

ZERO CARBON MOBILITY AND GREEN HYDROGEN – OPPORTUNITIES FOR GERMANY AND AUSTRALIA

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WHAT WE DO



International marketing
of Germany as a business
and technology location



Economic promotion of
the new
federal states and Berlin



Business location
consultancy services for
international investors



Export market
information for the
German economy



Market driver: policy goals

The German government made e-mobility a key area of its recent climate action programme

Goals for 2030



40%

**Emission reduction
in transport sector**



10 Mio.

**Electric Vehicles
in Germany**



1 Mio.

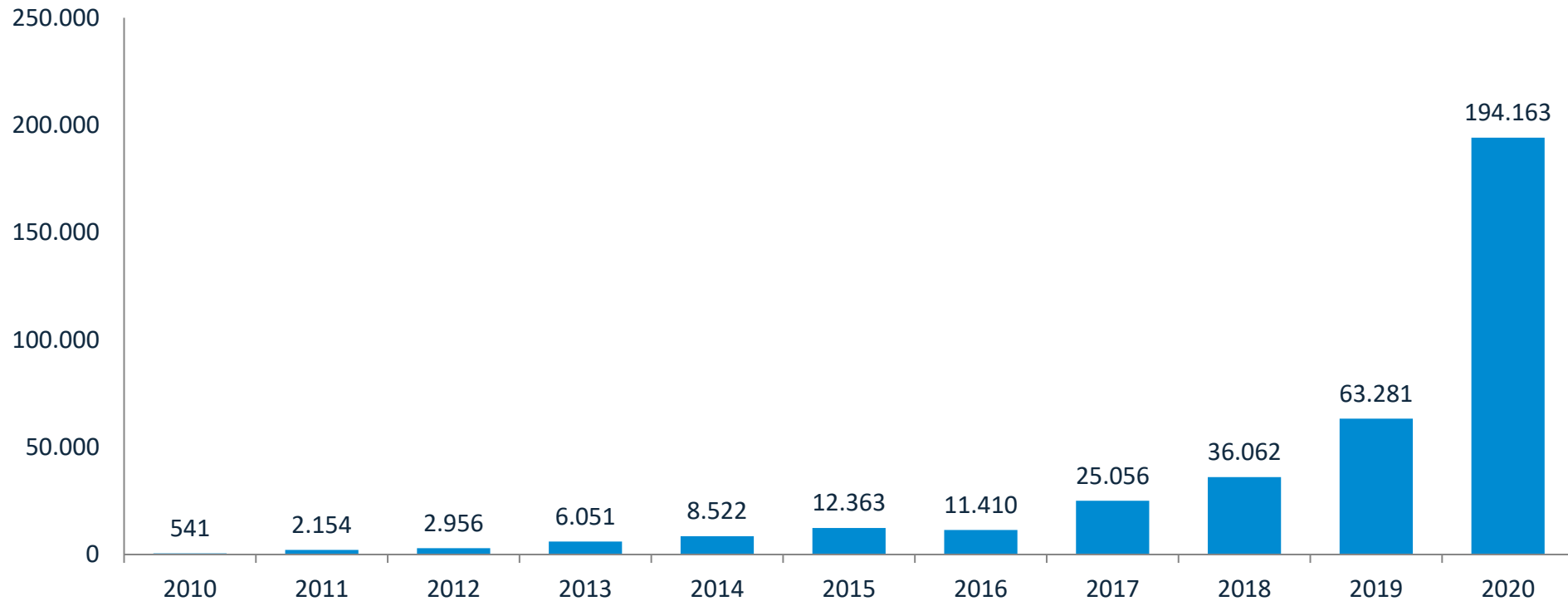
**EV Charging Stations
in Germany**

Source: Bundesregierung

Status Quo: EV development in Germany

The German market for BEV has been growing strongly

Electric vehicles (BEV)
(Number of units, 2010 – 2020)




Source: Statista

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Public support for E-Mobility in Germany

Overview of public measures and incentives



Cash incentives

- Vehicle price BEV up to EUR 40,000 EUR 9,000
- Vehicle price BEV over EUR 40,000 EUR 7,500
- Vehicle price PHEV up to EUR 40,000 EUR 6,750
- Vehicle price PHEV over EUR 40,000 EUR 5,625



Charging Infrastructure


- Investment of EUR 300 m for expansion of public charging infrastructure from 2017 to 2020
- 50.000 new charging station planed until 2022



Government spending

- Provision of EUR 100 m for public procurement of e-vehicles (until 2020)
- Goal: 20% e-vehicle share in public fleet by 2020

Recently resolved by German government (Nov. 2019)



Tax incentive

- All BEVs are exempt from motor vehicle tax for 10 years
- Employees, who are allowed to charge their vehicles at workplaces without cost are exempted from income tax for the benefit



R&D funding

- Around EUR 250 m annually
- Plan to set up a new R&D program for battery cell production (*Resolution in May 2016*)



