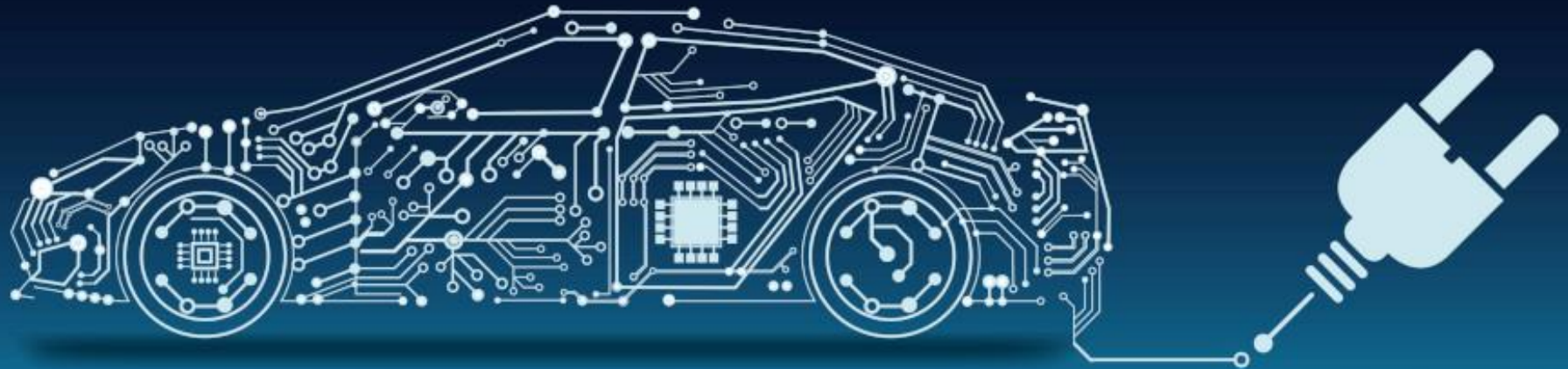


# Stifel expert call on SiC

*“The case of a graphite supplier”*

October 5th, 2023



Speaker  
Dr. Luc Themelin  
PhD Advanced Ceramic

# Mersen: who we are?

A global player **at the heart of technologies** who drives the industry forward and shapes **a more sustainable society**

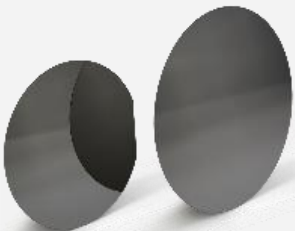


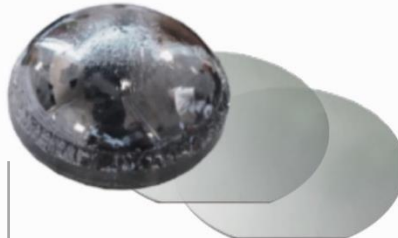
## 2 expertises with leading positions

**Advanced Materials  
(56% of sales):**  
High value-added  
customized solutions  
(graphite)

**Electrical Power  
(44% of sales):**  
A unique product portfolio  
serving electrical protection  
and power conversion  
(fuses)

**€1.1bn sales in 2022**

# Mersen's materials expertise for the SiC semicon industry

OUR EXPERTISE	POLYCRYSTALLINE SILICON CARBIDE			GRAPHITE & INSULATION FELT
	CVD POLYCRYSTALLINE SILICON CARBIDE	SILICON CARBIDE CVD COATED GRAPHITE PART	SINTERED SILICON CARBIDE	for SiC mono boule / wafer manufacturers
	 Polycrystalline wafer 150-200 mm	 Epitaxy susceptor	 Highly stable structure for fine etching	 Mono SiC boule/wafer
	Soitec	Epitaxy reactor manufacturers (OEM) + end-users	Semicon industry equipment manufacturers	SiC monocrystalline boule / wafer manufacturers (PVT process)

# Mersen's unique position in the complex manufacturing process for SiC – PVT process

SILICON CARBIDE BOULE FURNACE	SiC BOULE & WAFERS	SILICON CARBIDE EPITAXY	SiC POWER DEVICES (diodes & MOSFETS)
   <p><b>FINE GRAPHITE</b> (crucibles, guides, etc.)</p> <p><b>INSULATION FELT</b> (flexible or rigid)</p>		  <p><b>WAFER SUSCEPTOR</b> <b>SiC CVD COATED</b> <b>graphite part</b></p> <p>Wafer susceptor</p>	
		<p>OEM :</p> 	

