuhan
- Yichun
- Zhengzhou

Market Share (%)

- Beijing
- Shanghai
- Shenzhen
- Guangzhou
- Tianjin
- Xi'an
- Hangzhou
- Chongqing
- Qingdao
- Wuhan
- Xiamen
- Zhuzhou
- Xiangtan
- Changsha
- Nanchang
- Taiyuan
- Ningbo
- Linyi
- Haikou
- Lanzhou
- Chengdu
- Nanjing
- Shijiazhuang
- Nantong
- Hefei
- Wuhan
- Yichun
- Zhengzhou

Monetized Benefits:
- Public Charging Offering
- Road Access Incentive
- Parking Fee Incentive
- Registration Incentive
- Usage Subsidy
- Purchase Subsidy
- Others

Private BEV market share

0.0%
1.0%
2.0%
3.0%
4.0%
5.0%
6.0%
7.0%
Charging Infrastructure
Top markets invest in charging infrastructure

- EV sales and their charging infrastructure ecosystem grow together
- Countries are developing—and adapting—their charging strategies by shifting from simply putting more chargers on the ground to better catering local consumer needs
In China, the macro plans set the EV target and lead the development of policies.

The decade-long subsidy program has largely driven the EV market.

The design of the subsidy program has profound impact on vehicle technologies and market, such as long-range, high battery density cars.

At the national level, China is transitioning from fiscal incentives to EV sales mandates. Enforcement is the key for a true credit market.

Cities adopted a wide range of innovative polices, such as vehicle registration, parking, road access incentives and government-private partnership in fleet programs.

Registration (license plate) incentive was found to have major impact on consumer market.

China invested heavily in charging infrastructure.
Thank you!

Questions?

More info
ICCT electric vehicle page:
http://theicct.org/electric-vehicles

ZEV Alliance:
http://www.zevalliance.org

Email: hui@theicct.org
Back up slides
Challenges
Market reliance on subsidy?

Monthly NEV sales 2016-2019

Original data source: MIIT
Local protectionism?

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Isolated market?

- China’s EV developments: Leading market and producer, but still relatively isolated
  - Other EV-producing countries are exporting EVs much more to other markets
  - China has an immense opportunity to expand EV shipments abroad
Design of central subsidy overtime (bus)

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EF= Energy Efficiency, measured in Wh/100-km for passenger cars, or Wh/km kg for buses, coaches, trucks and vocational vehicles
ER=electric range, measured in km
LH=Length of vehicle
BS=Battery size, measured in kWh
BD=Battery energy density, measured in Wh/kg
BM=Battery mass as a percentage of vehicle curb mass, measured in %
CS=Charging speed of batteries
SP=Maximum vehicle speed
FS=Fuel saving compared with conventional vehicles
RP=Rated power

X Threshold  ■ Scaling factor  ☒ Threshold and scaling factor
### Design of central subsidy overtime (truck)

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**Design Parameters**

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**Icons**

- X Threshold
- ■ Scaling factor
- ✔ Threshold and scaling factor

---

**Note:**
- BEV: Battery Electric Vehicle
- PHEV: Plug-in Hybrid Electric Vehicle
- FCV: Fuel Cell Vehicle

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**Source:**
The International Council on Clean Transportation (ICCT)