

A close-up, low-angle shot of an electric vehicle's charging port. The port is illuminated from within with a bright blue light, and the surrounding area shows a blurred green glow, suggesting motion or energy flow. A thick, orange-colored cable is partially inserted into the port.

High performance. Delivered.

Electric Vehicle Market Attractiveness

Unraveling Challenges and Opportunities

The rise of electric vehicles (EV)¹ means long-established automotive players are experiencing profound and prolonged challenges such as new technologies and products, new competitors like Tesla Motors and Google, and the rise of fuel-efficiency regulations.



1. This study covers passenger vehicles in the battery electric vehicles (BEV) segment only, hybrid electric vehicles (HEV) are not considered.

Despite the current low oil price, global EV sales figures have been growing rapidly: from 36,000 units sold in 2011 to more than 270,000 four years later. However, the market share of EVs as a percentage of the global automotive market in 2015 was only 0.3 percent. An increase to just 3 percent would equate to 2.7 million EVs.

This potential for EV uptake, however, varies greatly across domestic markets.

For example, in the world's largest automotive market, China (20.9 million passenger vehicles sold in 2015), EVs in 2015 only accounted for 147,000 units. By contrast, in Norway (151,000 passenger vehicles), 26,000 EVs were sold. So, why does Norway have a 17 percent market share, while China only has 0.7 percent market share? What factors are driving EV market growth? Which EV markets should OEMs focus on? To help answer these questions, Accenture has developed an EV Market Attractiveness framework

that analyzes selected domestic EV markets and helps OEMs pinpoint crucial distinctions between markets to support their EV investment decision making.



EV Market Attractiveness is defined as the degree to which—from a customer perspective—the purchase of an EV instead of a conventional vehicle is a more attractive option, in both monetary and non-monetary terms. It depends on factors that are either market-specific (typically governmental regulations and subsidies) or non-market-specific (e.g. battery range). Non-market-specific factors influence the global attractiveness of the EV market and affect all domestic markets to a similar extent. For example, battery costs, which account for up to 25 percent of an EV's price, are predicted to fall from above US\$1,000 per kilowatt-hour in 2007 to US\$200 in 2020 (2015: US\$383). The so-called Gigafactory, a huge production site for high-performance lithium-ion batteries, built by Tesla Motors and Panasonic, will accelerate this price development, facilitating overall market growth.

In order to get to the root of market-specific developments, this study identifies the economic, political and technological factors that positively or negatively influence domestic EV Market

Attractiveness in each market. In most markets, a major obstacle for example is an insufficient charging infrastructure. In India, public EV infrastructure is currently hardly non-existent. In New Delhi, the government is planning to set up 65 charging stations via public-private partnerships, but this is a negligible number for a city with an urban population of 11 million inhabitants.