# A clear sign of Mersen's major role in the semicon SiC market: the contract with Wolfspeed



Leader in SiC technologies, and a longstanding partner of Mersen



Major investments in progress (USA, Germany)



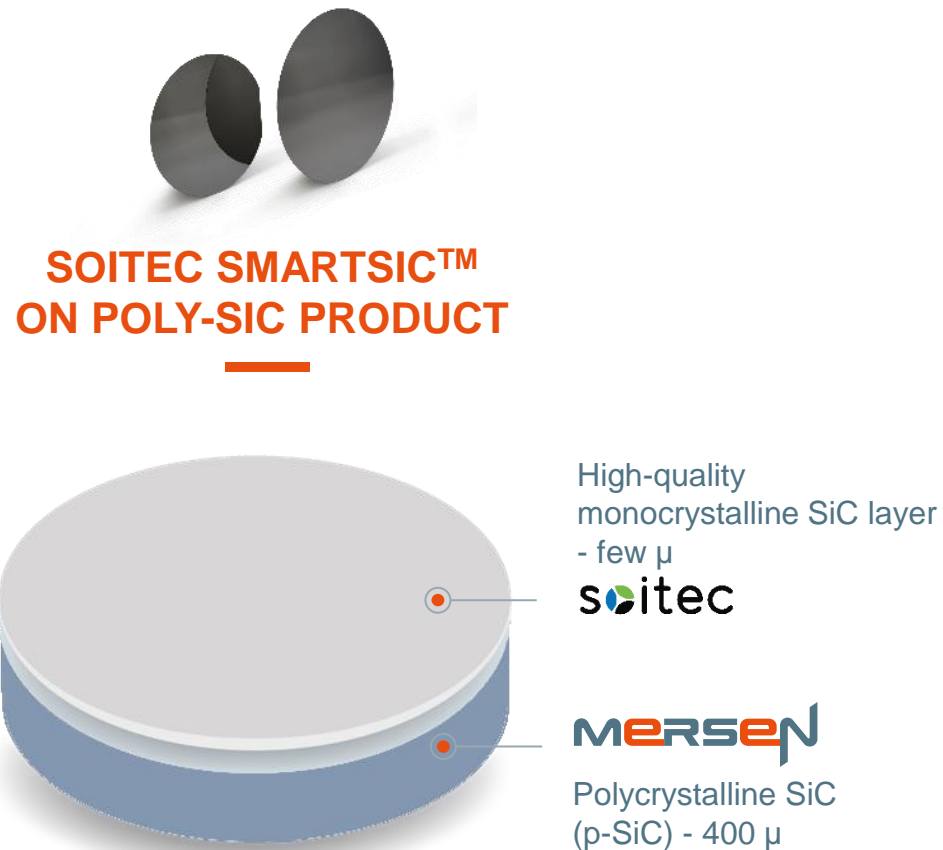
Agreements with EV players: BorgWarner, ZF, Mercedes Benz, Jaguar Land Rover, etc.





Sales potential over 5 years  
**USD400m**

Capital expenditure (2023-2025)  
**USD120m**

Creation of  
**200 jobs**  
mainly in the United States

# Soitec SmartSiC™: another technology serving the SiC power semiconductor market



	PVT	SmartSiC
COST	 High	 Low (CVD + SmartCut)
DOPING	 Limited by technology	 High to reduce resistivity



# Why is Mersen critical to the semiconductor industry?

## MATERIALS EXPERTISE

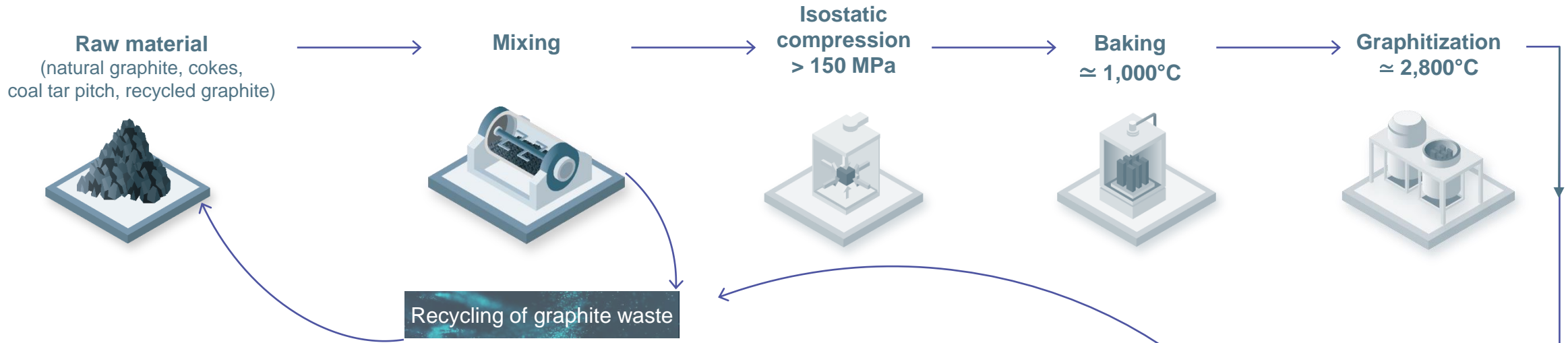
- **Ultra-fine Graphite grades** for intricate and precise design
- **SiC coated Graphite epitaxy susceptor** to avoid pollution of the process and extend lifetime
- **p-SiC wafer** for Soitec process to generate a lot of savings and better efficiency of the device
- **Sintered SiC parts** to enable fine etching in lithography

