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China's New-energy Vehicle Industry

FOURIN presents an up-to-the-minute survey on China's new-energy vehicle industry

■Size: A4, 200 pages ■Publication Date: Mar. 2011 ■Price: 120,000 JPY (free shipping but VAT for Japan orders)

Invaluable Intelligence and Data to Support Any Automotive Business in China

FOURIN's information gathering and research activity in China began in 1989. At that time China's annual vehicle production stood at only 580 thousand units. With more than 20 years of experience, FOURIN can provide in-depth reports on the Chinese automotive industry which you cannot find anywhere else.

While the world's attention flows towards China's automotive industry, where vehicle production and sales have become number one, the Chinese government has defined the new-energy vehicle industry as a national strategic industry, for which it looks to develop policies to foster the emerging sector ahead of other countries in order to acquire a leading hand in forming the next generation automotive industry.

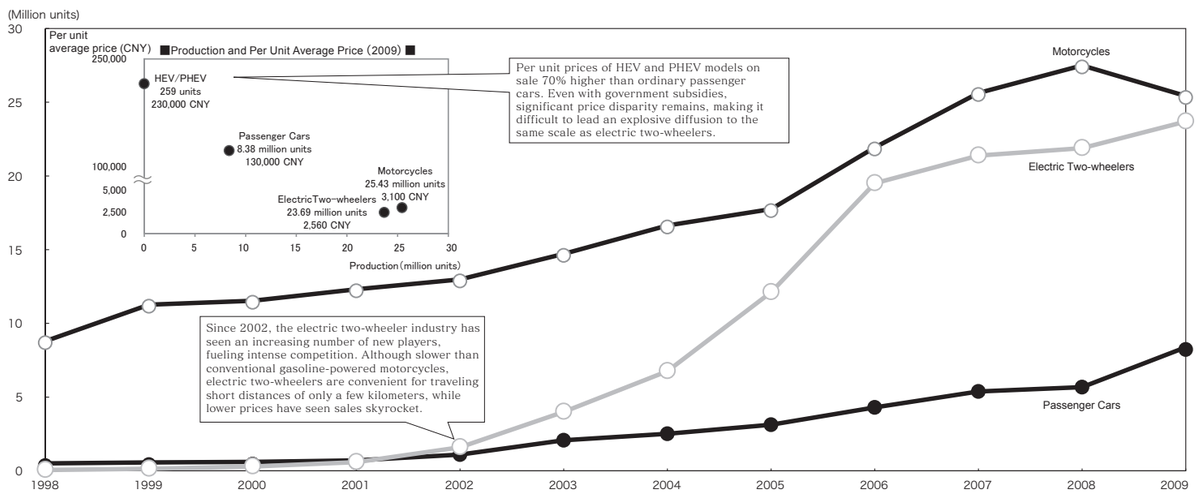
For reasons behind China's government intention, it is considered that there is less resistance for the dissemination of new-energy vehicles since China is in the initial stage of motorization and a 20 million-unit two-wheeler electric vehicle market is already forming. Moreover, besides the country has abundant rare metal reserves which are necessary for electric vehicles, the new-energy vehicle industry is expected to bring China a great opportunity to narrow the technology gap with automotive powerhouse countries while hybrid technology is reaching a good level of maturity.

As such, Chinese automakers aim to surpass foreign rivals by concentrating resources on electric vehicles which require relatively lower technology level. Still, for popularizing electric vehicles ahead of advanced countries, it is necessary to identify currently existing major technological obstacles. Chinese automakers and suppliers still lack refining technology for materials required for lithium-ion rechargeable batteries, core technology for separators which accounts for 20-30% of total battery cost and small drive-type motor technology to name a few.

Meanwhile, please note that the definition of the new-energy vehicle used in this publication refers to vehicles using alternative fuel technologies and electrification technologies and differs from that of the Chinese government in which only plug-in hybrid electric vehicles, electric vehicles and fuel-cell electric vehicles are included.

It is firmly believed that this publication will serve as an invaluable source of information to bring a further understanding concerning the Chinese government's policies and Chinese automakers' business strategies of the new-energy vehicle industry.

