

15 Million Electric Vehicles by 2030: Paths to Target Achievement and the Role of Chinese Carmakers

BCG and Agora Verkehrswende | Key findings

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Central results at a glance (I)

- A BEV ramp-up in Germany:** The target set by the German government of **15 million BEV on German roads** will not be achieved under current policy and market conditions. The climate protection targets for the transport sector are therefore at risk
 - At the current rate of ramp-up, there will be nine million BEVs on German roads in 2030—falling six million vehicles short of the target
 - An accelerated ramp-up will depend on measures in four domains: economic instruments, regulatory requirements, charging infrastructure, and market competition
 - Only by combining various instruments in all four domains can the 15 million BEV target be achieved

- B Role of China:** Chinese manufacturers offer a **broad and attractively priced range of vehicles** and can thus **contribute significantly** to achieving the 15 million BEV target in 2030
 - If the 15 million BEV target is reached in 2030, Chinese manufacturers are expected to account for 15 percent of the German BEV fleet
 - Increasing import duties will significantly jeopardize the achievement of the target and will reduce the BEV fleet in 2030 by 1.3 to 2.4 million vehicles. In addition, increased import duties and expected Chinese countermeasures will pose a considerable risk for the German automotive industry

Central results at a glance (II)

- C Employment effects:** While the **expected employment effects** of reaching the 15 million BEV target **will be negative for the core automotive industry** (-8% compared to 2023), they will be significantly more positive in the medium and long term **than those that would occur with a delayed e-mobility ramp-up**. Furthermore, knock-on employment effects in adjacent industries have the potential to offset job losses in the automotive sector:

 - Domestic value creation can be increased by establishing Chinese manufacturers in Germany and promoting skills and capacities in battery production
 - Electrification will create new employment, primarily through the construction and operation of charging and energy infrastructure

- D Financing needs:** Implementing the measures will give rise to **total funding needs of up to €65 billion by 2030**, depending on how the incentive instruments are designed. **Without the increased market engagement of Chinese manufacturers, the required financing will be higher**

 - The financing needs are composed of financial incentives for the purchase of BEVs and the development and operation of charging infrastructure
 - The more attractive the range of vehicles on the market, the lower the financial incentives required to persuade customers to purchase BEVs

- E Implications:** **Decisive action is needed to achieve the 15 million BEV target in 2030**. Due to the **lack of alternative measures** that can be implemented in time and are financially viable, the achievement of the **cross-sector climate targets and climate neutrality by 2045** will not be possible and recede further into the future

E-mobility and the role of China are omnipresent...

...our study offers important perspectives for an overall assessment

Slower ramp-up of e-mobility



Modeling of coordinated instrument bundles to achieve the 15 million BEV target



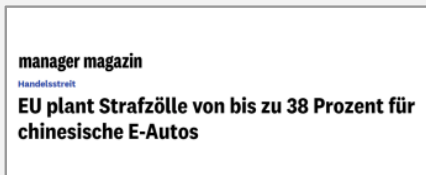
China's potential contribution



Analysis of China's potential contribution in terms of additional BEV volume with increased market participation



Prospect of an increase in import duties



Estimate of the impact of increased import duties on the 15 million BEV target and the German automotive industry

Accelerated ramp-up of e-mobility in Germany is critically important for climate protection and the economy



