VALUN KÄYTÖN SEMINAARI 2025
30.-31.10.2025, Tampere

Future Trends

of the

European Foundry Industry

Bundesverband der Deutschen Gießerei-Industrie e.V.

Max Schumacher

Bundesverband der Deutschen Gießerei-Industrie BDG
German Foundry Association

Stakeholders

600 German ferrous, non-ferrous metal and Steel foundries with approx. 70,000 employees

Suppliers to the foundry industry

Member of the

Federation of German Industries (BDI)

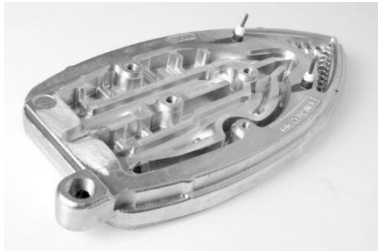
German Metals Association (WVMetalle)

European Foundry Federation EFF

Castings are present in almost all products

Ferrous and Steel

Non Ferrous



vdi-nachrichten.net, stolle.net, hh-moelln.de, wlw.de, german.alibaba.com, duester-guss.de, emg-casting.de, guss.de, kappes-guss.de, BDG, heise.de/hintergrund/Karosseriefertigung-Gigacasting-Alles-aus-einem-Guss-9597804.html

Target groups

- Foundrymen
- Youth (image)
- Youth (apprenticeship)
- General Public
- Foundry Journals
- (Inter)national newspapers
- Politicians, government

➔each with different approaches and media

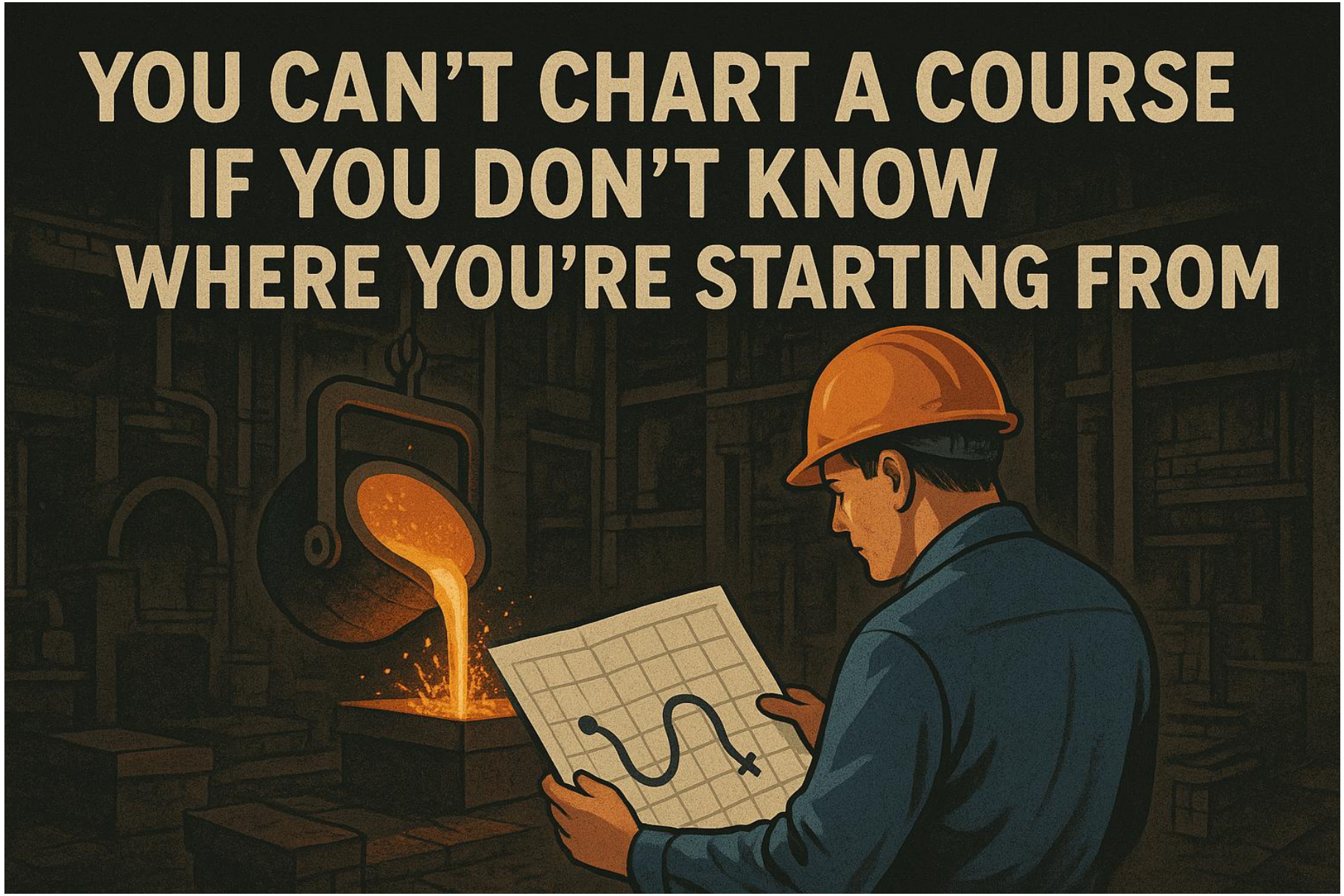

GUSS IST ALLTAG

If the question is not

- Do we need castings?

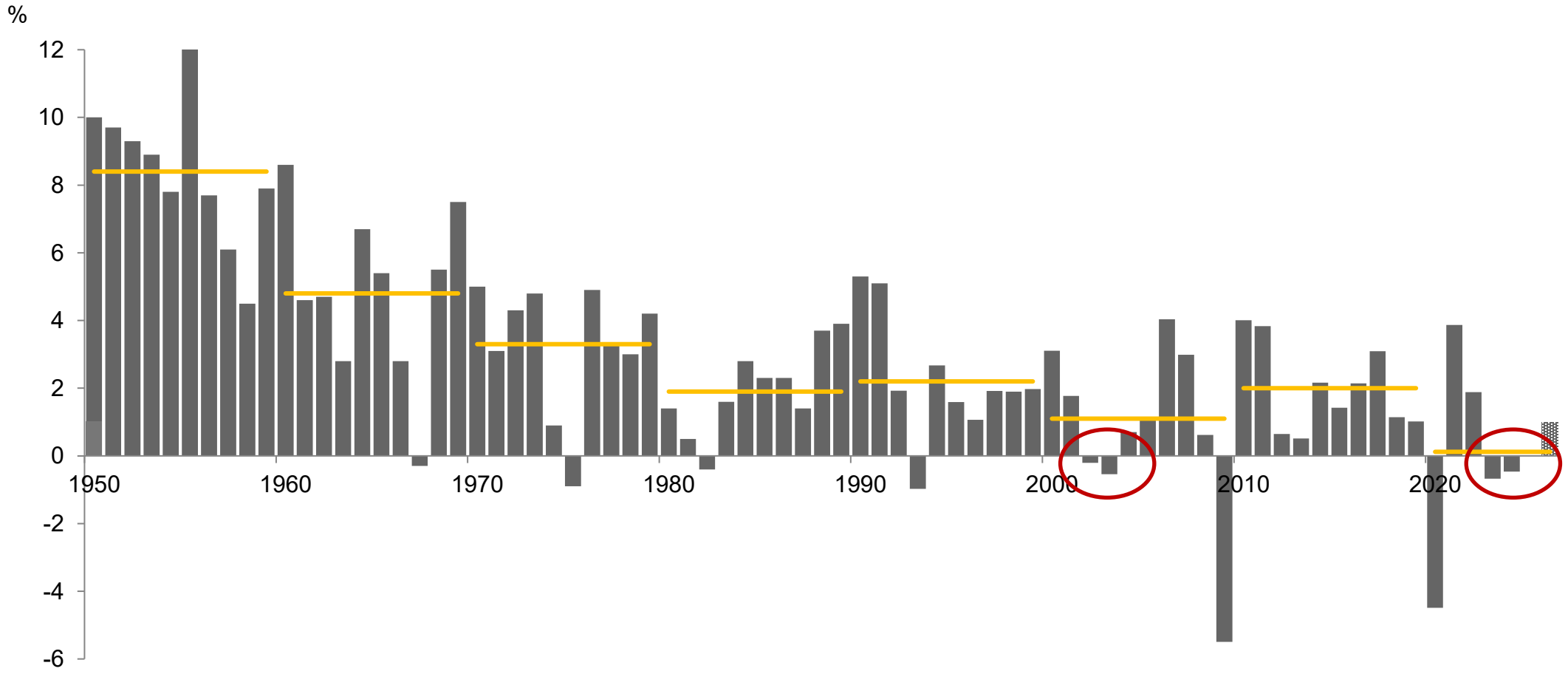
- Let us try another approach:

  Do we need the foundry industry in Europe …


YOU CAN'T CHART A COURSE
IF YOU DON'T KNOW
WHERE YOU'RE STARTING FROM

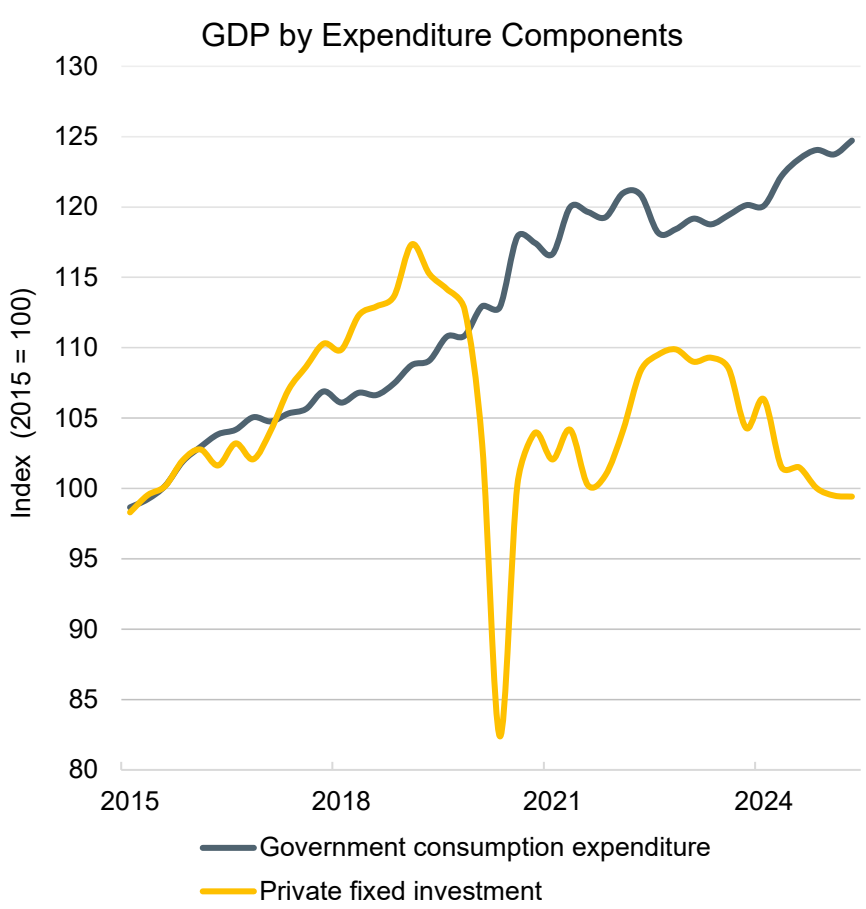
GDP Development Rate

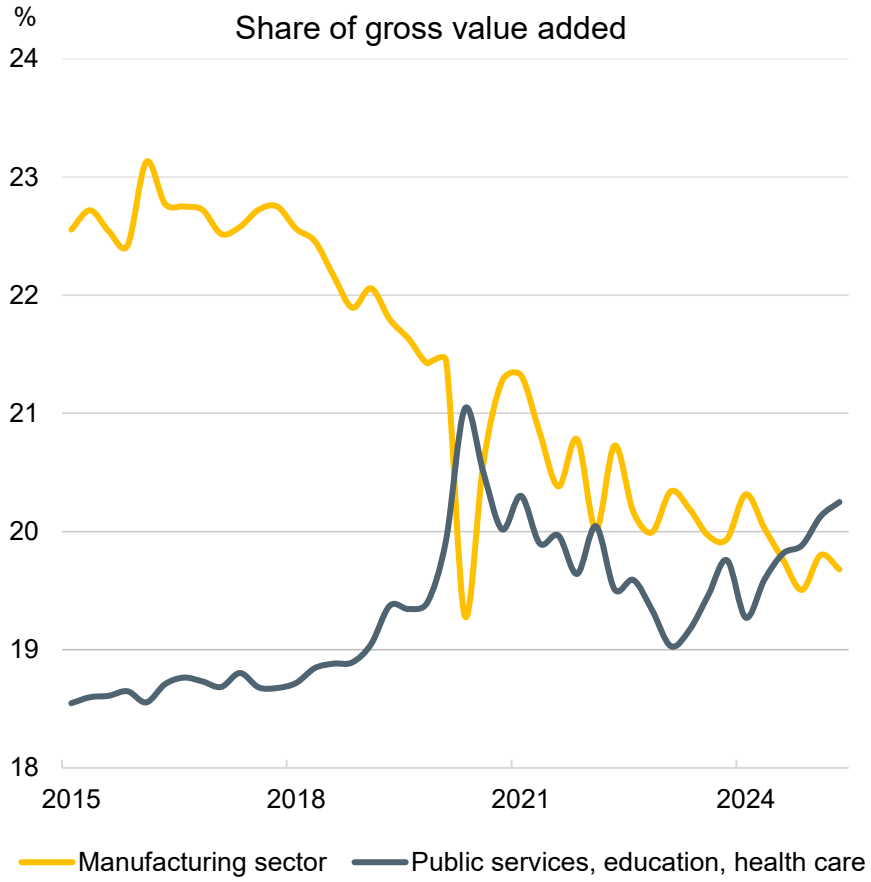
Germany facing historical weakness



Source: Stat.BA, 2025 & 2026 forecast

GDP-Accounts
June 2025





NIPA 2025 (2015)