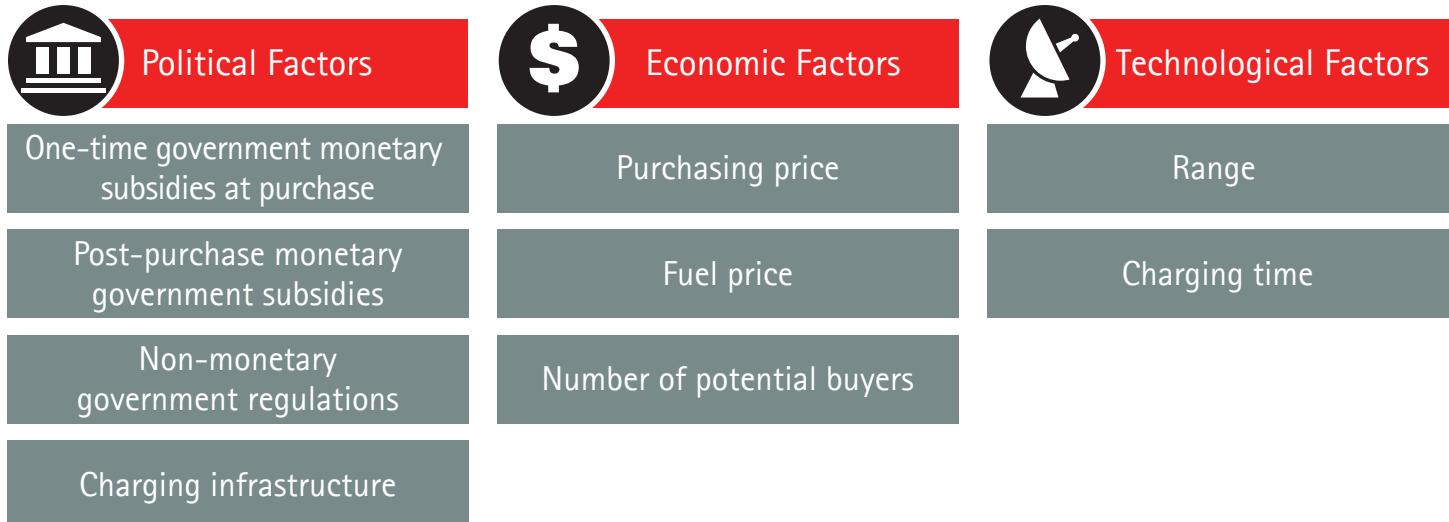
One of the biggest and strongest catalysts for EV Market Attractiveness is the presence of monetary and non-monetary government subsidies. The latter can be observed in Norway where the government is driving the EV market with measures like nationwide access to bus lanes or free parking. Motorists in Oslo said that it saved them an hour on their daily commute to be able to use the bus lanes and have easy access to dedicated "EV only" parking lots. Another example of government support for market development is China. In order to reduce emissions, the government decided to ban conventional scooters from mega cities. In 2013, this led to sales of 9.4 million electric scooters. The sales figures of those electric scooters in the

rest of the world were negligible 31,000 units. Although this did not involve the automotive EV market, it is a clear example of the sizable impact that government decisions can have.

The market examples of China, Norway and India show that automotive OEMs are operating in a highly heterogeneous marketplace. In order to provide more transparency and structure, Accenture investigated 14 selected markets with respect to their EV Market Attractiveness: Brazil, Canada, China, France, Germany, India, Japan, the Netherlands, Norway, Russia, South Korea, Sweden, United Kingdom, and the United States. Those 14 markets are defined as union set of the 10 largest automotive markets and the 10 largest EV markets.

Accenture identified nine main market-influencing factors in the following categories: Political, Economic and Technological (see Figure 1).

Figure 1: Factors for EV Market Attractiveness Study



From Hesitators to High Potentials: Where and When to Invest

The study examines each of the 14 markets and places them in one of the four classification quadrants (see Figure 2—High Potentials, Best-in-Class, Pensioners and Hesitators—depending on their EV market size in 2015 and anticipated EV market growth until 2020. The size of each bubble indicates the size of that overall passenger vehicle market and hence points to its future market potential.