The 15 million BEV target is necessary for German climate protection goals



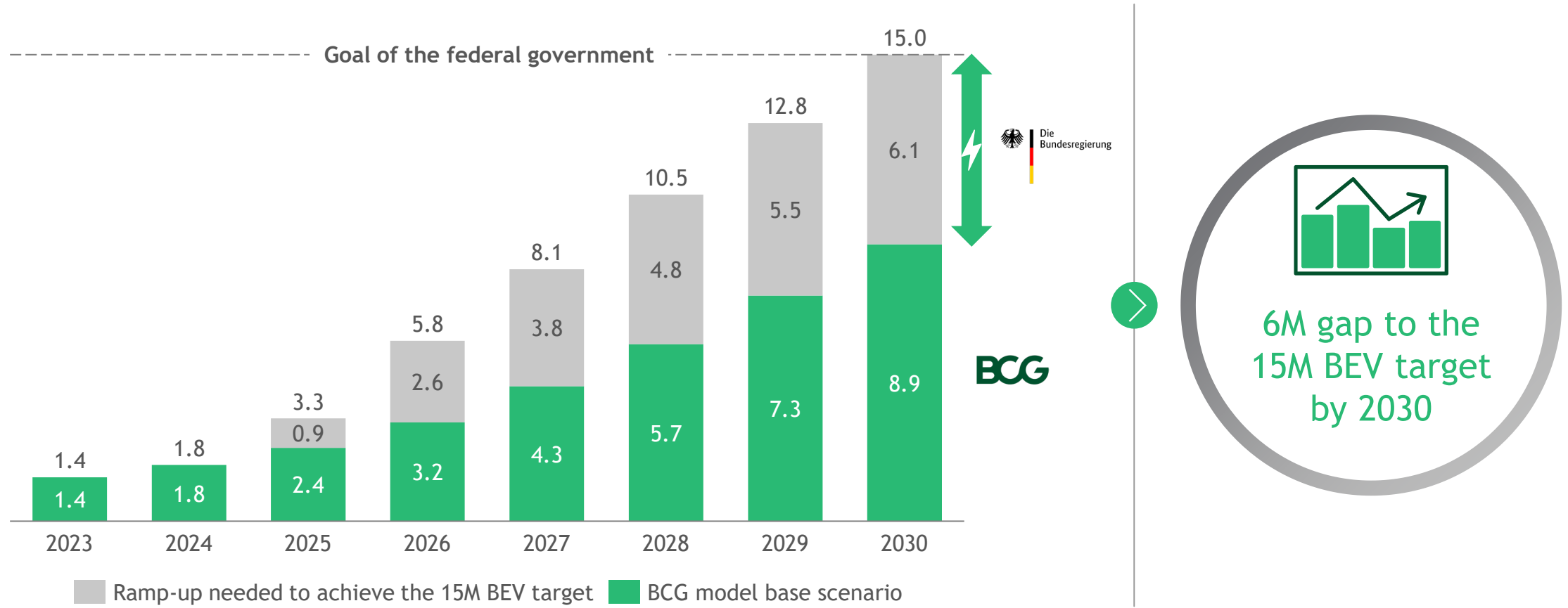
Drive transition enables medium- and long-term job security



Securing the long-term competitiveness of the automotive industry

With current trends, around 9 million BEVs are expected in 2030





Expected BEV ramp-up under current conditions [in M vehicles]