China: Potential Vehicle Electrification Shift Based on Diffusion of Electric Two-wheelers



Note: Per unit prices for electric two-wheelers and conventional motorcycles adopt average export prices in 2009. Passenger car, HEV and PHEV per unit prices are weighted average calculated using retail prices in 2009 based on passenger car production excluding utility vehicles. HEV and PHEV production uses volume of the Toyota Prius and BYD F3DM only.
(Compiled by FOURIN using data from CAAM and the China Bicycle Association)

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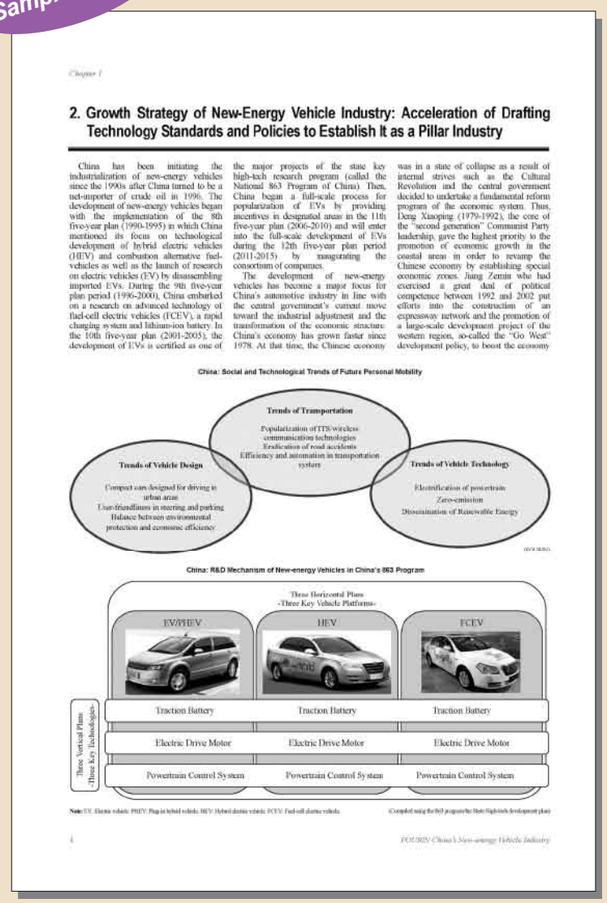
■Table of Contents of China's New-energy Vehicle Industry

Sample Pages



Chapter 1

2. Growth Strategy of New-Energy Vehicle Industry: Acceleration of Drafting Technology Standards and Policies to Establish It as a Pillar Industry

China has been initiating the industrialization of new-energy vehicles since the 1990s after China turned to be a net-importer of crude oil in 1996. The development of new-energy vehicles began with the implementation of the 8th five-year plan (1990-1995) in which China mentioned its focus on technological development of hybrid electric vehicles (HEV) and combustion alternative fuel-vehicles as well as the launch of research on electric vehicles (EV) by disassembling imported EVs. During the 9th five-year plan period (1996-2000), China embarked on a research on advanced technology of fuel-cell electric vehicles (FCEV), a rapid charging system and lithium-ion battery. In the 10th five-year plan (2001-2005), the development of EVs is certified as one of the major projects of the state key high-tech research program (called the National 863 Program of China). Then, China began a full-scale process for popularization of EVs by providing incentives in designated areas in the 11th five-year plan (2006-2010) and will enter into the full-scale development of EVs during the 12th five-year plan period (2011-2015) by inaugurating the consortium of companies.

The development of new-energy vehicles has become a major focus for China's automotive industry in line with the central government's current move toward the industrial adjustment and the transformation of the economic structure. China's economy has grown faster since 1978. At that time, the Chinese economy was in a state of collapse as a result of internal strives such as the Cultural Revolution and the central government decided to undertake a fundamental reform program of the economic system. Thus, Deng Xiaoping (1979-1992), the core of the "second generation" Communist Party leadership, gave the highest priority to the promotion of economic growth in the coastal areas in order to revamp the Chinese economy by establishing special economic zones. Jiang Zemin who had exercised a great deal of political competence between 1992 and 2002 put efforts into the construction of an expressway network and the promotion of a large-scale development project of the western region, so-called the "Go West" development policy, to boost the economy