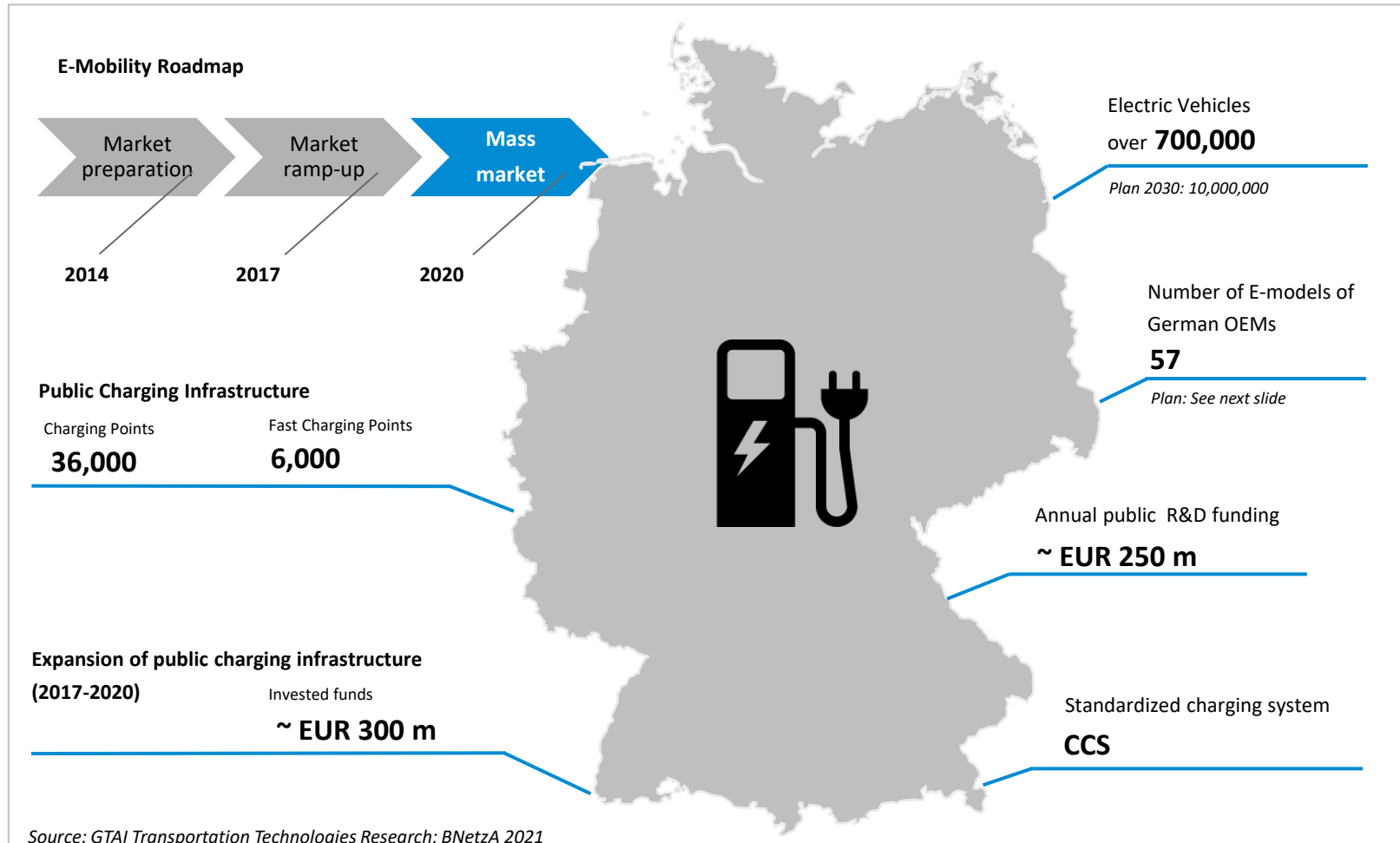
Road traffic measures

- Authorized Use of Bus Lanes for Electric Vehicles
- Special Parking Places for Electric Vehicles
- Suspension of restricted entry access for electric vehicles

Source: GTAI Transportation Technologies Research (2019); BAFA (2020)

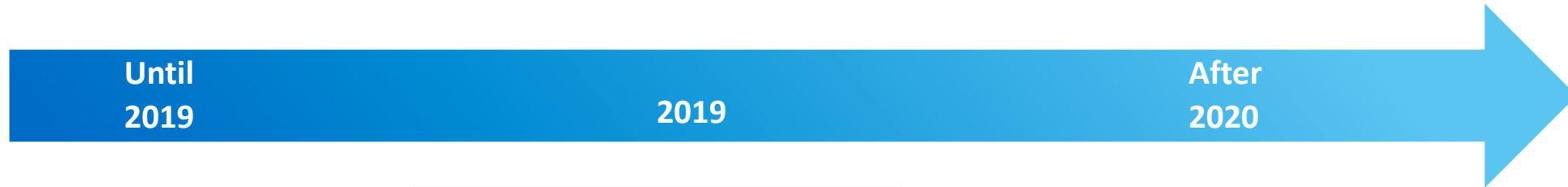
E-Mobility in Germany – Status quo

E-Mobility in Numbers (Q2/2021)



Efficient Drive

With a total of 243 EV models worldwide, 36 are from German OEM



- Germany is a lead provider of E-Mobility with the widest range of EV
- German OEM introduced 31 EV models
- Car models have different propulsion systems: BEV, REEV & PHEV

Release of new e-car models 2019/20		
OEM	Model	Type
Audi	E-tron	EV
	A8 e-tron	PHV
	Q4 e-tron	EV
	E-tron Sportback	EV
	Q2C e-tron	EV
BMW	X5 xDrive45e	PHV
	330e iPerformance	PHV
	X3 xDrive30e	PHV
VW	e-Golf	EV
	Tiguan L PHEV/GTE	PHV
	e-Lavida	EV
	e-Bora	EV
Daimler	C300de	PHV
Opel/Vauxhall	Grandland X Hybrid4	PHV
Porsche	911 PHV	PHV
	Taycan	EV



