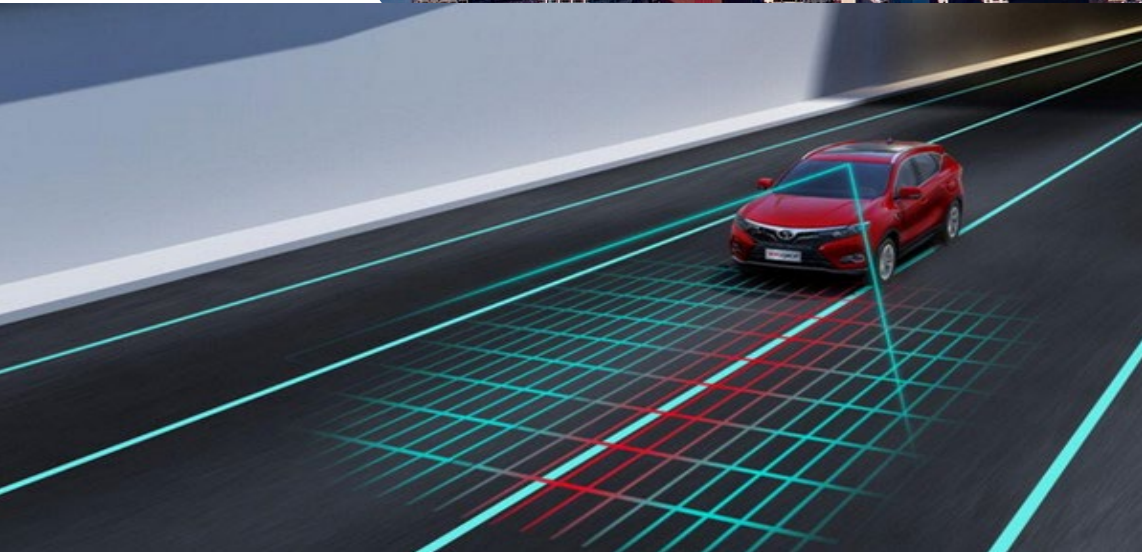




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Global and China Power Battery Management System (BMS) Industry Report, 2022-2026

Mar.2022

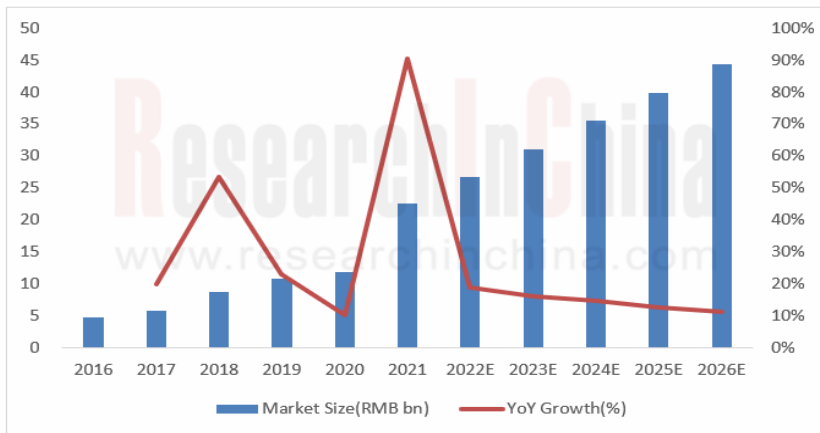
1. Robust demand from new energy vehicle spurs BMS market to boom

New energy vehicle sales have been growing rapidly worldwide over the recent years, reaching 6.5 million units with a year-on-year upsurge of 108% and with a penetration rate up to 8.1% in 2021. There exists vigorous demand for new energy vehicles whose sales would be even stronger if not for the "long-term shortage of auto parts" faced by OEMs.

As the global new energy vehicle market springs up, BMS for new energy vehicle takes a sizable market scale. In 2021, global NEV sales soared 108% year on year, which boosted the BMS market value to register \$11.5 billion and rise 56.5% on an annualized basis.

In 2021, China's NEV sales reported 3.521 million units as a percentage of 54.2% in global total, with a year-on-year spike of 157.6% and the market penetration of 13.4%. As the world's largest producer and consumer of new energy vehicles, China's demand for BMS has been climbing continuously. The Chinese new energy vehicle BMS market was estimated to be worth RMB22.51 billion in 2021, up 90.6% from a year earlier.

China's NEV BMS Market Size and YoY Change, 2016-2026E



Source: ResearchInChina

2. Competition pricks up and OEMs enjoy superiorities

The global new energy vehicle BMS market is tripartite: carmakers represented by Tesla and BYD; the battery manufacturers like CATL and LGC; and the third-party BMS providers such as Ningbo Preh Joyson Automotive Electronics and SINOEV Technologies.

Among them, Tesla and BYD, with handsome NEV sales, were the top two giants sweeping 14.4% and 9.1% of the global new energy vehicle BMS market in 2021 respectively, followed by Preh Joyson (8.8%). Battery vendors CATL and LGC were ranked fourth and fifth.

In the Chinese NEV BMS market, BYD, CATL and Tesla stay ahead of others; wherein, BYD (FinDreams Battery) overtook CATL in 2021 to become the No.1 (a 15.5% share) whose deliveries skyrocketed 253.3% year on year.

