GLOBAL EV HOME CHARGING SOLUTION MARKET AND SMART EV CHARGING-BASED HOME ENERGY MANAGEMENT MARKET

INDEPENDENT MARKET STUDY

Confidential for

Shanghai Zhida Technology Development Co., Ltd.

Frost & Sullivan

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For and on behalf of
Frost & Sullivan (Beijing) Inc., Shanghai Branch Co.

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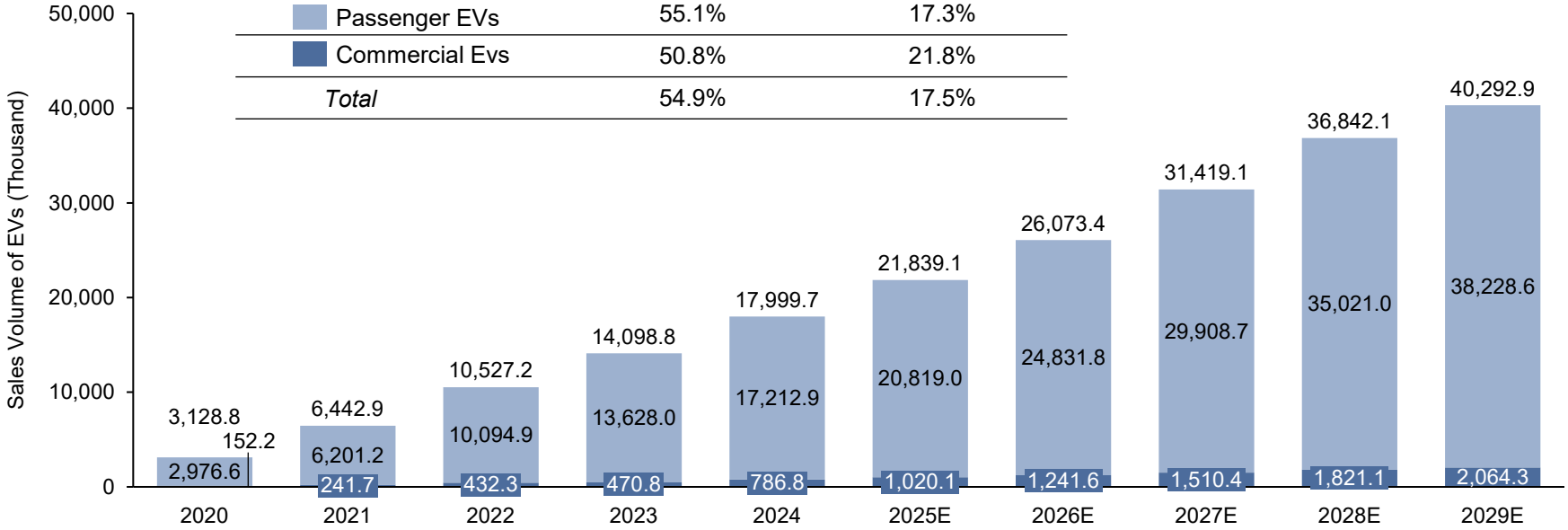
Content

Overview of Global EV Industry

Global Sales Volume of EVs by Types

Sales Volume of EVs by Type (Global), 2020 – 2029E

Sales Volume	CAGR (2020-2024)	CAGR (2024-2029E)
Passenger EVs	55.1%	17.3%
Commercial Evs	50.8%	21.8%
Total	54.9%	17.5%



- Electric vehicles (EVs) refer to vehicles that use electricity as their primary fuel. By different functions, electric vehicles can be divided into passenger vehicles and commercial vehicles. The global EV industry is undergoing rapid evolution, emerging as a pivotal force in driving the transformation of the automotive sector and reshaping the energy landscape. Propelled by the convergence of carbon neutrality goals, energy security imperatives, and the growing demand for intelligent mobility, EVs have transitioned from early-stage policy-driven adoption to a critical phase of market-oriented and large-scale development. Major automotive markets worldwide are accelerating their electrification strategies, fostering collaborative innovation across the entire value chain, which includes the breakthroughs in battery technology, the enhancement of charging and swapping infrastructure, and the advancements in vehicle intelligence.
- From 2020 to 2024, the global sales volume of EVs increased from approximately 3.1 million to 18.0 million, representing a CAGR of 54.9%. During the same period, the sales volume of passenger EVs and commercial EVs grew at a CAGR of 55.1% and 50.8%, respectively. By 2029, the global sales volume of EVs is anticipated to increase to approximately 40.3 million, growing at a CAGR of 17.5% from 2024 to 2029. From 2024 to 2029, the sales volume of passenger EVs and commercial EVs is expected to grow at a CAGR of 17.3% and 21.8%, respectively.

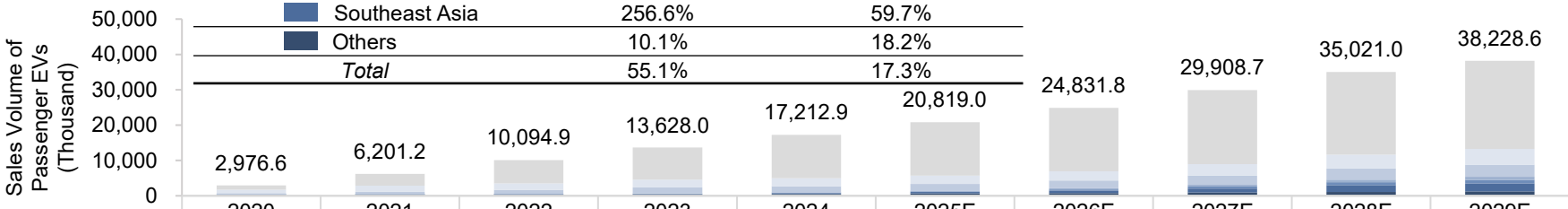
Source: Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Overview of Global EV Industry

Global Sales Volume of Passenger EVs by Region

Sales Volume of Passenger EVs by Region (Global), 2020 – 2029E

Sales Volume of Passenger EVs	*CAGR (2020-2024)*	*CAGR (2024-2029E)*
China	77.1%	15.3%
Europe	22.0%	14.9%
North America	48.3%	14.8%
South America	99.3%	46.3%
Middle East	93.9%	45.7%
Southeast Asia	256.6%	59.7%
Others	10.1%	18.2%
Total	55.1%	17.3%



	2020	2021	2022	2023	2024	2025E	2026E	2027E	2028E	2029E
Total	2,976.6	6,201.2	10,094.9	13,628.0	17,212.9	20,819.0	24,831.8	29,908.7	35,021.0	38,228.6
China	1,245.7	3,334.0	6,549.0	9,047.6	12,259.4	15,115.9	17,912.3	20,957.4	23,367.5	25,003.2
Europe	1,004.6	1,674.3	1,892.7	2,230.2	2,223.5	2,336.9	2,584.6	3,230.8	3,957.7	4,460.3
North America	353.6	733.5	1,127.8	1,646.6	1,712.5	1,897.5	2,206.8	2,617.3	3,143.4	3,410.6
South America	8.1	26.9	40.2	77.3	127.8	205.5	321.2	492.4	742.5	856.1
Middle East	10.2	27.1	49.2	89.7	144.1	226.5	350.4	536.5	812.8	946.9
Southeast Asia	1.4	5.6	37.1	115.8	226.3	407.8	704.3	1,186.0	1,956.9	2,354.2
Others	353.0	399.8	398.9	420.8	519.3	628.9	752.2	888.3	1,040.2	1,197.3

- Owing to the de-carbonization goals of the global automobile industry, the improvement of EV technologies, and the development of EV home charging infrastructure, the global EV market has been experiencing rapid development. From 2020 to 2024, the global sales volume of passenger EVs increased from approximately 3.0 million to 17.2 million, representing a CAGR of 55.1%. During the same period, the sales volume of passenger EVs in China, Europe, North America, South America, Middle East and Southeast Asia grew at a CAGR of 77.1%, 22.0%, 48.3%, 99.3%, 93.9% and 256.6%, respectively.
- By the end of 2029, the global sales volume of passenger EVs is anticipated to increase to approximately 38.2 million, representing a CAGR of 17.3% from 2024 to 2029. From 2024 to 2029, the sales volume of passenger EVs in China, Europe, North America, South America, Middle East and Southeast Asia is expected to grow at a CAGR of 15.3%, 14.9%, 14.8%, 46.3%, 45.7% and 59.7%, respectively.

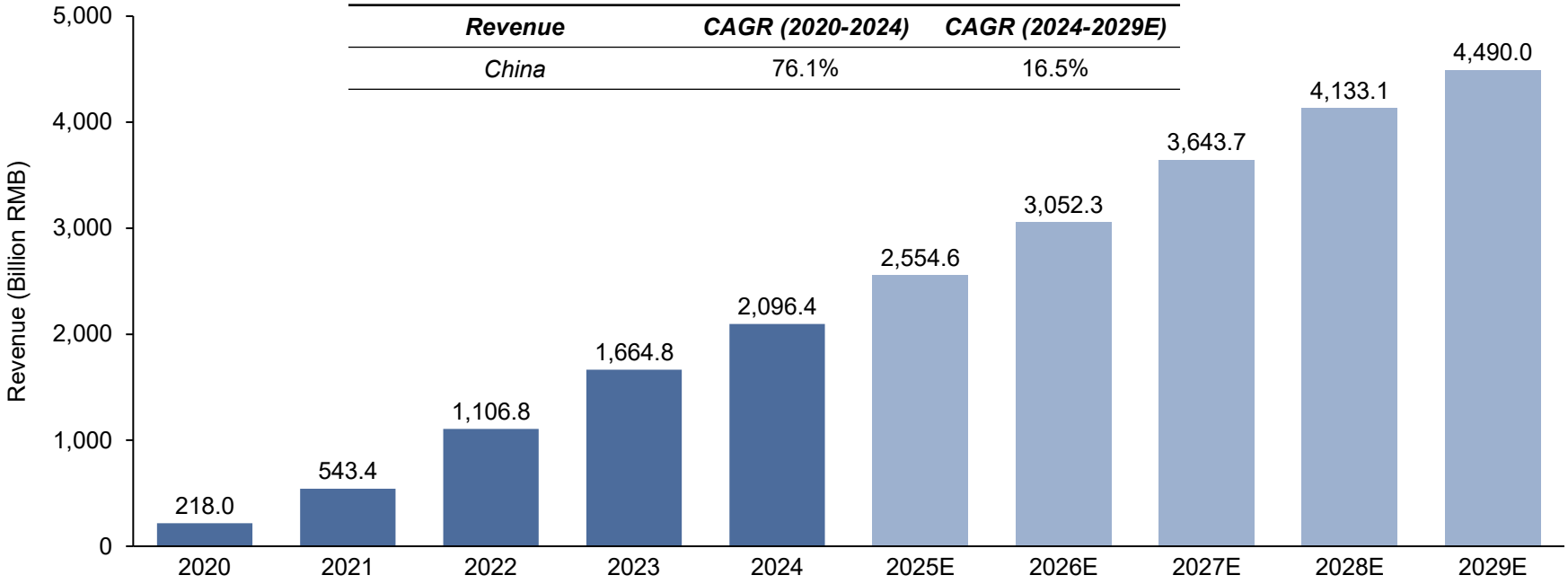
Source: International Energy Agency; China Association of Automobile Manufacturers; China Passenger Cars Association; Frost & Sullivan Analysis

Overview of Global EV Industry

Sales Revenue of Passenger EVs in China

Revenue of Passenger EVs (China), 2020 – 2029E

Revenue	*CAGR (2020-2024)*	*CAGR (2024-2029E)*
China	76.1%	16.5%



- The global market size of passenger EVs in terms of revenue increased from RMB568.1 billion in 2020 to RMB3,102.1 billion in 2024, with a CAGR of 52.9%. By 2029, the global market size of passenger EVs in terms of revenue is expected to reach RMB7,401.3 billion, growing at a CAGR of 19.0% from 2024 to 2029. The global average price of passenger EVs has experienced a decrease from RMB190.9 thousand per unit in 2020 to RMB180.2 thousand per unit in 2024, with a CAGR of -1.4%. With the improvement in the intelligence and performances of passenger EVs, the global average price of passenger EVs is expected to rebound and reach RMB193.6 thousand per unit by 2029, growing at a CAGR of 1.4% from 2024 to 2029.
- The market size of passenger EVs in China in terms of revenue increased from RMB218.0 billion in 2020 to RMB2,096.4 billion in 2024, with a CAGR of 76.1%. From 2022 to 2024, the market size of passenger EVs in China in terms of revenue grew at a CAGR of 37.6%. By 2029, the market size of passenger EVs in China in terms of revenue is expected to reach RMB4,490.0 billion, growing at a CAGR of 16.5% from 2024 to 2029. The average price of passenger EVs in China amounted to RMB169.0 thousand per unit, RMB184.0 thousand per unit and RMB171.0 thousand per unit in 2022, 2023 and 2024, respectively. The average price of passenger EVs in China experienced a slight increase from 2022 to 2024, with a CAGR of 0.6%.

