

The WACKER logo is displayed in a white rectangular box with a black border, set against a background of solar panels and a blue sky with clouds.

WACKER

CREATING TOMORROW'S SOLUTIONS

Polysilicon from WACKER – the strategic raw material for the solar and the semiconductor industry

Wacker POLYSILICON, November 2023

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Over 100 Years of Success

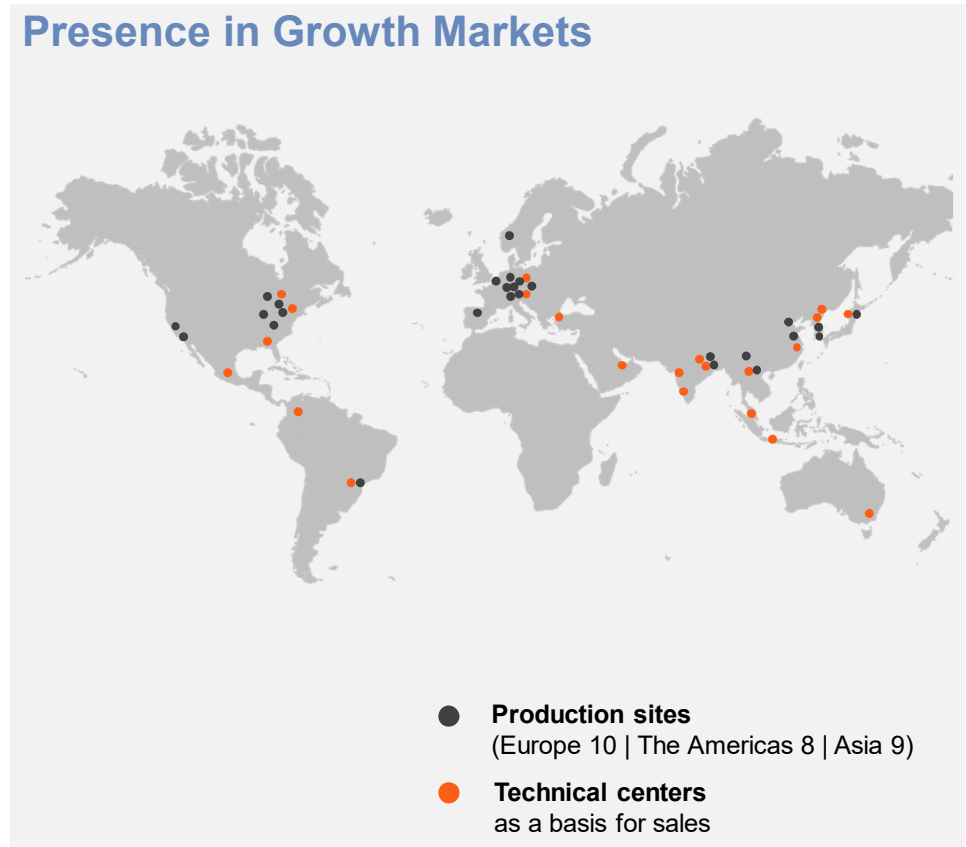
Wacker Chemie AG

- ▶ Founded in 1914 by Dr. Alexander Wacker
- ▶ Headquartered in Munich, Germany

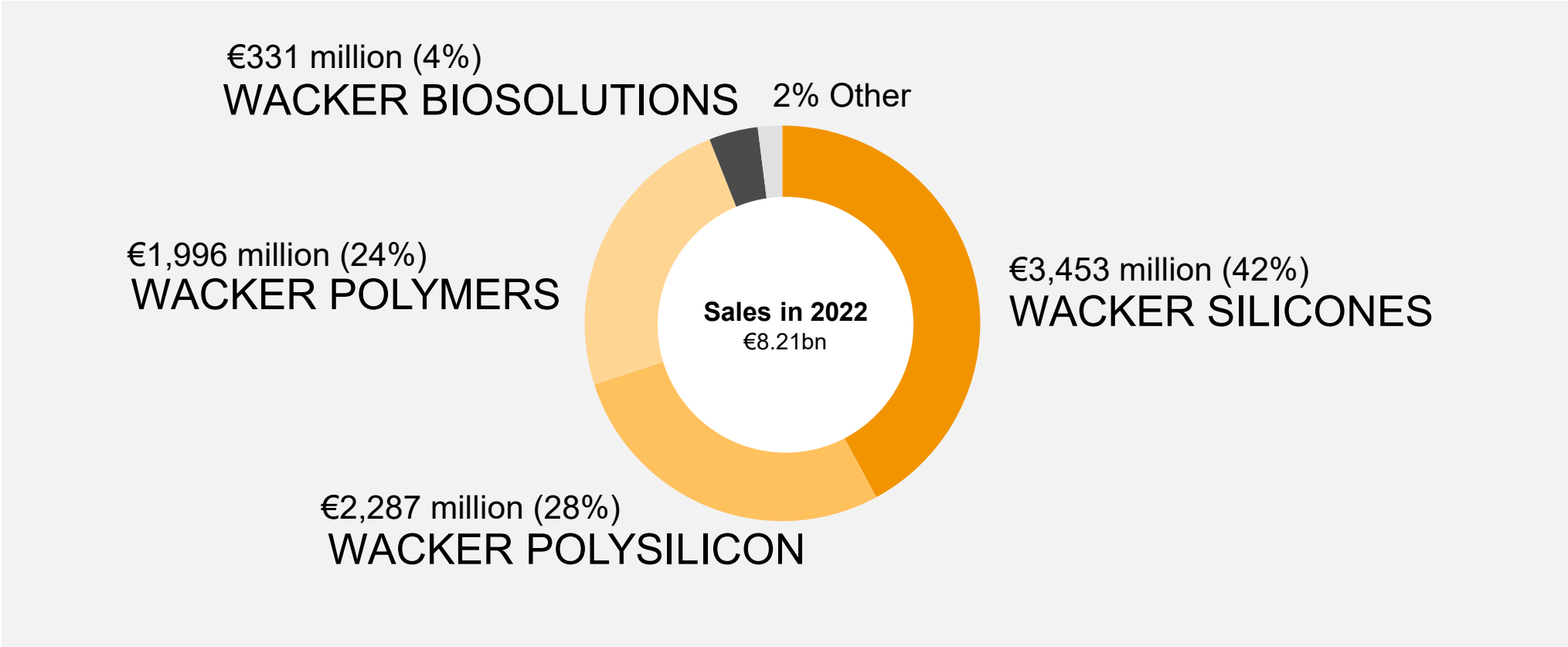
WACKER Group (2022)

- ▶ Sales: €8.21 billion
- ▶ EBITDA: €2,081 million
- ▶ R&D: €178 million
- ▶ Investments: €547 million
- ▶ Employees: 15,725