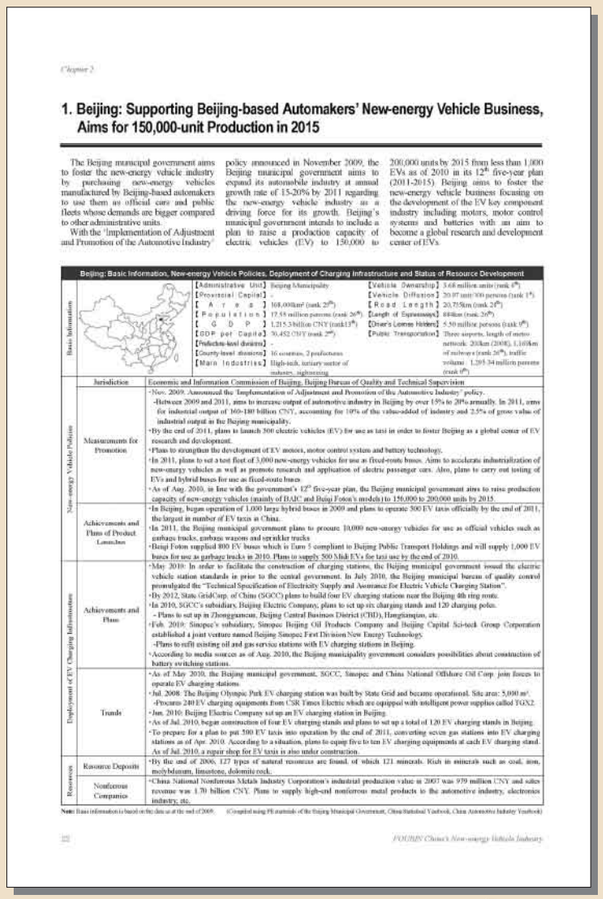
China: Social and Technological Trends of Future Personal Mobility

(GCV SHOU)

China: R&D Mechanism of New-energy Vehicles in China's 863 Program

Note: EV: Electric vehicle; PHEV: Plug-in hybrid vehicle; HEV: Hybrid electric vehicle; FCEV: Fuel-cell electric vehicle. (Compiled using the 863 program/the State High-tech Development plan)

(First page of report)



Chapter 2

1. Beijing: Supporting Beijing-based Automakers' New-energy Vehicle Business, Aims for 150,000-unit Production in 2015

The Beijing municipal government aims to foster the new-energy vehicle industry by purchasing new-energy vehicles manufactured by Beijing-based automakers to use them as official cars and public fleets whose demands are bigger compared to other administrative units.

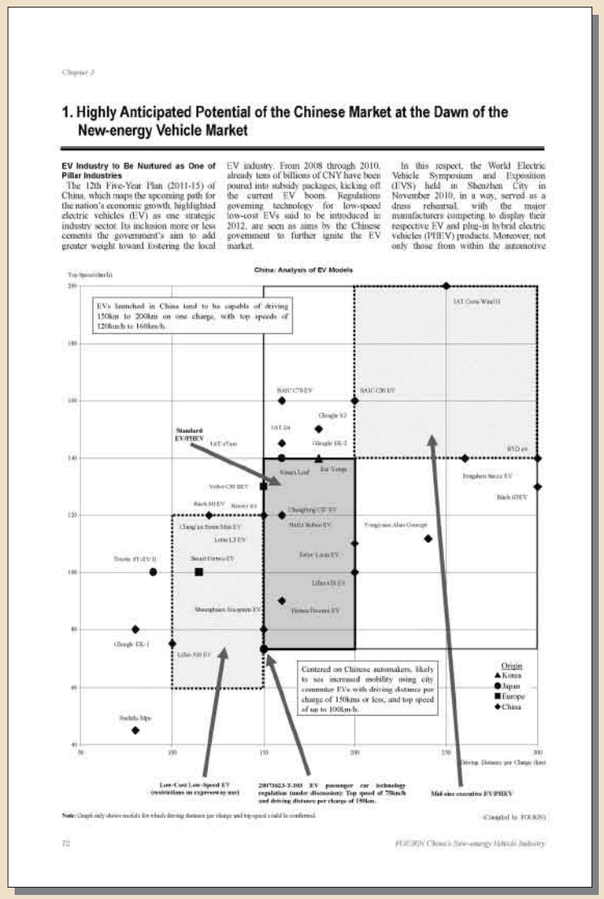
With the "Implementation of Adjustment and Promotion of the Automotive Industry" policy announced in November 2009, the Beijing municipal government aims to expand its automobile industry at annual growth rate of 15-20% by 2011 regarding the new-energy vehicle industry as a driving force for its growth. Beijing's municipal government intends to include a plan to raise a production capacity of electric vehicles (EV) to 150,000 to 200,000 units by 2015 from less than 1,000 EVs as of 2010 in its 12th five-year plan (2011-2015). Beijing aims to foster the new-energy vehicle business focusing on the development of the EV key component industry including motors, motor control systems and batteries with an aim to become a global research and development center of EVs.