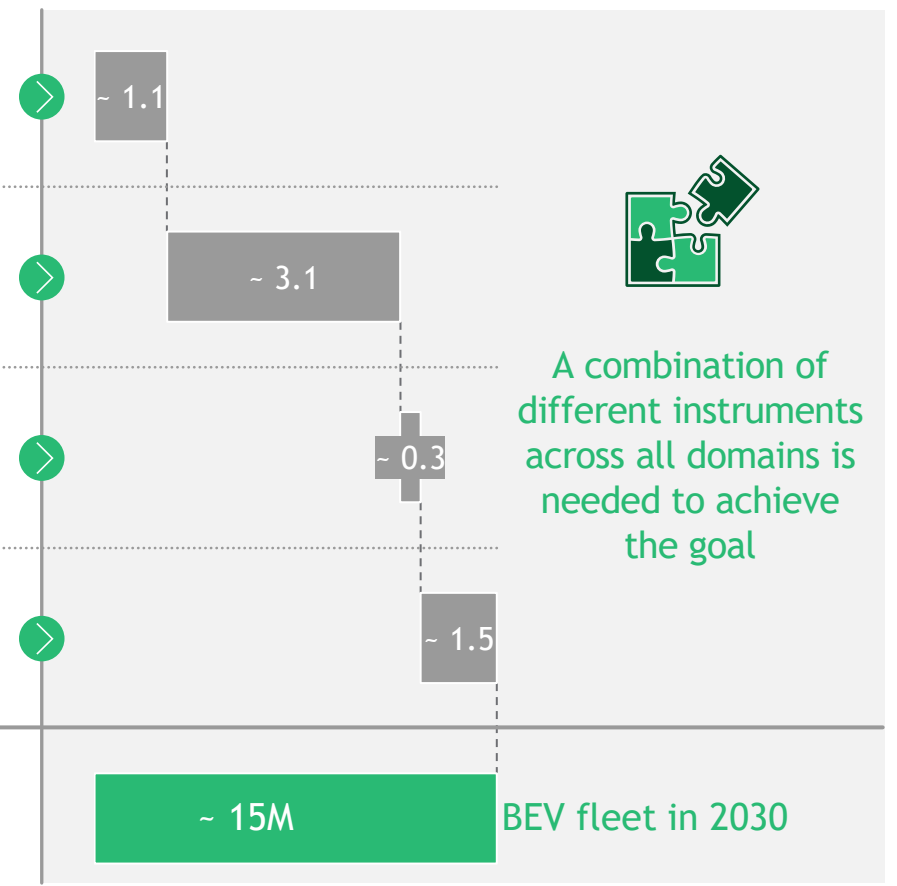
Note: Simulation of the ramp-up required to achieve the 15 million target in 2030 Source: BCG and Agora Verkehrswende

15M BEV target only achievable with a combination of different instruments

Policy domains and specific measures required to achieve the 15M BEV target¹

 Economic instruments	<ul style="list-style-type: none"> • A bonus-penalty system with full cost relief for BEVs and increase in the price of combustion engines as a financial incentive³
 Regulatory requirements	<ul style="list-style-type: none"> • Minimum BEV quota for commercial fleets and manufacturers including financial compensation, quota level rising over time
 Charging infrastructure	<ul style="list-style-type: none"> • Accelerated expansion of public and private charging infrastructure
 Market Competition	<ul style="list-style-type: none"> • Expanded supply and lower prices due to increased market participation by Chinese manufacturers

Additional BEV potential by 2030²



1. Measures were modeled as possible options and should not be understood as recommendations for action 2. Additional potential until 2030 based on BCG analysis 3. Bonus-penalty system through a set of different levers such as a purchase premium, energy price reduction, and a carbon tax applied to the full cost over five years Source: BCG and Agora Verkehrswende