Source: China Association of Automobile Manufacturers; China Passenger Cars Association; Frost & Sullivan Analysis

Recent Development of Global EV Industry

- Since the beginning of 2025, the global sales volume of passenger EVs has continued to grow at a robust pace. In the five months ended May 31, 2025, the global sales volume of passenger EVs reached 7.7 million, representing a year-on-year growth of 32.1%. In the Chinese market, spurred by government subsidies under the national ultra-long-term bond program aimed at encouraging vehicle replacement, passenger EV sales have maintained high growth momentum. In the five months ended May 31, 2025, the sales volume of passenger EVs in China reached 5.2 million, representing a year-on-year growth of 41.1%. In North America, the EV market experienced a slowdown in growth due to the discontinuation of government subsidies in the United States. As a result, the sales volume of passenger EVs in North America reach 0.7 million during the same period, reflecting a modest 3.8% year-on-year growth. In Europe, various governments continued to roll out supportive policies for EV market. For instance, Spain reactivated the MOVES plan in April 2025 and extended a personal income tax deduction of 15% for EV purchases. In Italy, new tax rates on company vehicles were introduced in 2025, reducing the fringe benefit tax rate to 10% for EVs. Meanwhile, in September 2024, Germany implemented tax incentives for electric vehicles, offering corporate buyers a tax deduction of up to 40% on newly purchased EVs or qualifying zero-emission vehicles. These measures have collectively driven a rebound in European EV demand. In the five months ended May 31, 2025, the sales volume of passenger EVs in Europe reached 1.4 million, representing a year-on-year growth of 21.0%.
- The global EV industry is expected to maintain steady growth driven by the following key factors:

  (i) **Rising EV penetration rates.** In recent years, the global EV industry has experienced rapid development, fueled by global efforts to reduce carbon emissions and growing consumer awareness of sustainability. Governments around the world have introduced supportive policies to encourage EV adoption and have invested heavily in charging infrastructure. At the same time, advancements in EV intelligence have greatly enhanced the user experience, offering greater convenience and efficiency to meet increasingly diversified consumer demands. Moreover, continuous improvements in battery technology have significantly extended driving ranges and reduced charging times, boosting consumer confidence and accelerating the shift toward EVs. As a result, EV penetration rate is expected to keep rising, becoming a key driver of the automotive industry's growth. The global passenger EV penetration rate is projected to increase from 24.3% in 2024 to 47.3% by 2029;

  (ii) **Rapid technological innovation and smart technologies.** Propelled by technological innovation, the EV industry is undergoing accelerated transformation toward intelligence. Key smart technologies include autonomous driving and intelligent cockpits. Nowadays, autonomous driving has achieved full-scene automation of steering and braking, moving toward hands-free operation —significantly improving driving comfort, safety, and convenience. In addition, intelligent cockpits now incorporate advanced technologies such as AI voice assistants, enabling more seamless and intuitive human-machine interaction. Over-the-air (OTA) updates also allow continuous enhancements to in-vehicle systems, enabling vehicles to evolve over their lifecycle and delivering ongoing value to users; and

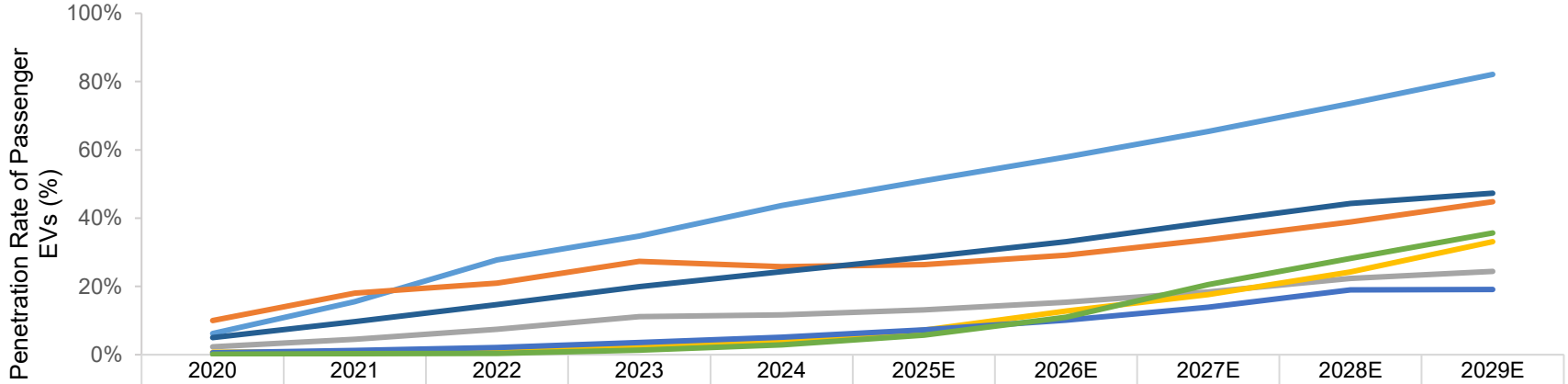
  (iii) **Opportunities in emerging markets.** Emerging markets such as South America, the Middle East, and Southeast Asia are witnessing a rapid rise in EV industries, driven by robust consumer demand and favorable policy environments. These regions demonstrate strong growth momentum and development potential. By 2029, the sales volume of passenger EVs is expected to reach 0.9 million in South America, 0.9 million in the Middle East, and 2.4 million in Southeast Asia, with CAGR of 46.3%, 45.7%, and 59.7%, respectively, from 2024 to 2029.
- EV home charging solutions are the primary method of energy replenishment for EVs, offering households a convenient and cost-effective way to charge their EVs. As a result, the EV industry is closely linked to the EV home charging solution market. With the continued rise in the global sales volume of EVs, the demand for the installation of home EV chargers is also expected to grow accordingly. Therefore, the expansion of the global EV industry will directly drive the development of the global EV home charging solution market.

Source: China Association of Automobile Manufacturers; China Passenger Cars Association; Frost & Sullivan Analysis

Overview of Global EV Industry

Global Penetration Rate of Passenger EVs by Region

Penetration Rate of Passenger EVs by Region (Global), 2020 – 2029E



	2020	2021	2022	2023	2024	2025E	2026E	2027E	2028E	2029E
China	6.2%	15.5%	27.8%	34.7%	43.7%	50.9%	57.9%	65.4%	73.6%	82.1%
Europe	10.0%	18.0%	21.0%	27.3%	25.8%	26.4%	29.1%	33.7%	38.9%	44.8%
North America	2.3%	4.5%	7.4%	11.1%	11.7%	13.1%	15.4%	18.4%	22.3%	24.4%
South America	0.7%	0.9%	0.9%	2.2%	4.0%	7.2%	12.8%	17.6%	24.2%	33.1%
Middle East	0.6%	1.2%	2.1%	3.6%	5.2%	7.3%	10.1%	13.9%	18.9%	19.1%
Southeast Asia	0.1%	0.3%	0.4%	1.4%	2.9%	5.8%	11.0%	20.6%	28.2%	35.7%
Global	5.0%	9.7%	14.7%	19.9%	24.3%	28.5%	33.1%	38.8%	44.3%	47.3%

- Along with the development of global EV market, the penetration rate of passenger EVs in terms of sales volume globally rapidly increased from approximately 5.0% in 2020 to approximately 24.3% in 2024. By the end of 2029, it is expected to reach 47.3%. In major regions of the world, such as China, Europe, North America, South America, Middle East and Southeast Asia, the penetration rate of passenger EVs in terms of sales volume has rapidly increased from approximately 9.2%, 10.0%, 2.3%, 0.7%, 0.6% and 0.1% in 2020 to approximately 43.7%, 25.8%, 11.7%, 4.0%, 5.2% and 2.9% in 2024, respectively.
- The proportion of China's EV exports to the United States is minimal. According to the General Administration of Customs of the PRC, in 2024, China's EV exports to the U.S. amounted to USD156.3 million, representing 0.4% of China's total EV export value, which amounted to USD40.1 billion. This indicates that U.S. tariff policies have a limited impact on China's EV manufacturers. In 2024, China's home EV charger exports to the U.S. accounted for less than 1% of China's total home EV charger exports, which indicates that the U.S. tariff policies have a limited impact on China's home EV charger manufacturers.

Source: International Energy Agency; China Association of Automobile Manufacturers; China Passenger Cars Association; Frost & Sullivan Analysis

Content

Overview of EV Home Charging and EV Public Charging

- EV chargers can be categorized into home EV chargers and public EV chargers, among which home EV chargers are a convenient and cost-effective way to charge EVs at home, whilst public EV chargers allow EV owners to charge their vehicles away from home in publicly accessible EV charging stations in public locations such as parking lots, shopping centers, highway service areas, among others. In 2024, the sales volume of public EV chargers reached 0.9 million in China and 1.5 million globally, with a CAGR of 29.9% and 36.9% from 2020 to 2024, respectively. By 2029, the sales volume of public EV chargers is expected to reach 1.4 million in China and 2.2 million globally, growing at a CAGR of 8.2% and 8.5% from 2024 to 2029, respectively. The penetration rate of public EV chargers (number of public EV chargers in use divided by parc of passenger EVs) reached 13.3% in China and 10.1% globally as of December 31, 2024. As of December 31, 2029, the penetration rate of public EV chargers is expected to reach 15.2% in China and 13.1% globally. Meanwhile, the sales volume of home EV chargers reached 3.3 million in China and 5.7 million globally in 2024, with a CAGR of 111.7% and 93.2% from 2020 to 2024, respectively. By 2029, the sales volume of home EV chargers is expected to reach 6.7 million in China and 14.4 million globally, growing at a CAGR of 15.1% and 20.3% from 2024 to 2029, respectively.
- The sales volume of public EV chargers installed in the commercial and residential properties reached 97.7 thousand and 79.3 thousand in 2024, and is expected to reach 148.9 thousand and 125.7 thousand, growing at a CAGR of 8.8% and 9.7% from 2024 to 2029, respectively. The public EV chargers installed in the commercial and residential properties may divert the demand for the Group's products, but the impact remains limited, primarily as the number of public EV chargers installed in the commercial and residential properties is typically limited. At present, the number of parking lots equipped with public EV chargers in the commercial and residential properties generally accounts for less than 10% of the total number of parking lots in China, far from meeting the charging needs of EV owners, who often face long waiting times. In addition, charging EVs at public EV chargers installed in commercial and residential properties usually involves additional service fees. Therefore, EV owners normally prefer to install and use home EV chargers. Moreover, the "Guidelines for the Development of Electric Vehicle Charging Infrastructure (2015-2020)" (《電動汽車充電基礎設施發展指南(2015-2020年)》), issued by the State Council, proposed that home EV chargers represent the future development trend and are expected to account for over 90% of all EV chargers, which drives the demand for home EV chargers. Accordingly, the public EV chargers installed in commercial and residential properties may have limited impact on the demand for the Group's products.