Mercedes-Benz E 350 e



BMW 530e Performance



Porsche Panamera 4

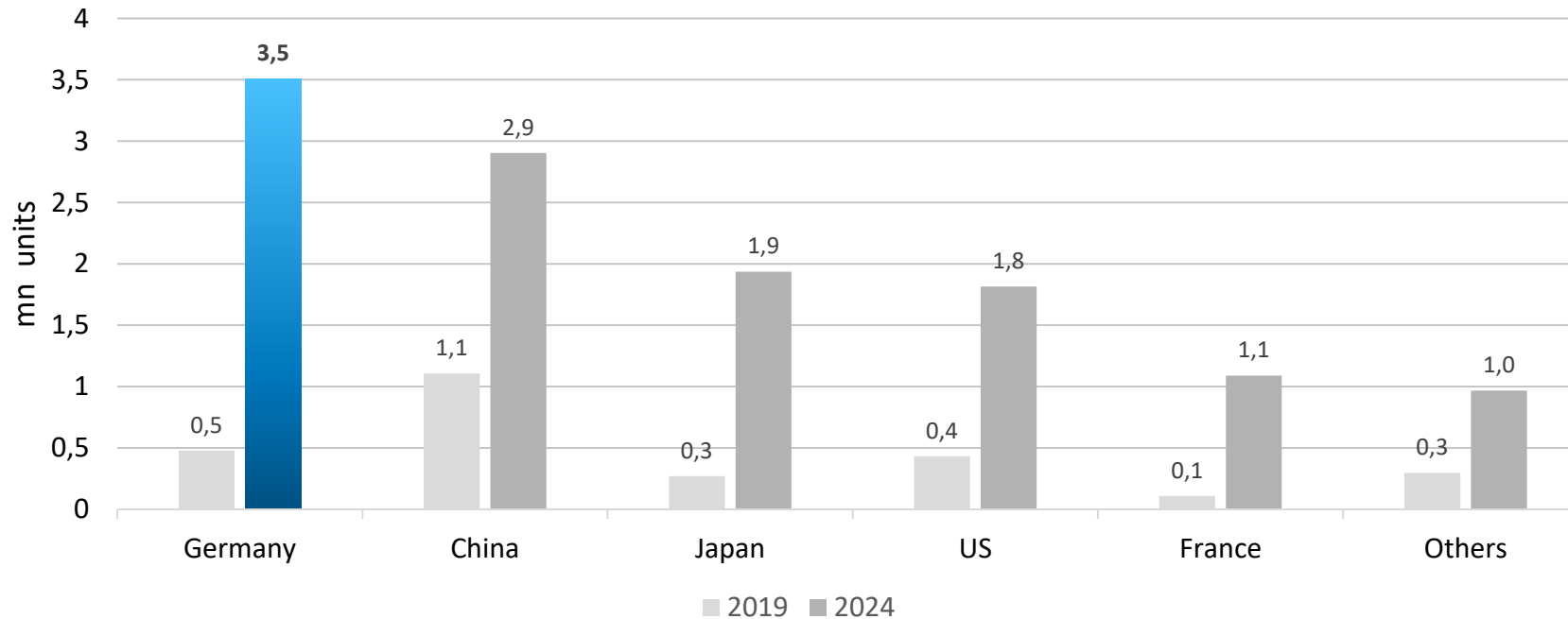
- The Volkswagen Group plans to manufacture 50 new EV and 30 PHEV by 2025
- BMW plans to introduce 25 new electric vehicles until 2025
- Until 2022, Mercedes will produce an electric version of every major model

Electric Future Trends

Global EV production

EV light vehicle production by OEM country origin

(2019 and 2024, mn units)



Sources: McKinsey Electric Vehicle Index (EVI) (2020)

European Battery Alliance

Commission approves €3.2 billion support by seven Member States for a project of common European interest for a **battery value chain**