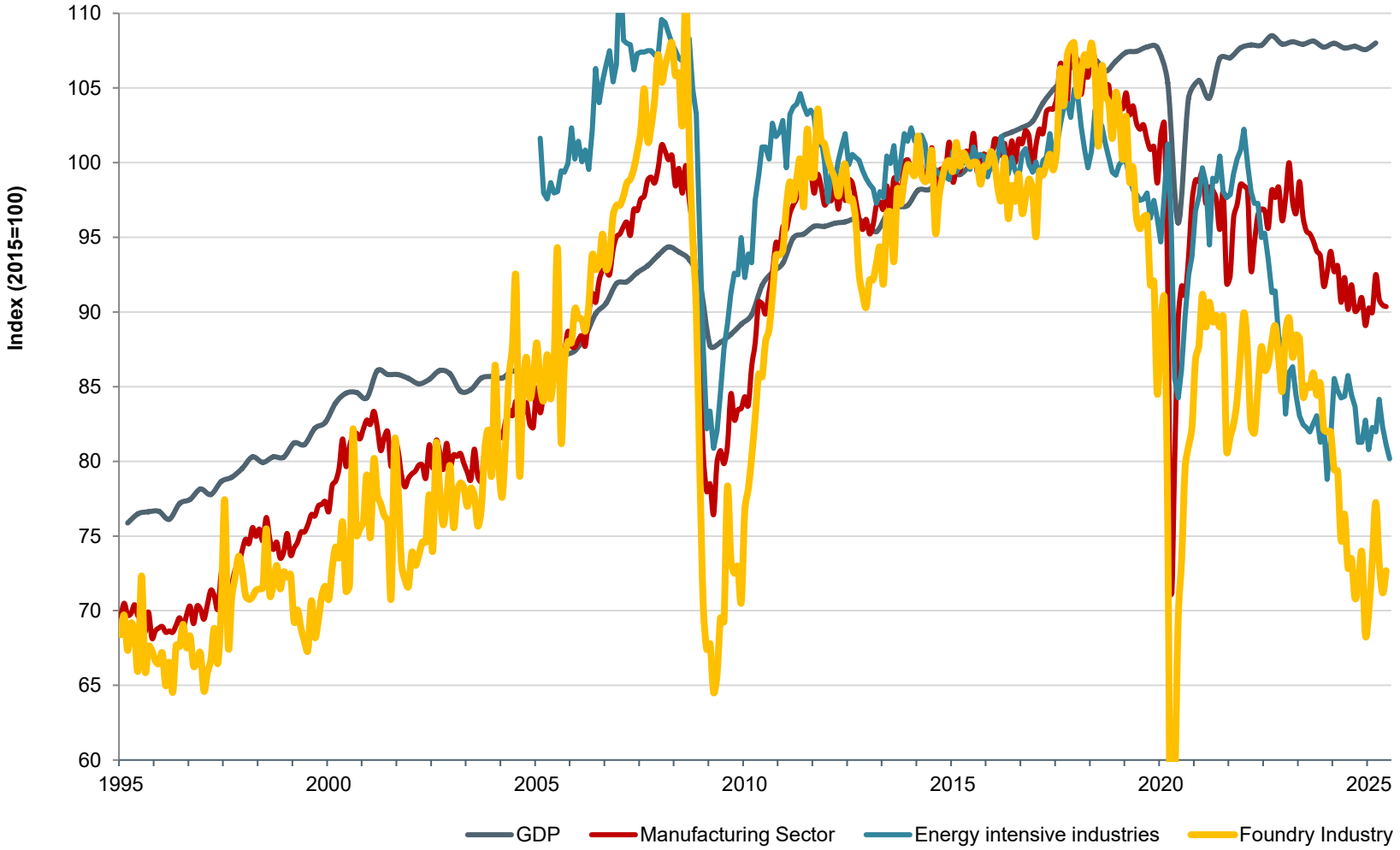
Industry share
19,7 %
(22,7 %)

Public Services share
20,2 %
(18,6 %)

Source: Stat . BA, BDG

Production Trends in Germany

Foundry industry records the sharpest decline



Source: Stat.BA, BIP = preisbereinigt

Ø last 3 months vs Ø 2018

GDP
+ 1 %

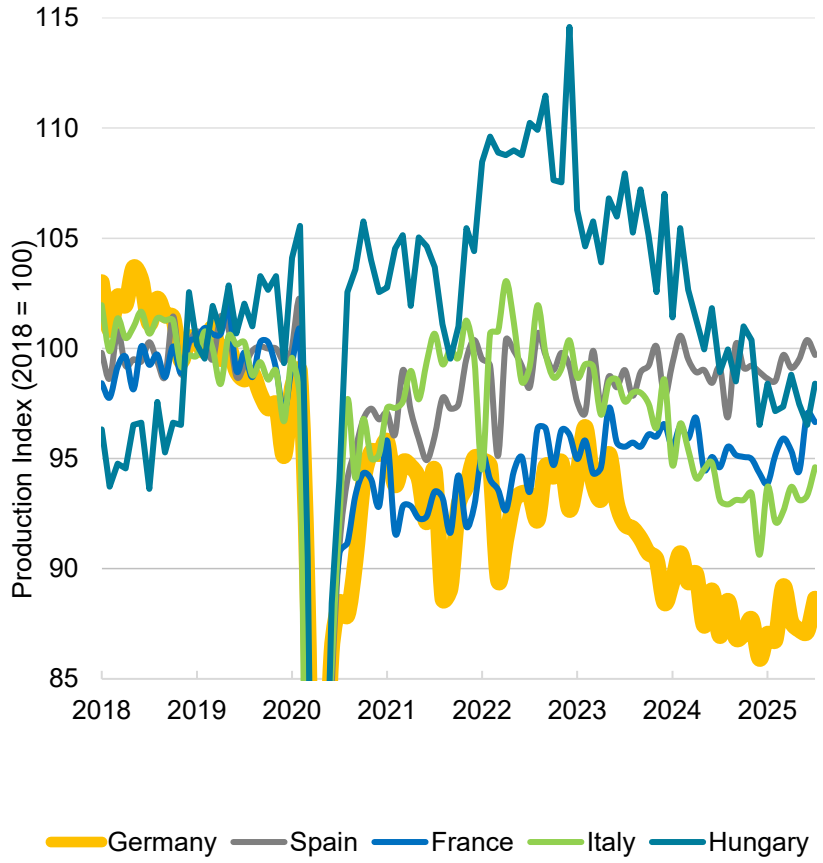
Manufacturing sector
- 15 %

Energy intensive industries
- 21 %

Foundry industry
- 30 %

Manufacturing Production in Europe

Germany underperforming



Last 3 months vs Ø 2018

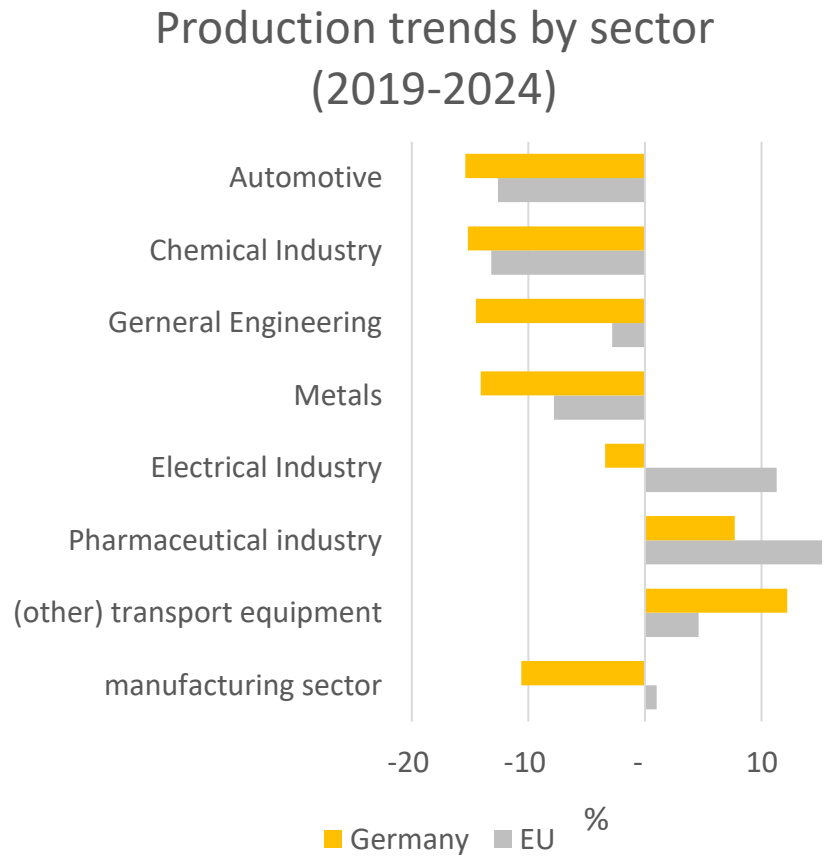
Germany
-15 %

Spain
-3 %

France
-11 %

Italy
-7 %

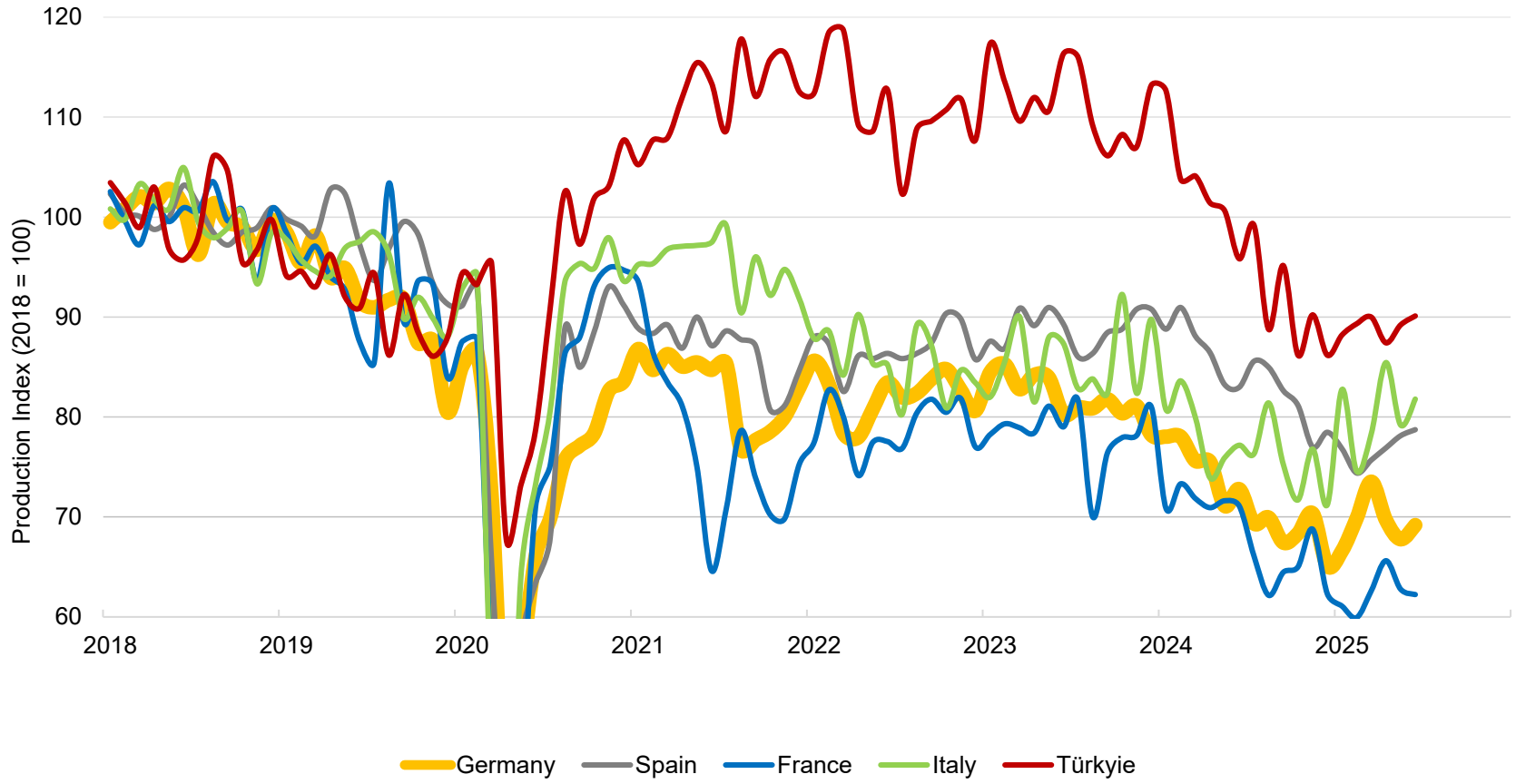
Hungary
+1 %



Source: Eurostat, BDG,

Foundry Production in Europe

All regions with major losses



Last 3 months vs Ø 2018

Germany
-30%

Spain
-22 %

France
-36 %

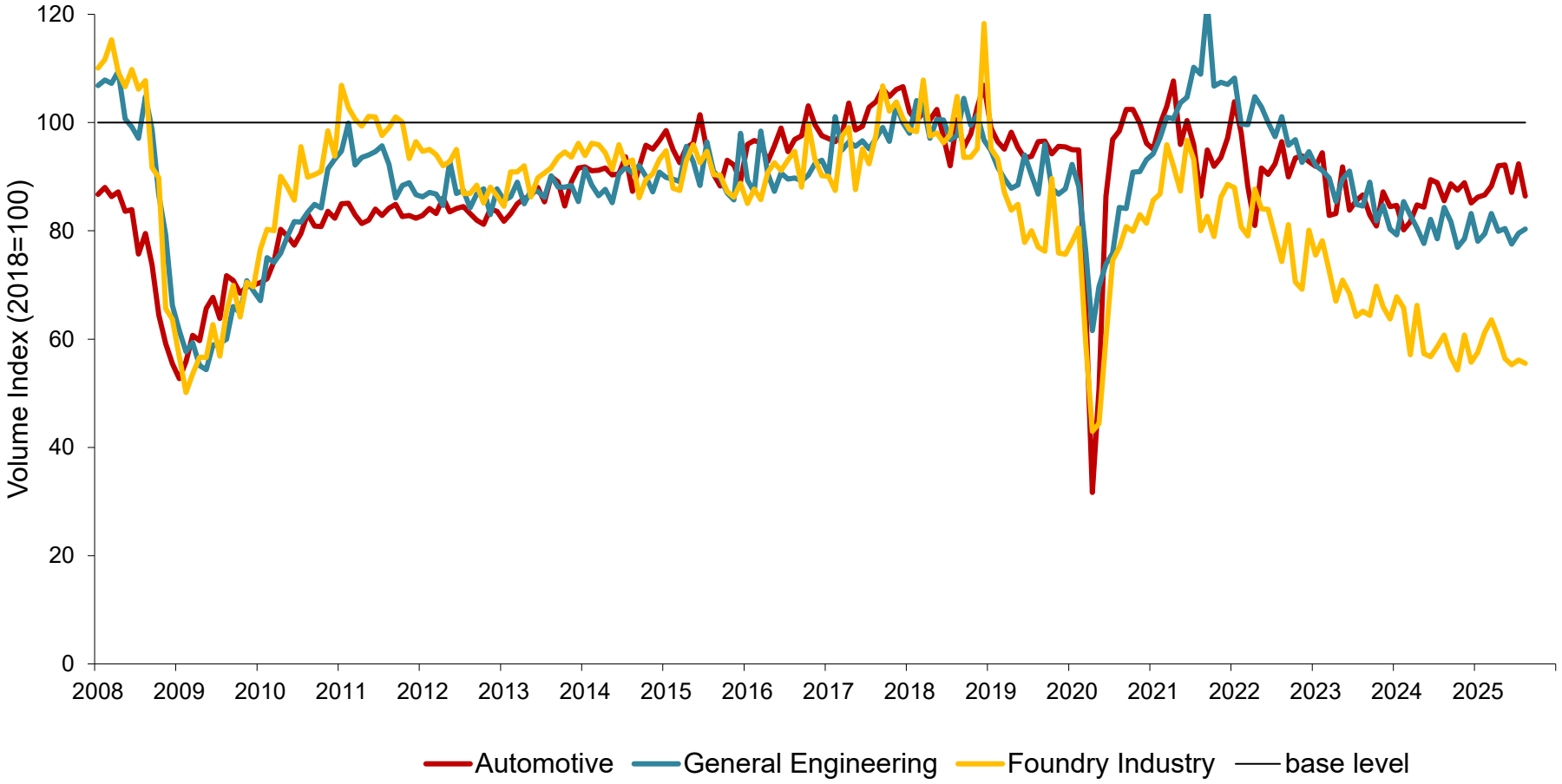
Italy
-18 %

Türkyie
-12 %

Source: Eurostat, BDG

Incoming Orders – German Foundry Industry

Casting demand is decoupling from customer industries



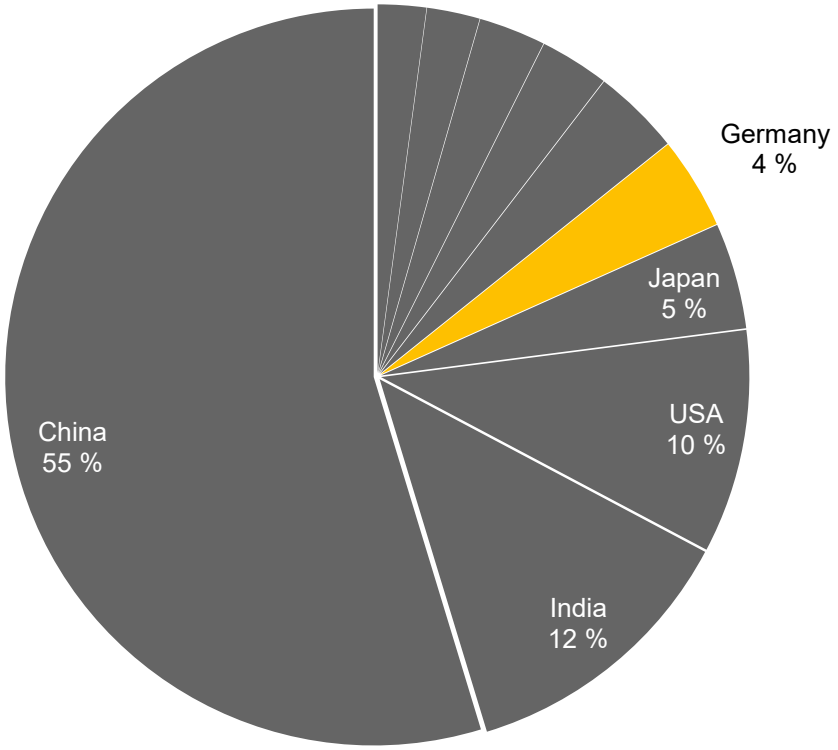
change (%) compared with previous year	
01. - 08.2025	
Automotive	+ 4,7%
General Engineering	- 1,9%
Foundry Industry	- 5,0%