Source: Frost & Sullivan Analysis

Market Definition and Overview of EV home charging solutions

- EV home charging solutions mainly refer to EV home charging solutions provided to households, including both product offerings and service offerings, providing a safe charging experience as well as efficient energy management. Specifically, the product offerings of EV home charging solutions mainly include home EV chargers and related accessories including portable EV chargers, whilst the service offerings mainly include installation and after-sales services of home EV chargers, and digital energy management services during charging process, such as smart remote control, safe charging, off-peak charging and data analytics.
- Compared to regular home EV chargers, smart home EV chargers, applying technologies such as IoT, can be controlled via mobile apps for real-time monitoring and management around the clock and make EV home charging convenient, efficient and safe. Smart home EV chargers serve as a gateway to digital energy management services to EV home users. With growing demand for smart charging experiences, smart home EV chargers have been experiencing rapid development.
- Home EV chargers are generally AC chargers. The main difference of technologies between AC chargers and DC chargers is the location where AC power gets converted. AC chargers are coupled with built-in converters in EVs, known as onboard chargers. Onboard chargers achieve energy conversion from AC to DC within EVs and then supply DC to battery packs. EVs are usually charged by AC chargers at home or at dedicated EV home charging stations. Compared with AC chargers, DC chargers have the converters inside the chargers themselves and AC from the power grid is converted to DC before transmitting to EVs. EVs are usually charged by DC chargers at public EV home charging stations.
- The technologies required for AC chargers mainly include (i) versatility, which can support the EV home charging of a variety of EV brands and models; (ii) security protection mechanism, including over-voltage protection, over-current protection, leakage protection, among others, to ensure the safety and reliability of the charging process; and (iii) data monitoring and management technology, which can achieve real-time monitoring of the charging process.
- The technologies required for DC chargers mainly include (i) fast charging technology, which is capable to provide a large amount of power for EVs in a short period of time; (ii) high-efficiency charging technology, which can reduce the energy loss in energy conversion and improve charging efficiency; and (iii) intelligent management technology, which realizes the functions of monitoring, regulating and billing of the charging with intelligent management systems.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Advantages of EV Home Charging for EV Home Users

Advantages	Description
Low Costs	• Home EV chargers, which typically utilize household electricity, offer a more cost-effective solution due to lower electricity rates. They also enable users to plan efficient and personalized charging schedules by calculating peak and off-peak charging periods, thereby reducing home energy costs. On the other hand, public EV chargers often use commercial electricity, which comes with relatively higher rates. Furthermore, as the charging speed increases, the charging cost of public EV chargers will escalate.
Convenience	• Home EV chargers are usually installed near the users' homes or parking lots, allowing users to charge their EVs in close proximity to their homes. Home EV chargers, compared to public ones, provide superior convenience by eliminating the need for trips to public charging stations and the uncertainty of waiting for available spaces.
Safety	• Since EVs need to withstand large current and voltage when charging, it is easy to cause safety accidents if the charging facilities are of poor quality or improperly operated. In general, home EV chargers are AC chargers, which have a relatively low charging power, and more stable current and voltage, making them safer and more reliable during the charging. EV home charging can also reduce damage to the battery and extend its service life. In addition, home EV chargers also have a variety of safety protection functions such as over-current, over-voltage and short circuit protection, among others, which effectively avoids safety accidents caused by improper operation or equipment failure.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Advantages of EV Home Charging for Providers of EV Home Charging Solutions

Advantages	Description
Lower Investment	• Public DC chargers, due to their complex technology and equipment, have high production and installation costs. Operating public charging stations also demands significant investment in site leasing, civil construction, equipment, and security systems. In contrast, home EV chargers, which are typically AC chargers, require less investment.
Provision of Smart Charging Experiences	• With innovative business layout of EV home charging solutions, market participants can access a broad spectrum of EV home users, which allow them to collect, integrate, and analyze relevant data to provide smart charging experiences to EV home users, supporting the development of home energy management services, and further driving vertical integration in EV home charging.
Resilience Against Alternative Energy Substitution	• While alternative energy sources like hydrogen are advancing, their use in vehicles is expected to increase. However, since home users cannot store hydrogen and other alternative energy, this type of alternative energy will likely be more prevalent in the public sector. Thus, infrastructure such as public charging stations are more likely to be replaced by alternative energy. EV home charging, due to its key role in home energy management, remains resilient against risks of substitution by alternative energies.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

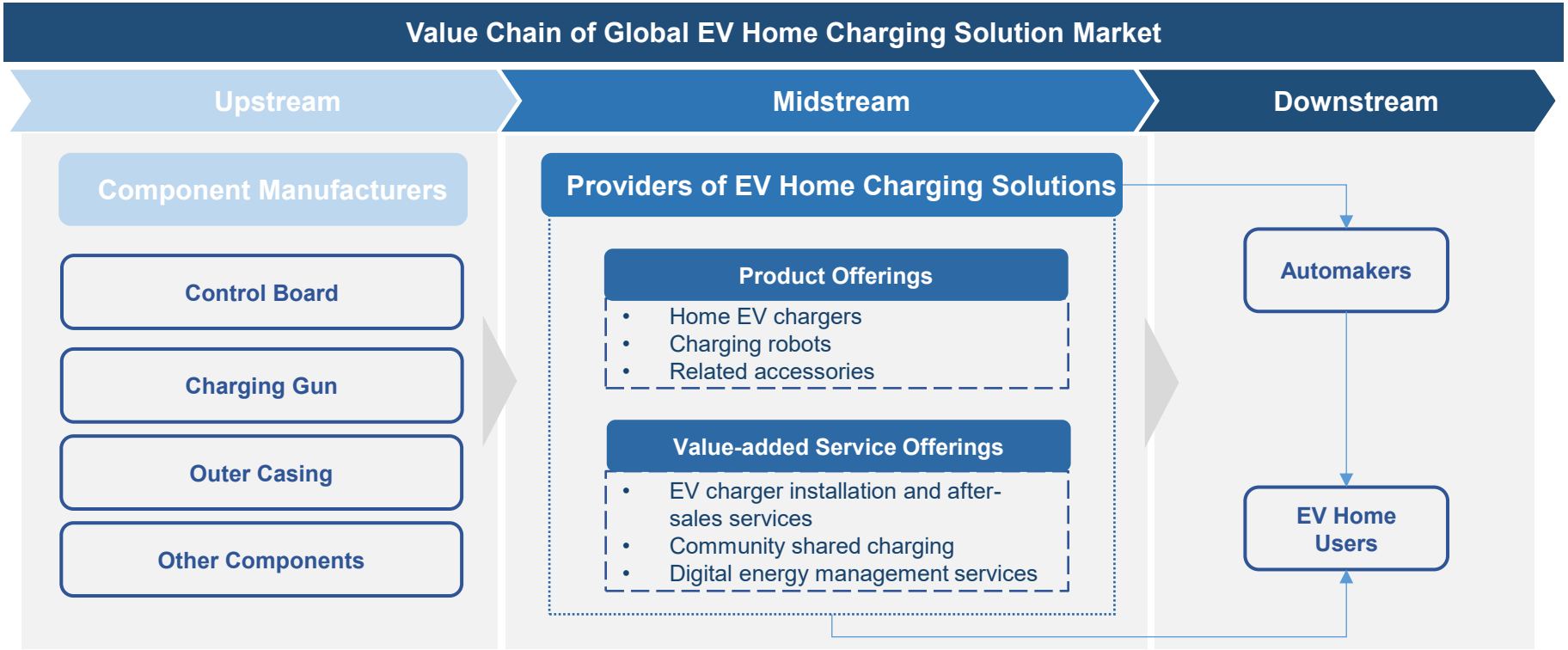
Pain Point of EV Home Charging Solution Services

Pain Points	Analysis
Installation and After-sales Challenges	• Many EV home users lack the knowledge to install home EV chargers and need professional services. Automakers also face challenges in finding reliable after-sales installation service providers across different regions. Therefore, providers of EV home charging solutions with service networks can offer timely installation and after-sales services, aiding automakers in expanding their business rapidly in new and overseas markets.
Growing Demand for Smart Charging	• There is a growing demand among EV home users for features like data visualization, remote control, smart charging and discharging control, real-time alerts, fault diagnosis, and charging schedule planning. To meet these rising needs and improve user experience, providers of EV home charging solutions offer digital platforms to help users manage their charging process efficiently and reduce energy costs.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Value Chain Analysis



- The global EV home charging solutions encompass a value chain that includes upstream component manufacturers, midstream providers of EV home charging solutions, and downstream automakers and EV home users. The providers of EV home charging solutions can sell home EV chargers to automakers or directly to EV home users through retail channels, providing products and services. While some automakers have started producing or assembling home EV chargers, most of them are gradually withdrawing from the market as they often lack the quality services that professional providers of EV home charging solutions with strong service networks and digital platforms can offer. The service offerings of EV home charging solution providers include EV charger installation and after-sales services, community shared charging which allows users to conveniently locate and share the use of home EV chargers, and digital energy management services such as smart remote control, safe charging and off/peak charging. The automakers lack the quality installation and after-sales services primarily as (i) automakers generally focus on their main business as the manufacturing and sales of EVs; and (ii) automakers do not have nationwide coverage and even overseas layout of service networks for the installation and after-sales services of home EV chargers. Additionally, some energy enterprises have entered the home energy management ecosystem by partnering with the providers of EV home charging solutions, adopting innovative business models such as commission based on the energy consumed during EV home charging.

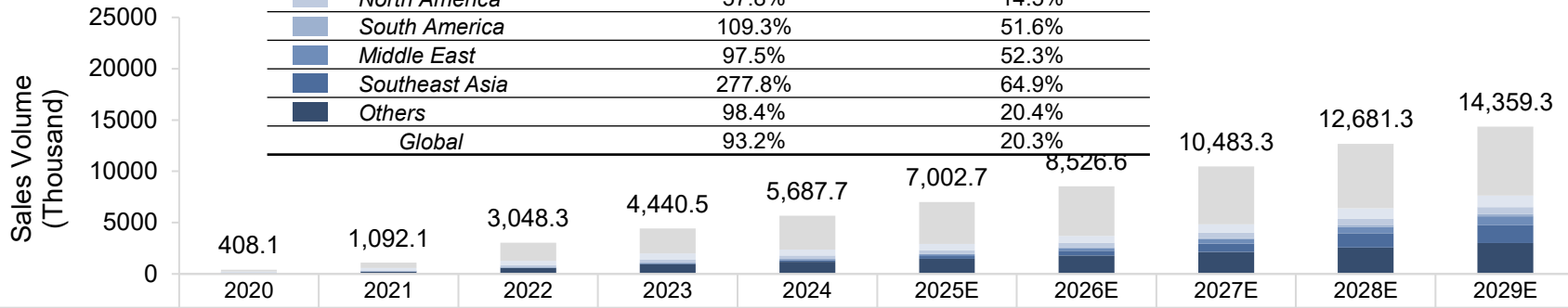
Source: Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Global Sales Volume of Home EV Chargers

Sales Volume of Home EV Chargers (Global), 2020 – 2029E

Sales Volume of Home EV Chargers	CAGR (2020-2024)	CAGR (2024-2029E)
China	111.7%	15.1%
Europe	53.2%	15.0%
North America	57.8%	14.5%
South America	109.3%	51.6%
Middle East	97.5%	52.3%
Southeast Asia	277.8%	64.9%
Others	98.4%	20.4%
Global	93.2%	20.3%



	2020	2021	2022	2023	2024	2025E	2026E	2027E	2028E	2029E
Global	408.1	1,092.1	3,048.3	4,440.5	5,687.7	7,002.7	8,526.6	10,483.3	12,681.3	14,359.3
China	165.1	505.5	1786.1	2452.2	3317.9	4084.4	4831.8	5643.7	6281.4	6708.6
Europe	103.0	238.1	396.7	568.0	566.9	596.4	660.2	825.9	1012.6	1142.2
North America	53.9	122.1	217.6	318.9	333.8	371.9	433.4	512.6	621.1	657.3
South America	1.5	5.1	7.8	16.7	28.8	47.2	75.9	120.5	178.3	230.9
Middle East	7.0	18.9	35.1	65.1	106.4	169.8	266.7	414.1	635.4	872.3
Southeast Asia	0.7	3.4	23.8	71.1	142.6	264.2	469.6	814.6	1385.4	1736.9
Others	76.9	199.0	581.2	948.5	1,191.3	1,468.8	1,789.0	2,151.9	2,567.1	3,011.1

- The sales volume of home EV chargers refers to the sales volume by home EV charger manufacturers, which include both automakers and third-party providers. Driven by the growing sales volume of EVs, the global sales volume of home EV chargers increased from 0.4 million in 2020 to 5.7 million in 2024, representing a CAGR of 93.2%. In 2020, due to the impact of COVID-19 pandemic, the on-site installation services of EV chargers were interrupted, causing a decrease in the sales volume of home EV chargers. From 2020 to 2024, the sales volume of home EV chargers in China, Europe, North America, South America, Middle East and Southeast Asia grew at a CAGR of 111.7%, 53.2%, 57.8%, 109.3%, 97.5% and 277.8%, respectively.
- The EV industry's growth is expected to drive the rapid growth in home EV charger demand. In 2029, the global sales volume of home EV chargers is expected to reach 14.4 million, representing a CAGR of 20.3% from 2024 to 2029. During the same period, the sales volume of home EV chargers in China, Europe, North America, South America, Middle East and Southeast Asia are expected to grow at a CAGR of 15.1%, 15.0%, 14.5%, 51.6%, 52.3%and 64.9%, respectively.