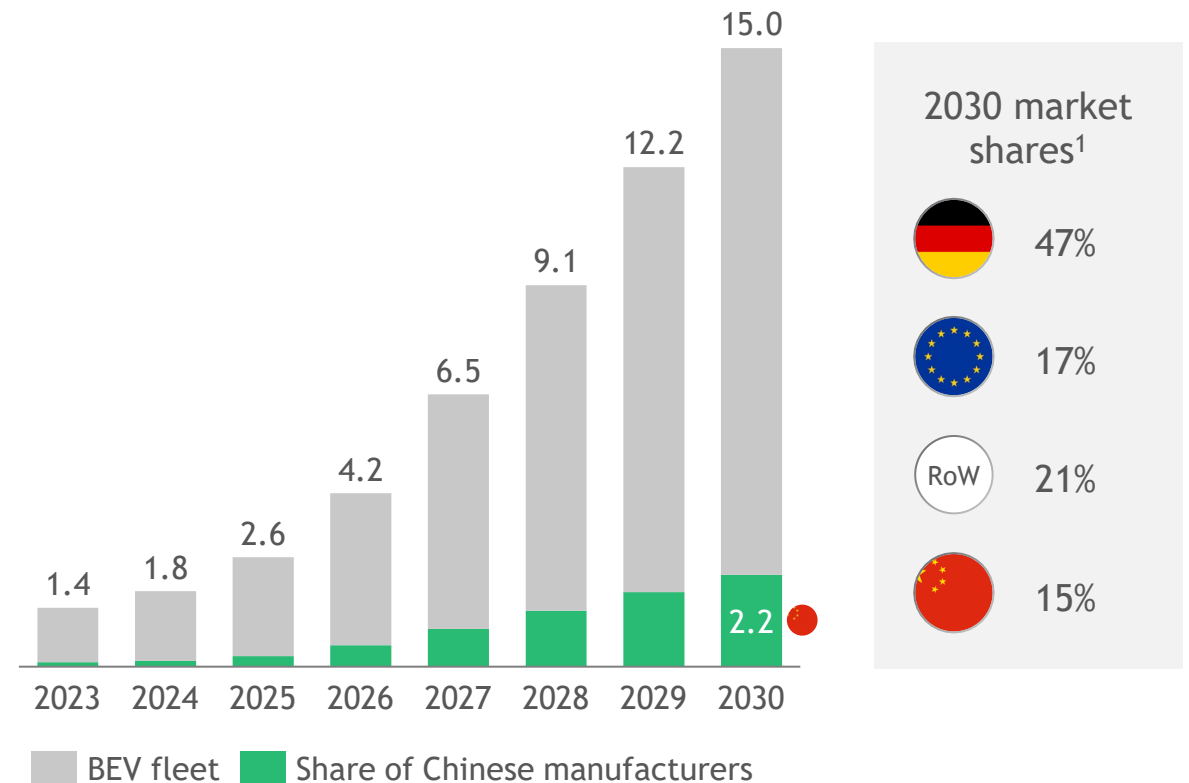
Chinese manufacturers can contribute significantly to target achievement