Source: Stat. BA, Index 2021=100, X13 JDemetra+, kclender- and sosonnal adjusted, calcukation BDG

Foundry Industrial Production Ranking

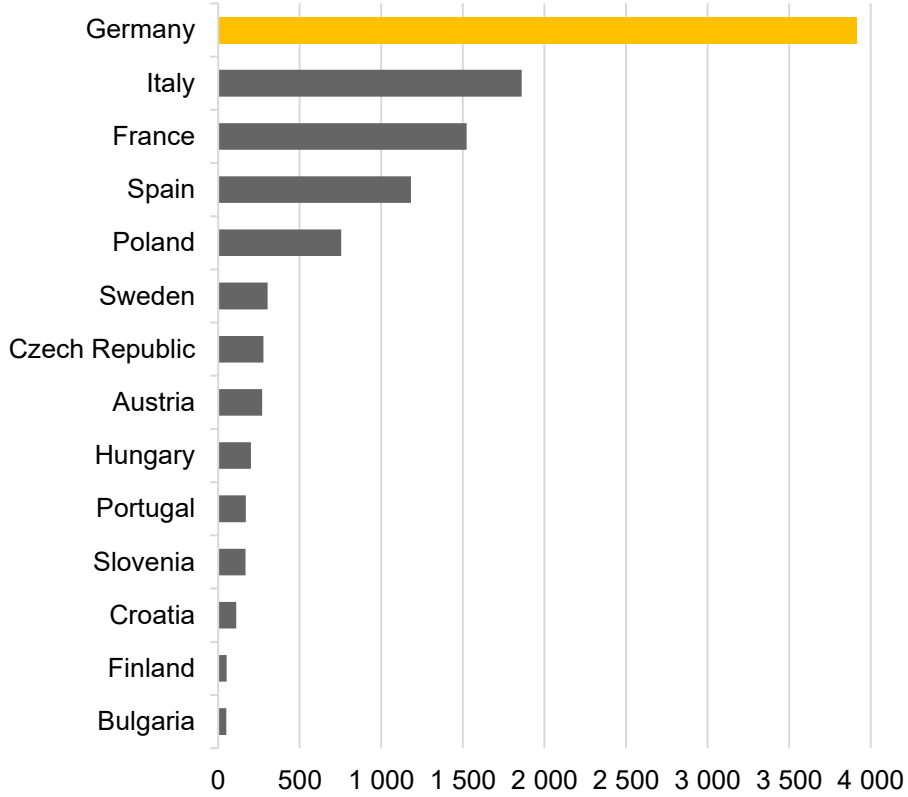
World Share*

Volume Square 5
Productivity Place 1



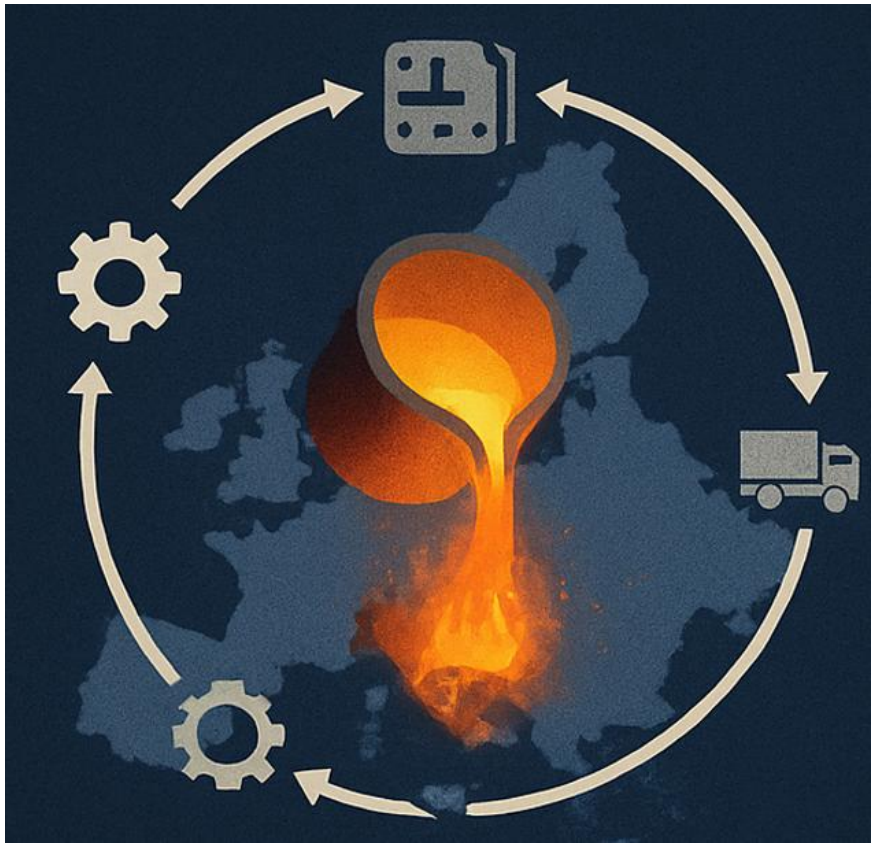
EU production**

Volume Place 1
Productivity Place 1



Quelle: nationale Verbände, CAEF, modern casting; *2021; ** 2023

Why Closed Value Chains Matter for Europe’s Foundry Industry



- **Industrial Backbone of Transformation**
  - Foundries provide the essential cast components for Europe’s clean-tech industries, from wind turbines and e-mobility to circular infrastructure. Without them, the energy transition remains an empty shell.
- **Strategic Autonomy, Not Autarky**
  - Closed value chains do not mean isolation. They mean control over critical production stages, ensuring reliability, quality, and traceable CO_2-footprints across borders.
- **Resilience through Proximity**
  - A foundry network within Europe shortens transport routes, lowers emissions, and safeguards supply security. Every tonne cast in Europe strengthens industrial sovereignty.
- **Survival Question for Europe’s Industry**
  - Which foundries will survive — and where will Europe source its transformation materials if they don’t? A resilient Europe needs a resilient foundry base.

→Resilience starts where metals are made

Which challenges do we have to overcome?

DEGLOBALISATION & DEINDUSTRIALISATION

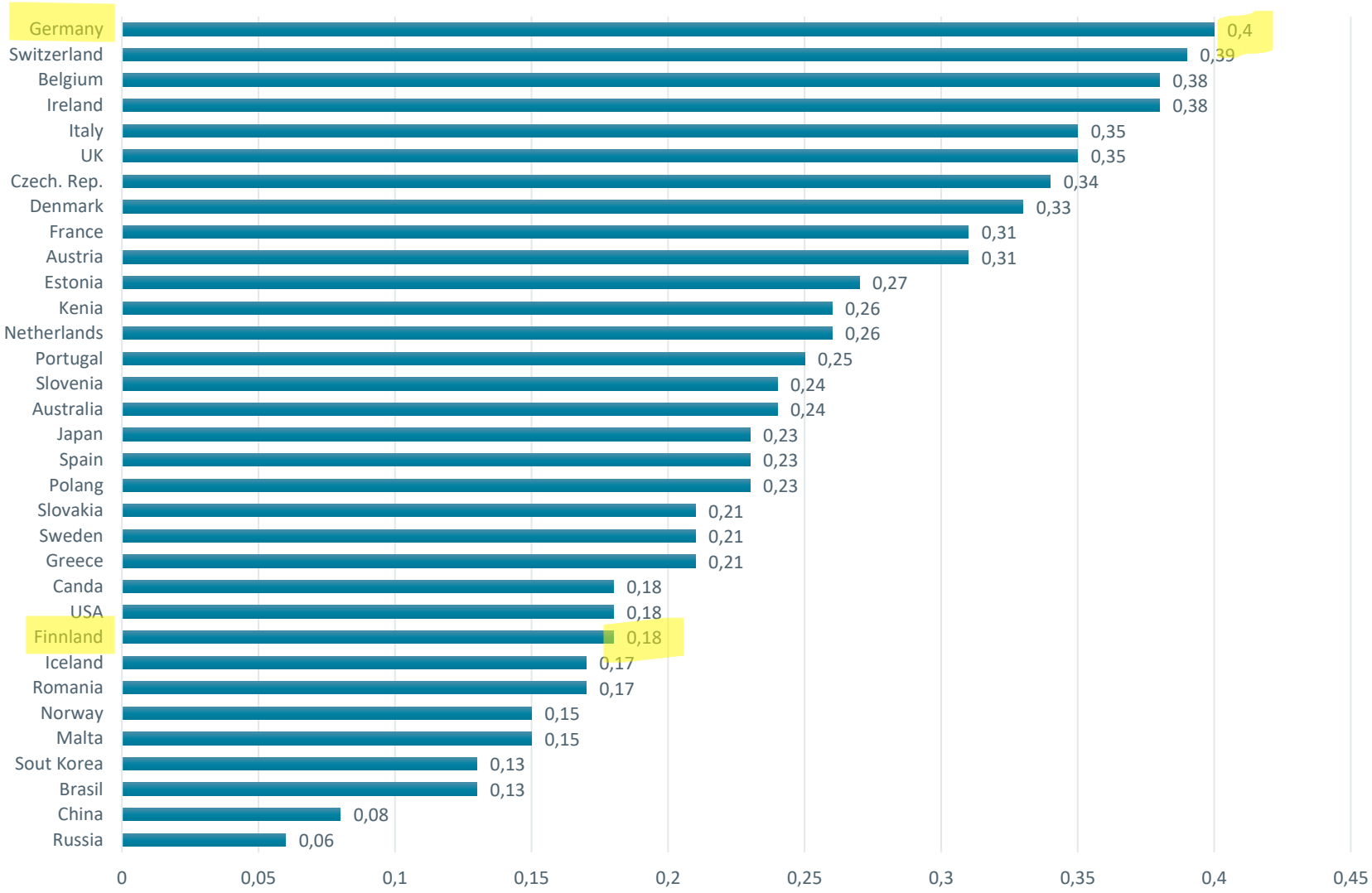
DECARBONISATION

DEMOGRAFICS & NEW WORK

DIGITAL TRANSFORMATION

Electric Energy Prices

€ Ct./kWh



Fit 4-55 package unchanged: target -55% GHG emissions by 2030

(kleine) **Auswahl der Fit-4-55-Rechtsakte auf EU-Ebene 2023/24**

Long-term perspectives of the ETS

Corporate Sustainability Due Diligence Directive (CSDDD)

Corporate Sustainability Reporting Directive (CSRD)

Green Claims Directive

EU Carbon Removals and Carbon Farming Regulation (CRCF)

RED 3 (Renewable Energy Directive)

and other related implementing acts, at EU and national level

Emission trading

- embeds itself in a mix of instruments
- is the central instrument of EU climate policy
- Also provides for CCS and CCU!

Regulations in emissions trading

- are strongly influenced by other regulations – for example from the RED
- directly and indirectly influence other obligations - for example, reporting under the CSRD (MRV)
- Effect of the price signal also outside of emissions trading – not only, but also auction proceeds and their use (financing effect)

EU Climate Protection Regulation Article 2 (1):

Goal of climate neutrality: The EU-wide emissions of (...) Greenhouse gases must be removed and offset by 2050 at the latest, so that emissions are reduced to net zero by that date.

"We are determined"...

- **Reduce CO2e emissions by 20% compared to 2019 per vehicle through supply chain by 2030**
- Increase in renewable energies at suppliers
- 60% of suppliers have proof of Science Based Targets (SBT) or B rating in the Carbon Disclosure Project (CDP)

Mission: Zero

- Every vehicle should leave as small a CO2 footprint as possible.
- CO2-neutral production at all Audi production sites from 2025

CO2-neutral production of the Taycan

- Reduction of CO2 emissions along the value chain
- CO2-neutral production

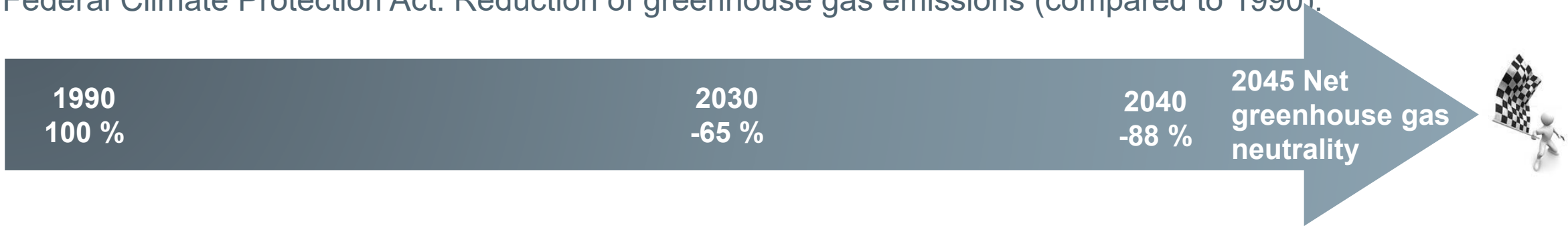
20% reduction of CO2e emissions per vehicle through the supply chain by 2025

- Proportion of recyclable material at least 25% with a focus on plastic, steel and aluminium
- 100% regenerable energy at Tier 1 suppliers

Quelle: Nemak, 13.10.2020

No transformation plan without a CO2 footprint!