Source: International Energy Agency; China Electric Vehicle Charging Infrastructure Promotion Alliance; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of EV Subsidy Policy in China

- Although the EV subsidy policy in China was terminated in December 2022, the Chinese government continued to encourage the development of EV market. For instance, in June 2023, the Ministry of Finance, the State Taxation Administration, and the Ministry of Industry and Information Technology announced the "Notice on Continuing and Optimizing Vehicle Purchase Tax Exemption Policy for New Energy Vehicles" (《關於延續和優化新能源汽車車輛購置稅減免政策的公告》), extending the vehicle purchase tax exemption policy for new energy vehicles from December 31, 2023 to December 31, 2027. In the long term, except for EV subsidy policy, the lower usage costs of EVs, and license plate restrictions of ICEs will become the main driving forces of the market. Therefore, the termination of EV subsidy policy and the vehicle purchase tax exemptions in China may not have material impacts on the development of EV market as well as EV home charging solution market in China. Additionally, in 2025, the China Association of Automobile Manufacturers issued the "Initiative on Maintaining Fair Competition and Promoting Healthy Industry Development" (《關於維護公平競爭秩序促進行業健康發展的倡議》), supporting China's automotive enterprises to engage in market competition through legitimate means, while firmly opposing unbridled price competition, thereby fostering the healthy development of China's EV market and EV home charging solution market. Subsequently, on June 28, 2025, multiple automakers including BYD, DENZA, FANGCHENGBAO, DEEPAL, and ARCFOX announced they would gradually implement new vehicle purchase policies. The new energy vehicle industry is expected to make healthy adjustments to product pricing and supply chain pricing. In July 2025, Toyota Motor Corporation announced to raise component procurement prices by 10% to 15% in the first half of fiscal year 2025. The price adjustment is intended to proactively share cost pressures with suppliers and safeguard supply chain stability. In the same year, the State Council revised the "Regulations on Ensuring Payment to Small and Medium-sized Enterprises" (《保障中小企業款項支付條例》), aiming to address the issue of overdue payments faced by SMEs. The regulations officially came into effect on June 1, 2025. As a result, by June 11, 2025, several automotive manufacturers, including Guangzhou Automobile Group Co., Ltd, China FAW Group Corp., Ltd., Dongfeng Motor Group Co., Ltd. Seres Group Co., Ltd., Geely Automobile Holdings Limited, and BYD Auto Co., Ltd., have been committed to ensuring that payment terms to their suppliers would not exceed 60 days.

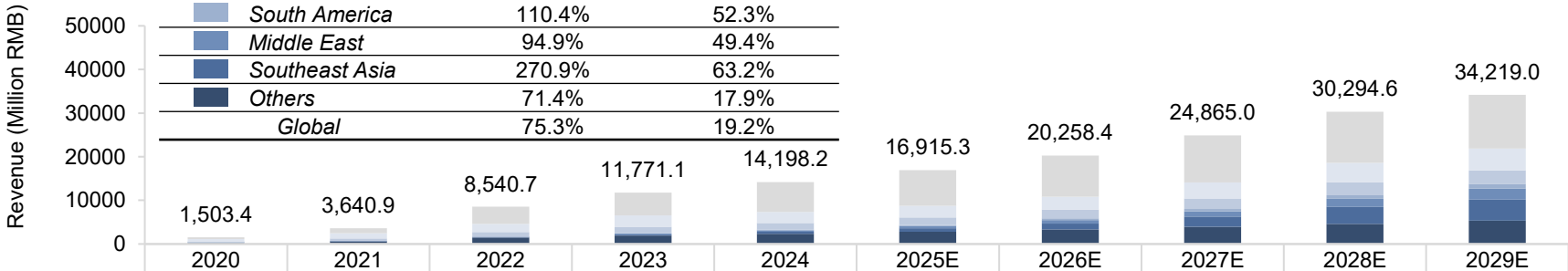
Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Revenue of EV Home Charging Solution Market

Revenue of EV Home Charging Solution Market (Global), 2020 – 2029E

Revenue of EV Home Charging Solution Market	CAGR (2020-2024)	CAGR (2024-2029E)
China	103.6%	12.6%
Europe	48.2%	14.4%
North America	55.6%	14.3%
South America	110.4%	52.3%
Middle East	94.9%	49.4%
Southeast Asia	270.9%	63.2%
Others	71.4%	17.9%
Global	75.3%	19.2%



	2020	2021	2022	2023	2024	2025E	2026E	2027E	2028E	2029E
Global	1,503.4	3,640.9	8,540.7	11,771.1	14,198.2	16,915.3	20,258.4	24,865.0	30,294.6	34,219.0
China	396.3	1,173.6	3,935.3	5,203.6	6,810.6	8,151.0	9,405.3	10,742.4	11,718.4	12,346.2
Europe	534.1	1,171.0	1,871.0	2,612.0	2,576.2	2,692.7	2,970.3	3,685.8	4,487.3	5,047.5
North America	267.2	595.2	1,037.7	1,510.3	1,566.6	1,738.6	2,022.3	2,388.7	2,894.1	3,062.9
South America	6.6	23.2	34.7	75.1	129.4	213.4	346.0	554.6	820.3	1,061.6
Middle East	23.4	62.6	115.1	210.2	337.9	529.2	814.3	1,238.7	1,863.8	2,511.6
Southeast Asia	2.2	10.7	71.9	211.4	416.3	759.9	1,335.1	2,294.1	3,873.6	4,817.1
Others	273.6	604.6	1,475.0	1,948.5	2,361.2	2,830.5	3,365.1	3,960.7	4,637.1	5,372.1

- From 2020 to 2024, the total revenue of global EV home charging solution market increased from RMB1.5 billion to RMB14.2 billion, representing a CAGR of 75.3%. In 2020, due to the shrinkage of global sales volume of EV home chargers, the total revenue of global EV home charging solution market decreased accordingly. During the same period, the total revenue of EV home charging solution market in China, Europe, North America, South America, Middle East and Southeast Asia grew at a CAGR of 103.6%, 48.2%, 55.6%, 110.4%, 94.9% and 270.9%, respectively.
- By 2029, with the growing sales volume of EVs and EV Home chargers, the total revenue of global EV home charging solution market is expected to reach RMB34.2 billion, representing a CAGR of 19.2% from 2024 to 2029. The average prices of EV home chargers in the overseas markets are generally higher than that in China, which contributes to higher profitability in the overseas markets. It is expected that the overseas market will become one of main driving forces for the development of global EV home charging solution market in the future. During the same period, the total revenue of EV home charging solution market in China, Europe, North America, South America, Middle East and Southeast Asia is expected to grow at a CAGR of 12.6%, 14.4%, 14.3%, 52.3%, 49.4% and 63.2%, respectively.

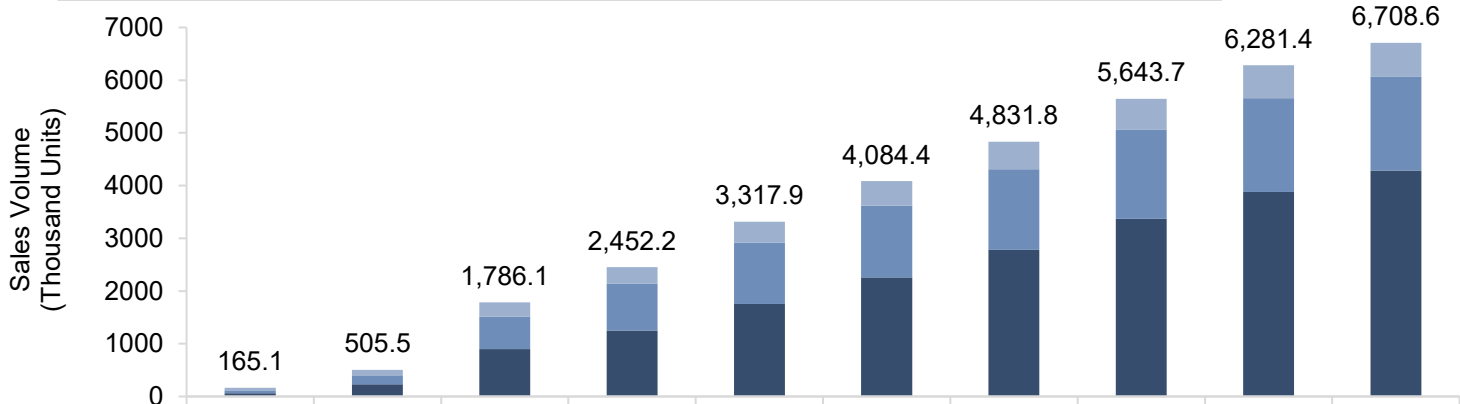
Source: International Energy Agency; China Electric Vehicle Charging Infrastructure Promotion Alliance; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Sales Volume of EV Home Chargers by City Tier in China

Sales Volume of EV Home Chargers by City Tier (China), 2020 – 2029E

Sales Volume of EV Home Chargers	*CAGR (2020-2024)*	*CAGR (2024-2029E)*
First-tier Cities	70.9%	10.0%
Second-tier Cities	112.7%	8.9%
Third, fourth and lower-tier Cities	131.0%	19.5%
China	111.7%	15.1%



	2020	2021	2022	2023	2024	2025E	2026E	2027E	2028E	2029E
China	165.1	505.5	1,786.1	2,452.2	3,317.9	4,084.4	4,831.8	5,643.7	6,281.4	6,708.6
First-tier Cities	46.5	101.4	272.5	315.9	396.6	464.3	523.5	584.3	623.1	638.1
Second-tier Cities	56.9	173.0	616.2	884.4	1,164.8	1,358.3	1,525.5	1,688.8	1,775.5	1,782.7
Third, Fourth and Lower-tier Cities	61.7	231.1	897.4	1,251.9	1,756.5	2,261.8	2,782.8	3,370.6	3,882.8	4,287.8

- With the development of EV industry, the sales volume of home EV chargers in China has experienced a rapid growth from 0.2 million in 2020 to 3.3 million in 2024, representing a CAGR of 111.7%. In recent years, Chinese government has introduced favourable policies to promote the penetration of EVs in the lower-tier cities, such as the “Implementation Opinions on Accelerating the Construction of Charging Infrastructure and Better Supporting the Use of New Energy Vehicles in Rural Areas and the Rural Revitalization” (《關於加快推進充電基礎設施建設更好支持新能源汽車下鄉和鄉村振興的實施意見》), thereby driving a rapid growth in the sales volume of home EV chargers in third, fourth and lower-tier cities, from 0.1 million in 2020 to 1.8 million in 2024, representing a CAGR of 131.0%. In 2029, the sales volume of home EV chargers in China is expected to reach 6.7 million, representing a CAGR of 15.1%from 2024 to 2029. During the same period, the sales volume of home EV chargers in third, fourth and lower-tier cities is expected to reach 4.3 million, representing a CAGR of 19.5%

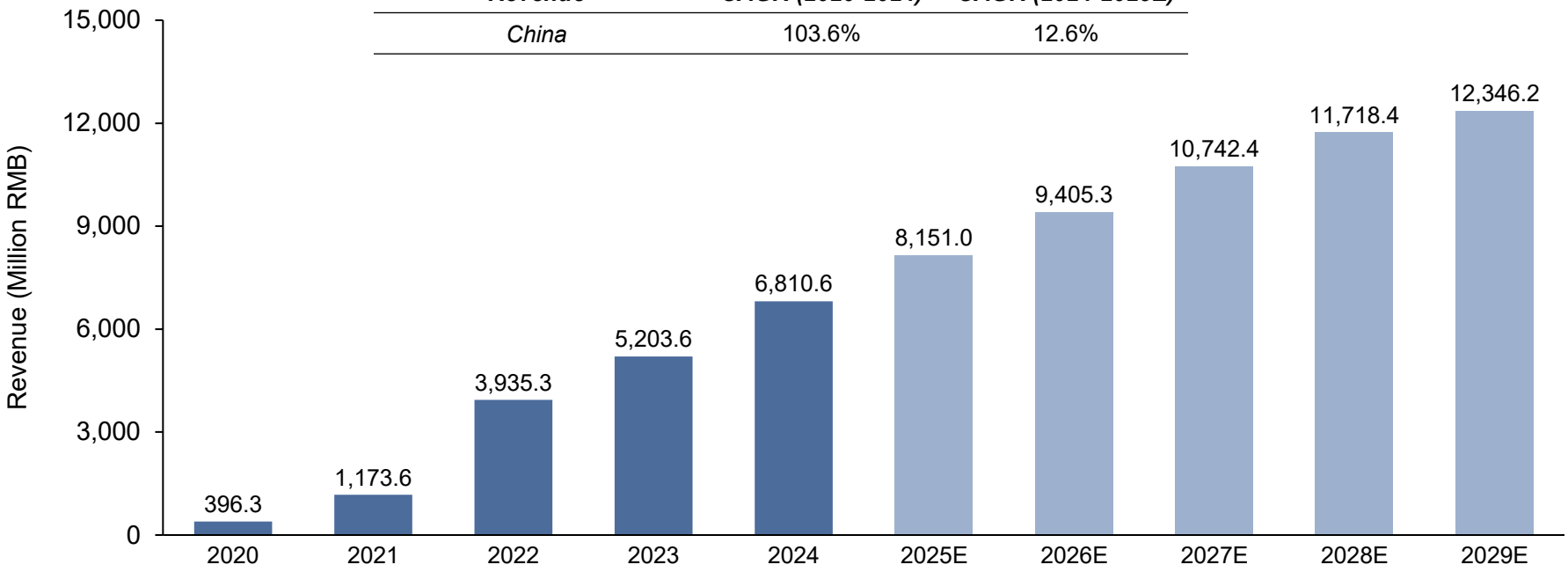
Source: Frost & Sullivan Analysis

Overview of Global EV Industry

Sales Revenue of Passenger EVs in China

Revenue of EV Home Charging Solution Market (China), 2020 – 2029E

Revenue	*CAGR (2020-2024)*	*CAGR (2024-2029E)*
China	103.6%	12.6%



- The total revenue of China's EV home charging solution market increased from RMB396.3 million in 2020 to RMB6,810.6 million in 2024, with a CAGR of 103.6%. From 2022 to 2024, the total revenue of China's EV home charging solution market grew at a CAGR of 31.6%. In the future, the total revenue of China's EV home charging solution market is expected to maintain a stable growth and reach RMB12,346.2 million in 2029, growing at a CAGR of 12.6% from 2024 to 2029. The average price of home EV chargers in China amounted to RMB1.2 thousand per unit, RMB1.1 thousand per unit and RMB1.0 thousand per unit in 2022, 2023 and 2024, respectively. The average price of home EV chargers in China has experienced a decrease from 2022 to 2024, with a CAGR of -8.7%.