Presence in Growth Markets

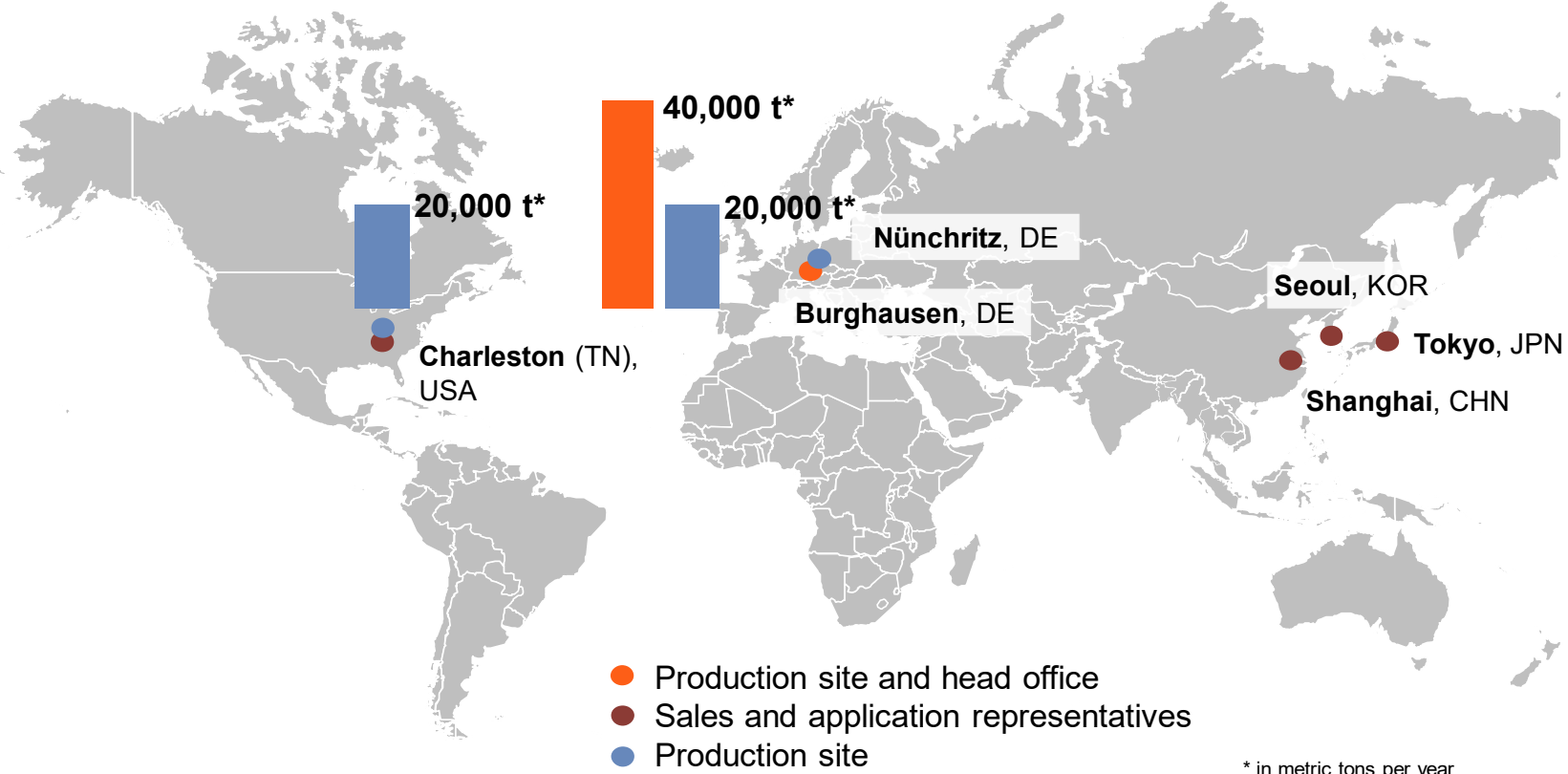


Attractive Business Portfolio with Many Growth Opportunities



With 80.000 tons WACKER is a global leader for manufacturing hyperpure polysilicon

