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Commercial Vehicle Intelligent Chassis Industry Report, 2022

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AD heavy truck solution providers successively enter the actual operation and pre-installed mass production stage

Commercial vehicle industry is characterized by large output value, long industry chain, high relevance, high technical requirements, wide employment and large consumer pull, and is a barometer of national economic development. China is currently the world's largest single market for commercial vehicle sales, contributing nearly half of global sales each year. In 2022, Scania held the launching ceremony for the construction of the manufacturing base in Rugao, Jiangsu Province, and the launch of heavy truck joint venture between Daimler Benz and BAIC Foton, opening a new prelude to the industry.

With the technological revolution of "electrification and intelligence" of automobiles, commercial vehicle chassis also ushered in the technological change from conventional chassis, electric chassis to intelligent chassis. The future development of intelligent chassis technology, the construction of the industry chain and the layout of the supply chain will have a profound impact on the development trend of commercial vehicles.

As an important intersection of electrification and intelligence, the intelligent chassis has been highly valued by automotive industry and strongly sought after by capital in recent years, with a large number of companies entering and laying out a strong position to carry out related core technology.

Conventional Chassis

Electric Chassis

Intelligent Chassis

Trend of intelligent chassis for commercial vehicles

The intelligent chassis for commercial vehicles is moving in step with "electrification, intelligence, software and sharing" and is showing the following trends:

- **Trend 1: Technological changes and business model changes to support the sharing of intelligent chassis for commercial vehicles**
- **Trend 2: More and more start-ups focus on commercial vehicle chassis industry**
- **Trend 3: Intelligent chassis design for commercial vehicles is gradually becoming passenger car-oriented**
- **Trend 4: Intelligent chassis for commercial vehicles enables diversified fuel platforms**
- **Trend 5: Goals and technical paths for development of intelligent chassis**

Trend 1: Technological changes and business model changes to support the sharing of intelligent chassis for commercial vehicles

The efficient operation of logistics needs to be based on specialization of commercial vehicles, but the challenge of generalization in turn limits the ability to apply vehicles across industries, or will have an impact on vehicle utilization. The contradiction between specialization and versatility can be balanced in the future by the intelligent chassis installation and the separation of chassis, and the design of scenario-based installations and chassis standardization. Scenario-based installation, which can meet the professional requirements of each scenario in a differentiated way and maximize the use efficiency in the scenario; Chassis standardization meets the requirements of mass production for product standardization, thereby reducing production costs. The development of new energy and autonomous driving technology will accelerate the landing of standard chassis and provide technical support for the sharing development of commercial vehicle chassis.

The skateboard chassis highly concerned by the industry is expected to be implemented firstly in commercial vehicle field. The **"wire-controlled technology, cell to chassis (CTC), casting of large chassis parts, corner module, battery replacement"** promoted by the intelligent chassis of passenger cars or various application scenarios of commercial vehicles have been realized one by one.

Trend 2: More and more start-ups focus on commercial vehicle chassis industry

Several domestic and foreign companies have already entered the commercial vehicle intelligent chassis track, including Gaussin, which has set up its headquarters in China to bring its latest pure electric and hydrogen truck technologies and products to the Chinese market in the form of a next-generation Skateboard Truck Platform.

Super Panther is the first technology company in China to focus on intelligent chassis for new energy commercial vehicles. It is different from the "skateboard chassis" technology company for passenger cars, and will combine the ecological needs of logistics by creating a new chassis system to help transform the logistics industry in the new energy trend.