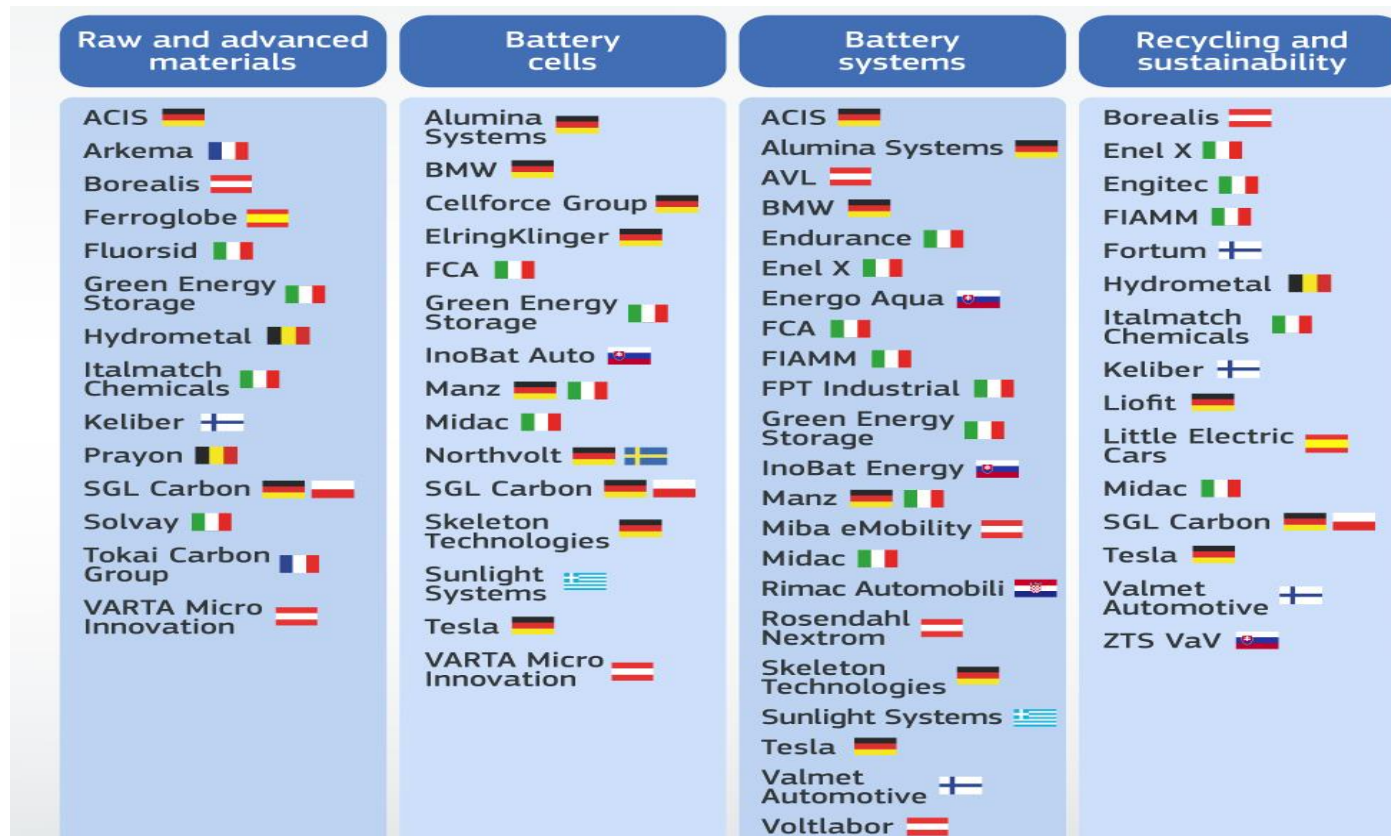


First round:

- 3.2 billion € public incentives
- 8 € total investment
- 17 companies

European Battery Alliance

Commission approves €2.9 billion support by twelve Member States for a second important European project for a **battery value chain**

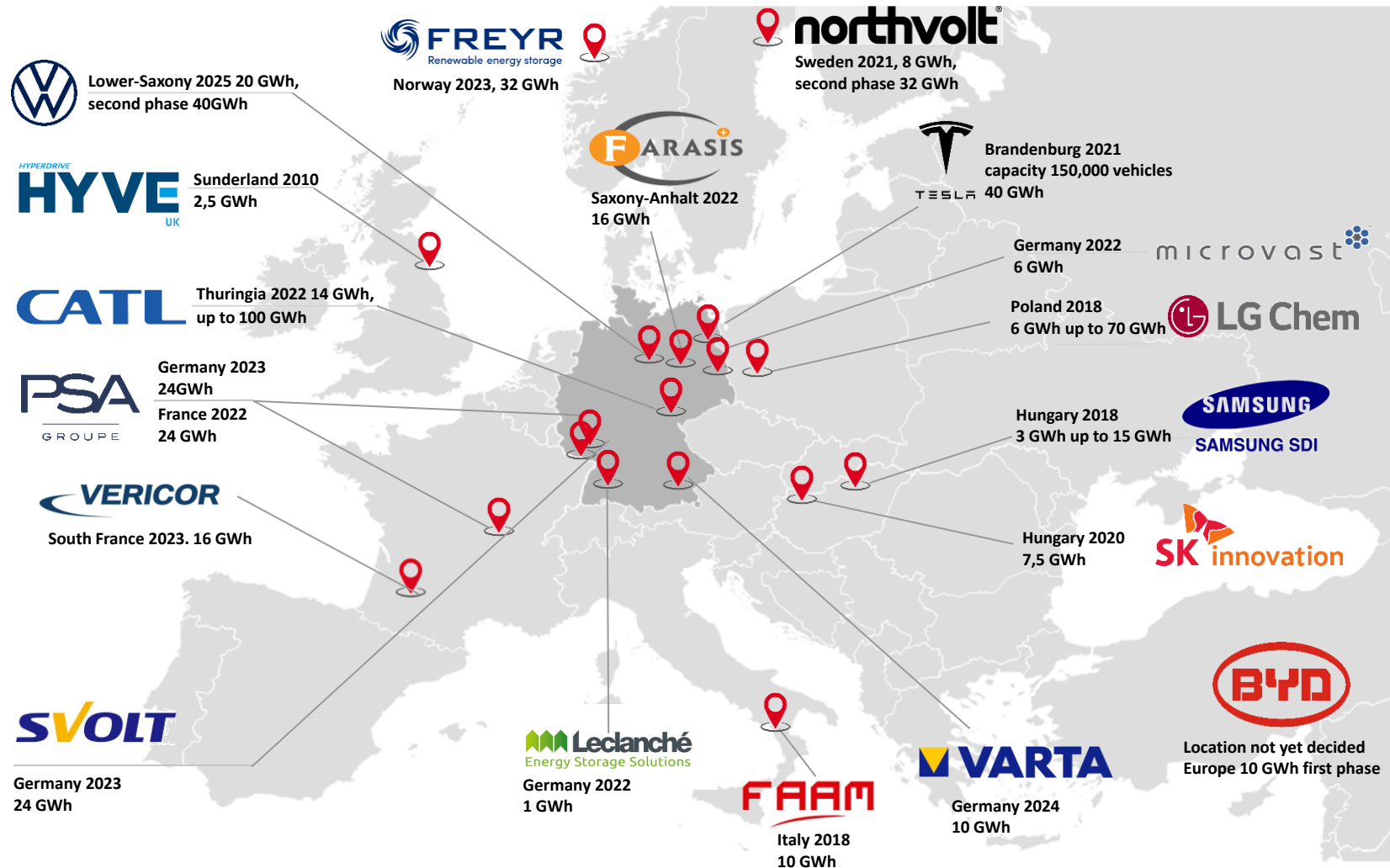


Second round:

- 2.9 billion € public incentives
- 12 billion € total investment
- 42 companies

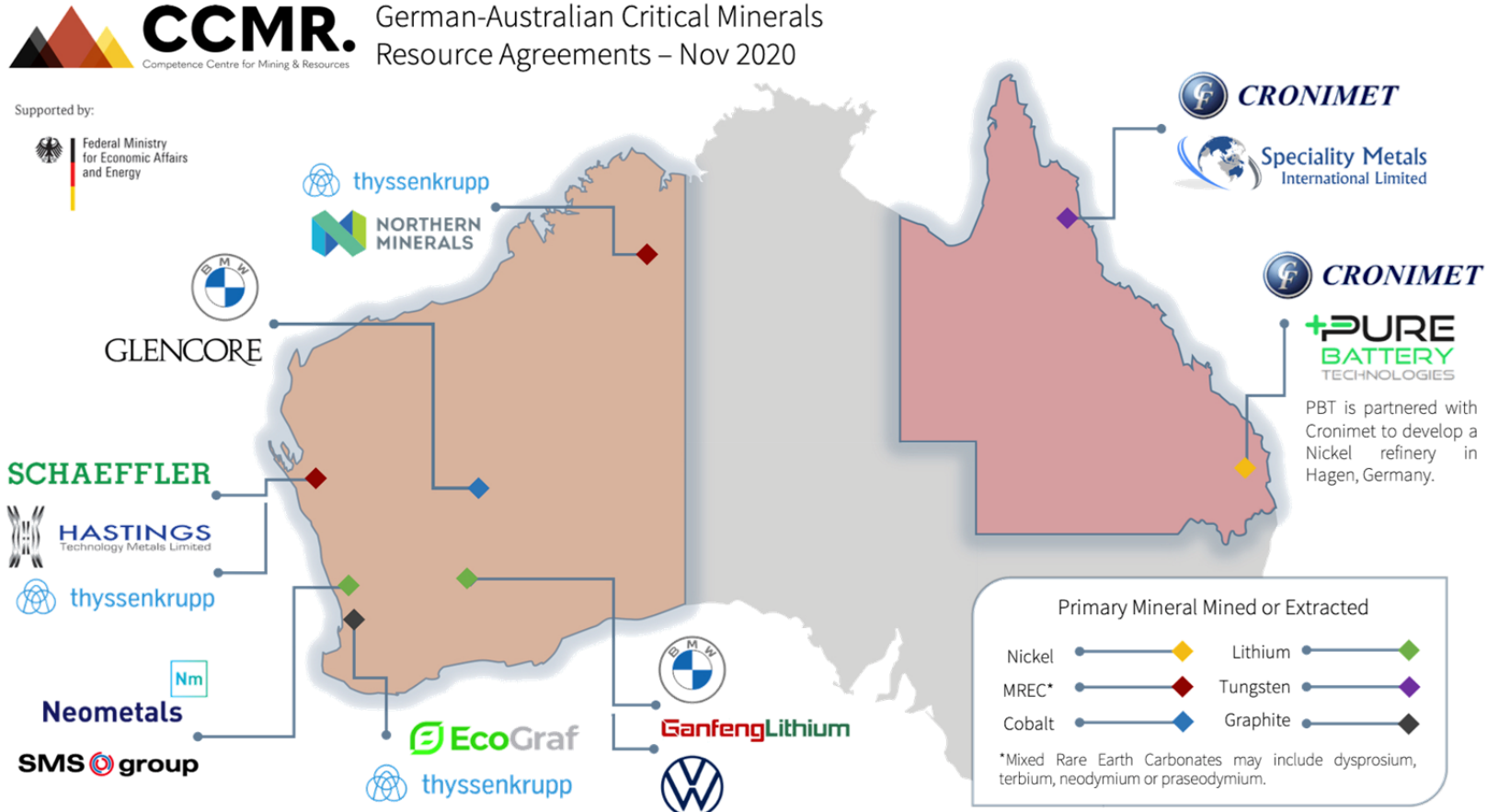
Li-Ion Battery Production in Europe

Cell manufacturer seem to move closer to the German OEMs



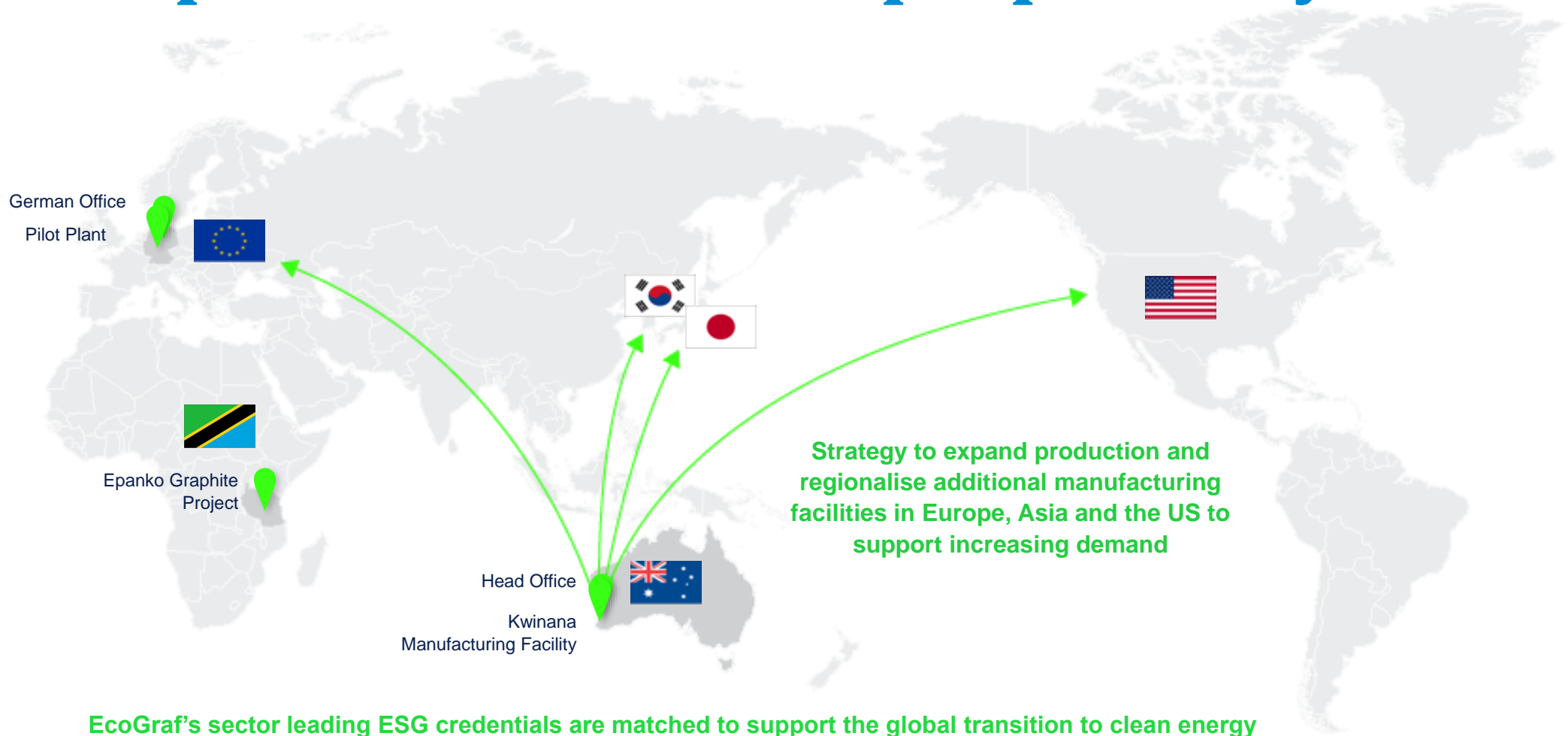
Increasing demand for critical minerals

Major boost for German-Australian cooperation



Source: German-Australian Chamber of Industry and Commerce

20 potential locations proposed by GTAI



Quelle: EcoGraf™

Nm Neometals

SMS group