Three productions sites in Germany and USA

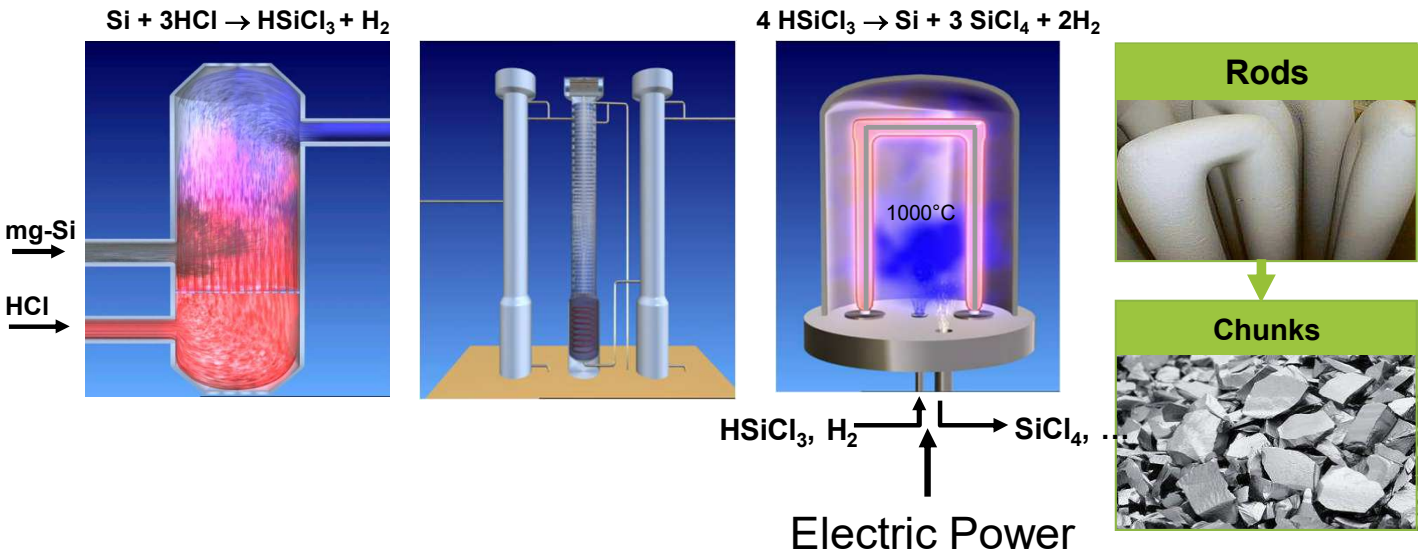


WACKER POLYSILICON Invested More than 2 Billion € in Germany (Since 2005)

Integrated Chemical Production Site in Burghausen (Germany)



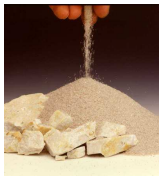
Polysilicon Production Is a Four Step Purification Process



Polysilicon – The Essential Base Material for Semiconductors and Solar Panels

Solar Poly

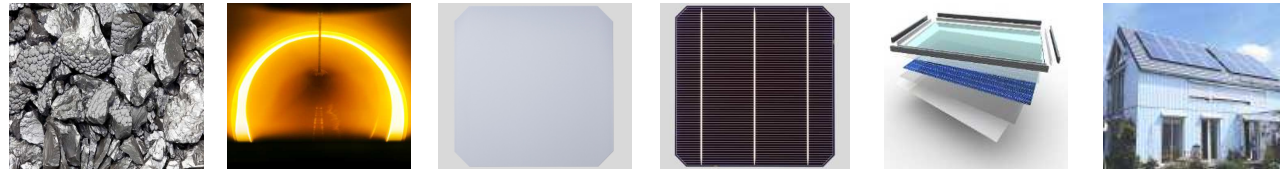
Polysilicon purity: >99,999999999%



Quarz (SiO₂)



Si-Metall (99%)