Influence of Chinese manufacturers on BEV ramp-up

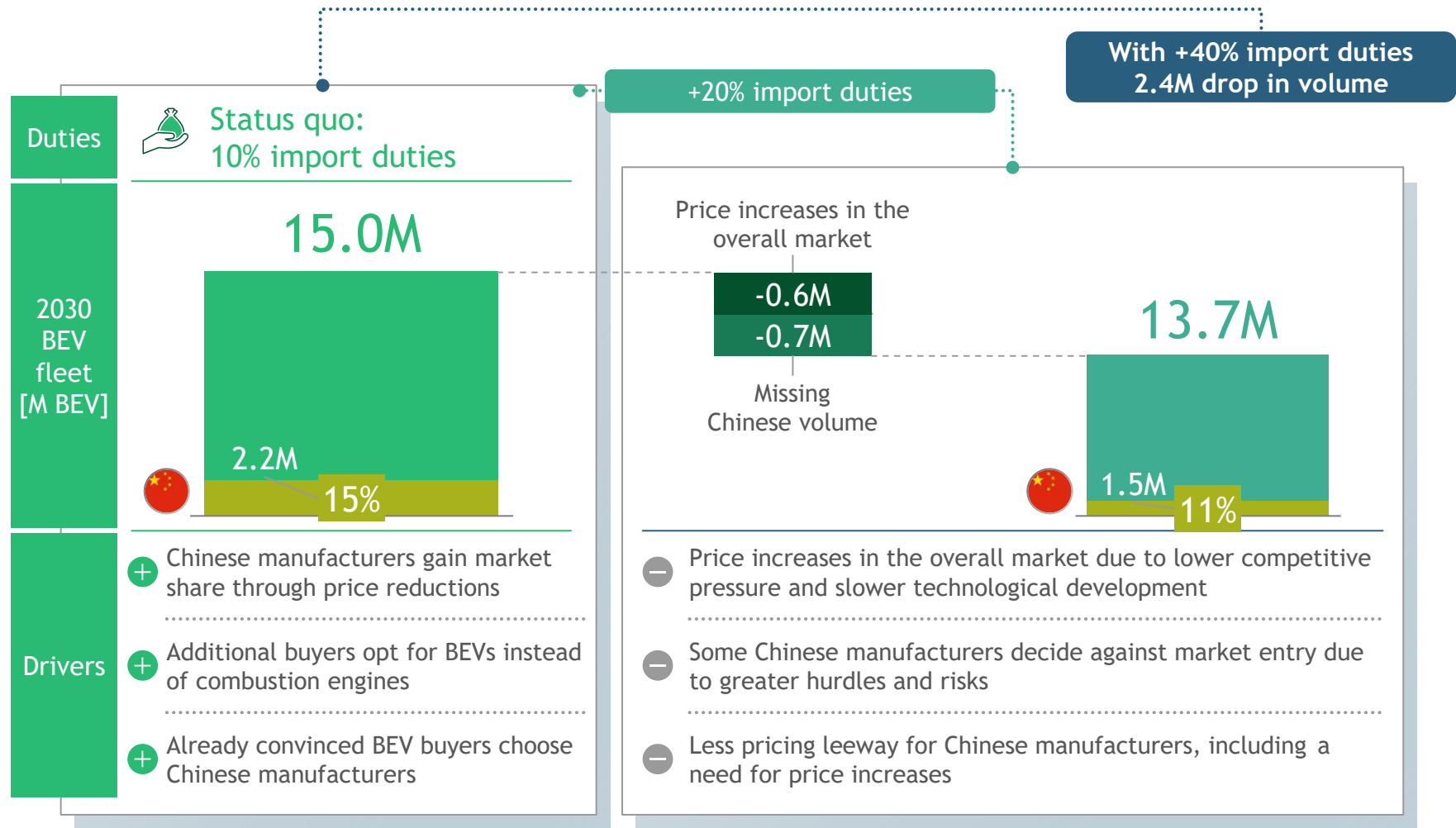
- I **Product range**
Chinese manufacturers offer vehicles especially in the low-priced A and B segments
- II **Price**
Chinese manufacturers can make greater use of production cost advantages and can lower the expected market prices

○ Manufacturer cluster "rest of world"

Share of Chinese manufacturers in the German BEV fleet if the 15 million BEV target is reached [in M]



20% increase in import duties leads to 1.3M fewer BEVs—subsequent risks for the German automotive industry



Importance of China for the German automotive industry

Sales and profit

- ~35% of German manufacturers' sales and profit are generated in China

Supply chains

- A large number of vehicle components are manufactured in China

Commodities

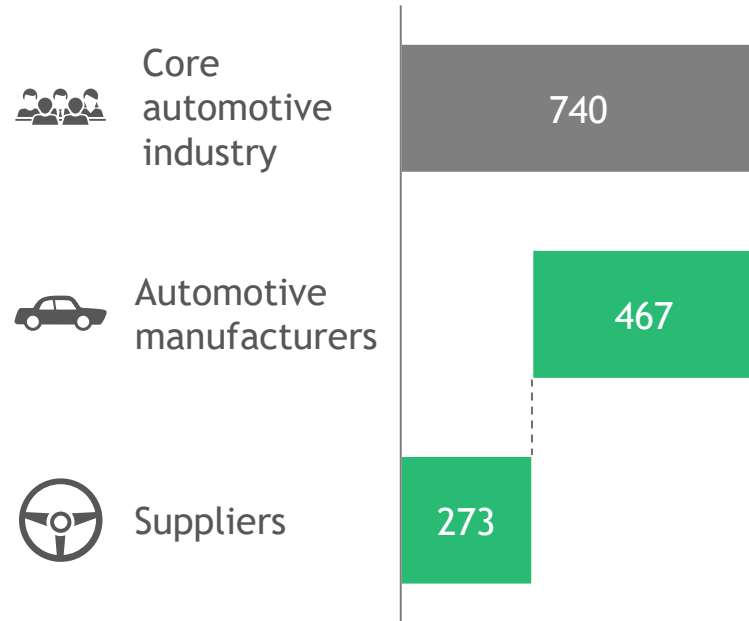
- 60% of BEV-relevant raw materials are controlled by China



Depending on countermeasures by China, significant business risks are expected, including layoffs

Study predicts employment effect due to shift in value creation

Employment in the core automotive sector [in thousands of employees]



Factors influencing value creation

Value creation in the core automotive industry for vehicles sold in Germany depends on...



