

Leading the charge

SEPTEMBER 2023

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Branded charging networks for electric vehicles – Insights from China

Whether and how fast the market for electric vehicles (EVs) develops worldwide depends crucially on the expansion of vehicle charging networks. In China – the clear leader in electric mobility today – more and more automakers are building their own branded charging networks. What can OEMs in the rest of the world learn from China's example?

China's public charging network for EVs continues to expand rapidly, driven both by government policy and market demand. In 2022 the country added more than 650,000 public charging pillars to its existing network, which now totals almost 1.8 million charging pillars nationwide – a year-on-year increase of 56 percent. The country, which leads the world in e-mobility, currently places a particular focus on DC charging pillars: These fast-charging pillars accounted for 43.5 percent of all charging pillars by the end of 2022.

At the same time, we can observe increasing involvement of original equipment manufacturers, or OEMs, in the expansion of the EV charging network. This phenomenon is currently limited to China (with the exception of Tesla, which beyond China is also building a branded charging network in Europe and the United States). Thus, in 2022 China had an estimated 40,000 branded charging pillars, with new players and domestic brands growing rapidly at the expense of OEM joint ventures.

For OEMs aiming to transform their brands and quickly capture users' mindshare, building a branded charging network can be a key competitive differentiator, boosting user confidence and triggering sales conversion. In Europe and North America, by contrast, traditional OEMs are generally developing charging infrastructure through joint venture charge point operators (CPOs), with few players offering their own branded networks.

The clear exception here – and it is a major exception – is Tesla. The American multinational currently runs extensive charging networks in different continents, including the United States, Europe and China. In the United States it provides a significant proportion of public charging with its own NACS standard.

One of the major advantages of OEM-branded charging networks is that they ensure a seamless charging experience for users of the brand in question. Even in China, however, OEMs face a range of challenges when building branded charging networks, not just in the area of user experience but also in concept validation, budget planning and execution. Below, we examine six key challenges drawn from the experience of Chinese OEMs that are nevertheless relevant for automakers around the globe. We then make tentative recommendations for how OEMs can rise to these challenges.

• **Six challenges for OEMs**

#1 Define the scale of the network

The first challenge for OEMs is to define the correct scale of any branded charging network they build. Different OEMs have different product positionings, target customer groups, investment budgets and maturity in terms of electrification, and all of these factors have a role to play in defining the scale of the future network.

We categorize the main players in the Chinese market into three types based on the relative scale of their branded charging networks (that is, the size of the network relative to the brand's EV car parc) and their degree of openness to other brands (that is, whether the stations can be used by everyone, by selected partners only, or solely by drivers of the brand in question). The first category is **energy service players**, which are large-scale and potentially have a high degree of openness compared to other categories; these are often new technology OEMs, or new take-offs (NTOs). The second category is **differentiated service players**, with large relative scale but less openness; this group includes some international premium brands and mid-to-high-end local brands. The final type is **brand demonstration players**, which have small scale and a low level of openness; this group includes some luxury brands.

The three different types of players exhibit different characteristics in terms of their charging business positioning, network scale, scenario coverage and degree of openness. For example, energy service players in China can have more than 10,000 charging pillars, with a vehicle-to-pillar ratio of 50:1 or less, while differentiated service players may have several hundred branded charging stations covering the core needs of their own customers. By contrast, brand demonstration players focus entirely on the charging needs of customers driving

their vehicles during trips along specific routes or for distinct types of journeys – off-road trips, vacations and so on. Experience in China shows that merely imitating the leading players in branded networks often fails to achieve the desired results.

Three types of branded charging players

	Energy service player	Differentiated service player	Brand demonstration player
Business positioning	<ul style="list-style-type: none"> Customer experience Brand promotion 	<ul style="list-style-type: none"> Premium customer service 	<ul style="list-style-type: none"> Brand promotion Marketing brand's own EV models
Scale of network	<p>> 10,000 charging piles, with vehicle-to-pile ratio of ~50:1 or less, covering >50% of public charging demand for brand's users</p> <p>●●●●●●</p>	<p>Several hundred branded charging stations, covering core needs of the brand's customers</p> <p>●●●○○○</p>	<p>A few branded charging stations, focused on serving brand's own customers while on trips</p> <p>●○○○○○</p>
Scenario coverage	Covers diverse scenarios such as urban, destinations, and long-distance routes, meeting various charging demands	Mainly focused on core urban charging scenarios , e.g. shopping malls and some hotels and resorts, etc.	Mainly specific routes and types of journey, e.g. off-road, vacations, etc.
Openness	Open to all brands: Aim is to build a reputation for high-quality service and increase utilization of the charging network	Exclusive: Open only to the brand's own customers	Partially open to public: But brand's own customers enjoy prioritized benefits

Source Desktop research; Roland Berger

Roland Berger

#2 Evaluate return on investment

Key questions for OEMs are, what are the key factors affecting return on investment (ROI), and how can the OEM ensure reasonable expectations for ROI within the organization? Different departments often disagree as to whether ROI should be evaluated independently and what represents a reasonable ROI. This can lead to a lengthy process of consensus-building on resource allocation for building charging stations in the first place.