Federal Climate Protection Act: Reduction of greenhouse gas emissions (compared to 1990):



Transformation plan as part of the corporate strategy

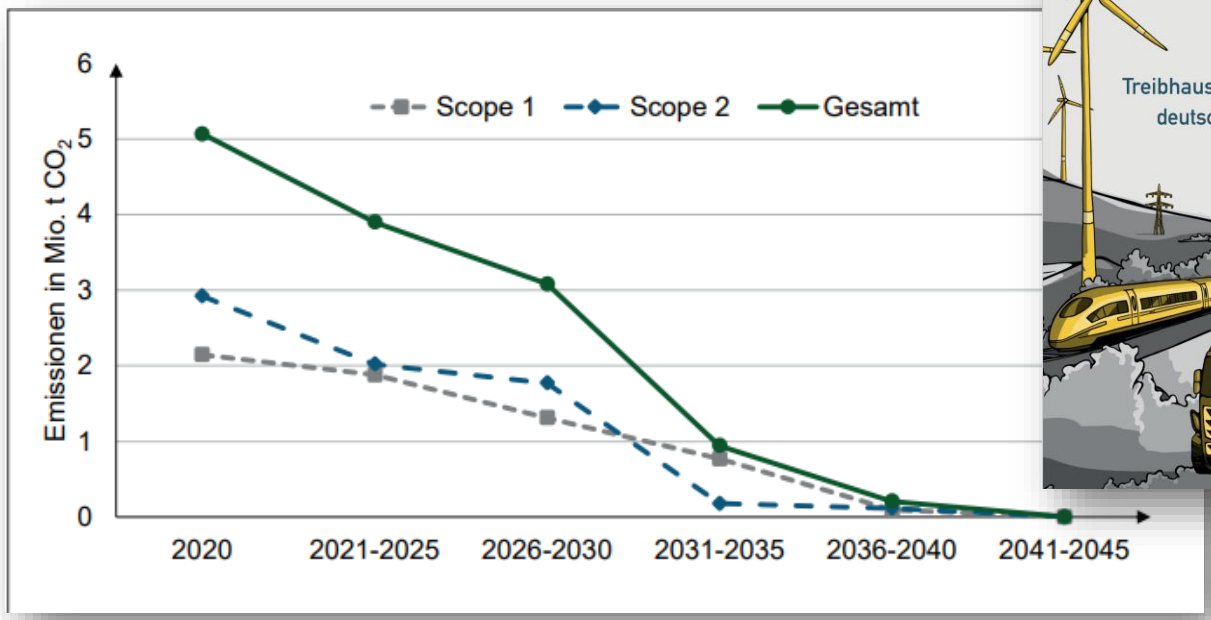
IED 2.0: Creation of a transformation plan for energy-intensive sectors by 2030

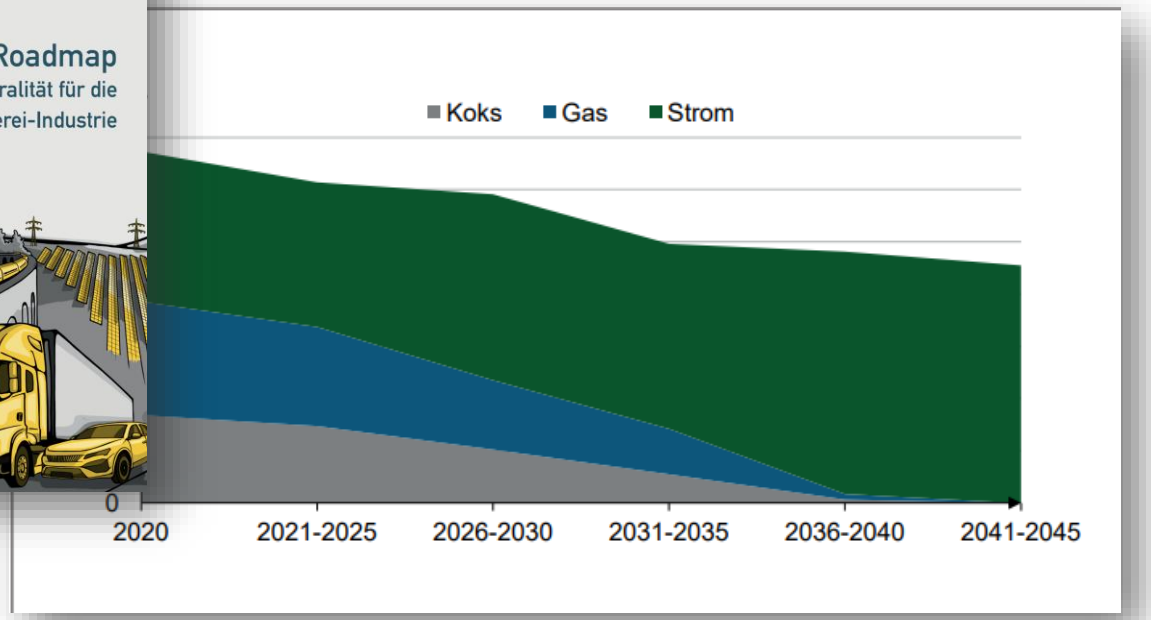
Upgrade from environmental and energy management to climate and sustainability management

Highly complex, long-term process with individual sub-projects – no "master plan" available

Path 2: Electrification

- Substitution of cupola and gas heating with induction and electric resistance furnaces.
- Electrical demand rises ≈ 58 % to ≈ 9 TWh; gas and coke consumption decline by 60–67 %.
- Investment cost ≈ €4.4 billion; viability hinges on affordable renewable electricity.
- Only pathway achieving near-zero emissions by 2045.





FRED – Carbon Footprint Calculator

- FRED = Footprint REDuction Tool
- FRED enables the determination of the Product Carbon Footprint (PCF) for cast products and the Corporate Carbon Footprint (CCF) for foundry companies
- Foundries can map individual process chains as well as influencing parameters of the production of a casting and calculate the resulting CO_2 emissions
- FRED is validated according to ISO 14064 and 14067 as well as Greenhouse Gas Protocol (GHG) and is a member of the Catena-X Automotive Network

- Database with industrial primary data can bridge your own data gaps
- Hotspot analysis provides indication for effective CO2 reduction measures
- Simulation of mitigation measures as a planning and strategy tool

International dimension: CO2 pricing is used globally as an instrument

(xiii) Instruments are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Instruments are considered "under consideration" if the government has announced its intention to work toward the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. Some countries that have mechanisms implemented also have additional instruments under consideration. For subnational jurisdictions only the subnational instrument is reflected.

Source: World Bank. 2023. State and Trends of Carbon Pricing 2023. Washington, DC: World Bank. doi: 10.1596/978-1-4648-2006-9. License: Creative Commons Attribution CC BY 3.0 IGO.

Main areas of transformation

DEGLOBALISATION & DEINDUSTRIALISATION

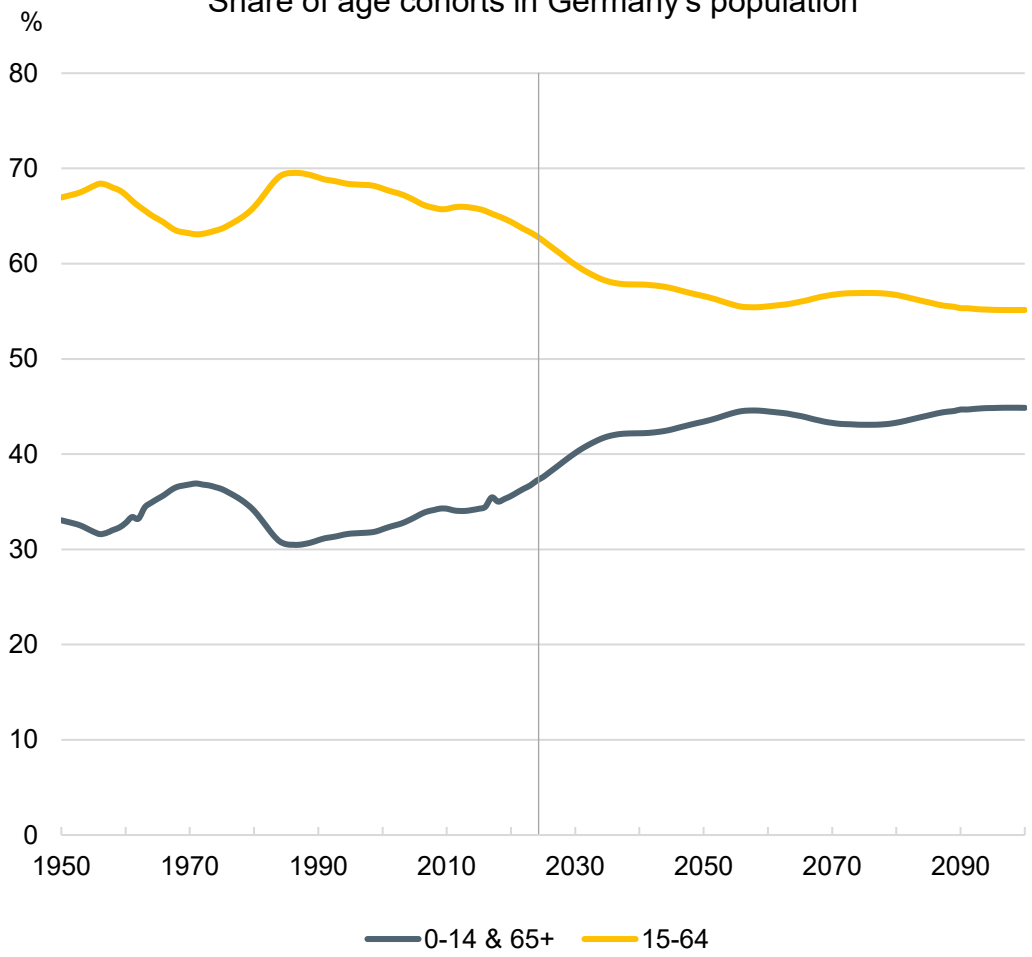
DECARBONISATION

DEMOGRAPHICS & NEW WORK

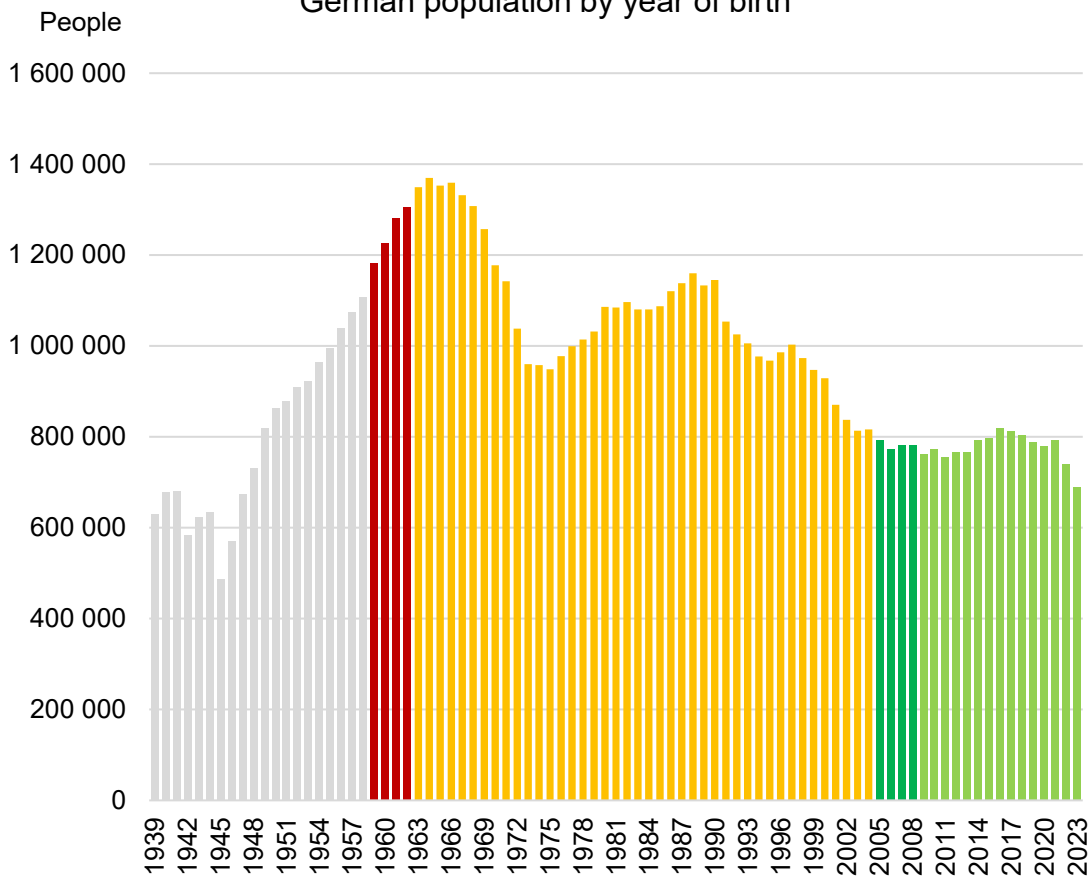
DIGITAL TRANSFORMATION

Demographic Change

Share of age cohorts in Germany’s population

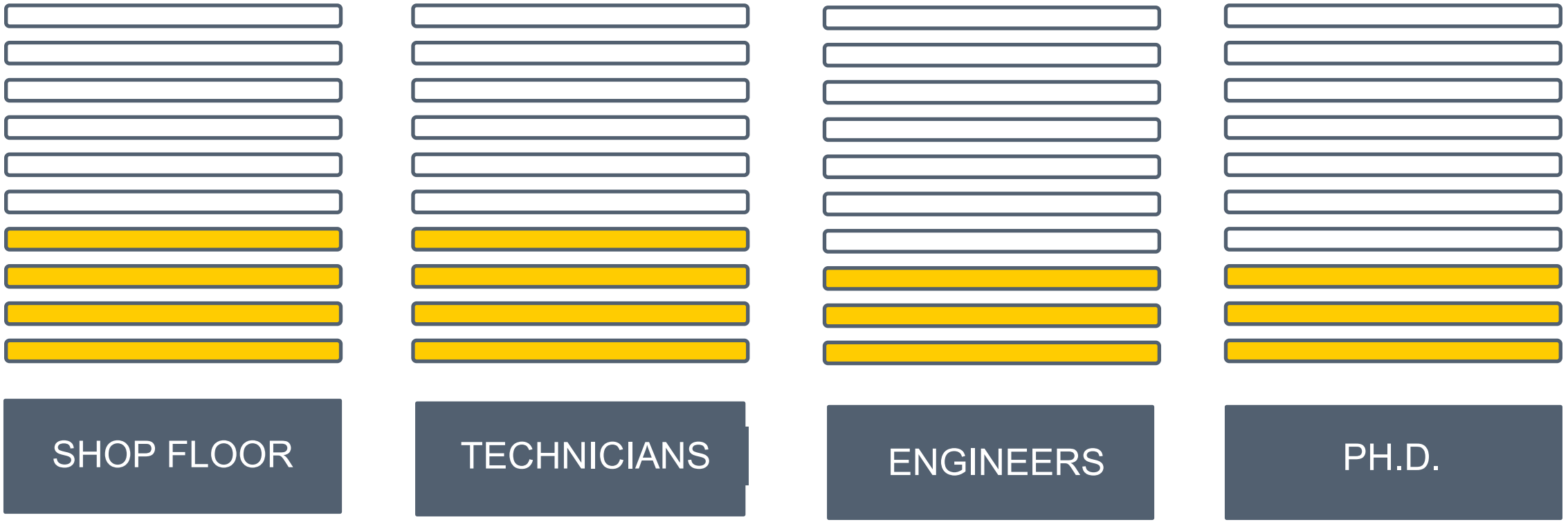


German population by year of birth



Quelle: UN, Stat . BA.