China Share

Semi Poly

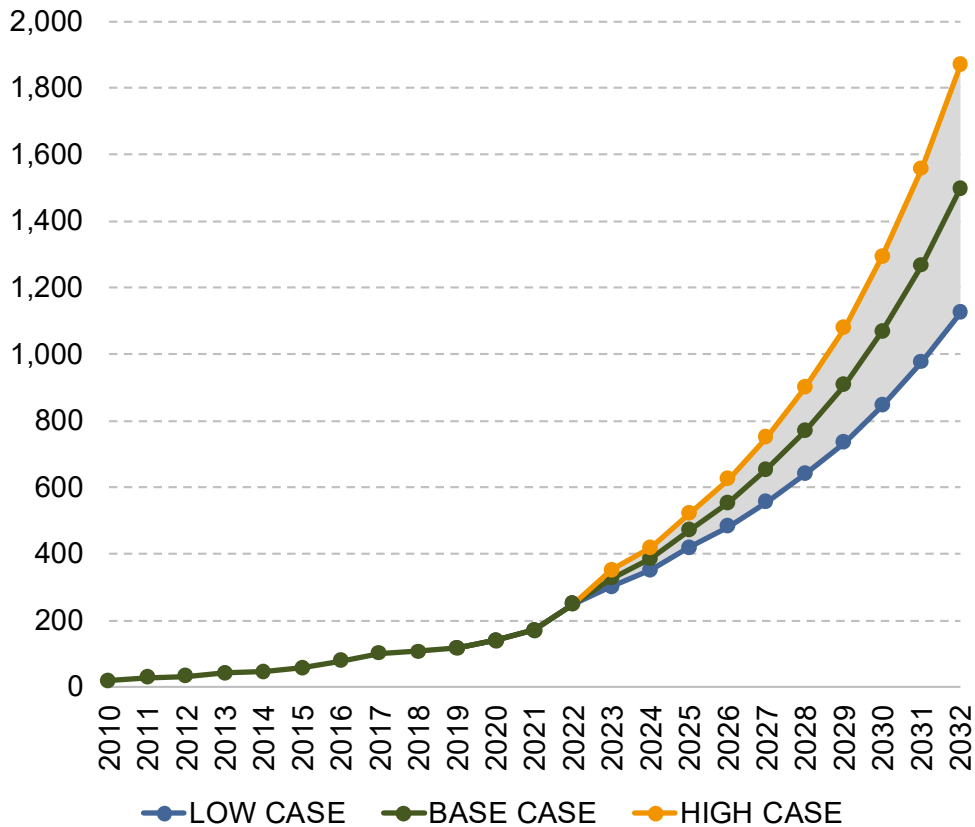
Polysilicon purity: >99,999999999%



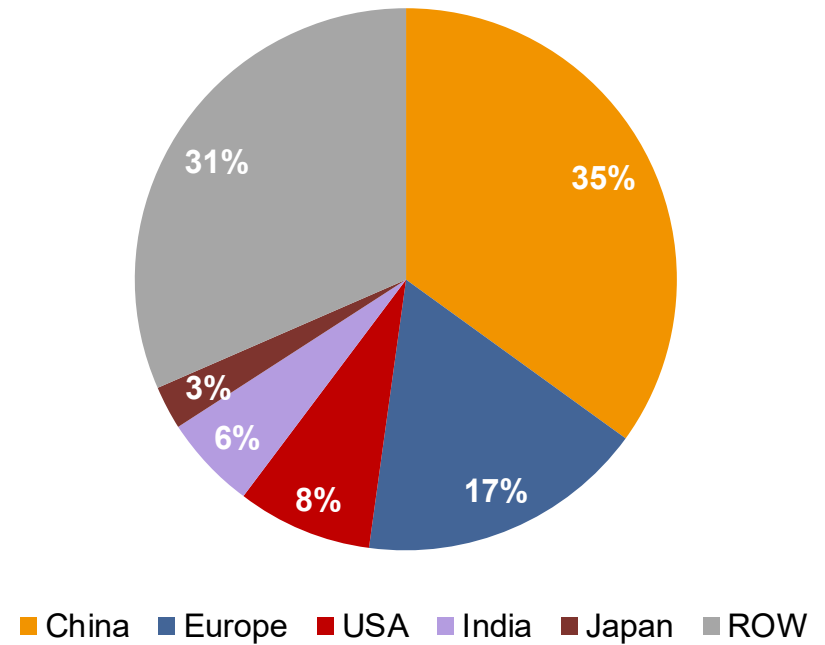
*) market share (global)

Strong Growth of Photovoltaics – 2/3rd of PV Installations Outside of China

Global PV Market Development (GW)



Regional Split of PV Installations in 2022 (%)



Sources: GB-P estimates, market studies

Massive Subsidies Triggering Regional Development of Integrated Value Chains

▶ **Canada:** Government plans to introduce IRA*-style investment budget

▶ **USA:** IRA* could trigger 50 GW of fully integrated capacities until 2027 (from Poly to Module)

▶ **EU:** Target to rebuild solar manufacturing industry, **Germany** launched own supply chain initiative (10 GW from poly to module)