In China we see significant differences in ROI between mature branded charging networks and new entrants. The payback period for a single charging station at a shopping mall in China ranges from five to six years, in the case of one leading NTO, to more than ten years for a certain international luxury brand.

"In China, more and more automakers are building their own branded charging networks. As the e-mobility revolution picks up speed, OEMs around the globe need to urgently address a variety of long-term issues."

JACK ZHUANG
Principal,
Roland Berger

Return on investment: Two case studies

	Case A A leading NTO	Case B An international luxury brand
Brand's EV car parc	Started early, maintains a leading position in EV car parc	Transitioning at a slower pace, EV car parc at the level of tens of thousands units
Users habits and benefits	Cultivated user habits early on by offering free charging at branded charging stations	Free charging in selected networks, user awareness of branded charging stations needs to be strengthened
Types of charging piles	Supercharging DC pile (approx. 250 kW), designed and manufactured by the OEM	Supercharging DC pile (>300 kW), design requirements and standards proposed by the OEM, charging piles manufactured and installed by contractors
Locations	Early deployment with strong brand influence and strong bargaining power in lease agreements of land	Late entry to the market, strong competition, leading to higher premium for high-quality sites
Payback period ¹	5-6 years	Approx. 10 years

¹ For a single charging station located at a shopping mall
Source Desktop research; expert interviews; Roland Berger

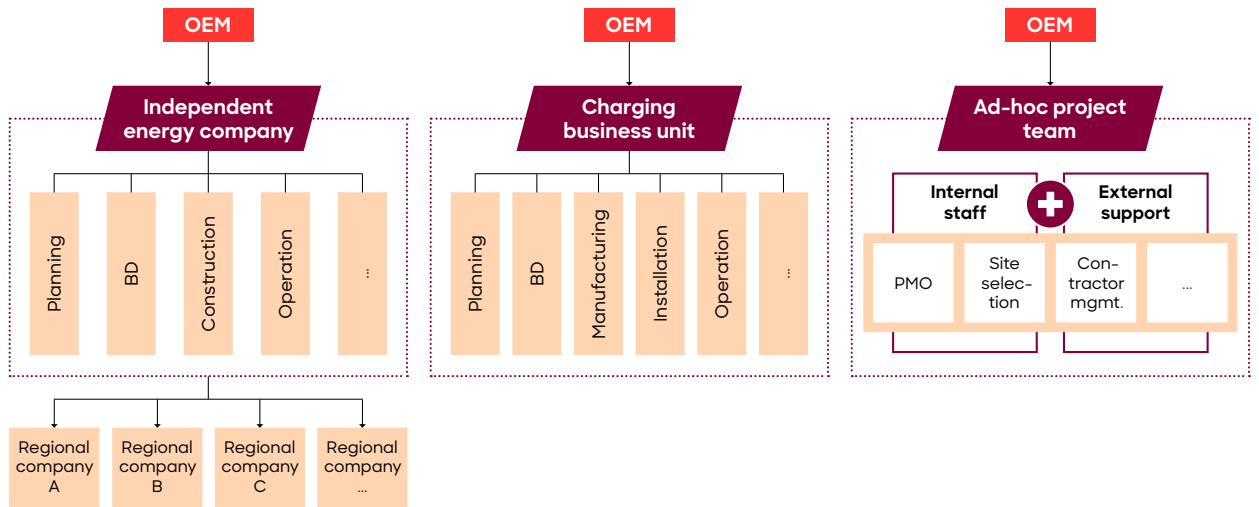
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#3 Get the organizational structure right

What is the best organizational structure for OEMs' internal management of their charging business? When it comes to building branded charging networks, OEMs often face challenges at both organizational and operational levels, including time constraints, heavy workloads, a lack of professional personnel and teams, and difficulties in cross-departmental collaboration. Different types of OEMs adopt different organizational structures for their charging business, and choose different functional coverage based on the depth and breadth of their business. The challenge is to find the correct structure to ensure smooth implementation and provision of services.