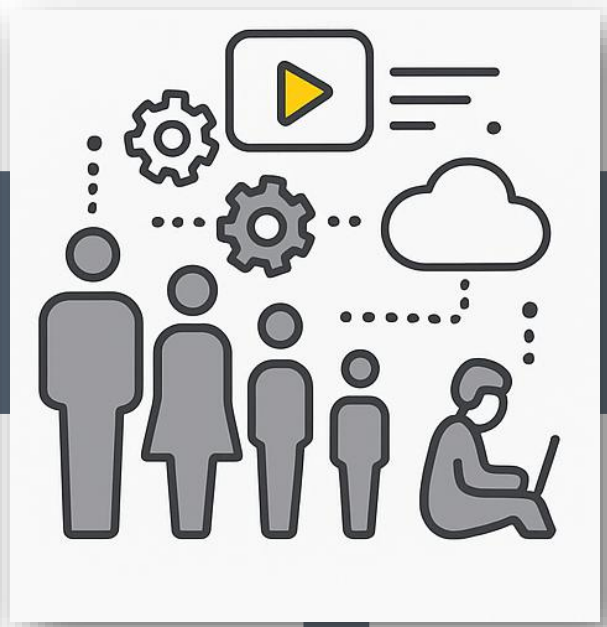
Availability of skilled labour 2024 // Ranking from 1 – 10



Main areas of transformation

DEGLOBALISATION & DEINDUSTRIALISATION

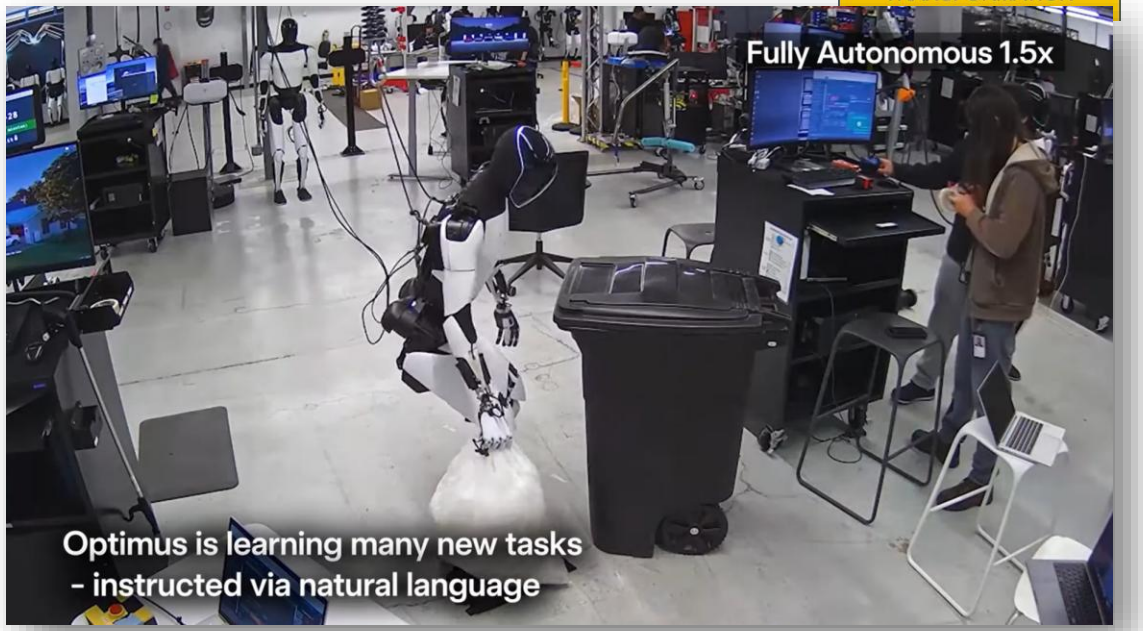
DECARBONISATION



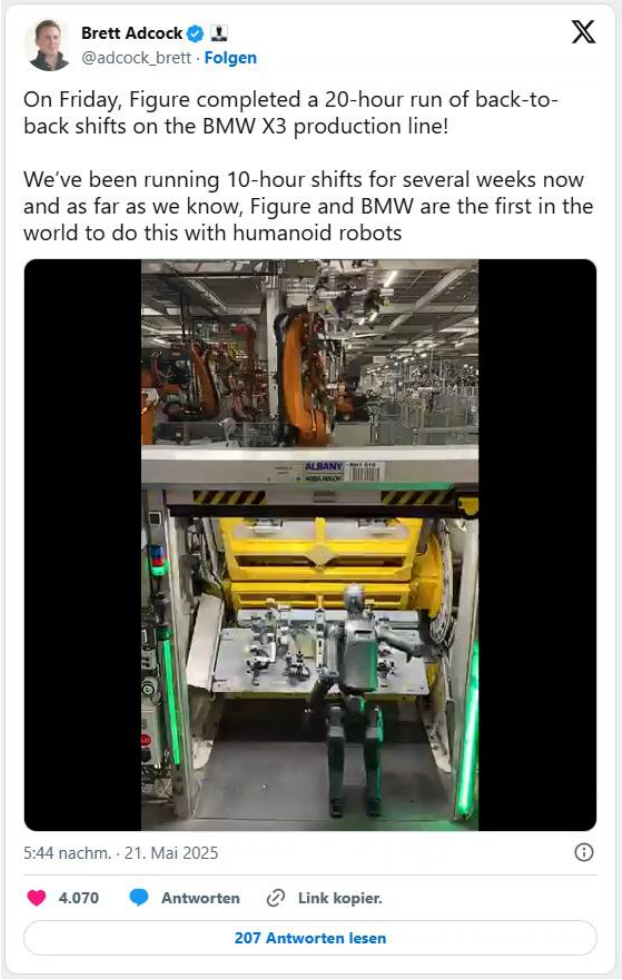
DEMOGRAPHICS & NEW WORK

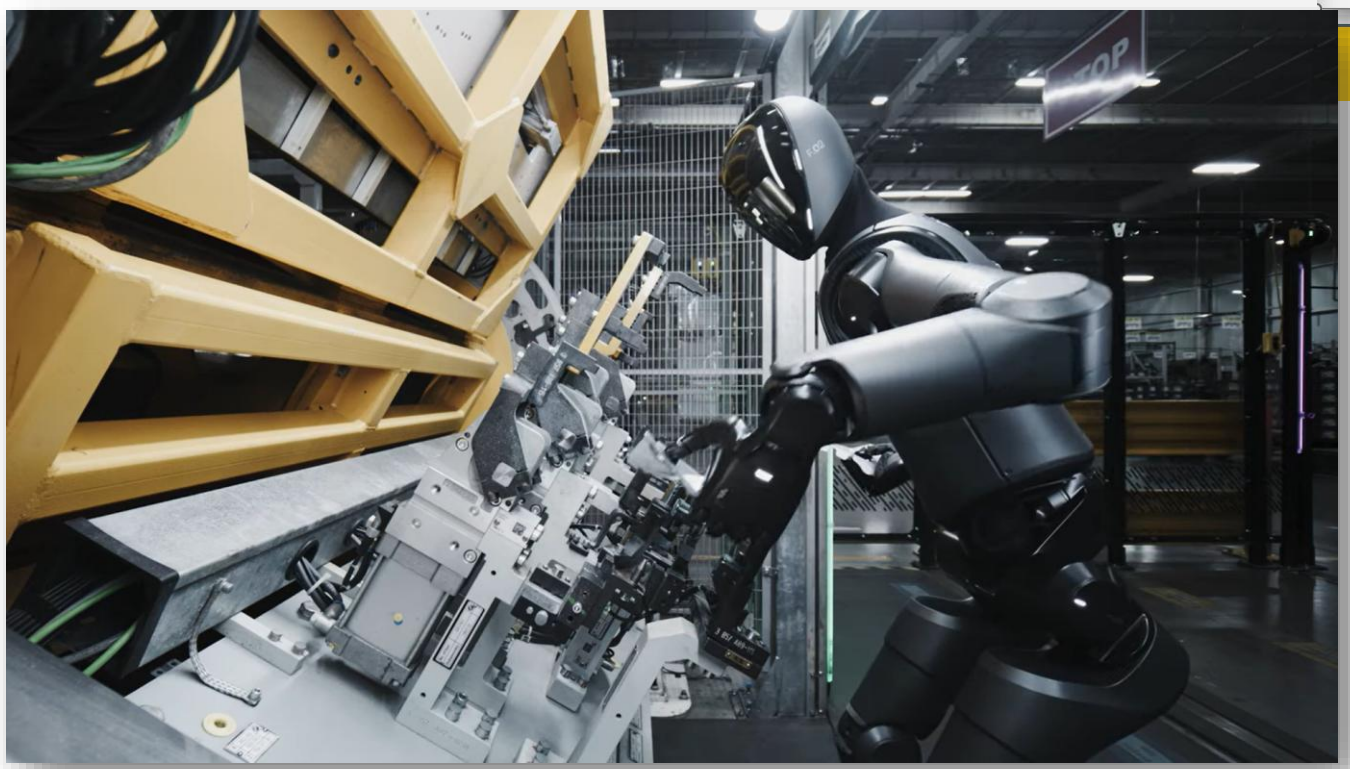
DIGITAL TRANSFORMATION

AI: How far can we go?



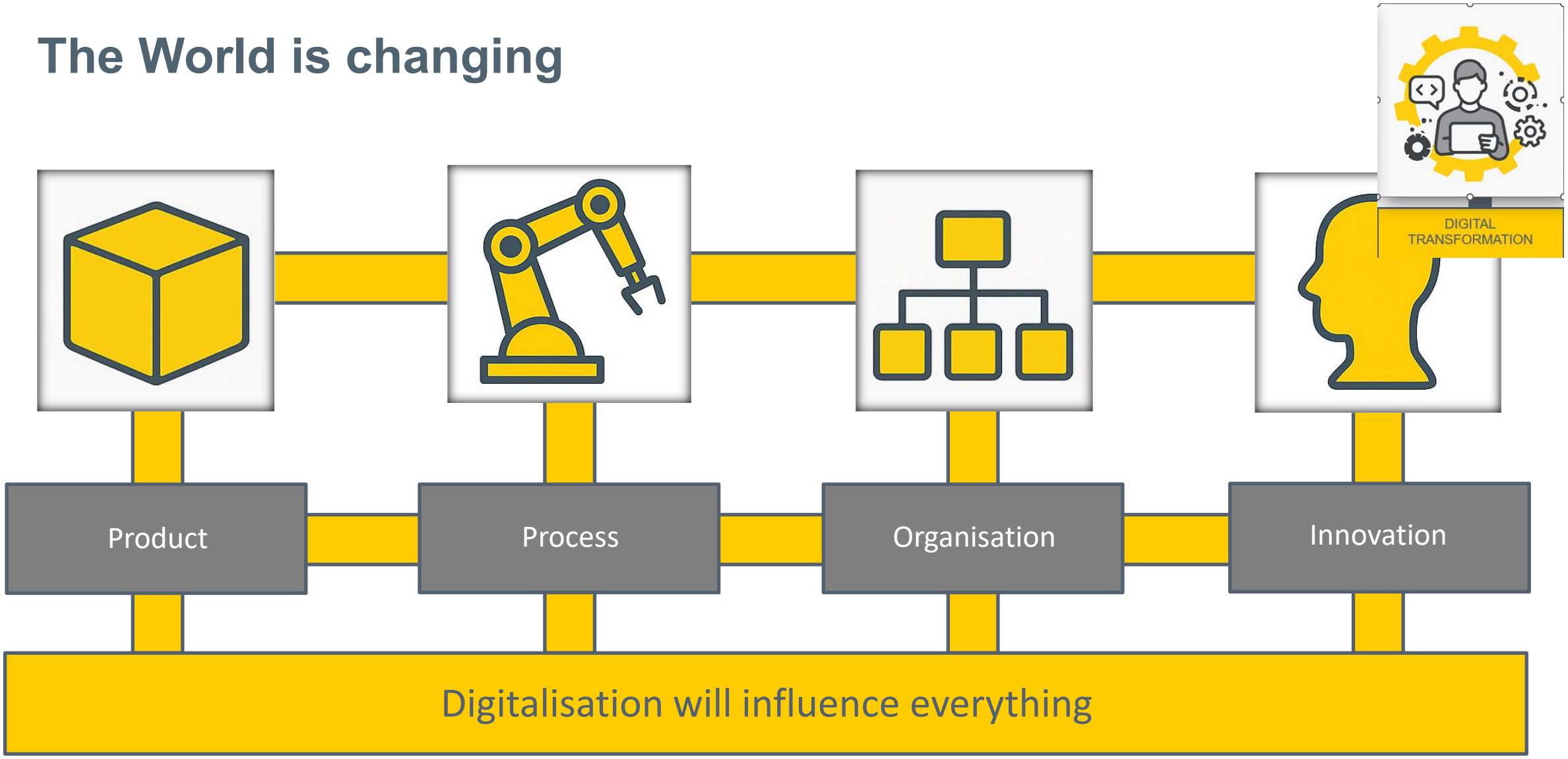
AI is not science fiction but reality





DIGITAL TRANSFORMATION

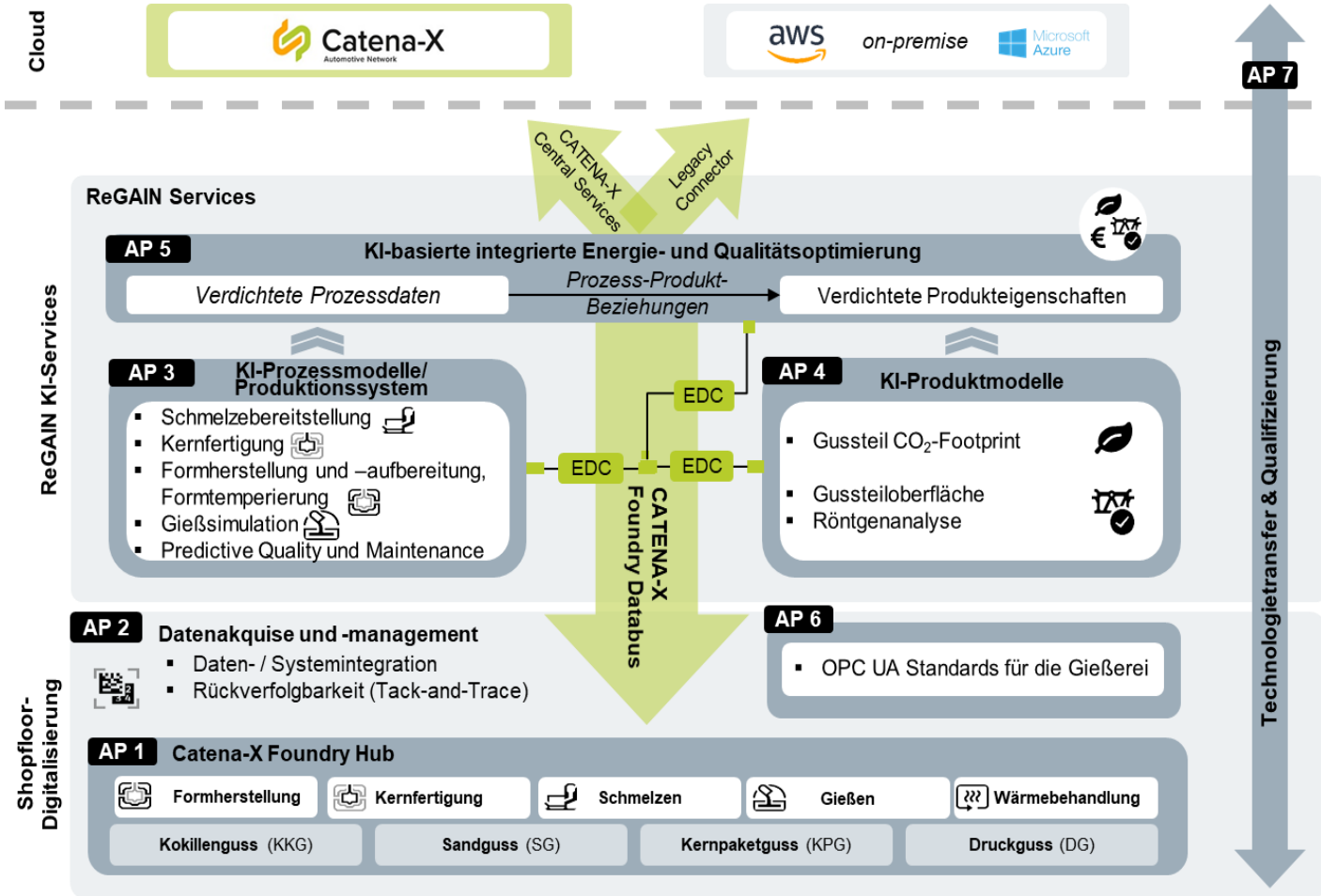
The World is changing



Research and development focus areas of the ReGain-Project

Resilient automotive foundries through the use of AI supported assistant for sustainable processes (ReGAIN)