engineering
competence centre
in Hilchenbach

Neometals

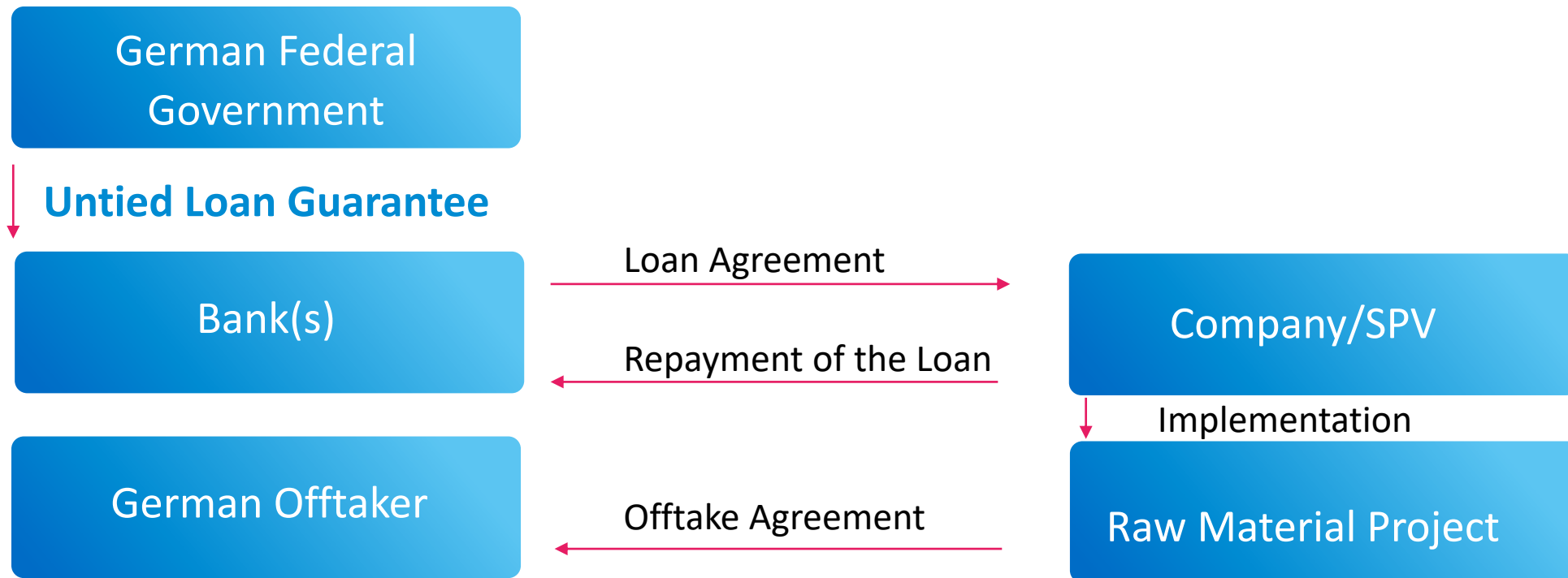
- Primobius designed the demonstration plant in cooperation with SMS group.
- Engineering and production under one roof to ensure efficient order processing
- 1,000m² facility
- Commercial-scale shredding circuit of 20,000tpa
- Refining section with design capacity to process ~2tpd of leach feed
- Ethical disposal of hazardous LIBs, generated re-usable materials for the production of new batteries.