	Founded	Product (Feature)	Typical Customer
Super Panther	2022	The Super Panther chassis reduces vehicle development costs by 50%, shortens vehicle development cycles by 50%, and improves conversion efficiency by over 30%.	JAC Heavy Truck, Anfeng Iron & Steel, etc.
Jingwei Hirain	2003	Jingwei Hirain's new generation port HAV heavy-duty chassis	Rizhao Port Project, etc.
Kunlang Technology	2021	KL4250EV autonomous tractor, KL1180EV autonomous cargo platform, KL4180EV autonomous cargo platform	Shandong Transportation and Logistics Association, Shandong Port Logistics Group, etc.
Windrose	2022	Windrose has completed the first version of soft-mode static engineering prototype at the end of August 2022 and dynamic engineering prototype at the end of the year, with summer calibration and winter calibration in 2023 and mass production in Q4 2024.	Chinese and American customers
Beijing Yuhui Technology	2021	EH-T8/EH-T60 two kinds of commercial vehicle skateboard chassis and cloud control system	Overseas ports, Smart ports
Xiangrong Tsintergy	2021	A "new skateboard chassis hydrogen intelligent commercial vehicle" is planned to be launched at the end of 2022. The vehicle adopts an efficient and compact distributed drive with a universal wire-controlled skateboard chassis technology with L3 intelligent control mode, and can combine various energy modes such as gas ammonia, liquid ammonia and pure electricity.	BAIC, GAC, Changan
WESTWELL	2015	Qomolo ONE, a cross-scenario autonomous heavy-duty mobility platform, and Q-Truck, a full-time autonomous mass-production commercial vehicle, will save approximately RMB100,000 per year in energy costs and vehicle maintenance fees for a single Q-Truck.	Cenntro Electric, etc.
USTC Sinovate Software	2000	USTC Sinovate Software "Little Star" intelligent wire-controlled flatbed truck, can be used in various autonomous commercial vehicles, with a maximum load of 500kg.	--
DeepWay	2020	Its first vehicle, the DeepWay Xingchen, uses a battery system with an increased energy density of 130Wh/kg and will be in open road trial operation in December 2022 and mass production will begin in June 2023.	--

Trend 3: Intelligent chassis design for commercial vehicles is gradually becoming passenger car-oriented

The commercial vehicle chassis needs to be deeply integrated with intelligent cockpit, autonomous driving and powertrain in order to become a true intelligent chassis, which can actively control, adaptive and self-learning and can be OTA upgraded according to the user preferences to decide the character of the vehicle.

Jiefang Cabin-less Chassis for Port Use

Yutong Wheel-side Motor Chassis

Trend 4: Intelligent chassis for commercial vehicles enables diversified fuel platforms

Daimler Benz GenH2 liquid hydrogen heavy truck chassis comes with two tanks for storing liquid hydrogen, each holding around 40kg of liquid hydrogen, and is matched with two 150kW fuel cell systems. The intensive test scenarios for Mercedes-Benz hydrogen fuel cell prototype are said to include internal test lanes and public roads, with the development goal of achieving a range of over 1,000km and being able to cope with flexible and demanding road conditions in heavy long-distance transport. Daimler Trucks plans to have hydrogen fuel cell trucks join the production model line-up in the next 5-10 years as well.