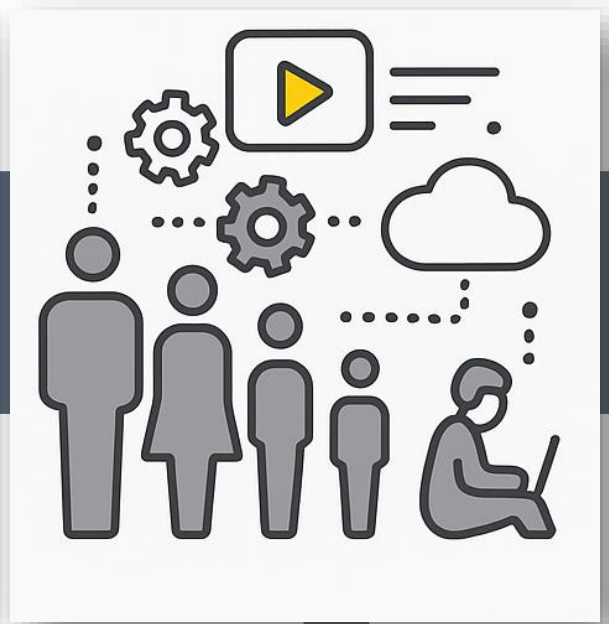
- **Data acquisition and processing, system and platform development** (WP 1 & 2)
- **Cross-company manufacturing and quality documentation** (WP 1, 2 & 6)
- **Data-driven process optimization for foundry applications** (WP 3, 4 & 5)
- **Increasing efficiency, flexibility, and resilience through AI assistance systems** (WP 3, 4 & 5)
- **Internal and inter-company communication with OPC UA and Catena-X** (WP 1 & 6)
- **Standardization and support of transfer and qualification measures** (WP 6 & 7)



Main areas of transformation

DEGLOBALISATION & DEINDUSTRIALISATION

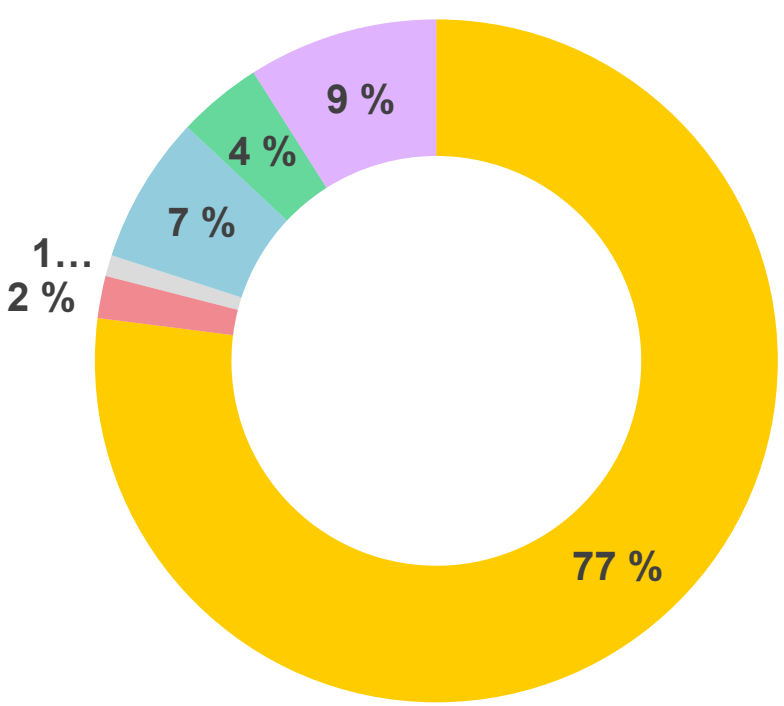
DECARBONISATION



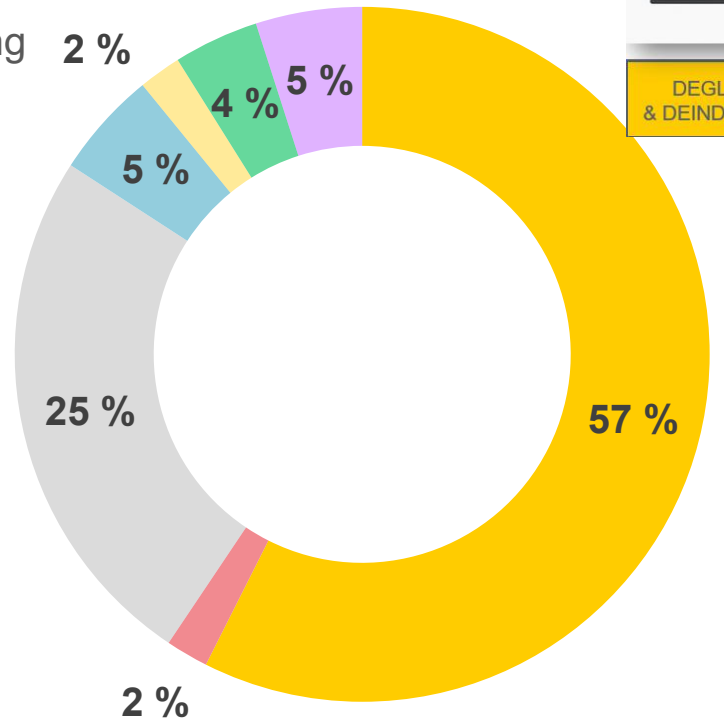
DEMOGRAPHICS & NEW WORK

DIGITAL TRANSFORMATION

Customer structure (t in %) – No industry without castings



- Road vehicle manufacturing
- Rail vehicle manufacturing
- Mechanical engineering
- Construction industry
- Steel industry
- Electrical industry
- Other



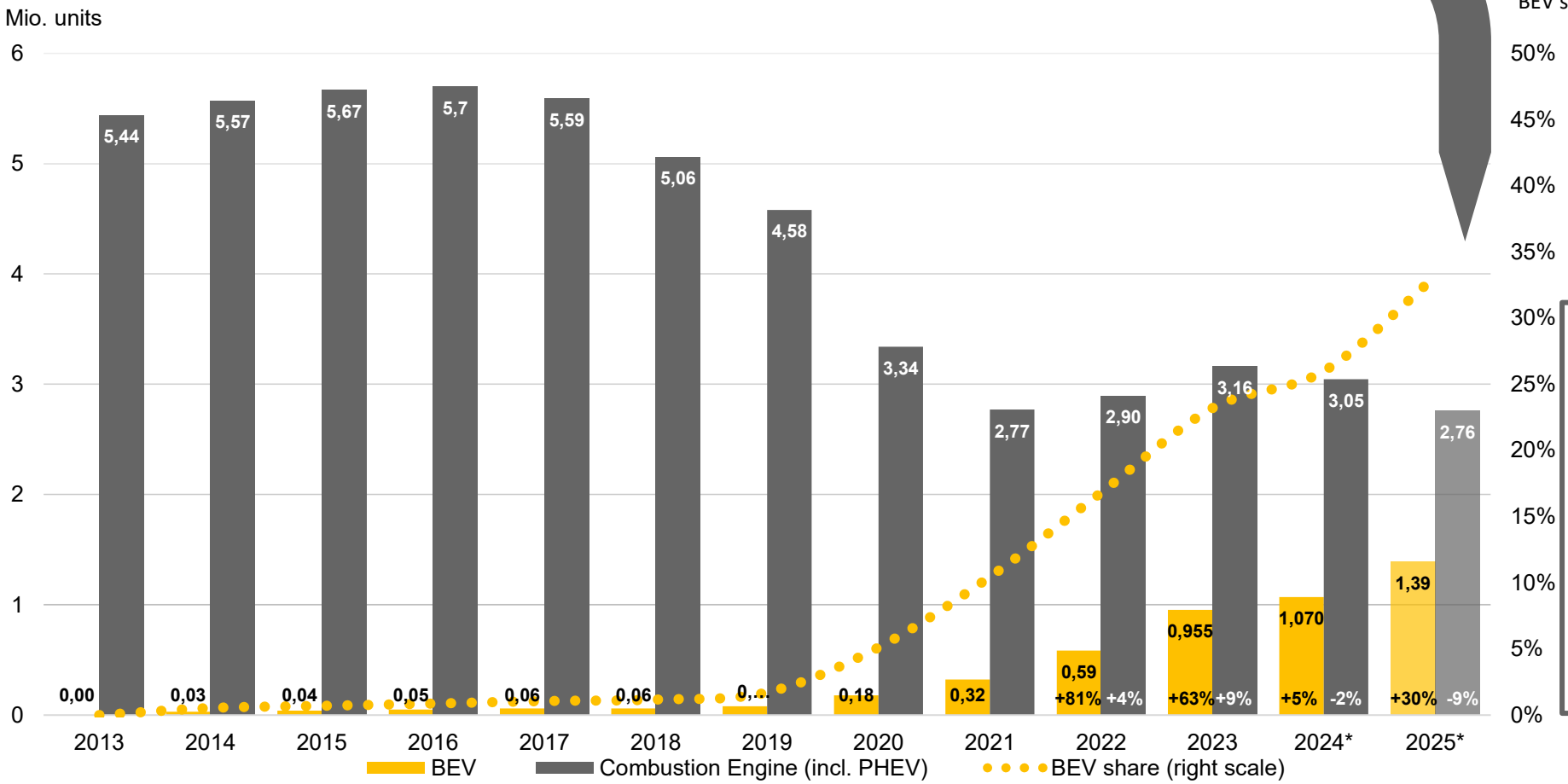
Non Ferrous

Fe

Quelle: BDG, 2024, teils Schätzungen, Differenz zu 100% durch Runden bei Nachkommastellen

Passenger Car Production in Germany

Forecast 2025: total 4.150.000 (+ 1 %)
BEV 1.391.000 (+ 30 %)



Strategic Dialogue

Revision of CO_2 emission performance standards from 2025 to 2028

Ban of combustion engines to be put under review at an early stage

Source: VDA; *forecast

What do we need to be successful?

- a competitive product
- the actual business model (which is more than being a good foundryman)
- a competitive proces
- a competitive national framework (energy, taxes, bureaucracy…)

Bart Everson - https://www.flickr.com/photos/editor/48728796337/

The Game Changer

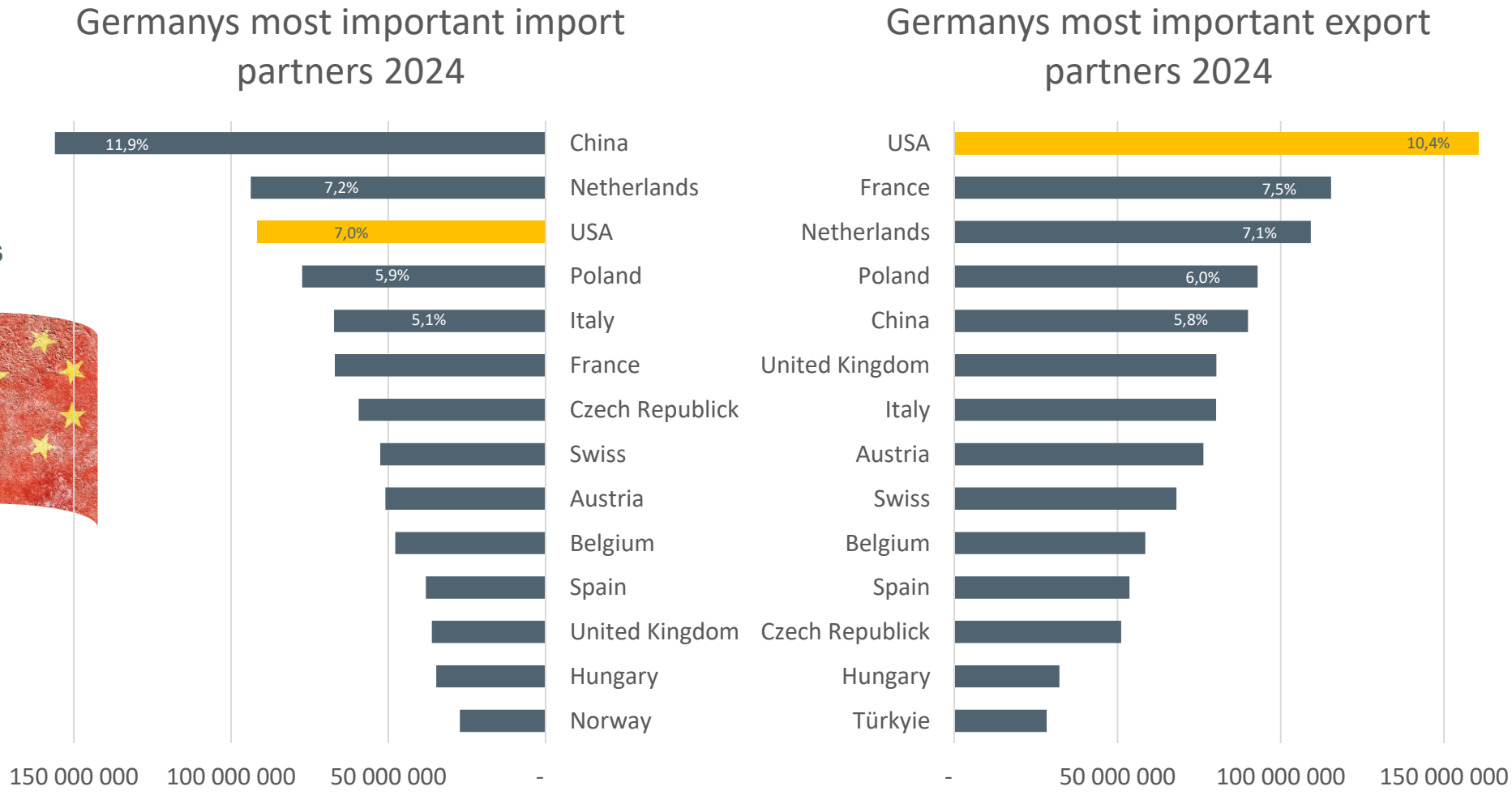
US Tariffs

- US vs. EU:
  - 15% in general,
  - 50% for aluminum and steel
    - Including many castings
- US vs. China ???