The illustration below shows three different possible organizational structures for the branded charging business. In Case A, an NTO sets up an independent energy company. The organizational structure has comprehensive departments and divisions responsible for end-to-end management of the planning, design, construction and operation of the branded charging network, with regional subsidiaries promoting network deployment and operations. Case B is where an NTO sets up a business unit specifically for the charging business. This unit has a complete set of business functions, including front-end planning, business development, middle-end equipment production and installation, and back-end operation management and promotion. The company then improves efficiency and reduces station operation costs by cooperating with external operators. In Case C, the OEM sets up an ad hoc, temporary project team using members of its own staff and external professionals. This team is then responsible for station deployment management, while implementation is carried out by contractors. In this setup, the OEM can start planning and building the network quickly and flexibly.

Different organizational structures



Source: Desktop research; expert interviews; Roland Berger

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#4 Strengthen contractor management

How can OEMs strengthen their contractor management and so ensure that the construction of their branded charging stations progresses smoothly? Most OEMs lack experience and do not yet have the necessary teams in areas such as charging equipment, site resources and operational capabilities. As a result, they are highly reliant on external contractors, which need to be managed systematically right from the outset.

Building charging networks involves coordinating multiple areas, including equipment, site resources, supporting facilities and systems. In China we observe problems relating to site selection, such as a lack of resources on the part of the OEM, varied quality of the sites recommended, time-consuming screening processes and low conversion rates. These factors delay progress in building the network.

Another challenge is the construction process itself: Lack of support from experienced personnel can make it difficult for OEMs to detect issues such as contractors cutting corners or misreporting working hours. Poor quality leads to the need for rework, which further extends the construction period.

A third problematic area is the end-to-end testing of stations, which is required by the OEM before the station goes live. In some cases, the selected supervising party may be unfamiliar with the surroundings of the station and, where acceptance issues arise, prefer to avoid responsibility rather than making improvement suggestions. All of these challenges will apply equally to conventional OEMs that decide to build their own branded charging networks.

#5 Enhance user experience

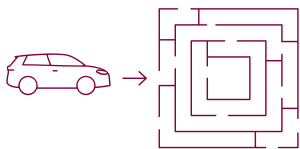
The challenge for OEMs here is how to identify key pain points along the charging journey and continuously improve user experience on this basis. Traditional OEMs in particular must shift from a "product mindset" to a "user mindset" when building a charging network. To achieve the best user experience with regard to equipment selection, station layout, functionality and service design, drivers' perspectives are crucial. Leading OEMs in China follow a systematic methodology and draw on their extensive operational experience to optimize the user experience at each phase of the charging journey, enabling them to stand out from their competitors.

For example, a common complaint from drivers is that it is difficult to find the charging stations in underground parking garages. To resolve this issue, one NTO has had the company managing the parking garage put up signs to guide drivers to the charging station, while another NTO has improved the software on their app to make it easier for drivers to navigate to the charging station. Another common driver complaint is that they turn up at a charging station where they have reserved a space, only to find that someone else has taken their spot. One premium brand has solved this problem by adding automatic ground locks to their stations that only unlock when the right vehicle arrives. A third pain point for drivers is that they have to hang around while waiting for their vehicles to charge. The solution offered by one high-end brand? Provide clients with valet parking and charging services, and offer them free drinks while they wait.

Common pain points along the charging journey

Pain Point A

"The app guides me to the underground parking garage, but the garages are so complex that often I can't find the charging station..."



Pain Point B

"Often I get to the charging station only to find that the spot I reserved has been taken by somebody else - another wasted trip!"



Pain Point C

"I usually spend somewhere between 30 minutes and several hours charging. What am I supposed to do while I'm waiting?"