▶ **India:** PLI** trigger ambitious expansion plans along the whole value chain (from Poly to Module)

▶ **China:** Massive subsidies to foster capacity expansions (terawatt scale), export restrictions for Chinese wafer technologies

▶ **Australia:** Plans to become a global green energy hub (e.g. solar, hydrogen, ammonia)

*) Inflation Reduction Act; **) Production Linked Incentives

WACKER: Benchmark for Carbon-Footprint and Energy Consumption – Fully Complies with Environmental, Social and Governmental Requirements

WACKER Solar Polysilicon Has Significantly Lower Carbon Footprint than its Competitors



Best-in-Class Polysilicon CO₂ Footprint¹

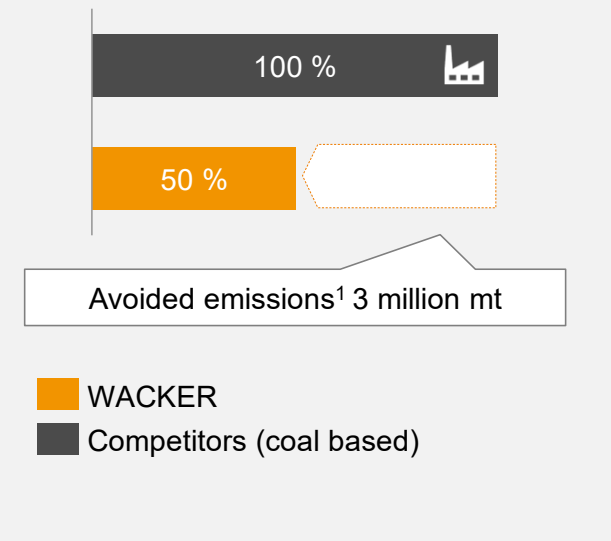
- ▶ Total energy consumption ~25% lower than competitors and access to cleaner energy mix