US Trade Politics

US is most important single export market for German industry

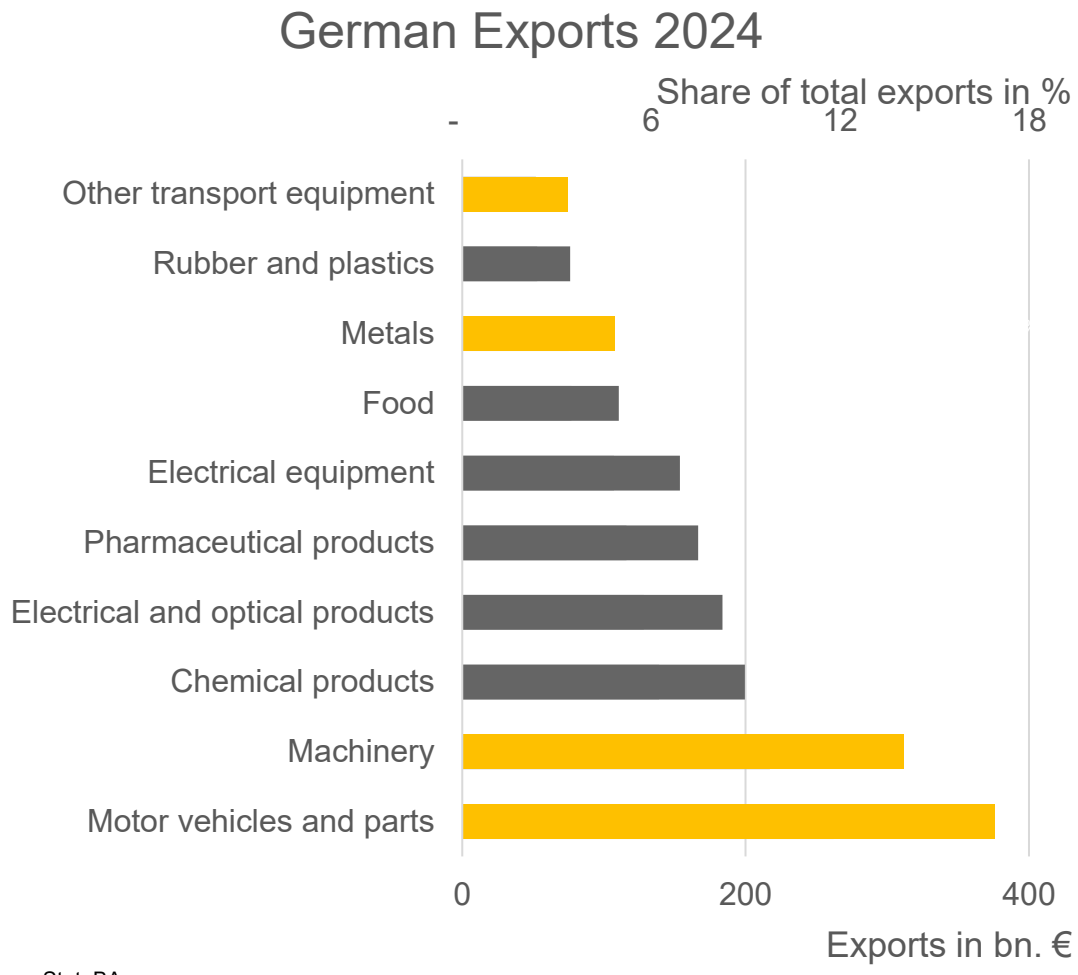
Global conflicts

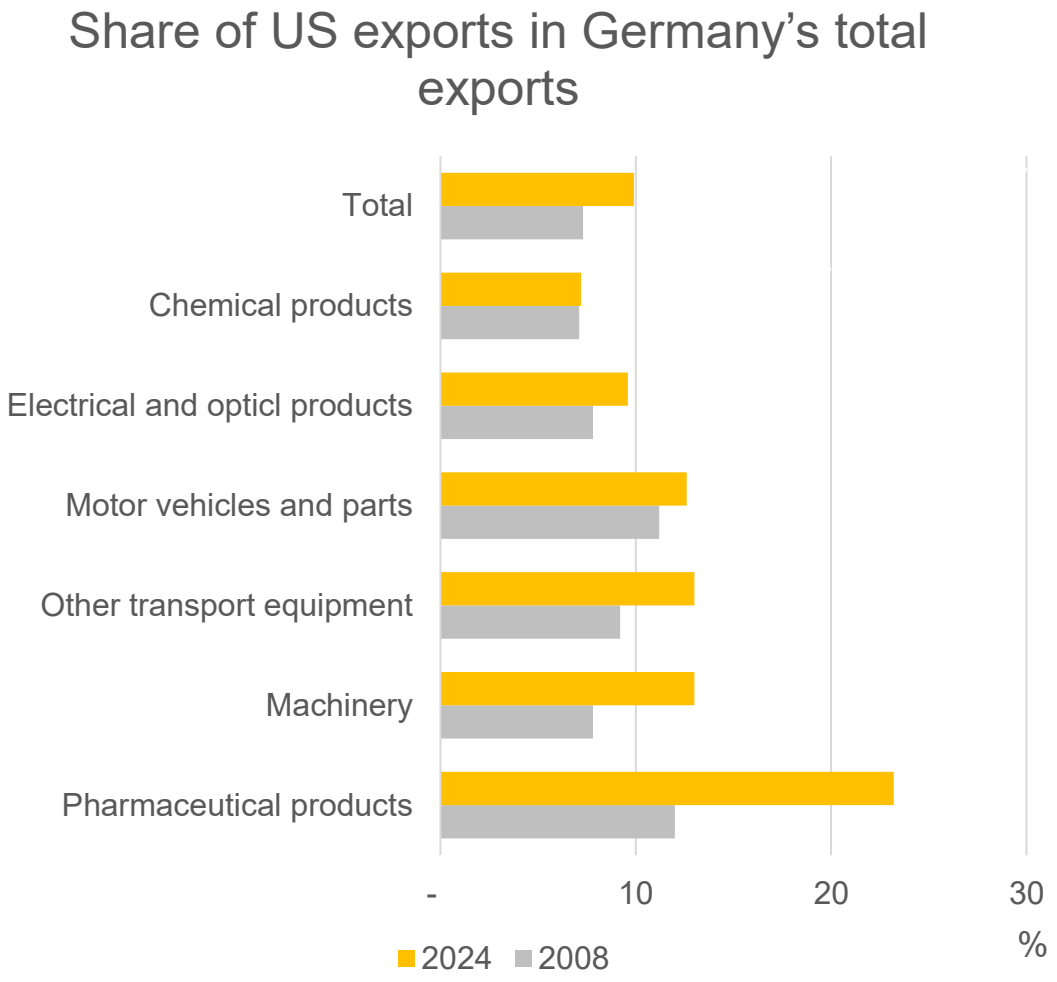


Source: Stat. BA.

US Trade Politics

Foundry customers are export intensive and have a high US-share

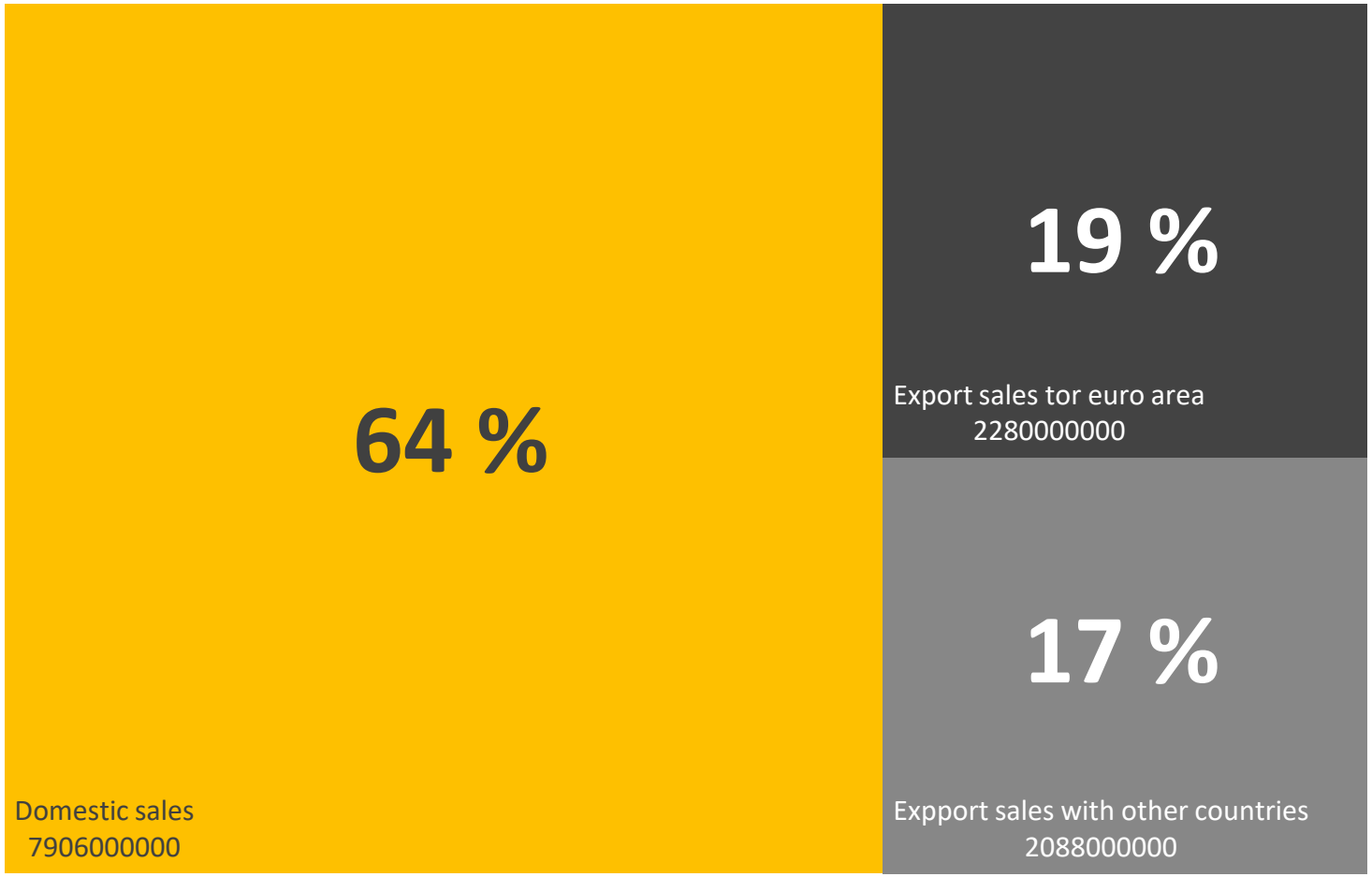




Source: Stat. BA.

US Trade Politics

Foundry industry affected by international trade distortions



BDG-Commentary

The US share of non-EU exports is around 20 %.

Directly and indirectly through customer industries, around 10 % of sector turnover (approx. €1.2 billion) depends on the US market.

Half of the industry expects significant demand effects from US tariff policy.

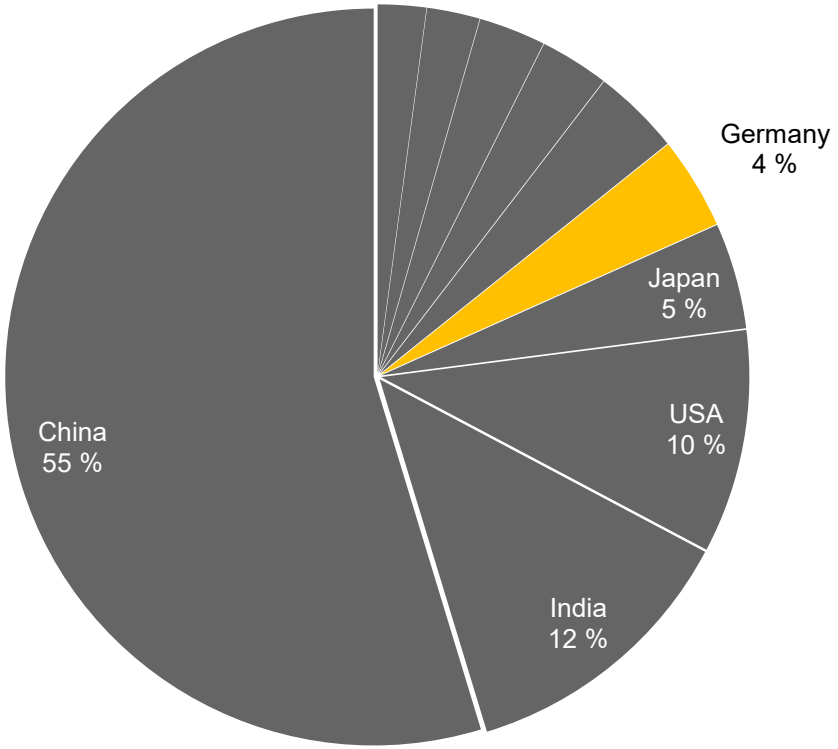
Rising import pressure as a result of increasing protectionism in the US market.

Source: Stat. BA. Companies < 50 employees

Foundry Industrial Production Ranking

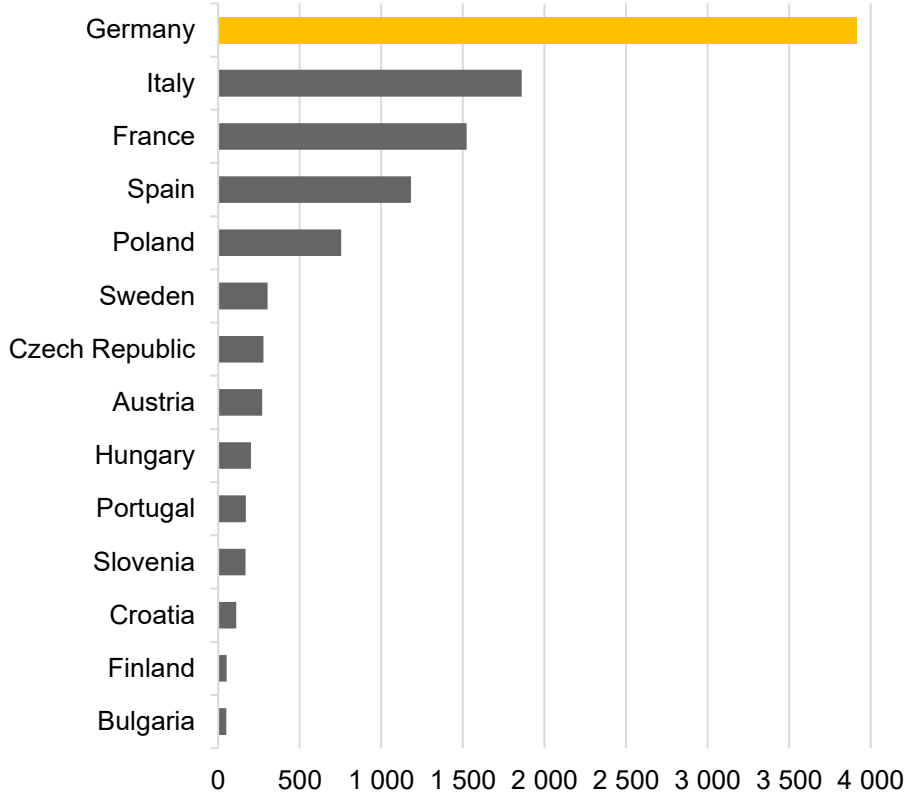
World Share*

Volume Square 5
Productivity Place 1



EU production**

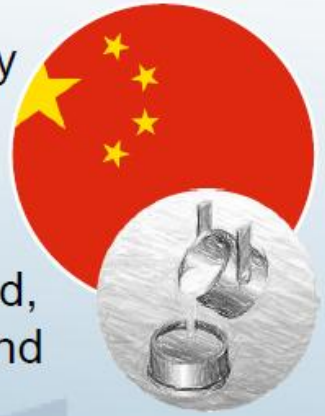
Volume Place 1
Productivity Place 1



Quelle: nationale Verbände, CAEF, modern casting; *2021; ** 2023

FOUNDRY PRODUCTION IN CHINA

Source: WFO Global Foundry Report 2024



- 2018 to 2019 slightly **decreased**
- 2020 to 2021 recovery of downstream demand, 51.95 million tons and **54.05 million tons**, respectively, with a year-on-year increase of **6.56% and 4.04%.**