Source: Desktop research; Roland Berger

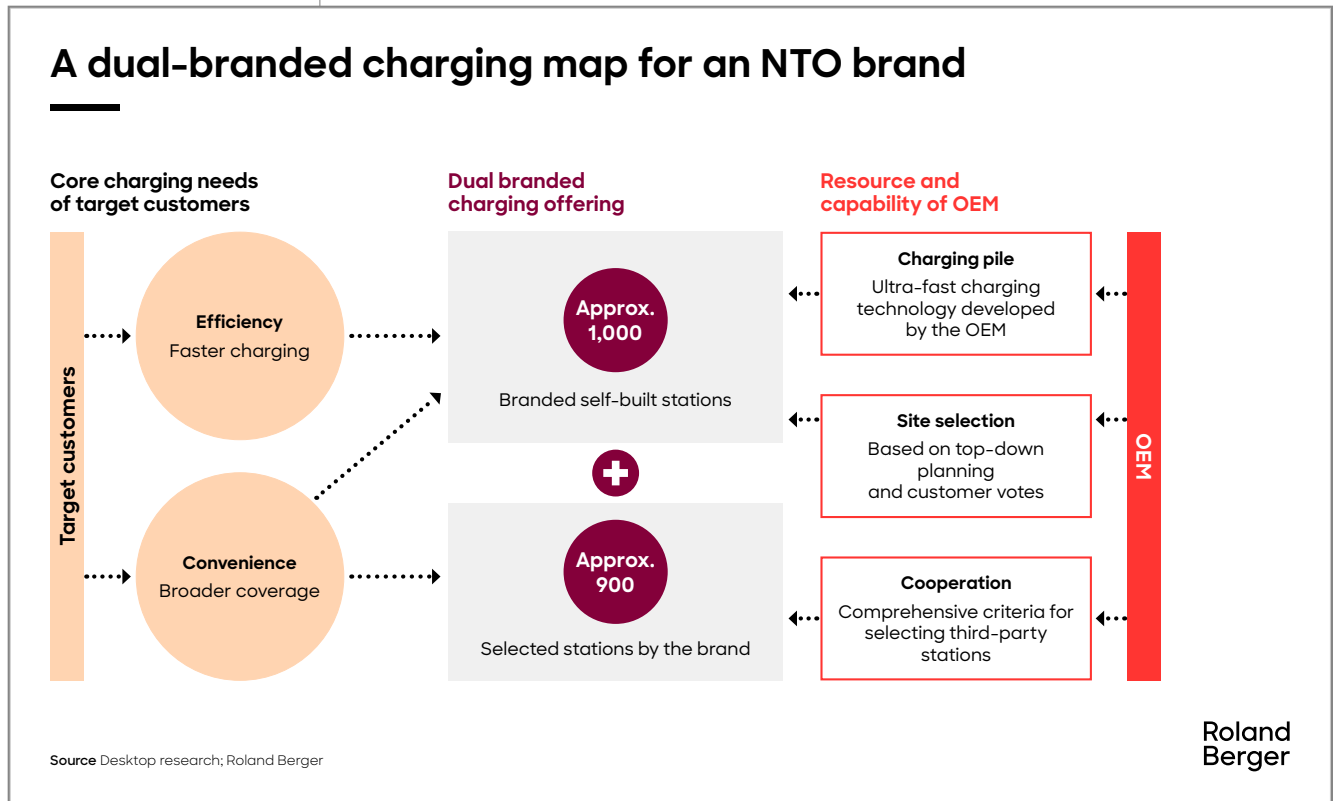
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#6 Ensure a high-quality charging network

How can OEMs develop a high-quality charging network and portfolio of charging services? Creating a multi-tiered, comprehensive charging offering is crucial for achieving competitive advantage. Branded charging networks provide a better

charging experience for vehicle owners but their scale may not fully meet drivers' charging needs, especially in the case of latecomer OEMs. This is where we currently see branded charging networks, branded charging alliances and selected third-party charging networks joining forces and playing a significant role in the charging landscape.

OEMs should adapt their own resources and capabilities based on the core charging needs of their target users. In this way they can build a map of high-quality, differentiated charging services – as shown for an NTO brand below.



• Recommended actions

OEMs can take various steps to master each of the areas covered by the challenges outlined above – that is, scale, ROI, organizational structure, contractor management, user experience, and quality. Action in each of these areas should be top of the management agenda for players considering building a branded charging station network, whichever market they are active in.

Scale

When deciding on the scale of their proposed branded charging network, OEMs should consider different value propositions. These value propositions differ in terms of the company's positioning and its development strategy for the branded charging business. Thus, a **large and comprehensive** approach could be right for energy service players, which treat charging as an independent business, offering scale, a comprehensive charging system across diverse scenarios. To attract more customers and increase revenue they should consider increasing their degree of openness,

allowing their charging stations to be used by selected partners or anyone at all. For differentiated service players – consisting of some international premium brands and mid-to-high-end local brands – we recommend a **tailored and refined** approach. These players can build charging networks (or "charging alliances") that are tailored to the needs of their brand owners, focusing on distinct, high-end boutique services and experiences. They may also want to consider forming partnerships with brands with similar characteristics, as a way of expanding coverage.

Finally, brand demonstration players, represented by luxury brands, should aim for charging stations that are **small and more often exclusive**. They can set up charging stations on a small scale at traffic hubs (airports, railroad stations and so on), in downtown showrooms and other distinctive locations. They can maximize their promotion of the brand and its products by having well-designed, attractive charging stations that stand out from competitors' offerings.