Beijing: Basic Information, New-energy Vehicle Policies, Deployment of Charging Infrastructure and Status of Resource Development

Basic Information		【Administrative Unit】 Beijing Municipality 【Provincial Capital】 【Area】 168,000km² (rank 20th) 【Population】 17.55 million persons (rank 26th) 【GDP】 1,215.3 billion CNY (rank13th) 【GDP per Capital】 70,452 CNY (rank 2nd) 【Prefecture-level division】 【County-level division】 16 counties, 2 prefectures 【Main Industries】 High-tech, tertiary sector of industries, sightseeing	【Vehicle Ownership】 3.68 million units (rank 4th) 【Vehicle Diffusion】 20.87 units/100 persons (rank 1st) 【Road Length】 20,758km (rank 24th) 【Length of Expressways】 848km (rank 2nd) 【Driver's License Holders】 5.50 million persons (rank 6th) 【Public Transportation】 Three airports; length of metro-network: 200km (2008); 1,168km of railways (rank 26th); traffic volume: 1,295.34 million persons (rank 4th)
Non-energy Vehicle Policies	Jurisdiction	Economic and Information Commission of Beijing, Beijing Bureau of Quality and Technical Supervision	
	Measurements for Promotion	•Nov. 2009: Announced the "Implementation of Adjustment and Promotion of the Automotive Industry" policy. -Between 2009 and 2011, aims to increase output of automotive industry in Beijing by over 15% to 20% annually. In 2011, aims for industrial output of 360-380 billion CNY, accounting for 10% of the value-added of industry and 2.5% of gross value of industrial output in the Beijing municipality. •By the end of 2011, plans to launch 300 electric vehicles (EV) for use as taxi in order to foster Beijing as a global center of EV research and development. •Plans to strengthen the development of EV motors, motor control system and battery technology. •In 2011, plans to set a test fleet of 1,000 new-energy vehicles for use as fixed-route buses. Aims to accelerate industrialization of new-energy vehicles as well as promote research and application of electric passenger cars. Also, plans to carry out testing of EVs and hybrid buses for use as fixed-route buses. •As of Aug. 2010, in line with the government's 12th five-year plan, the Beijing municipal government aims to raise production capacity of new-energy vehicles (mainly of BJAC and Beiqi Foton's models) to 150,000 to 200,000 units by 2015.	
	Achievements and Plans of Product Launches	•In Beijing, began operation of 1,000 large hybrid buses in 2009 and plans to operate 300 EV taxis officially by the end of 2011, the largest in number of EV taxis in China. •In 2011, the Beijing municipal government plans to procure 10,000 new-energy vehicles for use as official vehicles such as garbage trucks, garbage wagons and sprinkler trucks. •Beiqi Foton supplied 800 EV buses which is Euro 5 compliant to Beijing Public Transport Holdings and will supply 1,000 EV buses for use as garbage trucks in 2010. Plans to supply 500 Ideal EVs for taxi use by the end of 2010.	
Deployment of EV Charging Infrastructures	Achievements and Plans	•May 2010: In order to facilitate the construction of charging stations, the Beijing municipal government issued the electric vehicle station standards in prior to the central government. In July 2010, the Beijing municipal bureau of quality control promulgated the "Technical Specification of Electricity Supply and Assurance for Electric Vehicle Charging Station". •By 2012, State Grid Corp. of China (SGCC) plans to build four EV charging stations near the Beijing 4th ring route. •In 2010, SGCC's subsidiary, Beijing Electric Company, plans to set up six charging stands and 120 charging poles. – Plans to set up in Zhongguancun, Beijing Central Business District (CBD), Hongtaimiqiao, etc.	
	Trends	•Feb. 2010: Sinopec's subsidiary, Sinopec Beijing Oil Products Company and Beijing Capital Sci-tech Group Corporation established a joint venture named Beijing Sinopec First Division New Energy Technology. -Plans to refit existing oil and gas service stations with EV charging stations in Beijing. •According to media sources as of Aug. 2010, the Beijing municipality government considers possibilities about construction of battery switching stations. •As of May 2010, the Beijing municipal government, SGCC, Sinopec and China National Offshore Oil Corp. join forces to operate EV charging stations. •Jul. 2008: The Beijing Olympic Park EV charging station was built by State Grid and became operational. Site area: 5,000 m². -Procures 240 EV charging equipments from CSR Times Electric which are equipped with intelligent power supplies called TGX2. •Jun. 2010: Beijing Electric Company set up an EV charging station in Beijing. •As of Jul. 2010, began construction of four EV charging stands and plans to set up a total of 120 EV charging stands in Beijing. •To prepare for a plan to put 300 EV taxis into operation by the end of 2011, converting seven gas stations into EV charging stations as of Apr. 2010. According to a situation, plans to equip five to ten EV charging equipments at each EV charging stand. As of Jul. 2010, a repair shop for EV taxis is also under construction.	
Resources	Resource Deposits	•By the end of 2006, 127 types of natural resources are found, of which 121 minerals. Rich in minerals such as coal, iron, molybdenum, limestone, dolomite rock.	
	Nonferrous Companies	•China National Nonferrous Metals Industry Corporation's industrial production value in 2007 was 979 million CNY and sales revenue was 1.70 billion CNY. Plans to supply high-end nonferrous metal products to the automotive industry, electronics industry, etc.	