3. Preferential policies draw to an end, and the NEV BMS market will be impacted

In April 2020, the Ministry of Finance, the State Taxation Administration and the Ministry of Industry and Information Technology jointly issued the Announcement on Policies Relating to the Exemption of New Energy Vehicles from Vehicle Purchase Tax, proposing that from January 1, 2021 to December 31, 2022, it will be exempt from purchase tax to buy NEVs.

The NEV subsidy policy will end on December 31, 2022, and vehicles licensed after December 31 will no longer be subsidized, according to the latest new energy vehicle purchase subsidy policy issued jointly by four ministries on December 31, 2021.

Starting from 2023, the new energy vehicle purchase tax exemption and NEV purchase subsidies in China will be terminated concurrently, which will affect the NEV sales to a certain extent, thus inflicting the demand for BMS.

4. New energy vehicle BMS is evolving towards 'wireless, integrated and cloud-based'

(1) Wireless

Wireless BMS has the merits of low power consumption, reduced in-package wiring harness, simplified structure, flexible deployment, etc., enabling lower assembly costs and weight reduction to agree with the lightweight trend of NEV. To date, ADI (Linear Technology), Texas Instruments, Visteon, NXP, etc. have forayed into wireless BMS.

Wireless BMS Products Parameters of Major Vendors

Name	Communication Frequency	Typical Hardware	Network Protocols	Security Level	Examples
ADI	2.4GHz	LTC6811+LTC5800	SmartMesh (Compliant with Wireless HART (IEC 62591) standard)	ASIL D ISO/SAE 21434	BMW i3 Lotus Cars Visteon
NXP	2.4GHz	BMU: MPC5744P/S32K3XX+ KW38/KW45 CMU: MC3377x+KW3x	BLE	ASIL D	Volkswagen
TI	2.4GHz	BQ79616+CC2662	TI WBMS protocol	ASIL D	

Source: ResearchInChina

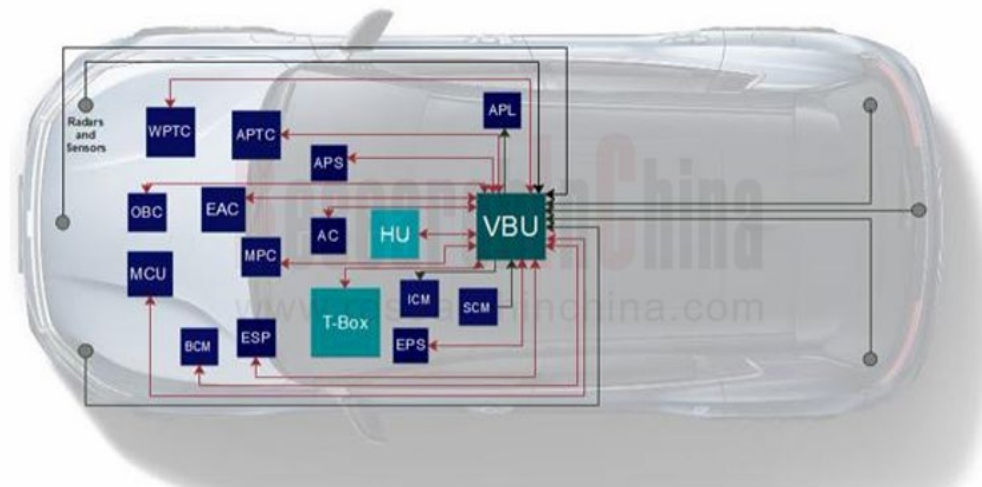
4. New energy vehicle BMS is evolving towards 'wireless, integrated and cloud-based'

(2) Integrated

With a universe of data brought by intelligent connectivity, the automotive electronic and electrical architecture (EEA) has also been upgraded, with the domain controller highly integrating all features of the split BMS, VCU and MCU into one, for centralized control and management to form a true one "system".

In June 2020, ENOVATE's self-developed and world's first power domain controller -- Vehicle Battery Unit (VBU) was successfully produced, integrating the key technologies of Vehicle Controller Unit (VCU) and Battery Management System (BMS), managing the 'motor, battery, electric control' system in a more efficient and accurate manner, while facilitating platform scalability and rapid iteration.

ENOVATE VBU



Source: ENOVATE

4. New energy vehicle BMS is evolving towards 'wireless, integrated and cloud-based'

(3) Cloud-based

The cloud-based BMS connects the BMS on electric vehicle to the cloud, enabling the whole life cycle of battery data to be "uploaded to the cloud" and the data collected to be evaluated with machine learning algorithms over the cloud to deliver better battery management strategies and battery failure warning functions.

In 2021, Huawei unveiled the pioneering AI BMS solution to address battery safety issue by a fusion of high-precision BMS chips with cloud-based AI technology. A number of automakers have cooperated with Huawei commercially and in depth, and Huawei's AI BMS cloud platform system has accessed to data of over 100,000 NEVs, successfully warning 10-plus cases of battery thermal runaway failures and enabling early treatment of some high-risk vehicles.

The report highlights the following:

- Policies about BMS, including NEV industry policy, BMS standards;
- Global and China new energy vehicle industry;
- Global and China BMS industry (status quo, market size, competition, development 20120114.giftrend, etc.);
- 14 global and 18 Chinese BMS vendors (operation, BMS business, etc.);
- 3 global BMS chip vendors (operation, BMS chip solutions, etc.)

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Beijing Headquarters

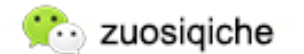
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