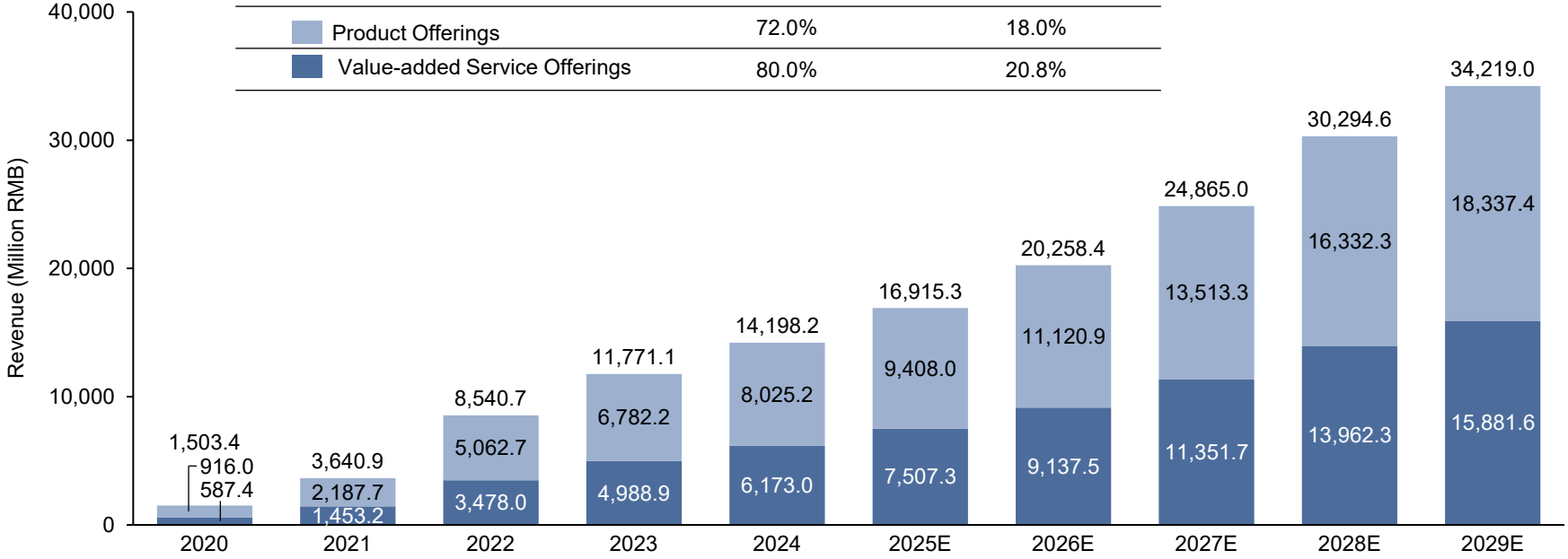
Source: China Electric Vehicle Charging Infrastructure Promotion Alliance; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Revenue Breakdown of Global EV Home Charging Solution Market

Revenue Breakdown of EV Home Charging Solution Market (Global), 2020 – 2029E

Revenue	CAGR (2020-2024)	CAGR (2024-2029E)
Product Offerings	72.0%	18.0%
Value-added Service Offerings	80.0%	20.8%



- The revenue of global EV home charging solutions is primarily derived from (i) product offerings such as home EV chargers and related accessories and (ii) service offerings such as installation and after-sales services. From 2020 to 2024, the revenue of product offerings increased from RMB0.9 billion to RMB8.0 billion, representing a CAGR of 72.0%. During the same period, the revenue of service offerings grew from RMB0.6 billion in 2020 to RMB6.2 billion in 2024, with a CAGR of 80.0%. By 2029, the revenue of product offerings and service offerings is expected to reach RMB18.3 billion and RMB15.9 billion, respectively, representing a CAGR of 18.0% and 20.8% from 2024 to 2029, respectively.
- From 2020 to 2024, the total sales value of home EV chargers globally increased from RMB0.8 billion to RMB7.2 billion, with a CAGR of 74.8%. By 2029, the total sales value of home EV chargers globally is expected to reach RMB16.8 billion, with a CAGR of 18.4% from 2024 to 2029. The total sales value of home EV chargers in China increased from RMB0.2 billion in 2020 to RMB3.5 billion in 2024, with a CAGR of 101.8%. By 2029, the total sales value of home EV chargers in China is expected to reach RMB6.6 billion, with a CAGR of 13.6% from 2024 to 2029.
- From 2020 to 2024, the global average price of home EV chargers decreased from RMB1.9 thousand per unit to RMB1.3 thousand per unit, with a CAGR of -9.6%. By 2029, the global average price of home EV chargers is expected to reach RMB1.2 thousand per unit, with a CAGR of -1.6% from 2024 to 2029.

Source: Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Market Drivers (1/2)

Drivers	Main Content
Supportive policies	• In order to support the development of the EV industry, governments across the globe are committed to promoting the construction of charging infrastructure including EV home charging, which boosted the development of the global EV home charging solution market. For instance, in 2022, China's National Development and Reform Commission and the National Energy Administration issued the "Implementation Opinions on Further Improving Service Guarantee Capability of EV Home Charging Infrastructure" (《關於進一步提升電動汽車充電基礎設施服務保障能力的實施意見》), proposing to accelerate the construction and installation of charging facilities in residential communities. In Europe, France provided a tax credit up to the value of EUR500 to residents for the purchase and installation of an EV charger, whilst all German residents can apply for a grant of EUR900 for the purchase and installation of an EV charger. In Thailand, the government has granted a tariff exemption on the import of EV charging equipment until 2027. In Brazil, the government has launched the "Green Mobility and Innovation Program" in 2024, which promotes the development of EVs and charging infrastructure through tax incentives, fiscal subsidies, and other supportive measures. In Australia, the government has committed AUD178 million to promote the use of EVs and assist 50,000 households in installing home EV chargers. In Indonesia, the government has established dedicated subsidy funds for charging piles and exempted charging equipment from import duties. In Malaysia, the government grants a full exemption from income tax for charging equipment manufacturers from 2023 to 2032, with an investment tax allowance of 100%. These supporting policies have provided policy guarantees for the rapid development of the global EV home charging solution market.
Steady growth of EV sales	• With the increasing global attention to environmental protection and sustainable development, the global energy structure has been shifting from fossil energy to green energy, which has driven the rapid growth of EV sales. From 2020 to 2024, the global sales volume of passenger EVs grew from 3.0 million to 17.2 million, representing a CAGR of 55.1%. In the future, the global sales volume of passenger EVs is expected to reach 38.2 million by 2029, representing a CAGR of 17.3% from 2024 to 2029. In China, the sales volume of passenger EVs grew from 1.2 million in 2020 to 12.3 million in 2024, with a CAGR of 77.1%. By 2029, the sales volume of passenger EVs in China is expected to reach 25.0 million, growing at a CAGR of 15.3% from 2024 to 2029. The global popularity of EVs and the prominent advantages of EV home charging in terms of low costs, convenience and safety provide enormous development potentials for the global EV home charging solution market.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Market Drivers (2/2)

Drivers	Main Content
Supportive infrastructure requiring installation of home EV chargers	• Some countries have introduced policies that require new residential buildings to have the conditions for the installation of home EV chargers. For instance, in 2023, the State Council in China issued the "Guiding Opinions on Further Building a High-Quality Charging Infrastructure System" (《關於進一步構建高品質充電基礎設施體系的指導意見》), which stipulates that all fixed parking lots in newly-built residential properties must have the conditions for the installation of home EV chargers to meet the requirements for direct meter connection. In addition, as EVs develop as the primary transportation mode for home users, they may prefer to install home EV chargers in advance to enjoy the convenience of charging once they purchase an EV. Thereby, the installation in advance can stimulate the further increase in the demand for home EV chargers.
Product, technology and service development and innovation	• The continuous advancement of production technologies of EV chargers and the continuous improvement of product standards, such as waterproof, dustproof, leakage protection, short circuit protection and other technical requirements, provide more stable and safer EV home charging solutions. The charging technologies have been further upgraded, such as the development of autonomous EV charging robots. Additionally, the providers of EV home charging solutions have expanded their service scope from traditional installation and after-sales services to smart charging services through digital platforms, such as visualization of power usage data, remote control of EV chargers, and off-peak charging services.
Uneven distribution of public charging infrastructure in China drives demand for home EV chargers	• In cities with more developed economies such as first and second tier cities in China, the investment in public charging infrastructure is relatively high, resulting in an extensive distribution of public EV chargers. By contrast, in lower-tier cities and rural areas, the distribution of public EV chargers remains limited. In these lower-tier markets, the insufficient supply of public EV chargers cannot meet the energy replenishment needs of EVs, thereby accelerating the growth in demand for home EV chargers. The sales volume of home EV chargers in third, fourth and lower-tier cities in China increased from 0.1 million in 2020 to 1.8 million in 2024, representing a CAGR of 131.0%.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Future Opportunities

Future Opportunities

Overseas Markets Demand	• The majority of global passenger EV sales is concentrated in China, Europe and the United States, among which the sales volume of passenger EVs in China accounted for 71.2% of global sales volume in 2024. Some overseas regions, such as Southeast Asia and South America, where the development of EV industry is in the initial stage, have significant growth potentials. The sales volume of passenger EVs in Southeast Asia is expected to grow from 226.3 thousand in 2024 to 2.4 million in 2029, representing a CAGR of 59.7%, whilst the sales volume of passenger EVs in South America is expected to grow from 127.8 thousand in 2024 to 856.1 thousand in 2029, representing a CAGR of 46.3%. The rapid development of the passenger EV industry in overseas regions will stimulate a significant growth in demand for EV home charging solutions, which will bring broad development opportunities for market players who have already established overseas presence.
Digital Energy Solutions	• EV home charging solutions can further optimize the energy management mode by utilizing digital energy solutions such as V2H (Vehicle-to-Home). The V2H technology enables an EV to be used as an energy storage system to power home devices during a blackout or when electricity prices are high. The emergence and widespread adoption of digital energy solutions will help EV home users to more flexibly and efficiently utilize and manage energy, and provide them with more stable and low-cost electricity services.
Autonomous EV charging robots	• From 2020 to 2024, the penetration rate of assisted autonomous driving system in new passenger vehicles sold in China grew significantly from 13.0% to 57.3%. With the development of assisted autonomous driving, EV home charging will achieve a higher level of intelligence and adopt new charging technologies, such as EV charging robots, which are designed to locate a user's EV and autonomously initiate the charging process to achieve unmanned and safe EV home charging. Consequently, the development of autonomous EV charging robots will further improve charging efficiency and provide a more convenient charging experience, thereby changing the charging method of EV home users. In addition, autonomous EV charging robots will play an important role in the vehicle-to-energy interaction, such as acquiring real-time data for efficient management of charging facilities, realizing charging scheduling, and involving in home energy management. The total sales volume of autonomous EV charging robots in the world is expected to witness a significant increase and reach approximately 902.0 thousands in 2029, representing a CAGR of 191.3% from 2024 to 2029.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market
Entry Barriers (1/2)

Entry Barriers	
Product Barrier	• The core technologies of EV home charging primarily consist of power technology, charging control technology and communication technology. Mastering these core technologies requires a large amount of R&D investment and sufficient technical reserves. In addition, in order to expand business layout in various regions around the world, new entrants need to obtain corresponding regional safety and performance standard certifications, such as CE certification (Europe), UL certification (United States), and TÜV Rheinland certification (Germany). Existing providers have mature technical experience and necessary certifications, making it challenging for new entrants to quickly obtain product qualifications and master core technologies.
Service Barrier	• Service capability is crucial for the providers of EV home charging solutions. Possessing strong service capabilities, the providers of EV home charging solutions can promptly respond to and fulfill various service requirements from users. Along with the business expansion to overseas regions, the providers of EV home charging solutions can maintain efficient operations and increase market shares rapidly by establishing overseas service networks. New entrants may face challenges in establishing a service network covering national and overseas markets.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market
Entry Barriers (2/2)

Entry Barriers	
Digitalization Barrier	• With IoT technology, existing providers of EV home charging solutions have developed digital energy management solutions that enable real-time monitoring, control, adjustments and optimization of EV home charging and home energy consumption, which also lays the technological foundation for the future application of vehicle-to-energy home energy management. However, it is rather difficult for new entrants to possess strong digitalization capabilities.
Manufacturing Barrier	• Strong manufacturing capabilities, especially having localized factories, is one of the entry barriers for new entrants. In order to support the expansion in overseas markets, it is important for the providers of EV home charging solutions to construct local factories to satisfy the growing market demands and enable stable and timely supply.
Brand Barrier	• The providers of EV home charging solutions need to accumulate brand reputation through the provision of products and services in the long term. Automakers and home users prefer renowned providers to ensure reliable product quality, timely service response, and smart charging experience. Existing providers of EV home charging solutions have established customer trust and brand awareness, posing a significant entry barrier for new entrants.

