China's Electric Vehicles Technology Roadmap

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1. Research Objective and Contents

- This study aims to:
  - Analyze key factors affecting electric vehicle development;
  - Exploring China's future approach to EV development; and
  - Identifying EV objectives, expected scenarios, and clarifying policy needs.
- The study focused on three important factors :
  - battery technology advances;
  - charging facilities; and
  - Pricing relationship between EV and conventional ICE vehicles.
- This study has carried out in-depth investigations into future battery technology development, the deployment of charging facilities, and the price reduction potential of EV and battery prices.
- On this basis, the prospects for China's EV development roadmap and policy roadmap have been proposed.

2 Factor analysis on battery technological progress

Figure Indicative Trends for Performance of lithium batteries

	2006-2010	2011-2015	2016-2020	2021-2025	2026-2030
Fully charged capacity (kWh)	16	24	48	80	112
Battery cost (USD/kWh)	750	375	290	107	75
Battery cost (RMB 1,000/car)	80	60	60	57	56
Energy density (mass, Wh/kg)	125	150	300	500	700
Energy density (volume, Wh/L)	207	269	460	600	600
Total power (kW)	20	45	90	90	90
Battery life cycle (No. of charges)	1,000	1,500	3,500	6,000	6,000
Safety	-----	Standardised	Standardised	Standardised	Standardised

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3 Factor analysis on charging facilities

- Our study suggests that the ideal future charging stations in China should consider focus on the needs of future EV technological progress.
- In the near future, charging stations must meet short-distance driving charge. The charging system will most likely use conventional methods of charging.
- In the long-term, to meet long distance EV drivers, conventional charging facilities will be deployed widely; fast charging and battery swapping will start to complement.
- Finally, the three charging methods will be combined into an integrated EV charging system.

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4 Factor analysis on electric vehicles prices

- The study conducted a comparative analysis on the costs of pure EV and advanced gas vehicles across their whole life time.
- The result showed that fuel cost of both vehicles will decline. But it is expected that the fuel cost of EV will be reduced faster than fuel vehicles.
- However over the next ten years, the whole life-cycle cost of fuel of EV will remain higher than the cost of advanced gasoline fuel vehicles. This situation will change by 2020. It is expected that after 2020, EV will become more cost effective.

5 China's Electric Vehicles Development Scenario

- China's car market will experience remarkable change to 2030
  - Ordinary gasoline cars will use much less fuel
  - Current 61% of market share shall drop to 2%
  - EVs will make up 27% of market share
- According to China's EV development targets:
  By 2020, China EV sales share = 20% of the world EV market.
  By 2030 this will increase to 28%

Thanks！

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