Circular Economy

- ▶ Integrated production and innovative closed recycling loops of by-products
- ▶ Fully electrified processes enables WACKER to use of renewable power

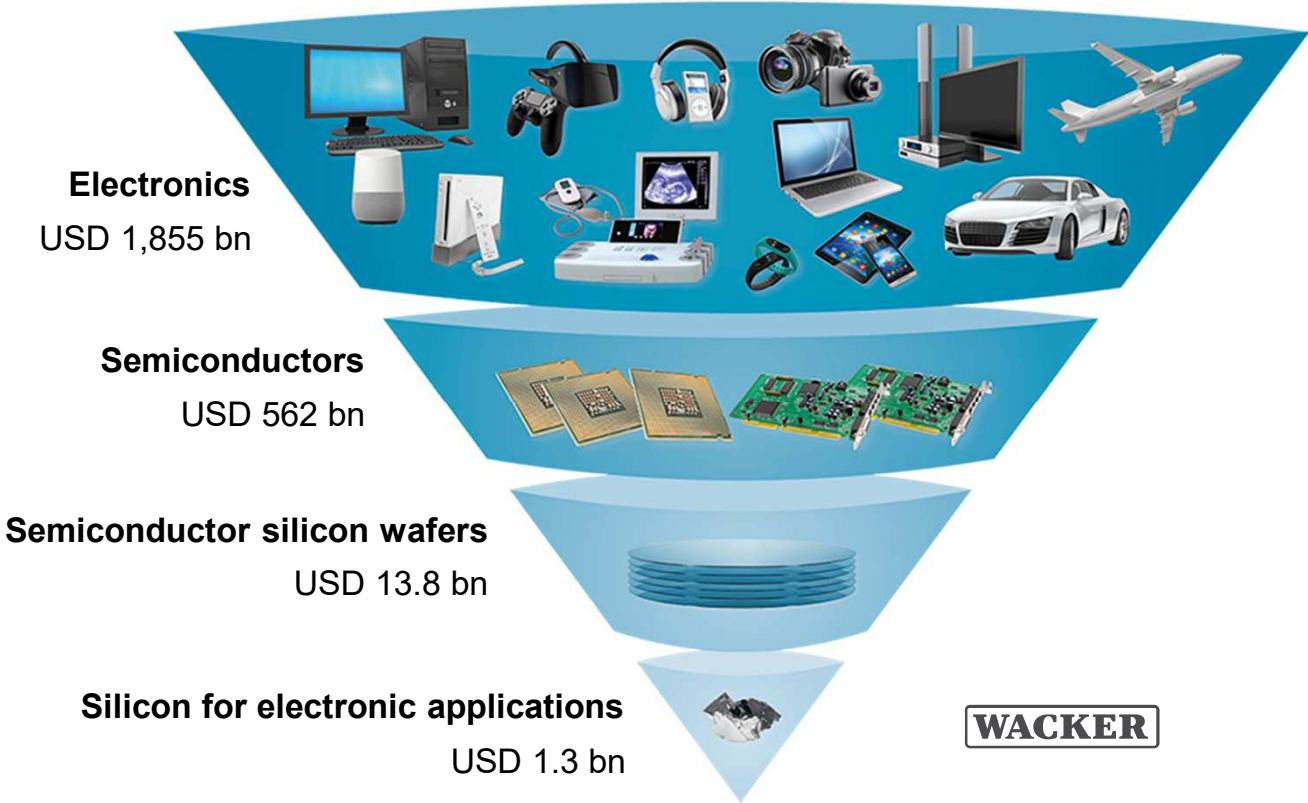
Carbon Footprint (kgCO_{2e}/kg Si)