Drive type

- > Lower added value in Germany for BEVs compared to combustion engines



Manufacturer origin

- > Lower German added value on models from foreign manufacturers



Vehicle segments

- > Lower German added value for low-priced vehicles

Note: The study considers only the impact on employment caused by the shift in the value chain of vehicles sold in Germany
Source: BCG and Agora Verkehrswende

8% decline in employment expected if the target is achieved—yet sticking with the combustion engine is not an alternative

Employment effect due to shift in value creation of passenger cars sold in Germany¹

	Base scenario	Target scenario
BEV fleet in 2030	✘ 9M	✔ 15M
BEV share	~ 35%	~ 61%
Market shares of the manufacturer cluster	54% 19% 22% 5%	51% 18% 21% 10% ⁴
Vehicle segments	Increasingly high-priced segments ³	Increasingly low-price segments
Core automotive industry [in thousands of employees, % of total employment]	-30 (4%)	-60 (8%)



○ Manufacturer cluster "rest of world"



With a slower BEV ramp-up, significantly higher job losses can be expected in the long term in the core automotive industry due to a loss of long-term competitiveness

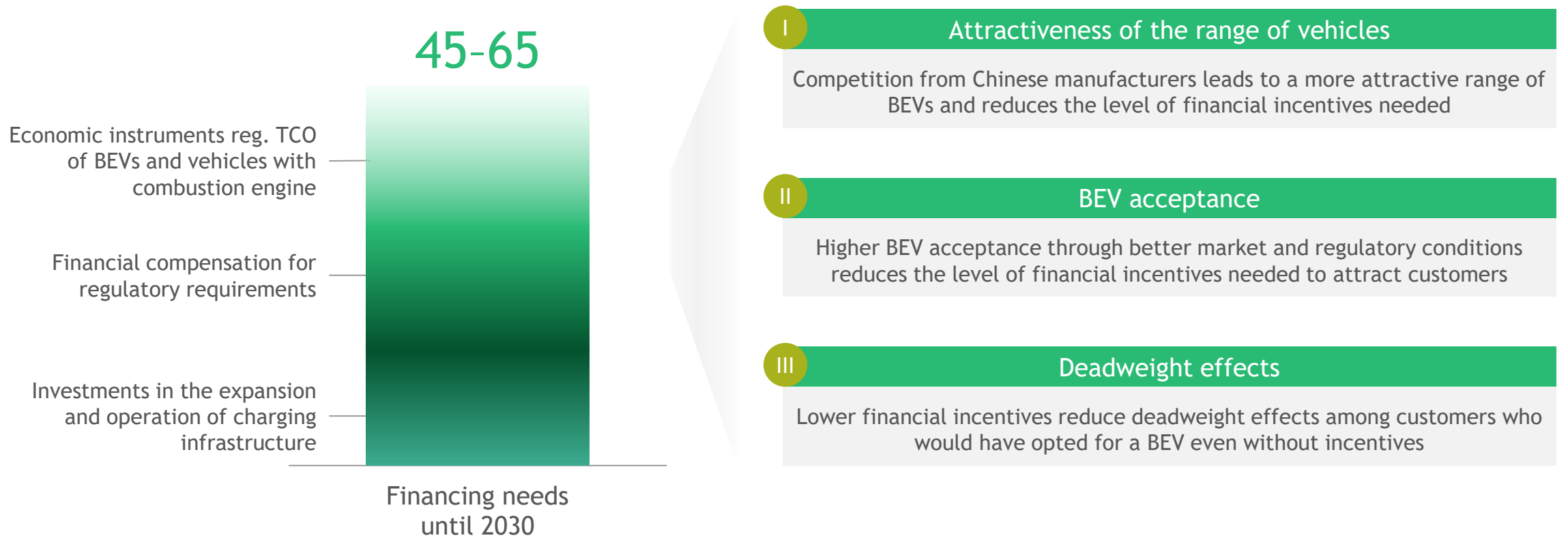
1. Shift in the core automotive industry due to a shift in value added exclusively from vehicles sold in Germany; impact compared to the initial value in 2023
 2. Proportionate to all vehicles sold in Germany, regardless of drive type 3. High-priced segments due to lack of supply in the low-price segment 4. 10% Chinese market share refers to all vehicles sold in Germany by 2030 and thus differs from the 15% Chinese BEV share of the vehicle fleet in 2030 Source: BCG and Agora Verkehrswende