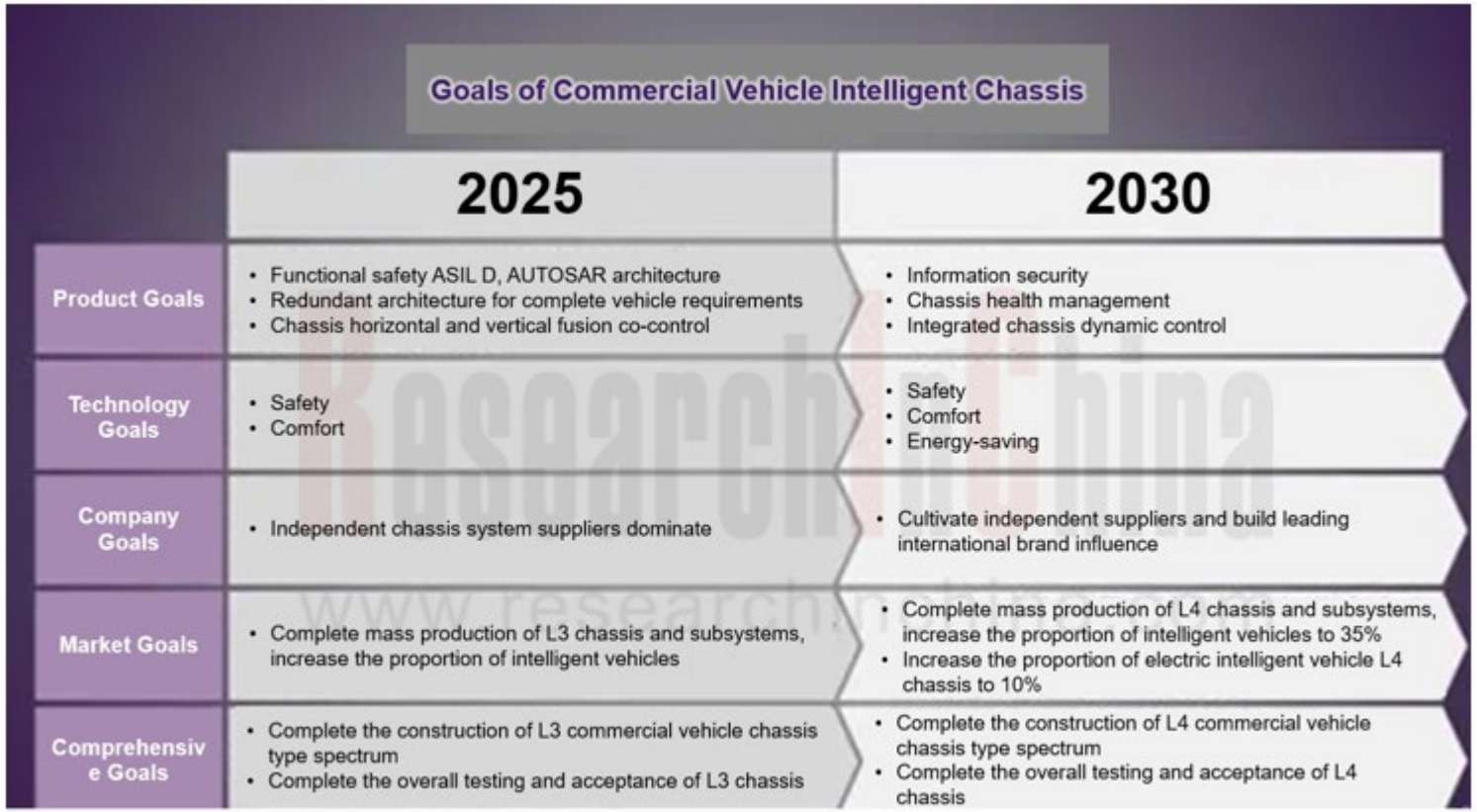
Daimler Benz GenH2 liquid hydrogen heavy truck

Due to the impact of technology and cost, trunk logistics vehicles are the short board of new energy development. How can we use mature technology and lower costs to help trunk logistics achieve low-carbon green transport? Geely's new energy commercial vehicles have undergone 17 years of R&D and have released a multi-motor central drive power chain and a new energy green methanol powered solution - the remote G2M methanol tractor.

Geely remote G2M methanol tractor, over 1000km range

Trend 5: Goals and technical paths for development of intelligent chassis

According to the "Intelligent Chassis Technology Roadmap" published by the Electric Vehicle Alliance Wire-Controlled Working Group in 2021, the goals for the development of intelligent chassis for commercial vehicles are shown in the following diagram:



Source: "Intelligent Chassis Technology Roadmap"

Goals in 2025 & 2030

Goals in 2025: The intelligent chassis equipped with independent brands of braking-by-wire and steering -by-wire will be applied in batches in influential enterprises in the industry; The key technical indicators of the intelligent chassis have reached the international advanced level; The industrial chain of key components is independent and controllable.

Goals in 2030: The initial formation of the brand effect of independent intelligent chassis and wire-controlled actuation of the automakers and parts enterprises; intelligent chassis in general to reach the international advanced level, key technical indicators to reach the international leading level; intelligent chassis to form a complete independent controllable industrial chain; cultivate internationally competitive enterprises.

The key technology path for the intelligent chassis of commercial vehicles is: to cope with the demand of L3 autonomous driving, the chassis realizes subsystem redundancy, adopts distributed control structure, independent longitudinal and horizontal active control, and system health alarm; to cope with the demand of L4 autonomous driving, the chassis domain control realizes minimal backup of autonomous driving and collaborative longitudinal and horizontal control; to cope with the demand of L5 autonomous driving, the chassis domain control realizes full functional backup of autonomous driving and integrated longitudinal and horizontal collaborative control.

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