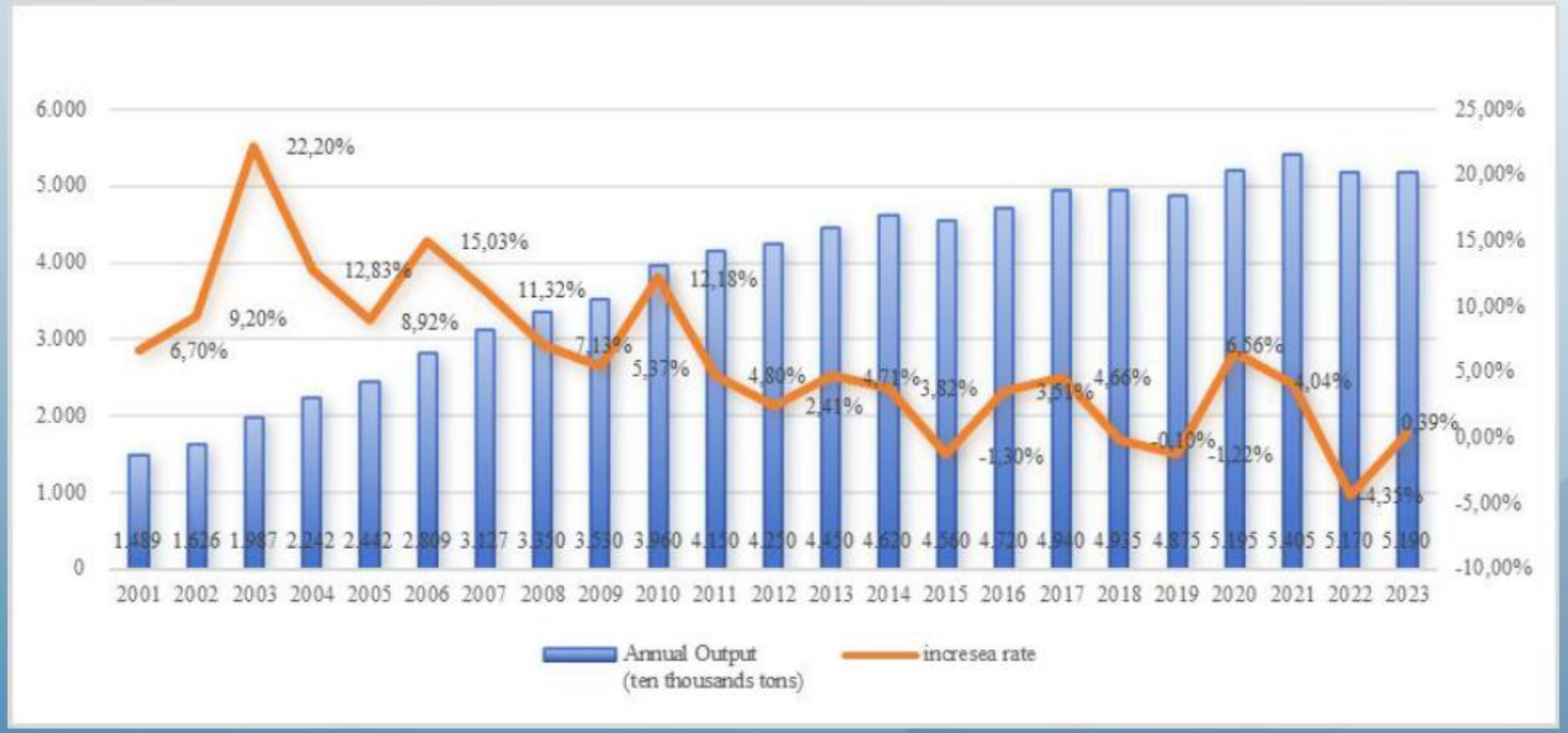


Figure: China's Casting Production from and its Share in Global Casting Production(2001-2023)

- In 2022, due to the increasing downward pressure on the national economy, the production of castings experienced a certain degree of **decline**.
- 2023, the total annual production of castings has **reached 51.9 million tons**

FOUNDRY PRODUCTION IN CHINA

Source: WFO Global Foundry Report 2024

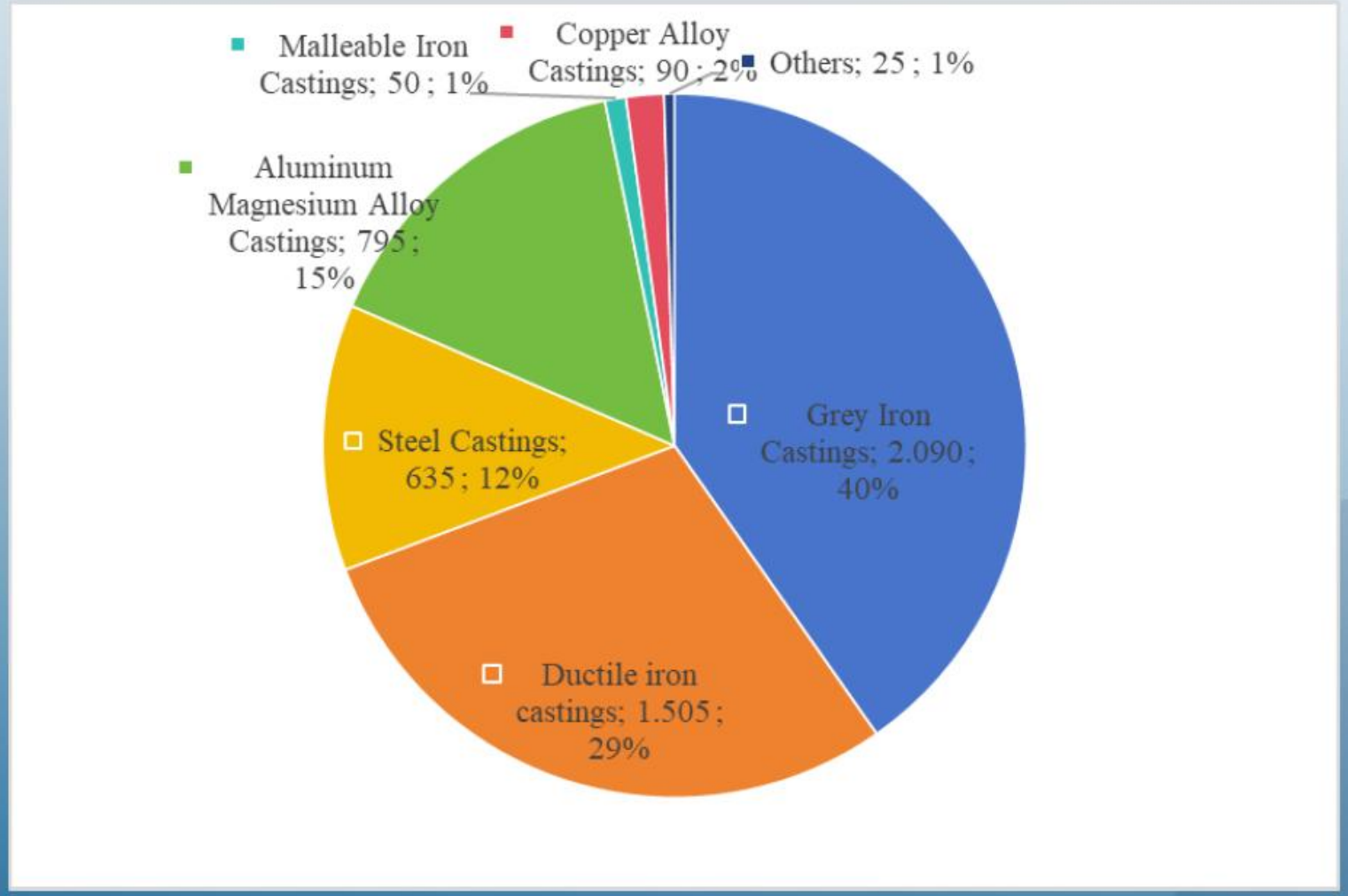


Figure: the proportion of China castings made of various materials in 2023(unit: ten thousands tons)

FOUNDRY PRODUCTION IN CHINA
MARKET ANALYSIS

Source: WFO Global Foundry Report 2024

Casting demand

Top 5 industries in 2023 are:

- Automobile
- Cast pipes
- Mining and metallurgical heavy machinery
- Combustion engines & agricultural machinery
- Engineering machinery.

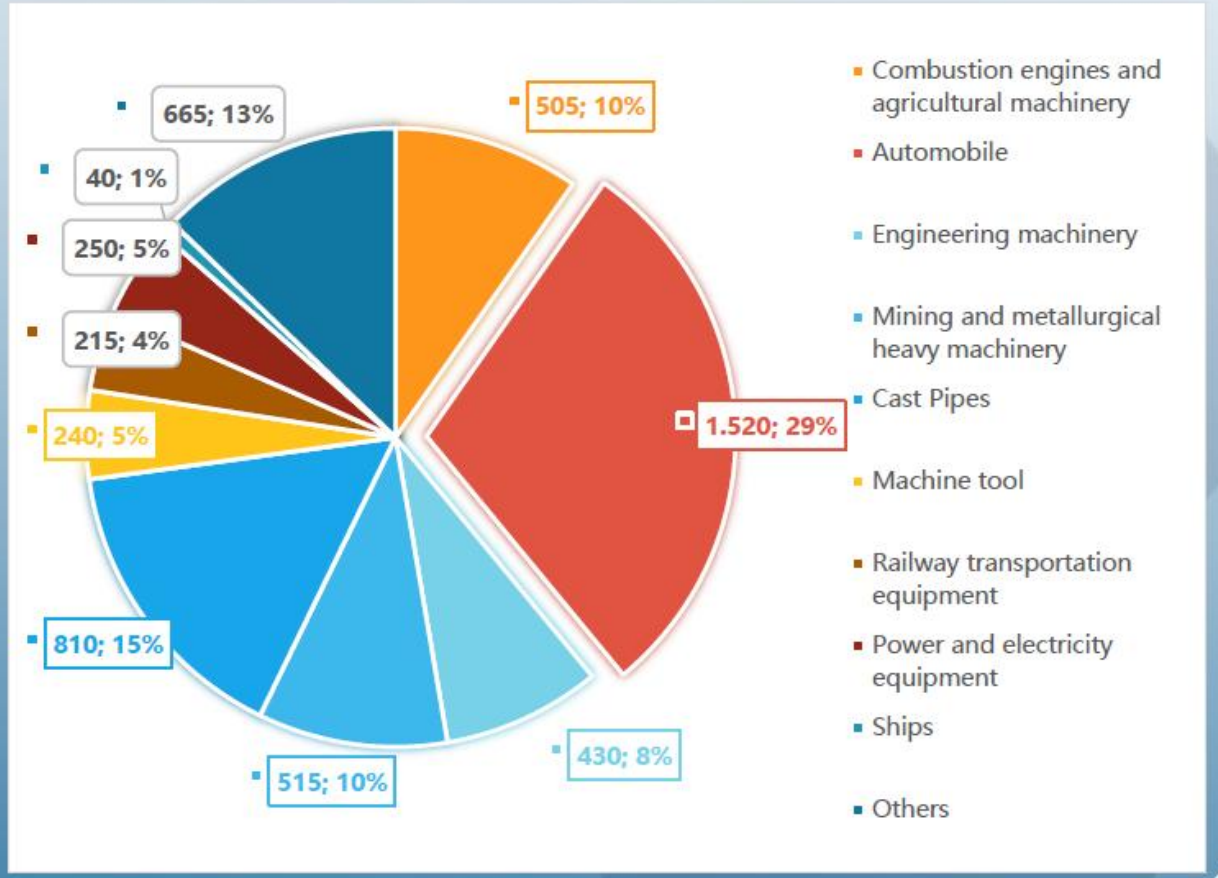
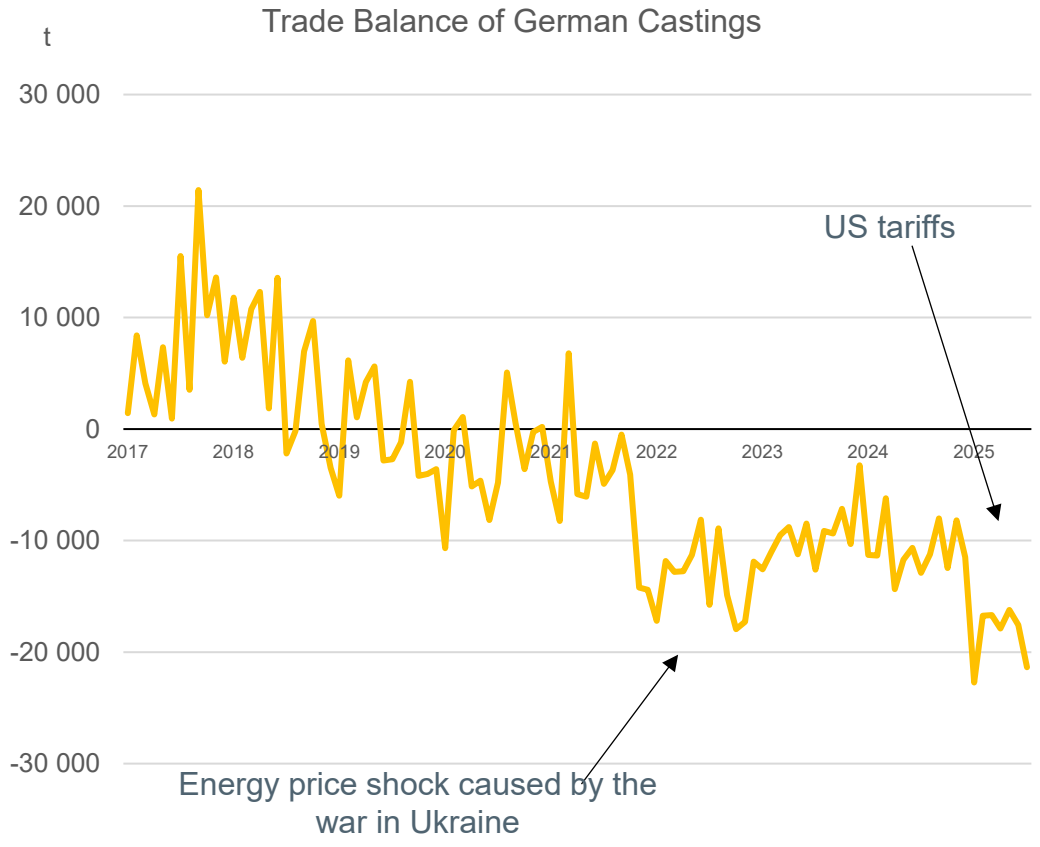


Figure: China's casting production for specific sectors in 2023(unit: ten thousands tons)

US Trade Politics

Asia is pushing aggressively into the German market.



BDG-Commentary

Toxic mix of Asian overcapacities and US tariff policy:

Trade diversion is leading to significantly rising prices and margin pressure on EU and German markets.

Germany's casting trade balance remains structurally negative after decades of deficit.

Casting imports (Jan.-Jul.)

	from China	from India
2024:	95.000t	24.000t
2025:	105.000t (+10%)	38.000t (+63%)

Source: Stat . BA, Calculation BDG

Conclusion & Outlook

competitiveness as such is often no longer sufficient

- The question is not: Do we need castings? Or
  Do we need foundries in Europe?

- The question is:

  How can European foundries be competitive in the future?

  ➔ **Depends**

- **Before Game Changer ➔ self efficacy**
  - a competitive product
  - a competitive proces (including AI !!!)
  - the actual business model (which is more than being a good foundryman)
  - a competitive national framework (energy, taxes, bureaucracy…)

- **After Game Changer:**
  - in addition protective economic measures like local content, Safeguards and/or tariffs

Thank you very much for your attention!