Best-in-Class

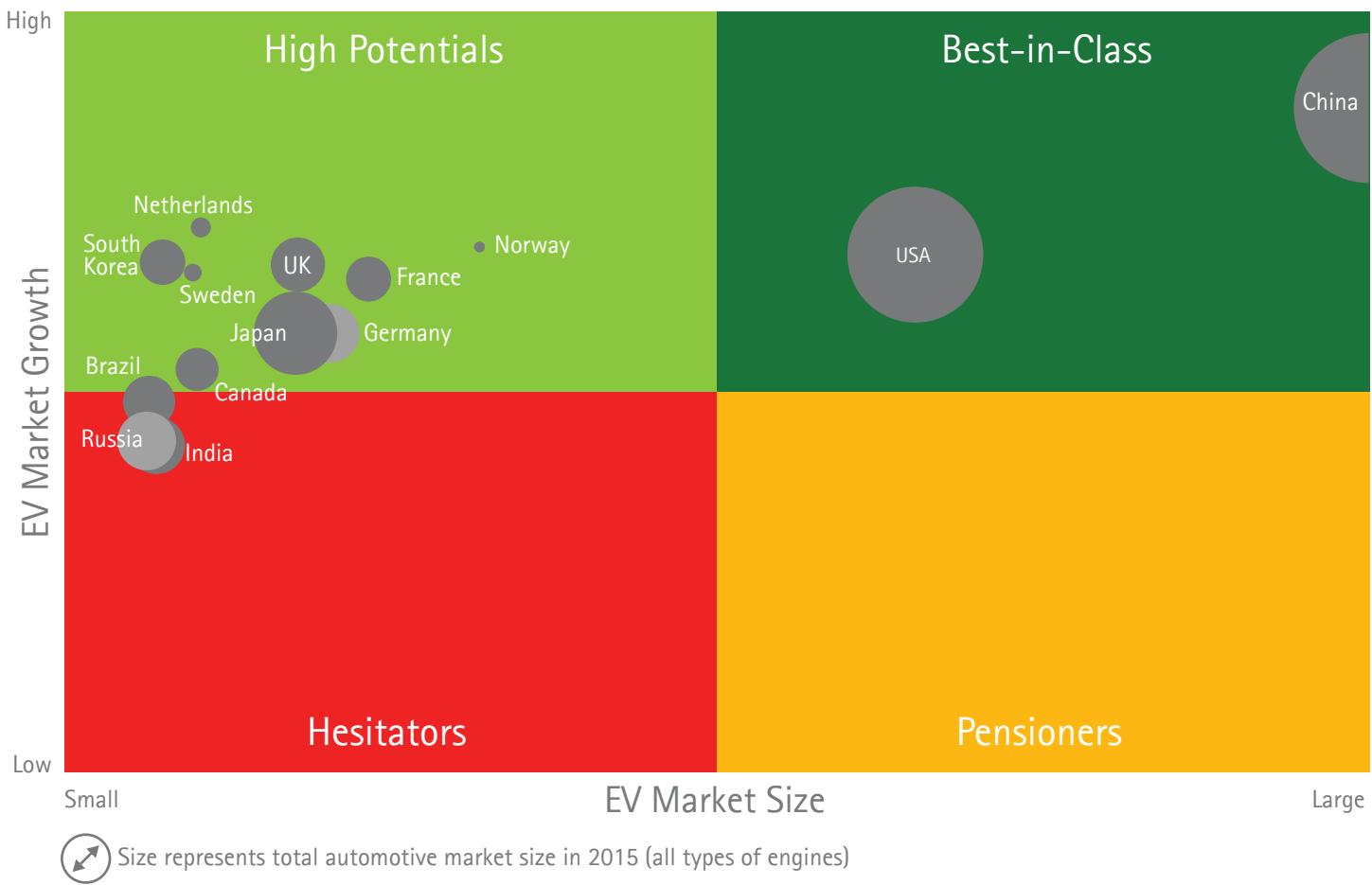
Best-in-Class markets provide both high EV market growth and EV market size. Markets in this cluster are most attractive for automotive OEMs. Typically, high government support for EVs has already established a well-developed charging infrastructure.

Market Example: China. With more than 147,000 EVs sold in 2015, China is by far the largest EV market worldwide. The positive assessment of market growth is also due to political measures. The Chinese government, for instance, offers credits of US\$8,500 at purchase. Furthermore, the charging infrastructure is more mature than in other industrialized markets, especially in densely populated regions. The government intends to build additional 12,000 charging stations until 2020.