Source: Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (1/7)

Global Top Five Providers of EV Home Charging Solutions by Global Sales Volume of Home EV Chargers During the Track Record Period

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	**Zhida**	**See "Business"**	**-**	**9.0%**
2	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. During the Track Record Period, its global sales volume of home EV chargers reached approximately 1.0 million.	Not Listed	6.8%
3	Company B	Founded in 1988 and headquartered in Switzerland, its electrification business offers a portfolio of products and digital solutions including home EV chargers. During the Track Record Period, its global sales volume of home EV chargers reached approximately 0.9 million.	Listed on SIX Swiss Exchange and Nasdaq Stockholm	6.1%
4	Company C	Founded in 2015 and headquartered in Guangdong Province, China, it is a global supplier for EV home charging facilities and software platform. During the Track Record Period, its global sales volume of home EV chargers reached approximately 0.9 million.	Not Listed	6.1%
5	Company D	Founded in 2002 and headquartered in Shanghai, China, it is one of the leading suppliers of industrial intelligent solutions focusing on intelligent electricity, intelligent robots, intelligent equipment and industrial Internet. During the Track Record Period, its global sales volume of home EV chargers reached approximately 0.8 million.	Listed on Shenzhen Stock Exchange	5.7%
Top 5				33.7%

- Depending on different application scenarios, EV charging solutions can be divided into EV home charging solutions and EV public charging solutions. EV home charging solution providers primarily focus on AC chargers, catering primarily to automakers and retail customers. On the other hand, EV public charging solution providers offer both AC and DC chargers, targeting charging point operators, fleets, public transport companies, among others. Within the EV home charging segment, there's a division between third-party providers and automakers. However, most automakers are gradually exiting this market due to their primary focus on EV manufacturing and sales, lacking nationwide service networks for home charging solutions. Globally, there are approximately 4,000 manufacturers of home EV chargers and 1,000 manufacturers of public EV chargers. Some manufacturers specialize in one type like the Group, while others offer both. Although some providers of EV public charging solutions may also enter the EV home charging market, competition dynamics between those specializing in public charging and those focusing on home charging are relatively mild due to differing customer bases and target markets.
- During the Track Record Period, the global sales volume of EV chargers reached approximately 19.2 million, among which the global sales volume of home EV chargers accounted for approximately 77.3%. In terms of global sales volume of home EV chargers during the Track Record Period, the global top five providers of EV home charging solutions accounted for approximately 33.7%. In terms of sales volume and sales value of home EV chargers in China during the Track Record Period, the Group both ranked first, with a market share of approximately 13.6% and 10.3%, respectively. In terms of sales value of global home EV chargers in 2024, the Group ranked fifth, with a market share of approximately 3.9%. In terms of sales value of home EV chargers in China in 2024, the Group ranked third, with a market share of approximately 6.6%.

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (2/7)

Top Five Providers of EV Home Charging Solutions by Sales Volume of Home EV Chargers in China During the Track Record Period

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	**Zhida**	**See "Business"**	**-**	**13.6%**
2	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.9 million.	Not Listed	10.7%
3	Company C	Founded in 2015 and headquartered in Guangdong Province, China, it is a global supplier for EV home charging facilities and software platform. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.8 million	Not Listed	9.7%
4	Company D	Founded in 2002 and headquartered in Shanghai, China, it is one of the leading suppliers of industrial intelligent solutions focusing on intelligent electricity, intelligent robots, intelligent equipment and industrial Internet. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.7 million.	Listed on Shenzhen Stock Exchange	7.8%
5	Company E	Founded in 2008 and headquartered in Zhejiang Province, China, it provides intelligent EV home charging solutions for the global users. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.6 million.	Listed on Shanghai Stock Exchange	7.3%
Top 5				49.1%

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (3/7)

Global Top Five Providers of EV Home Charging Solutions by Global Sales Value of Home EV Chargers During the Track Record Period

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	Company B	Founded in 1988 and headquartered in Switzerland, its electrification business offers a portfolio of products and digital solutions including home EV chargers. During the Track Record Period, its global sales value of home EV chargers reached approximately RMB3.4 billion.	Listed on SIX Swiss Exchange and Nasdaq Stockholm	17.3%
2	Company F	Founded in 1937 and headquartered in Netherlands, the company provides transformer stations, energy storage systems, charging stations for global customers. During the Track Record Period, its global sales value of home EV chargers reached approximately RMB2.4 billion.	Listed on Euronext Amsterdam	12.1%
3	Company G	Founded in 2015 and headquartered in Spain, the product portfolio of company include AC Charger, DC Charger, Software and Services. During the Track Record Period, its global sales value of home EV chargers reached approximately RMB2.2 billion.	Listed on New York Stock Exchange	11.3%
4	**Zhida**	See "Business"	**-**	**5.7%**
5	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. During the Track Record Period, its global sales value of home EV chargers reached approximately RMB1.0 billion.	Not Listed	5.0%
Top 5				51.4%

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (4/7)

Top Five Providers of EV Home Charging Solutions by Global Sales Value of Home EV Chargers in 2024

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	Company B	Founded in 1988 and headquartered in Switzerland, its electrification business offers a portfolio of products and digital solutions including home EV chargers. In 2024, its global sales value of home EV chargers reached approximately RMB1.0 billion.	Listed on SIX Swiss Exchange and Nasdag Stockholm	13.9%
2	Company G	Founded in 2015 and headquartered in Spain, the product portfolio of company include AC Charger, DC Charger, Software and Services. In 2024, its global sales value of home EV chargers reached approximately RMB0.7 billion.	Listed on New York Stock Exchange	10.0%
3	Company F	Founded in 1937 and headquartered in Netherlands, the company provides transformer stations, energy storage systems, charging stations for global customers. In 2024, its global sales value of home EV chargers reached approximately RMB0.6 billion.	Listed on Euronext Amsterdam	8.4%
4	Company E	Founded in 2008 and headquartered in Zhejiang Province, China, it provides intelligent EV home charging solutions for the global users. During the Track Record Period, its global sales value of home EV chargers reached approximately RMB0.3 billion.	Listed on Shanghai Stock Exchange	4.2%
5	**Zhida**	**See "Business"**	**-**	**3.9%**
Top 5				40.4%

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (5/7)

Top Five Providers of EV Home Charging Solutions by Sales Value of Home EV Chargers in China During the Track Record Period

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	**Zhida**	**See "Business"**	**-**	**10.3%**
2	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. During the Track Record Period, its sales value of home EV chargers in China reached approximately RMB0.9 billion.	Not Listed	10.2%
3	Company C	Founded in 2015 and headquartered in Guangdong Province, China, it is a global supplier for EV home charging facilities and software platform. During the Track Record Period, its sales value of home EV chargers in China reached approximately RMB0.8 billion.	Not Listed	9.0%
4	Company D	Founded in 2002 and headquartered in Shanghai, China, it is one of the leading suppliers of industrial intelligent solutions focusing on intelligent electricity, intelligent robots, intelligent equipment and industrial Internet. During the Track Record Period, its sales value of home EV chargers in China reached approximately RMB0.7 billion.	Listed on Shenzhen Stock Exchange	7.3%
5	Company E	Founded in 2008 and headquartered in Zhejiang Province, China, it provides intelligent EV home charging solutions for the global users. During the Track Record Period, its sales value of home EV chargers in China reached approximately RMB0.6 billion.	Listed on Shanghai Stock Exchange	6.4%
Top 5				43.2%

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (6/7)

Top Five Providers of EV Home Charging Solutions by Sales Value of Home EV Chargers in China in 2024

Ranking	Company Name	Background Information	Listing Status	Market Share (%)
1	Company E	Founded in 2008 and headquartered in Zhejiang Province, China, it provides intelligent EV home charging solutions for the global users. In 2024, its sales value of home EV chargers in China reached approximately RMB0.3 billion.	Listed on Shanghai Stock Exchange	8.6%
2	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. In 2024, its sales value of home EV chargers in China reached approximately RMB0.3 billion.	Not Listed	7.3%
3	**Zhida**	**See "Business"**	**-**	**6.6%**
4	Company C	Founded in 2015 and headquartered in Guangdong Province, China, it is a global supplier for EV home charging facilities and software platform. In 2024, its sales value of home EV chargers in China reached approximately RMB0.2 billion.	Not Listed	6.5%
5	Company D	Founded in 2002 and headquartered in Shanghai, China, it is one of the leading suppliers of industrial intelligent solutions focusing on intelligent electricity, intelligent robots, intelligent equipment and industrial Internet. In 2024, its sales value of home EV chargers in China reached approximately RMB0.2 billion.	Listed on Shenzhen Stock Exchange	6.1%
Top 5				35.1%

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players； Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Ranking and Market Share (7/7)

Top Three Providers of EV Home Charging Solutions by Number of Cities Covered in China, as at March 31, 2025

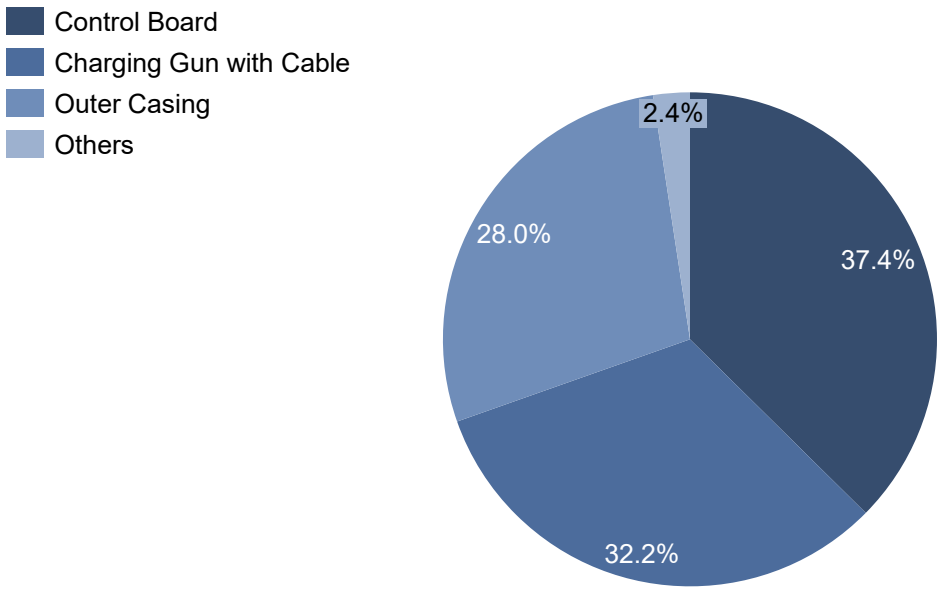
Ranking	Company Name	Background Information	Listing Status	Number of Cities Covered
1	**Zhida**	**See "Business"**	**-**	**Over 360**
2	Company A	Founded in 2014 and headquartered in Jiangsu Province, China, it provides devices, platforms and data operation services to global customers and creates a full-lifecycle platform for EV home charging through private charging and public charging. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.9 million.	Not Listed	Approximately 320
3	Company C	Founded in 2015 and headquartered in Guangdong Province, China, it is a global supplier for EV home charging facilities and software platform. During the Track Record Period, its sales volume of home EV chargers in China reached approximately 0.8 million.	Not Listed	Approximately 240

Source: Annual Reports; Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players； Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Cost Analysis of Global EV Home Charging Solution Market

Cost Structure of EV Home Chargers, 2024



- Home EV chargers are mainly composed of control board, charging gun with cable, outer casing and other components. The control board, with an integrated circuit, controls the discharge power of home EV chargers. Due to relatively complex manufacturing process and technology, the control board is the largest cost of home EV chargers, accounting for approximately 37.4% of the total cost. The second largest cost is the charging gun with cable, which is an important part that connects with the EV, accounting for approximately 32.2% of the total cost. The third largest cost is the outer casing of home EV charger, accounting for approximately 28.0%.