Source: Neometals, SMS Group

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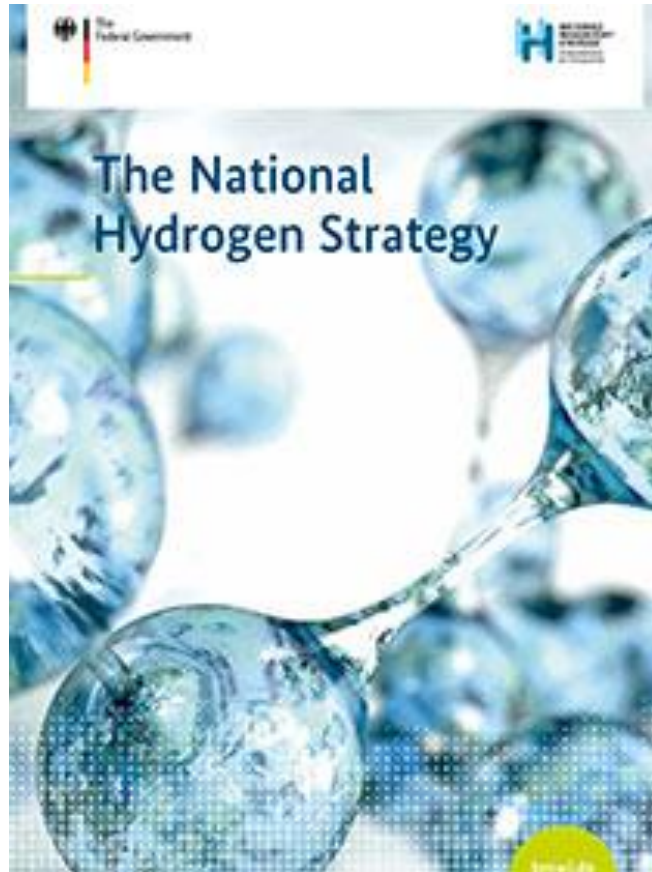
Untied Loan Guarantees of the Federal Republic of Germany

Basic structure of incorporating an Untied Loan Guarantee in a raw material project



Germany's National Hydrogen Strategy

Hydrogen will become central pillar in achieving Germany's energy transition



Source: BMWi, 2020

Goals of the National Hydrogen Strategy

- Invest EUR 9 billion: EUR 7 billion nationally + EUR 2 billion internationally
- 5 GW of electrolysis generation capacity till 2030
- Another 5 GW of electrolysis generation capacity till 2035 (2040)
- Develop a policy framework that encourages investments
- Determine concrete implementation measures