OEM Recommendations: Since the Best-in-Class markets—United States and China—have already reached attractive sales volumes, OEMs need to strengthen their local footprint. They should invest to help distribution networks exploit the rising demand for EVs. OEMs also need to adapt their product portfolios to specific market preferences. Chinese customer preferences

and government policies in particular differ from European standards which can already be observed in the market for conventional vehicles. Furthermore, OEMs need to develop suitable supply chains to serve different market demands.

Figure 2: EV Market Attractiveness Result Matrix



High Potentials

High Potentials have high growth prospects but a currently low EV market size. In these markets, governments usually have plans in place to invest significant amounts to make EVs more attractive, but their policies have not yet been fully implemented (e.g., the charging infrastructure needs further development). It is likely that High Potentials will see significant growth until 2020.

Market Example: France. In 2015, about 17,000 EVs were sold in France, which equates to less than 1 percent of the domestic passenger vehicle market. However, the French government supports the EV market development with numerous measures like purchase credits of up to 6,300 EUR, the free use of charging stations and free parking for EVs. By 2020, the French government aim is to establish 2.7 million established charging stations. All these measures will boost the domestic EV market.

OEM Recommendations: Automotive OEMs should invest in the High Potentials. Though the size of the High Potential EV markets is not yet large, OEMs should make use of the dynamic conditions, which are mainly driven by the political agenda. They need to ensure to be ready when the markets start growing. For example, in the current market environment of France, manufacturers should quickly make use of existing governmental measures to support EV purchases. At some point, public support will be stopped or cut back. Therefore, OEMs should make use of the first-mover advantage to reach critical mass and market share in corresponding markets. High velocity is a key success factor when for instance car dealerships must be geared to selling and servicing EVs, which requires investment in sales staff training, charging infrastructure installation and EV aftersales enablement.

Hesitators

Markets with a small market size and an expected low growth rate are defined as Hesitators. Typically, public charging infrastructure is not available, and low fuel prices make EVs economically unattractive.

Market Example: Brazil. The EV market, in effect, does not exist in Brazil. The number of potential buyers is extremely low and for those wealthy individuals who can afford an EV, there is hardly any public charging infrastructure available anyway. In the meantime, the government decided to support the EV market development by exempting the import tax as well as the annual car ownership tax of electric vehicles. Nevertheless, the Brazilian automotive market tends to move in the direction of ethanol derived from sugar beet as its future alternative to gasoline and diesel.

OEM Recommendations: Hesitators are currently of little interest for OEMs. Nevertheless, they should be regularly reevaluated regarding changing prerequisites. When entering an EV market, OEMs are confronted with high investment costs such as dedicated sales staff training and aftersales enablement (e.g. battery repair works). For Hesitator markets, OEMs should not yet make such investments since demand is negligible. Instead, OEMs should channel resources toward High Potential and Best-in-Class markets.

Pensioners

Pensioners are among the leaders in terms of EV market size. Typically, monetary subsidies for buying EVs are no longer provided. The market is highly saturated and expected growth is low.

Market Example: None. Since the EV market is still in an early phase, there are no markets matching this profile yet. However, the conditions in the medium term could change rapidly in the Best-in-Class and High Potential markets. At some point, governments may feel that their domestic EV markets have developed to the stage where they can "stand on their own" and support through subsidies and regulatory advantages can therefore be withdrawn.

Plan Globally, Focus Locally

As outlined above, domestic EV markets are highly heterogeneous (see Figure 3). Yet overall EV market growth is gaining pace. Summing up, what should OEMs do to plan and grow their EV investments?

Plan globally, focus locally:

Carefully channel your overall EV investments toward the right domestic markets. Use total unit market size as an indicator of market attractiveness: Market share is only relative to overall automotive market size.

Focus on Best-in-Class markets:

Concentrate on the United States and China in the short and medium term in order to scale fast.

These findings are based on current conditions in each market, but Accenture will regularly update the EV Market Attractiveness study to take into account the changing market environment.

Closely monitor High Potentials:

Set and extend your footprint in these markets.