Transformation to e-mobility enables additional employment

	 Core automotive industry	 Adjacent industries
Employment growth through...	<ul style="list-style-type: none">• Localization of Chinese BEV production• Establishment of battery development and production capacities	<ul style="list-style-type: none">• Rising demand for renewable energy and charging infrastructure• Increasing importance of powertrain-independent suppliers
Supporting measures	<ul style="list-style-type: none">• Trade policy measures such as Local Content Requirements (LCRs)• More attractive location conditions by reducing bureaucracy and optimizing factor costs• Subsidies for technology development and investments in the development of battery production capacities	<ul style="list-style-type: none">• Subsidies for retraining measures for employees in the core automotive industry• Regulatory relief for the expansion and operation of charging infrastructure• Investments in the expansion of charging infrastructure and the electricity grid

Up to €65 billion needed by 2030 to achieve the 15 million BEV target

Financing needs [in B€] to achieve the 15 million BEV target by 2030 and key influencing factors



A person wearing glasses is shown from the chest up, holding a charging cable connected to an electric vehicle. The background is a blurred outdoor setting.

A significant target shortfall would have far-reaching consequences beyond impacts to the climate

● Climate protection

Failure to meet the 15 million BEV target would mean missing the climate target in the transport sector and the cross-sector climate targets. As a result, climate neutrality would not be possible by 2045 and this goal would recede further into the future

● Financing needs

Failure to meet the 15 million BEV target would necessitate additional climate protection measures in the transport sector. In addition to higher financing requirements, timely achievement of this target would be unlikely

● Automotive industry

A slowed transition to e-mobility would delay BEV development and innovation in the German automotive industry. A faster ramp-up will secure market share for German manufacturers

Immediate and decisive action is needed to achieve the 15 million BEV target and safeguard the competitiveness of the automotive industry



Government

- In order to achieve Germany's climate protection targets, initiatives for 15 million BEV in 2030 are needed immediately across all named domains
- Participation of Chinese manufacturers will be needed to achieve the goal and will reduce the necessary financing requirements
- The increase in import duties will lead to 1.3M-2.4M fewer BEVs by 2030 and brings additional risks for the German automotive industry
- Employment losses are expected in the core automotive industry; employment in adjacent sectors must be promoted
- Negotiations to establish Chinese companies can promote innovation and value creation in Germany and Europe
- Open competition in the automotive industry will promote innovation and ensure the long-term competitiveness of German manufacturers



Manufacturers/
suppliers

- The creation of an attractive range of BEVs is of central importance for achieving climate targets and is critical to ensure long-term competitiveness
- A slower transition to e-mobility will have a negative long-term impact on the automotive industry—sticking with combustion engines is not an option
- Shifts in employment in the course of structural change due to e-mobility are unavoidable in the automotive industry
- Manufacturers and suppliers must adapt to new market conditions in the course of long-term electrification



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