



China New Energy Vehicle Power Electronics Industry Report, 2017-2020

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

China New Energy Vehicle Power Electronics Industry Report, 2017-2020 by ResearchInChina highlights the following:

- ◆Development status of new energy vehicle power electronics in China e.g. drive motor controller, DC/DC converter, on-board charger, including industrial chain, cost analysis, business model, competition pattern, competition of mainstream manufacturers, respective elaborations on passenger vehicle and commercial vehicle power electronics competition pattern as well as a detailed analysis on technical status and trends of automotive power electronics;
- ◆Analysis on 5 Chinese DC/DC and on-board charger enterprises, 22 Chinese motor controller enterprises, 8 global motor controller enterprises and 6 global IGBT enterprises, including corporate operation, development strategy, supply chain, new energy vehicle power electronics;
- ◆Overview of new energy vehicle power electronics, including definition, classification, upstream & downstream industry chain;
- ◆Operating environment for new energy vehicle power electronics, involving policy environment, the development of new energy vehicle market as well as its influence on new energy vehicle power electronics.

New energy vehicle electronic technology generally consists of battery management system (BMS), on-board charger, inverter, vehicle control unit (VCU)/hybrid control unit (HCU), pedestrian detection system, DC/DC, etc.. BMS, motor control inverter and VCU/HCU as core components of new energy vehicle must have very high security and reliability. New energy vehicle power electronics usually include AC/DC charger, DC-AC inverter and DC-DC; besides, there are motor controller for electric A/C compressor, PTC heater for electric A/C and others.

In the future, DC/DC converter and inverter will be integrated into new energy vehicle power controller, similar to VCU integration effect. However, the controller is generally placed in the nearest inverter unit to make software system shape a larger integration.

Motor controller price varies according to specifications and performance requirements. Currently, motor controller is generally priced at RMB20,000-30,000/set for big buses and RMB5,000-15,000/set for passenger vehicles. PHEV and HEV typically adopt the multi-motor architecture incorporating TM motor and ISG motor, and the corresponding motor controller costs higher.

Prices of DC-DC converter: (1) 2KW, RMB1,800-2,000/set; (2) 1.8KW, RMB1,500-1,700/set; (3) 1KW, RMB1,000/set.

Prices of on-board charger: (1) three-phase charger 10KW, RMB4,500-5,000/set; (2) single phase charger [EV] 6.6~7.2KW, RMB3,200-4,000/set; (3) single phase charger [PHEV] 3.3KW, RMB2,300-3,000/set.

As concerns the technology trends:

At present, EV motor controller mainly uses silica-based material oriented IGBT modules as before, but SiC-based WBG semiconductor devices have broken through limitations of silicon semiconductor devices in pressure-proof level, operating temperature, switching loss and switching speed, e.g. Nissan Leaf integrates motor, reducer and controller. This represents a trend towards standardized product from extremely small volume.

Functional integration is another aspect of system integration degree (SID). EV is possible to act as an energy storage element of new energy grid in the future, which requires the bi-directional association between vehicle and grid (V2G). And vehicle motor control inverter can also be used as charging/grid-feedback inverter for bi-directional connection between battery and grid, thus realizing integration of motor drive and two-way charger.

Two-way DC-DC converter has also been accepted by the market over last two years. It can achieve two-way energy transmission more easily, decrease the use of other electronic devices and economize the cost to some extent; plus advantages like small size and high efficiency, two-way DC-DC converter will find wider applications.

DC-DC Converter (On-board Charger) Companies and Their Customers

Company	Customer
TDK	Honda
Bosch	Audi, Volkswagen, SAIC, BAIC, etc.
Emerson	GM, Ford, SAIC, FAW
Valeo	Volkswagen, GM, SAIC, Dongfeng, FAW, BYD, Changan
Delphi	GM, FAW, Volkswagen, SAIC, Nissan, Chery
Infineon	BMW, Audi
SHINRY	BAIC, GAC, Dongfeng, JAC, Yutong, etc.
Tiecheng Information	King Long, Zotye, JAC, Shaanxi Tongjia Automobile, etc.
DEREN Electronics	PSA Peugeot Citroën, BMW, Dongfeng, etc.
ZG Power Supply	SAIC-GM-Wuling, Geely, Zotye, Lifan, Xindayang, GreenWheel, etc.
Hangzhou EV-Tech	Dongfeng, BAIC, SAIC, Zotye, Geely, King Long, etc.
TonHe Electronics Technologies	Foton, Yutong, Nanjing Golden Dragon Bus, Xiamen Golden Dragon Bus, Wanxiang Electric Vehicle, etc.

1 Overview of Automotive Power Electronics

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