Note: Basic information is based on the data as at the end of 2009. (Compiled using PE materials of the Beijing Municipal Government, China National Yearbook, China Automotive Industry Yearbook)

(First page of report)



Chapter 2

1. Highly Anticipated Potential of the Chinese Market at the Dawn of the New-energy Vehicle Market

EV Industry to Be Nutured as One of Pillar Industries

The 12th Five-Year Plan (2011-15) of China, which maps the upcoming path for the nation's economic growth, highlighted electric vehicles (EV) as one strategic industry sector. Its inclusion more or less cements the government's aim to add greater weight toward fostering the local EV industry. From 2008 through 2010, already tens of billions of CNY have been poured into subsidy packages, kicking off the current EV boom. Regulations governing technology for low-speed low-cost EVs said to be introduced in 2012, are seen as aims by the Chinese government to further ignite the EV market.

In this respect, the World Electric Vehicle Symposium and Exposition (EVS) held in Shenzhen City in November 2010, in a way, served as a dress rehearsal, with the major manufacturers competing to display their respective EV and plug-in hybrid electric vehicles (PHEV) products. Moreover, not only those from within the automotive

China: Analysis of EV Models

Note: Graph only shows models for which driving distance per charge and top speed could be confirmed. (Compiled by FOURIN)

(First page of report)

Chapter 2

5. Shanghai Waopai: Announced Nationally Uniform Price as Part of its Marketing Strategy and Launched the Fengjue Brand Electric Two-wheelers

Shanghai Waopai Electric Bicycles Co., Ltd. (hereinafter referred to as Shanghai Waopai) which was founded in 2004 locates its headquarters in Linhai, Zhejiang, and engages in production and sales of the Waopai brand electric two-wheelers (E2W). The company procures batteries from Linhai Tianpai Power Supply and other basic parts from Jiangxi Tianze Power Supply, Taizhou Huangyan Xindalu Painting and Molding Factory and Dasheng Vehicle Refit Factory. In July 2007, the company set up a Tianjin branch as a production and sales base of bicycle-type E2Ws which are marketed under the Fengjue brand. As of November 2010, Shanghai Waopai's annual production capacity is 1 million E2Ws.