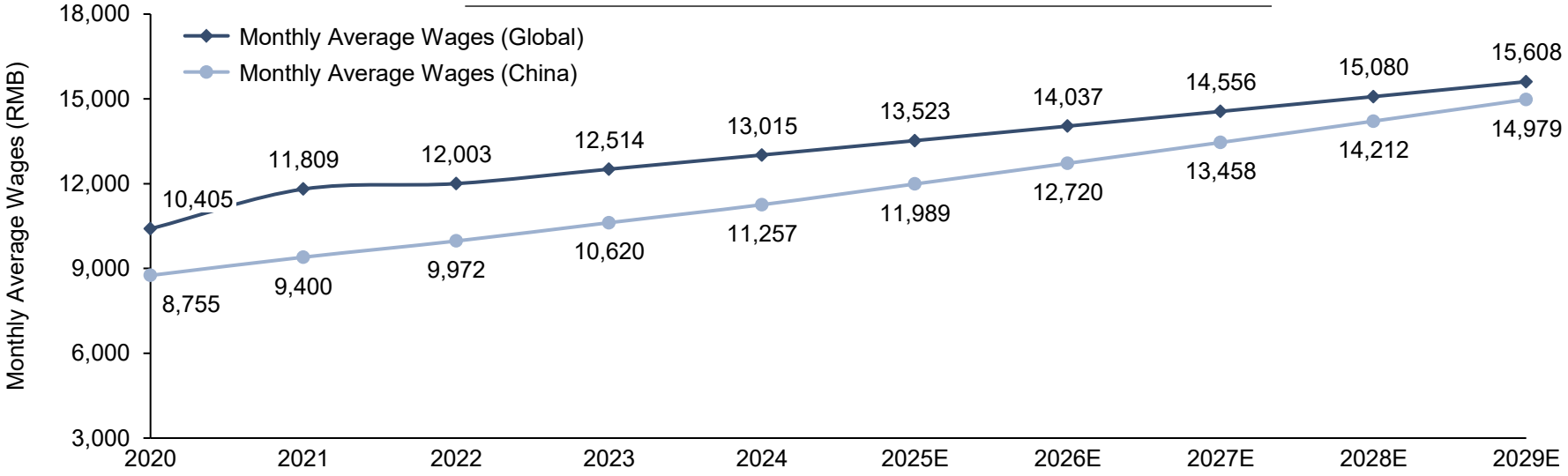
Source: Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global EV Home Charging Solution Market

Average Monthly Wages of Workers in EV Home Charging Solution Market

Average Monthly Wages of Installation and Maintenance Workers in EV Home Charging Solution Market

Monthly Average Wages	*CAGR (2020-2024)*	*CAGR (2024-2029E)*
China	6.5%	5.9%
Global	5.8%	3.7%



- Service capability is crucial for the providers of EV home charging solutions, and the labor costs of installation and maintenance workers are the major costs of service offerings by the providers of EV home charging solutions. The average wages of installation and maintenance workers in EV home charging solution market has increased continuously in recent years. The global monthly average wages of installation and maintenance workers in the EV home charging solution market increased from RMB10,405 in 2020 to RMB13,015 in 2024, representing a CAGR of 5.8%. The monthly average wages of installation and maintenance workers in EV home charging solution market in China increased from RMB8,755 in 2020 to RMB11,257 in 2024, representing a CAGR of 6.5%. In 2029, the global and Chinese average monthly wages are expected to reach RMB15,608 and RMB14,979, respectively, representing a CAGR of 3.7% and 5.9% from 2024 to 2029, respectively.

Source: World Bank; National Bureau of Statistics; Frost & Sullivan Analysis

Content

Market Definition and Overview of Smart EV Charging-Based Home Energy Management

- Smart EV home charging-based home energy management refers to the integration of various equipment including EV, power generation, electricity consumption and energy storage in the household as a home microgrid, the use of energy management systems for home energy control and management, and the provision of diversified digital energy services for home users. The Group has not yet entered into the smart EV home charging-based home energy management market.
- In the ecosystem of smart EV home charging-based home energy management, the EV serves as both the home equipment that consumes electricity, and as a home energy storage equipment, which is connected to the home microgrid through EV bidirectional chargers. EV power batteries are one of the most cost-efficient forms of energy storage since they require no additional investments in hardware. EV bidirectional chargers, which apply technologies such as V2H, are an important foundation for the smart EV home charging-based home energy management ecosystem. V2H technology allows EVs to power homes by using the EV power batteries to store energy sourced from the grid or from renewable energy sources, such as solar or wind power, which can then be used to power homes when needed, such as during a blackout or when electricity prices are high. In addition, the development of autonomous EV charging robots, which serve as hardware gateways to home energy management, can play an important role in this vehicle-to-energy & vehicle-to-home interaction.
- The major market players in the smart EV home charging-based home energy management ecosystem include (i) manufacturers of V2H/V2E home microgrid equipment, including EV home charging facilities, home photovoltaic systems, home energy storage systems and energy management systems, (ii) service providers that can offer installation, debugging and after-sales services for home microgrids, and various home digital energy services, and (iii) technology suppliers that can provide a series of technology solutions such as information and communication technologies. Some market players can provide solutions that cover diverse home microgrid equipment, services and technology solutions.

Source: Frost & Sullivan Analysis

Analysis of Global Smart EV Charging-Based Home Energy Management Market
Market Definition and Overview

Product and Service Offerings of Smart EV Charging-Based Home Energy Management Market

Smart EV Charging-Based Home Energy Management

EV Home charging solutions

- EV Home charging solutions mainly refer to comprehensive charging solutions including product offerings and value-added service offerings for EV home users, providing a safe and smart charging experience as well as efficient, low-cost and intelligent energy management.

V2H home energy services

- V2H home energy services refer to the product offerings of PV-storage-charging systems including EV home charging facilities, home photovoltaic systems, home energy storage systems and energy management systems, as well as the services offerings including the installation, debugging and after-sales services. V2H home energy services contributed to reduce home energy consumption and improve energy management efficiency.

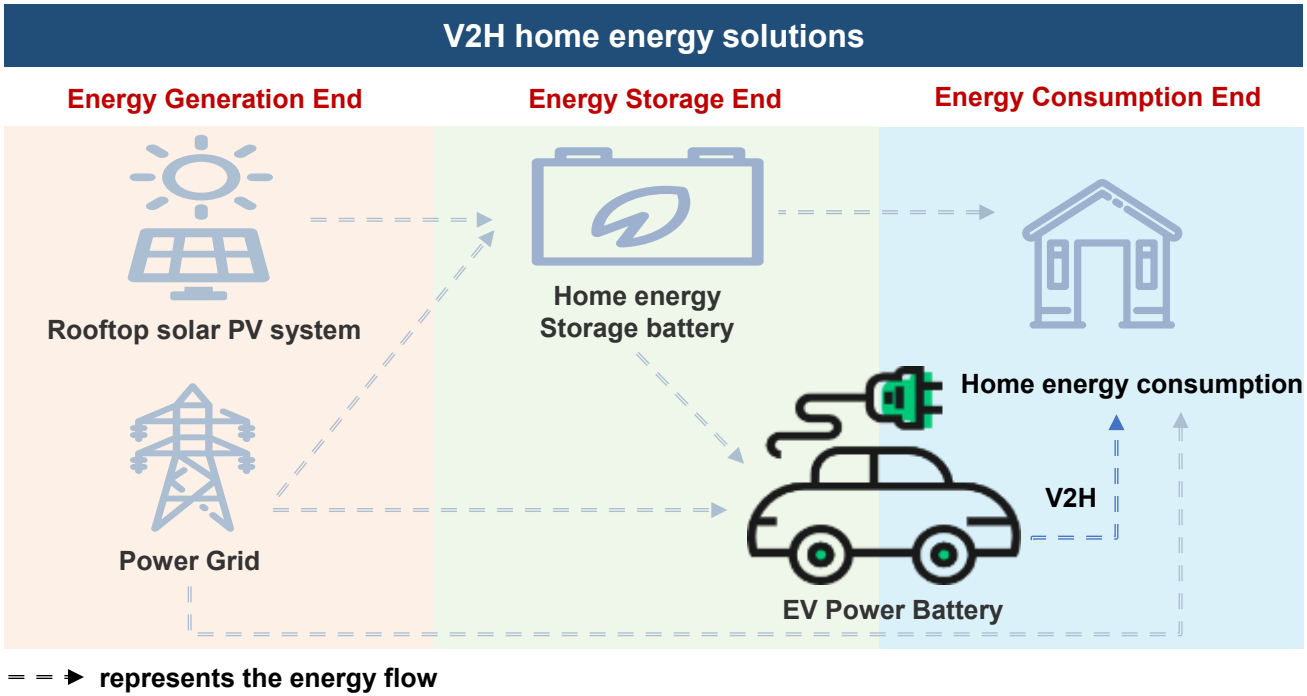
V2E home energy services

- V2E home energy services refer to the diversified digital energy services provided based on the business scenarios of bidirectional interaction between EV and energy sources, which effectively leverages the flexibility of EV power batteries connected to EV bidirectional chargers as both controllable loads and mobile energy storage systems, and also integrates the energy sources of EV home users to establish a digital home energy ecosystem.

Source: Frost & Sullivan Analysis

Analysis of Global Smart EV Charging-Based Home Energy Management Market
Analysis of V2H home energy solutions

- As illustrated in the diagram below, in V2H home energy solutions, the energy generation end is the photovoltaic power generation system and the power grid system, the energy storage end is the home energy storage system and the EV power battery, and the energy consumption end is the EV and various home appliances. EVs can be charged and transmit power to home appliances through EV bidirectional chargers, thereby achieving reasonable and efficient distribution of the generation and consumption of home energy.



Source: Interviews Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of V2E Home Energy Services

- V2E home energy services refer to the diversified digital energy services provided based on the business scenarios of bidirectional interaction between EV and energy sources, which effectively leverages the flexibility of EV power batteries connected to EV bidirectional chargers as both controllable loads and mobile energy storage systems, and also integrates the energy sources of EV home users to establish a digital home energy ecosystem.

1

Aggregated transaction platforms

- Aggregated transaction platforms refer to aggregated platforms where households can transact electricity or carbon sink. The service providers that own aggregated transaction platforms may charge commissions from the transaction conducted on their platforms.

2

Supply of home green electricity

- Supply of home green electricity refers to the supply of green electricity to EVs through EV chargers. EVs can use the green electricity as a load or further transmit green electricity to home appliances as home energy storage devices. Service providers may obtain subsidies by connecting green electricity, and further extend their business to the provision of home green electricity generation equipment.

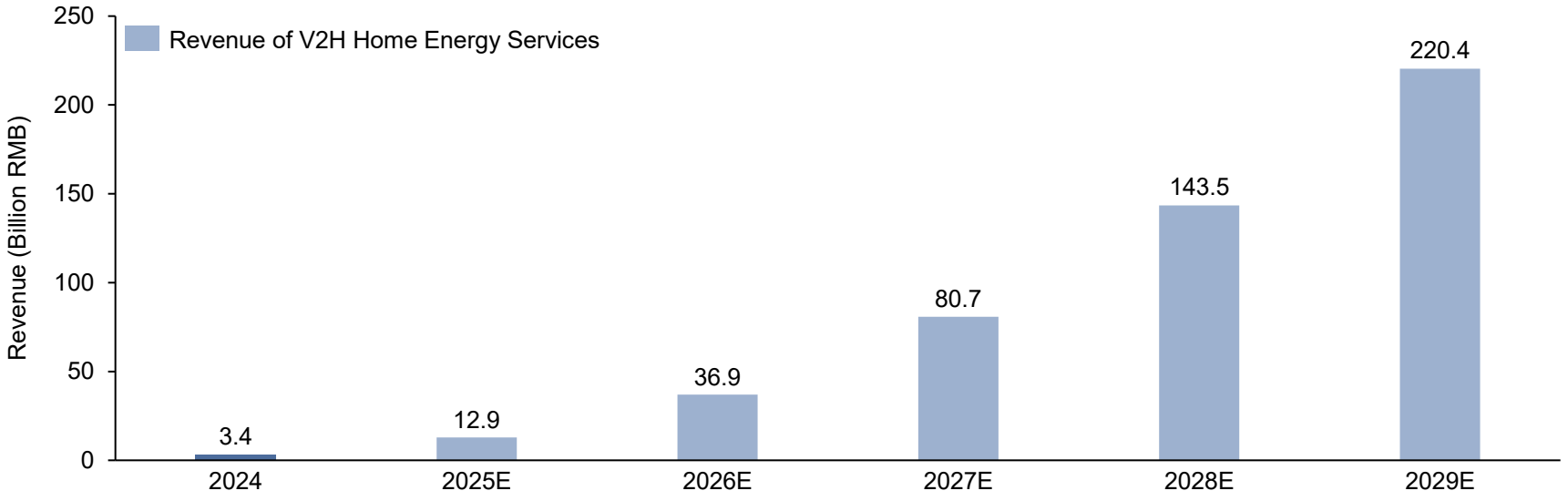
Source: Frost & Sullivan Analysis

Analysis of Global Smart EV Charging-Based Home Energy Management Market

Revenue of Global V2H Home Energy Services

Revenue of V2H Home Energy Services (Global), 2024 – 2029E

Revenue	*CAGR (2024-2029E)*
Global	130.3%



- Before 2023, the development of global V2H home energy services is in the initial stage, and the revenue mainly comes from pilot or small-scale application projects. In the future, driven by robust market demand stimulated by increasing penetration of EVs, favorable policies and decreasing costs of power generation, the total revenue of V2H home energy services in the world is expected to enjoy a significant increase and reach approximately RMB220.4 billion in 2029, representing a CAGR of 130.3% from 2024 to 2029. Overseas regions including Europe, the United States, Southeast Asia and Middle East are expected to have significant growth potentials. In 2029, the total revenue of V2H home energy services in Europe, the United States, Southeast Asia and Middle East is expected to reach RMB121.9 billion, RMB36.8 billion, RMB22.5 billion, RMB16.3 billion, respectively.