Return on investment

Established brands that make an early start on building a branded network can benefit from a first-mover advantage. With mature networks and prime locations, they stand to achieve substantial returns over time. By contrast, OEM brands that enter the market later could face shortcomings in equipment production, site resources and operational capabilities. Intense market competition continues to drive up construction costs in key locations, resulting in a longer expected ROI period for those that delay entering the market.

We advise latecomers to **set their ROI expectations accordingly**. They should recognize the role of branded charging networks in boosting user confidence and driving sales conversion. But, at the same time, they need to fully **understand the factors influencing the investment return cycle** for individual charging stations. With this in mind, they can then devise appropriate investment, construction and operational strategies.

Organizational structure

OEMs should consider their long-term goals and the phased development needs of their branding charging business, and on this basis create a fitting organizational structure and allocate appropriate resources. By **starting with the end-game in mind** they can ensure that they have a suitable organizational structure. For example, if their goal is to establish an independent, scalable business or to go public, the right move would be to set up an independent charging company or form a joint venture with strategic partners. By contrast, if their goal is to have an independent operation, they can take a "business unit approach". And if their goal is to achieve a rapid breakthrough on the market or simply to promote their brand, an "internal task force approach" offers advantages in terms of flexibility and efficiency.

OEMs should also **ensure that key stakeholders in the organization are on the same page**. If the different departments share a clear, consistent understanding of top-level strategy, they can cooperate and the company can achieve smooth implementation and operations, regardless of the organizational structure they choose.

Contractor management

The complexity, time sensitivity and resource investment involved in building branded charging networks presents challenges in the area of contractor management and progress tracking. We recommend that companies **establish clear, consistent standards** as a basis for choosing collaboration models, selecting high-quality contractors and ensuring the quality of charging stations. They will also benefit from **building a comprehensive, end-to-end, closed-loop management system** based on top construction standards, key business processes and potential risks. Furthermore, they may wish to consider **drawing on external support** – this can be particularly useful in the initial stages, as bringing in experienced external teams can ensure project progress, reduce risks and facilitate the gradual absorption of professional knowledge and capabilities by the internal team.

User experience

Companies should make the **user perspective** their core focus. Traditional OEMs in particular must give up their longstanding belief that user experience is the sole responsibility of customer service and aftersales. They should incorporate other user perspectives into the conceptual design stage, carry out continuous on-site testing and validation, and collect feedback to identify any pain points that they can optimize to smooth out the user experience.

Digitalization will be a key tool for OEMs. From the user interaction interface and functionality design to interconnectivity with cooperative ecosystem platforms and the use of backend management tools, digital solutions are key to ensuring charging service quality and improving operational efficiency.

Quality

Different types of OEMs face different demands from their target customer groups with regards to charging. They will need to focus on their customers' most critical charging needs, and at the same time create experiences that really stand out. Once they have done this, they can gradually improve and enrich their charging offering through brand alliances, partnerships and platform integration.

We recommend starting with a **branded charging network** that is operated independently and meets users' core charging needs through differentiated services and benefits. From this basis, OEMs can gradually develop a **charging alliance network** or collaborations with other branded charging stations with similar brand positioning and service quality. The next step would be to become a **selected third-party charging network**, achieving comprehensive coverage by working with high-quality external public charging networks. Finally, they can consider becoming a **fully open, public charging network**.

Final words

In the fiercely competitive world of electric vehicles, where public charging networks are highly valued, many OEMs find themselves at a critical juncture regarding their branded charging network strategies. As the e-mobility revolution picks up speed, companies need to address a series of long-term issues with increasing urgency.

With regard to **charging ecosystems**, the majority of traditional mass-brand OEMs, especially in Europe and the United States, are jointly investing in building public charging networks. With rapidly changing structures and business models, players need to decide how to establish differentiated charging ecosystems through innovation and collaboration. At the same time, luxury OEMs must find ways to demonstrate the uniqueness of their branded charging networks.

In a climate where user operations and the lifetime value of products are increasingly important, OEMs need to fully leverage the value of branded charging networks as long-term touchpoints with their customers. They should focus on achieving **operational excellence**, continuously improving charging station utilization through digital tools and seamless processes, thereby maximizing their resources.

At the same time, OEMs must not lose sight of **sustainability**. Against a background of decarbonization, companies must ask themselves how they can best collaborate with energy players to create sustainable development solutions, especially in areas such as energy storage systems (ESS) and vehicle-to-grid (V2G) technologies.

Further reading

- [EV CHARGING INDEX 2023](#)
- [ELECTRIFICATION IN THE AGE OF DEGLOBALIZATION](#)
- [BATTERY MONITOR 2022](#)
- [SMART MOBILITY](#)
- [EV CHARGING INDEX: EXPERT INSIGHT FROM CHINA](#)

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