1) Based on total annual solar volumes sold

Polysilicon the Foundation of Semiconductor Industry

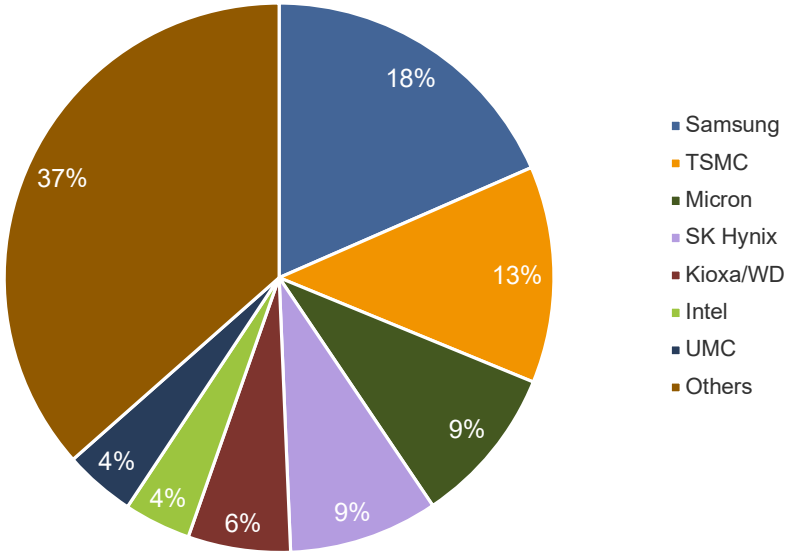
Electronics Value Chain 2022



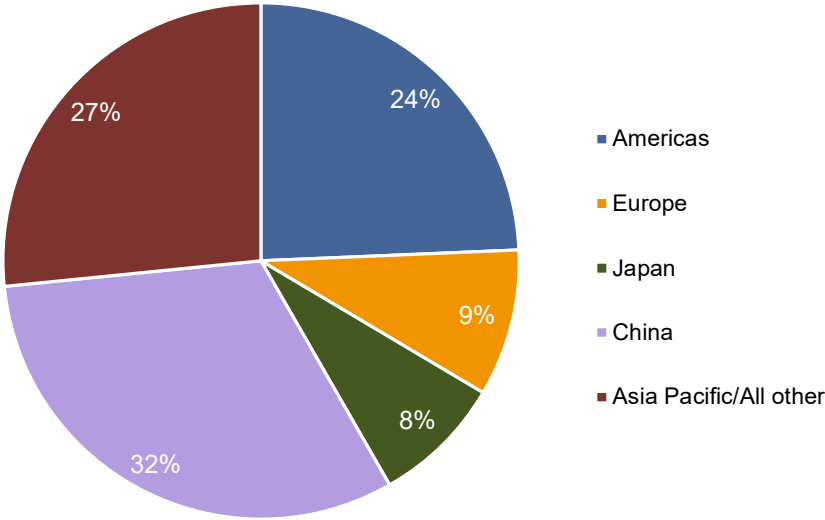
Source: Electronics (TechInsights), Semiconductors (WSTS, silicon-based only), Silicon wafers (SEMI SMG), Silicon (WACKER estimate)