Thyssenkrupp and Steag invest in Green Steel

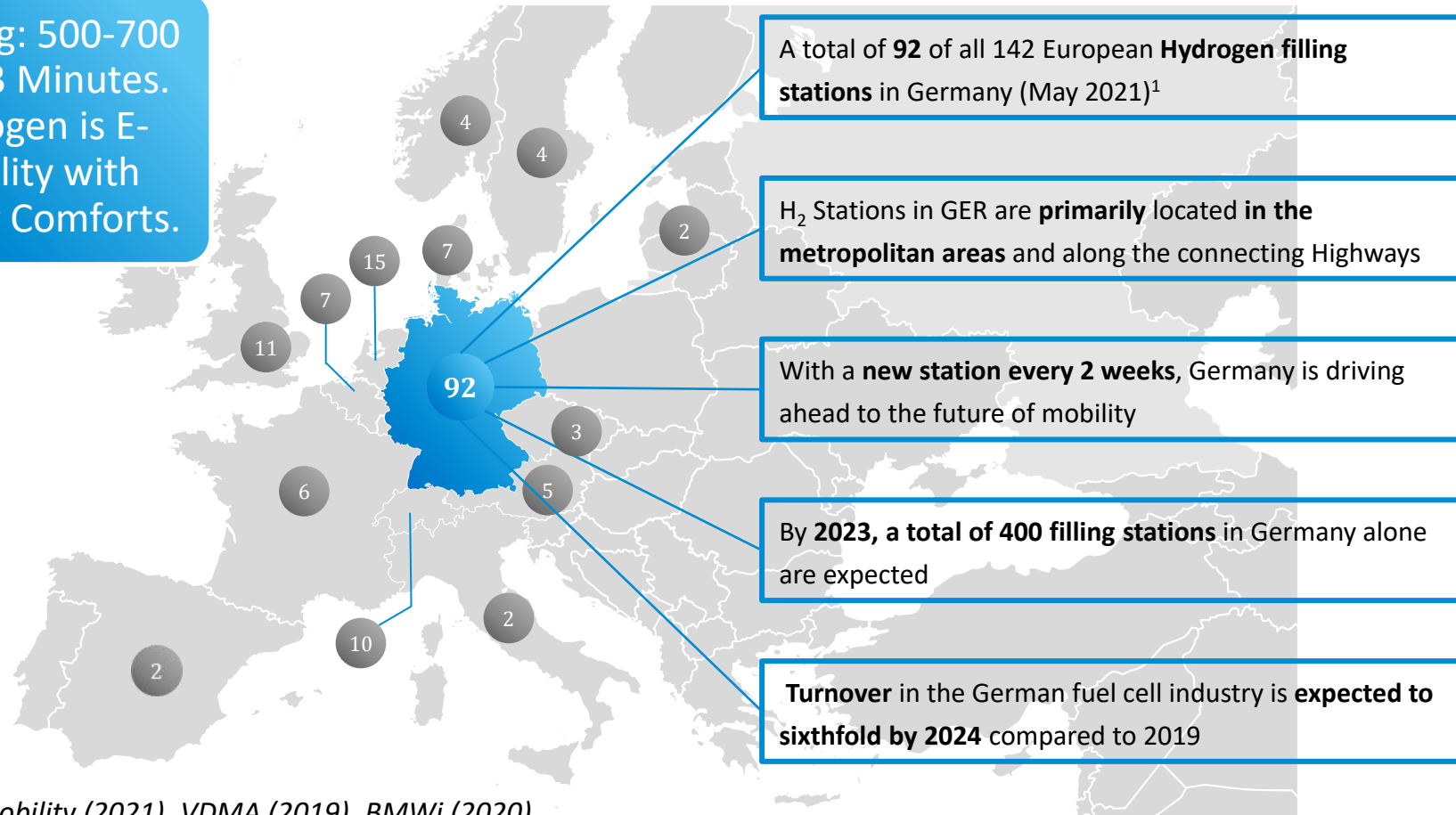
HydrOxy Hub Walsum

- Direct reduction plant at the Thyssenkrupp steel plant in Duisburg
- 500 MW electrolysis generation capacity at the neighboring Steag power station
- Project aligns with the German and EU Hydrogen Strategy
- Planned production start in 2025
- Feasibility study propelled

H₂ Filling Infrastructure in Europe

Germany prepares for the Future in Mobility and Energy

H₂ filling: 500-700 km in 3 Minutes.
Hydrogen is E-Mobility with familiar Comforts.



A total of **92** of all 142 European **Hydrogen filling stations** in Germany (May 2021)¹

H₂ Stations in GER are **primarily** located in the **metropolitan areas** and along the connecting Highways

With a **new station every 2 weeks**, Germany is driving ahead to the future of mobility

By **2023**, a total of **400 filling stations** in Germany alone are expected

Turnover in the German fuel cell industry is **expected to sixthfold by 2024** compared to 2019

Source: H2 Mobility (2021), VDMA (2019), BMWi (2020)

Note: ¹Island with 3 charging stations not on the map

Germany's National Hydrogen Strategy

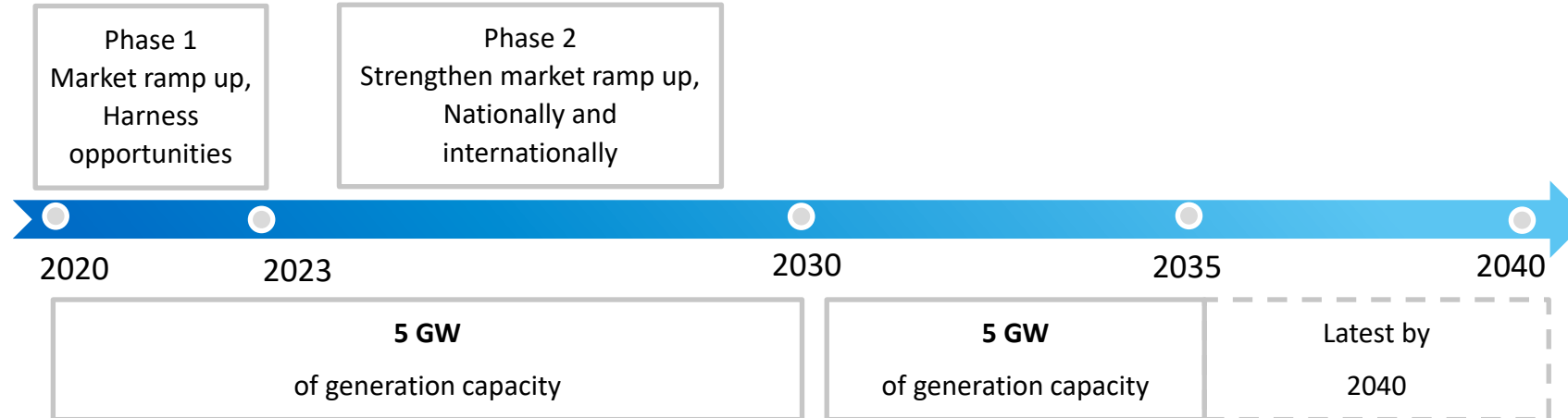
Hydrogen will become central pillar in achieving Germany's climate protection targets

EUR 7 billion for a national market ramp up

- Hydrogen Production (3 measure)
- Hydrogen Use
 - Mobility (9 measures)
 - Transport (4 measures)
 - Heat (2 measures)
- Infrastructure and Supply (3 measures)
- Research, Education and Innovation (7 measures)

EUR 2 billion for international partnerships

- European activities (4 measures)
- International hydrogen economy (5 measures)



Source: BMWi, 2020



Bilateral Feasibility Study

- German-Australian 24-month feasibility study.
- Explore necessary economical, technological and regulatory steps to establish a cost efficient and stable supply chain.
- Implementation by Akademie de Technikwissenschaften (acatech) and BDI.
- BMBF funding feasibility study with 1,5 billion Euro.
- Win-win situation for both countries

Business Location Germany

- Market and industry analyses
- Market entry strategy development support
- Extensive legal information (tax, labor law, etc.)
- Funding and financing options advice
- Location identification, site visit support



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