In June 2010, Shanghai Waopai announced officially a unified price for 37 models across China. As of July 2010, the company's models are eligible for China's subsidy programs in rural areas in Yunnan, Shanxi, Henan, Hebei and Jiangsu.

In respect of product development, the company co-developed an E2W fitted with a five-phase motor based on in-house three-phase motor technology with the Chinese Electric Vehicle Research Institute in 2009 and launched it under the Fengjue brand.

Shanghai Waopai: Company Outline

<Company Outline>
•Name: Shanghai Waopai Electric Bicycles Co., Ltd.
•Registered Capital: 15 million CNY
•Established: 2004
•Location: Linhai, Zhejiang
•Employees: 1,800 persons (as of Nov. 2010)
•Site Area: 25,000m²
•Building Area: 15,000m²
•Products: Electric two-wheelers
•Annual Production Capacity: 1 million electric two-wheelers (as of Nov. 2010)
•Production Base: Taizhou (luxury models), Tianjin (bicycle-type models)
•Facilities: 12 automated production lines (as of Nov. 2010)
•Reference: Obtained ISO9000 certification and European CE mark approval.

<Company History>
•In 2004, established Shanghai Waopai Electric Bicycles Co., Ltd. and entered the electric two-wheeler sector.
•In 2004, focused on market development in southern areas.
•In 2005, entered the market in Wuhan (Hubei), Shandong and Henan.
•In 2005, introduced linear motor technology from Germany and applied it to in-house motors.
•In 2006, expanded market share in Jiangsu and Zhejiang.
•Jul. 2007: Set up Tianjin branch as a production and sales base of simplified electric bicycles.
•Apr. 2010: Certified as one of national top ten electric two-wheeler manufacturers by China National Light Industry Council.

<Sales System>
•As of Nov. 2010, set up a sales network covering 1,500 cities, counties and towns across China.

<Current Trends>
•Jun. 2009: Began construction of a plant in Linhai, Zhejiang.
-Total investment: 80 million CNY. Site area: 66,700m², Building area: 80,000m².
-Annual production capacity: 1 million electric two-wheelers. Planned to be operational in 2010. Expected to generate production output of 1.5 billion CNY.
•Jun. 2010: Announced unified price for 37 models.
-Price range: 1,860-3,980 CNY.
•As of Jul. 2010, selected as one of electric two-wheeler manufacturers which are eligible for incentive plans in Yunnan, Shanxi, Henan, Hebei and Jiangsu.

<Affiliate Company by Category>
•Battery: Linhai Tianpai Power Supply Co., Ltd.
•Battery Plate: Jiangxi Tianze Power Supply
•Mold Building: Taizhou Huangyan Xindalu Painting and Molding Factory
•Frame Paint: Dasheng Vehicle Refit Factory

<Outline of Tianjin Branch>
•Name: Tianjin Branch of Shanghai Waopai
•Established: Jul. 2007
•Registered Capital: 1 million CNY
•Products: Fengjue brand electric two-wheelers

<Current Trends at Tianjin Branch>
•In 2000, developed an electric two-wheeler with five-phase motor with the Chinese Electric Vehicle Research Institute based on the company's three-phase motor and launched it under the Fengjue brand.

(Compiled using PE materials of Shanghai Waopai)

Shanghai Waopai: List of Major Models

Code Name	TDR011Z	TDR012Z	YTDR2802	YTDR2802
Photo				
Model Name	Huayangxiaomiao	Fanin	V6	A8
Dimension	1,750×630×1,100(mm)	1,750×630×1,100(mm)	1,750×630×1,100(mm)	1,750×630×1,100(mm)
Top Speed	32 km/h	32 km/h	35km/h	35km/h
Cruising Range*	45-70km	45-70km	40-120km	40-120km
Max. Payload	75kg	75kg	75kg	75kg

*Cruising range differs according to battery capacity (Compiled using PE materials of Shanghai Waopai)

(First page of report)