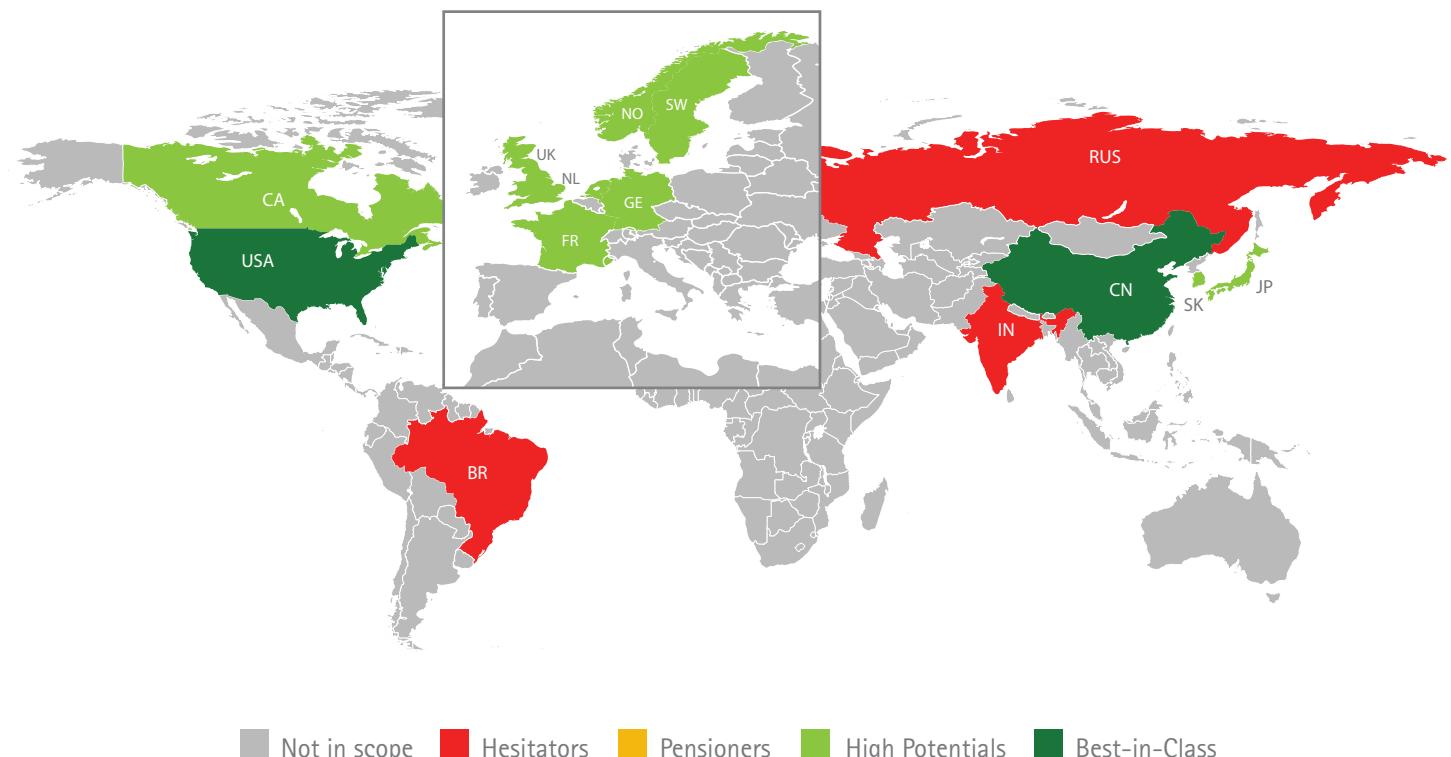
Hesitate with the Hesitators:

Don't put too much effort into the Hesitators, but keep them on your long-term radar.

Government agendas:

More than any other factor, government agendas can rapidly change the rules of the game, especially in China.

Figure 3: EV Market Attractiveness Result World Map



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