Source: Eurostat; Energy Storage Application Branch of China Industrial Association of Power Sources; Interview Conducted by Frost & Sullivan with Experts from Leading Market Players; Frost & Sullivan Analysis

Analysis of Global Smart EV Charging-Based Home Energy Management Market
Future Opportunities

Future Opportunities

Diversified Home Digital Energy Services	• Along with the development of digital energy and bidirectional charging technologies such as V2H/V2E, the interaction between EVs and energy will bring about diversified potential business scenarios, such as aggregated transaction platforms, supply of home green electricity and private energy transactions. The expanding scope of home digital energy services can further transform business models of market players. For instance, in order to reach a wide range of home users to monetize digital energy services, solution providers may proactively give up the profits or even revenue from part of product offerings.
Technological Advancements	• Continuous technological advancements will facilitate the popularity of smart EV home charging-based home energy management solutions. The technology innovation of energy storage batteries, such as the development of solid-state batteries, will further improve the energy density of home energy storage systems, extend the service life of home energy storage and charging systems, and provide a more convenient charging experience. In addition, with the development of the IoT and big data technologies, V2H home energy management systems will develop towards systems that can achieve real-time monitoring, remote control and energy consumption planning, further enhancing user adhesion to the systems.
Enhanced Cross-Industry Cooperation	• V2H and V2E home energy services have created opportunities for cross-industry cooperation among equipment manufacturers, automakers, energy companies and technology companies. By leveraging their respective advantages, they provide home users with more efficient energy management solutions. Furthermore, the enhanced cross-industry cooperation can foster innovative business models. For instance, the equipment manufacturers with digital platforms can cooperate with energy companies by providing aggregated platform for energy transactions so that energy companies can reach home user resources while platform operators can help their platform users to manage home energy and obtain commission from energy transactions.

Source: Frost & Sullivan Analysis

Content

Abbreviations and Terms

Abbreviations and Terms

- CAGR: compound annual growth rate
- GDP: gross domestic product
- R&D: research & development
- RMB: Renminbi, the lawful currency of the PR
- EV: Electric vehicle
- AC: Alternating current
- DC: Direct current

Limitations in Source of Information

- Interviews with end-users, venders and distributors are conducted to collect information for this report, based on a best-efforts basis.
- Frost & Sullivan will not be responsible for any information gaps where interviewees have refused to divulge confidential data or figures.
- In instances where information is not available, figures based on similar indicators combined with Frost & Sullivan in-house analysis will be deployed to arrive at an estimate.
- Frost & Sullivan will state the information sources at the bottom right-hand corner of each slide for easy reference.

Note to Numeric Calculations

- Value and percentage figures in this report are all rounded. Figures may not add up to the respective totals owing to rounding.
- The base year is 2024. The historic period is from 2020 to 2023. The forecast period is from 2025 to 2029.

Appendix Relating to the Company (1/3)

- During the Track Record Period, we provided smart home EV chargers and accessories and/or services to seven of the top ten automakers in China in terms of sales volume of EVs in 2024, according to Frost & Sullivan.
- In Thailand and Brazil, two fast-growing EV markets outside of China, we are one of the first movers that have established a presence as a recognized provider of smart home EV chargers and services, according to Frost & Sullivan.
- We are one of the top three brands in terms of retail sales of home EV chargers on e-commerce platforms in 2022, 2023 and 2024, according to Frost & Sullivan.
- According to Frost & Sullivan, direct sales and distribution are generally in line with the industry norms.
- According to Frost & Sullivan, the total sales value of the home EV chargers is RMB7.2 billion globally and RMB3.5 billion in China in 2024. Driven by the growing sales volume of EVs, the global sales volume of home EV chargers increased from 0.4 million in 2020 to 5.7 million in 2024, representing a CAGR of 93.2%. In 2020, due to the impact of COVID-19 pandemic, the on-site installation services of EV chargers were interrupted, causing a decrease in the sales volume of home EV chargers. From 2020 to 2024, the sales volume of home EV chargers in China, Europe, North America, South America, Middle East and Southeast Asia grew at a CAGR of 111.7%, 53.2%, 57.8%, 109.3%, 97.5% and 277.8%, respectively. The EV industry's growth is expected to drive the rapid growth in home EV charger demand. In 2029, the global sales volume of home EV chargers is expected to reach 14.4 million, representing a CAGR of 20.3% from 2024 to 2029. During the same period, the sales volume of home EV chargers in China, Europe, North America, South America, Middle East and Southeast Asia are expected to grow at a CAGR of 15.1%, 15.0%, 14.5%, 51.6%, 52.3% and 64.9%, respectively.
- According to Frost & Sullivan, EV automakers typically bundle home EV chargers as either standard or optional configurations, integrating charger providers like our company into their sales and service ecosystems. EV automakers maintain rigorous supplier selection standards, requiring bidding suppliers in the home EV charger industry to have at least two to five years of proven business operations in the EV home charging solution market, and only those meeting strict criteria in technical capability, product quality, production capacity, safety compliance, and service quality are selected. The number of charger suppliers admitted to the qualified supplier list of an EV brand rarely exceeds five.
- According to Frost & Sullivan, smart home EV charger is an industry term.
- In China, the automotive industry typically promotes sales in the fourth quarter of the year, leading to an increase in EV purchases during this period, according to Frost & Sullivan.
- We were named as "China Charging and Battery Swapping Industry Top 10 Most Valuable Investment Brand 2022 (2022中國充換電產業十大最具投資價值品牌)" by Chongdian360.cn and Charging and Battery Swapping Industry 100 Forum, which was the only named enterprise focused on home charging and home green energy digital technology, according to Frost & Sullivan.
- We have built the largest third-party household EV charger IoT database in terms of the number of EV chargers connected in China as of March 31, 2025, according to Frost & Sullivan.

Source: Frost & Sullivan Analysis

Appendix Relating to the Company (2/3)

- As one of the world's first EV charger companies that are awarded the certificate of the automotive standard IATF16949, we have established a strong manufacturing foothold in both China and overseas, according to Frost & Sullivan.
- Our competitive advantage lies in our ability to manufacture quality products at competitive prices and rapidly adapt our offerings to local market preferences, according to Frost & Sullivan. Supported by a strong customer service and support framework, this strategy will enhance brand recognition and loyalty, distinguishing us in markets with established competitors.
- According to Frost & Sullivan, based on the number of cooperating automakers as of December 31, 2024, we hold a leading position in China's home EV charging market.
- According to Frost & Sullivan, as an established participant in the new energy industry in China, our growth trajectory aligns closely with the growth of the overall EV industry in China.
- According to Frost & Sullivan, beginning in mid-2023, China's EV industry faced excess production capacity and a pullback in government subsidies, triggering price wars among leading automakers that intensified through 2024. With relatively stronger bargaining power in price negotiations, EV automakers pushed part of this pricing pressure upstream, weighing on the home EV charger industry and related service providers. Geographically, the vast majority of our sales during the Track Record Period were generated domestically. The competitive landscape in China compelled us to keep our prices competitive to maintain our market share. In 2024, the capacity utilization rate in China's EV industry was 58.3%. The average selling price of EVs in China declined from RMB184,000 per unit in 2023 to RMB171,000 per unit in 2024, reflecting a year-over-year decrease of 7.1%. Due to the decline in the average selling price of EVs in China, the EV automakers have pushed part of the pricing pressure to upstream suppliers, including home EV charger manufacturers and related service providers, resulting in a decrease in the average selling price of home EV chargers in China decreased by 8.7% from 2022 to 2024. Meanwhile, the average monthly wages of installation and maintenance workers in China's EV home charging solution market increased from RMB9,972 in 2022 to RMB11,257 in 2024, growing at a CAGR of 6.2%, which increased the costs of value-added service offerings and affected the profitability of home EV charger manufacturers and related service providers.
- According to Frost & Sullivan, gross profit margins associated with sales to automakers tend to be lower due to their relatively strong bargaining power, compared to direct sales to retail customers and sales through distributors.
- According to Frost & Sullivan, the primary customers for our EV charging robots and EMS solutions are not EV automakers, but rather public highway service areas, industrial parks, airports, shopping malls, parking facilities, and residential users.
- According to Frost & Sullivan, from 2020 to 2024, the penetration rate of assisted autonomous driving system in new passenger vehicles sold in China grew significantly from 13.0% to 57.3%.
- According to Frost & Sullivan, our return policy is generally in line with industry norms.

Source: Frost & Sullivan Analysis

Appendix Relating to the Company (3/3)

- According to Frost & Sullivan, customer concentration is common in the home EV charging industry in China, largely because there are relatively few EV manufacturers.
- According to Frost & Sullivan, automakers maintain high supplier standards, making it challenging to enter to their lists; however, once accepted, a durable partnership is established, and suppliers usually are not easily replaced.
- According to Frost & Sullivan, although some leading automakers select suppliers through a bidding process, they typically establish systematic and rigorous processes for supplier management. These include stringent qualification screening for bidders and comprehensive evaluation frameworks covering suppliers' capabilities across product quality, technology, delivery capacity, and service responsiveness. After awarding the contract, they also tend to engage in long-term collaboration with suppliers. In addition, once suppliers are selected, leading automakers generally provide multi-year demand forecasts to ensure stable long-term supply.
- As confirmed by Frost & Sullivan, for convenience purpose, it is not uncommon for the related parties' accounts of such customers to be used for corporate transaction settlements.
- According to Frost & Sullivan, U.S. tariff policies have a limited impact on our major customers, namely China's EV manufacturers, given the limited Chinese EV exports and sales into the U.S. market. As of the Latest Practicable Date, the U.S. imposed a 57.7% import tariff on Chinese home EV chargers.
- According to Frost & Sullivan, the proportion of China's EV exports to the U.S. is minimal. According to the General Administration of Customs of the PRC, from 2022 to 2024, the export value of Chinese EV to non-U.S. overseas markets increased from US$22.1 billion to US$39.9 billion, representing a CAGR of 34.4%.
- According to Frost & Sullivan, it is an industry norm that automakers typically delay the account reconciliation process until they receive payments from their end customers, which can take up to five months since end customers place EV purchase orders with the automakers, including (i) the period from order placement of EVs to the commencement of production, which takes up to four months, primarily due to automakers' varying production schedules; (ii) the period from commencement of EV production to completion of such production, which takes up to one week; (iii) the period from completion of the EV production to delivery of the EVs to designated locations, which takes up to four weeks; and (iv) the period from delivery of EVs to receipt of payments from end customers, which takes up to one week.
- According to Frost & Sullivan, such delays are typically not due to slow EV sales by automakers and are a normal part of the EV sales process.
- According to Frost & Sullivan, as of December 31, 2024, there are over 3,000 companies worldwide that meet our criteria for potential targets, including over 200 in North America (excluding the United States), over 600 in Europe, and over 300 in Southeast Asia.

Source: Frost & Sullivan Analysis

Methodologies

- Frost & Sullivan is an independent global consulting firm, which was founded in 1961 in New York. It offers industry research and market strategies and provides growth consulting and corporate training. Its industry coverage in the PRC includes automotive and transportation, chemicals, materials and food, commercial aviation, consumer products, energy and power systems, environment and building technologies, healthcare, industrial automation and electronics, industrial and machinery, and technology, media and telecom.
- The Frost & Sullivan's report includes overview of global EV industry, analysis of global EV home charging solution market, analysis of global smart EV charging-based home energy management market, among others.
- The market research process for this study has been undertaken through detailed primary research which involves discussing the status of the industry with leading industry participants and industry experts. Secondary research involved reviewing company reports, independent research reports and data based on Frost & Sullivan's own research database.
- Projected total market size was obtained from historical data analysis plotted against macroeconomic data as well as specific related industry drivers.
- Frost & Sullivan's report was compiled based on the below assumptions:
  - Global economy is likely to maintain steady growth in the next decade;
  - Global social, economic, and political environment is likely to remain stable in the forecast period;
  - Market drivers like supporting policies, rapid growth in EV sales, upgrading of products and services, etc.;
  - The COVID-19 is likely to affect the stability of global macro economy in short term.