All Steps of the Semiconductor Value Chain Globally Diversified

Semi Wafer Fab Capacity by Supplier 2022



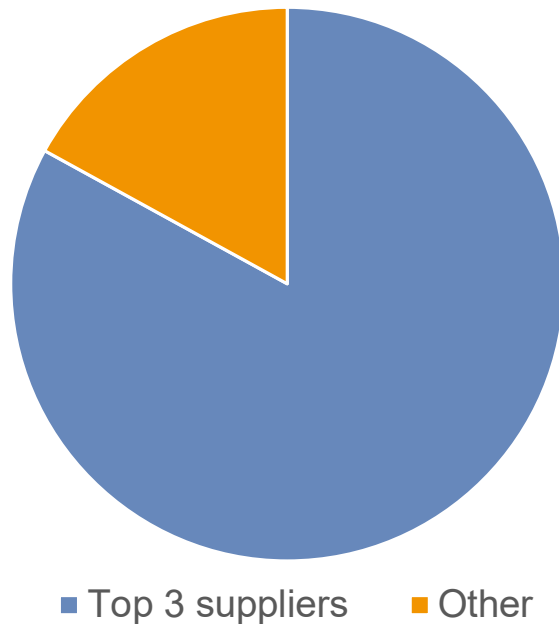
Semiconductor Device Market 2022



Sources: WACKER analyses, IC Insights, WSTS/SIA

WACKER Market Leader in Semiconductor Grade Polysilicon

2022 Polysilicon for Semi Market



Competitive Situation

- ▶ Consolidation ongoing in semiconductor grade polysilicon market with three major suppliers left and smaller suppliers struggling
- ▶ Newcomers lagging behind in quality
- ▶ WACKER highly dedicated to semi customers
- ▶ WACKER leading in quality, quantity and cost

▶ **WACKER is the most reliable and #1 semiconductor silicon supplier**

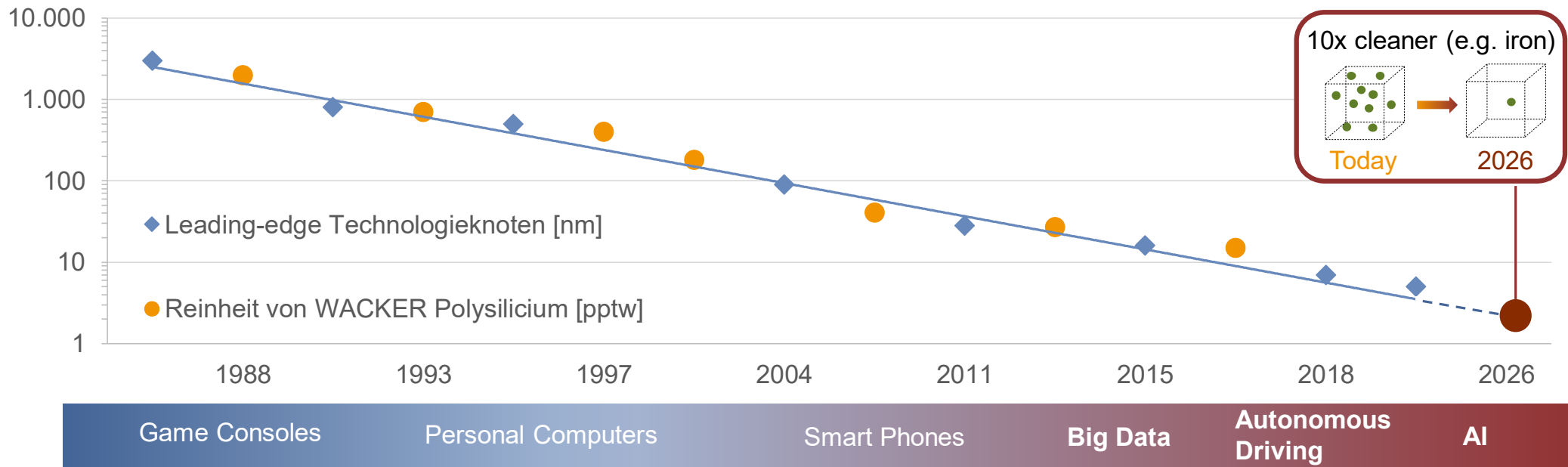
source: WACKER estimate

WACKER Is Investing Some 300 Mio. Euro in Semiconductor Polysilicon



- ▶ Investment of app. 300 Mio. € in leading edge etching technology. Add. Etching Capacity > 50 %
- ▶ EU IPCEI for microelectronics supports the project with funding of around 46 million euros.
- ▶ The Project aims at producing the highest quality with the lowest possible impact on climate and environment, thus contributing to the overall EU Green Deal objectives.
- ▶ Further improvement of Quality required for: CMOS image sensors, High resistivity applications for 5G/6G, Advanced design rules (<3nm).

Next Level of Purity for Future Chip Technologies



IPCEI Microelectronics and Communication Technologies



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Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages



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Summary – How to keep competitiveness of polysilicon in Europe for solar and semiconductor

WACKER Needs Strong Support to Secure and Expand Polysilicon Capacities in Europe

OPEX Support

e.g. Industrial
Electricity Price

CAPEX Support

**Full Solar Supply
Chain**

**Effective Net
Zero Industry Act**

**Support to
expand on
existing sites**

**Effective ESG
regulations**

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