## PRODUCTION CAPABILITIES

- **Unique capacity expansion plan** – (+4000t in iso graphite) mandatory as graphite parts and insulation are **consumable**
- **Machining, purification process** centers
- **Worldwide** – Ability to supply to customers where they are located
- **Graphite grades and insulation felts dedicated** to PVT SiC process

# Iso-graphite manufacturing process: high barriers to entry

Graphite capacity plants

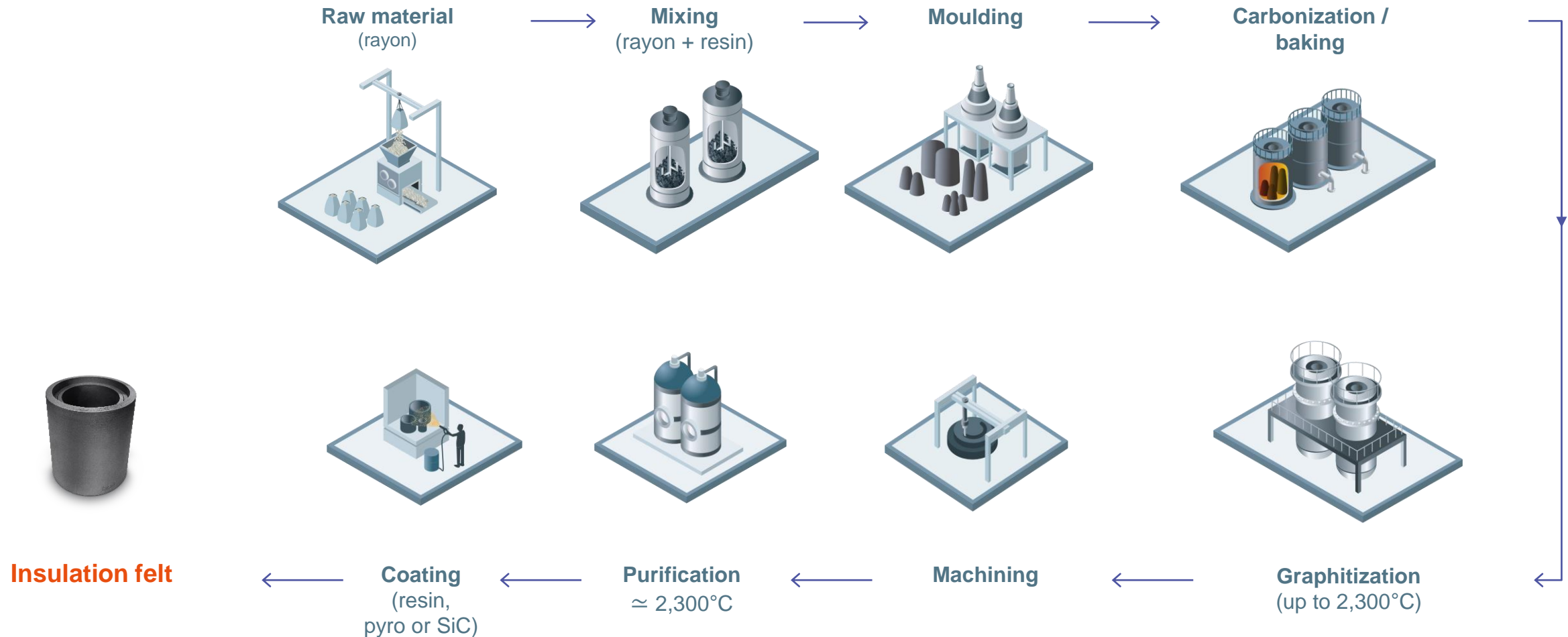


Finishing plants

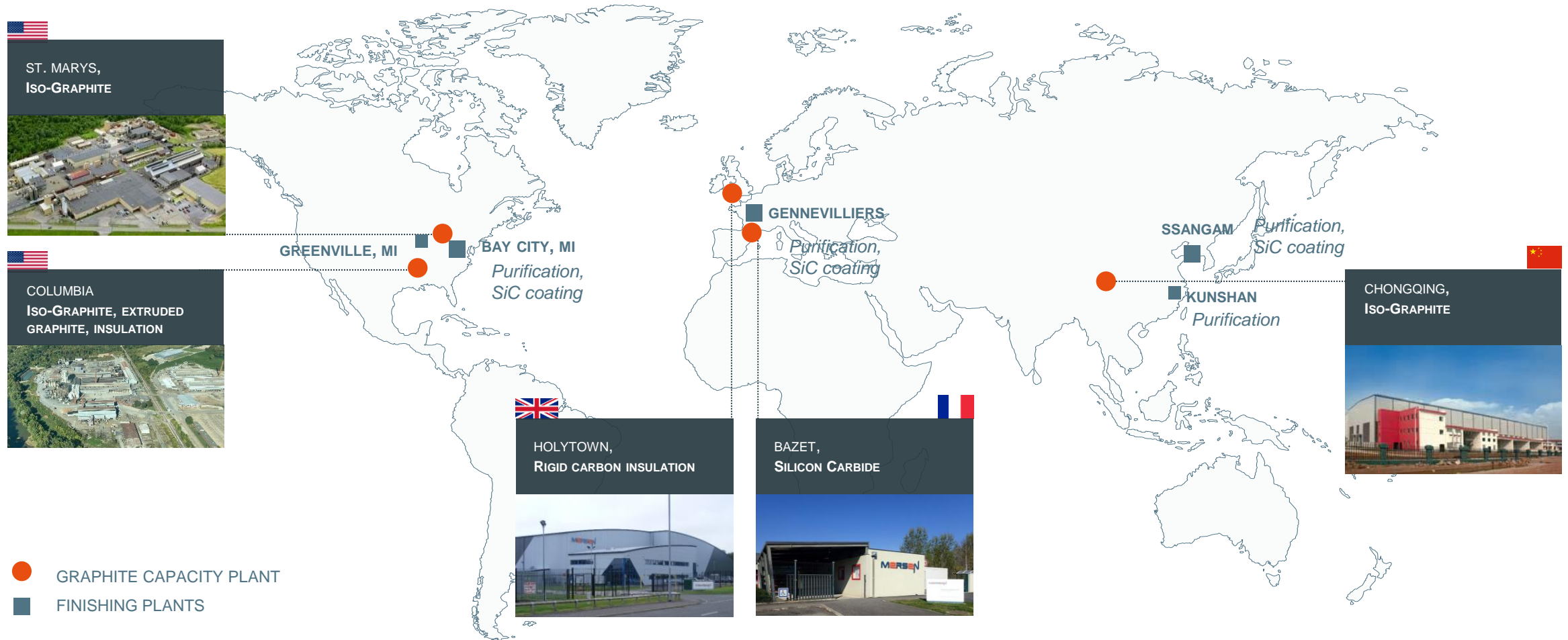




# Insulation felt: a complementary material to graphite



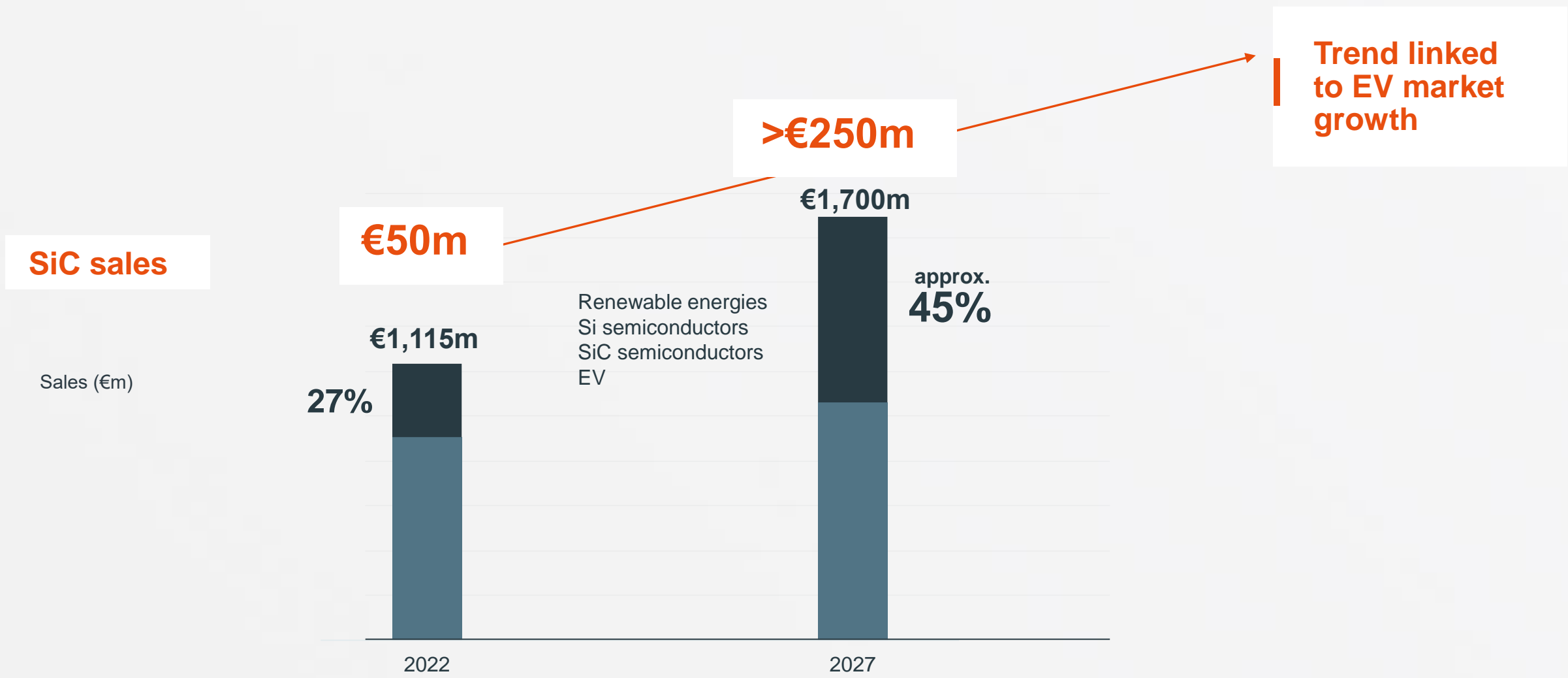
# A unique global production capabilities to serve the semiconductor market



# An investment plan to increase capacity and thus match demand in the SiC semicon market

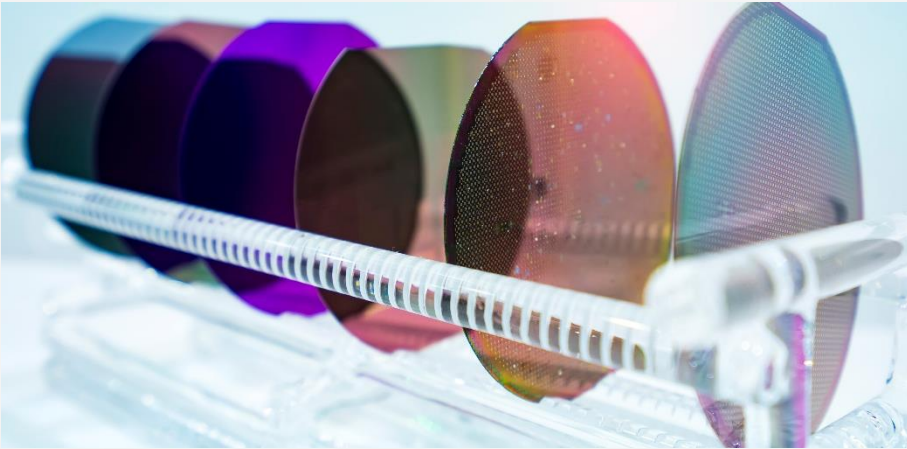
SiC semicon	<b>ISOSTATIC GRAPHITE</b>	Capacity increased from 12,000t to 16,000t – Columbia site (US)
	<b>INSULATION FELT</b>	Capacity increased by more than 2 times – US, UK
	<b>MATERIALS FINISHING PLANTS</b>	Significant expansion of 4 plants – 1 in France, 3 in the US

# SiC market: a significant contribution to our 2027 plan



# Mersen's expertise covers the EV market, both upstream and downstream ...

## MATERIALS EXPERTISE

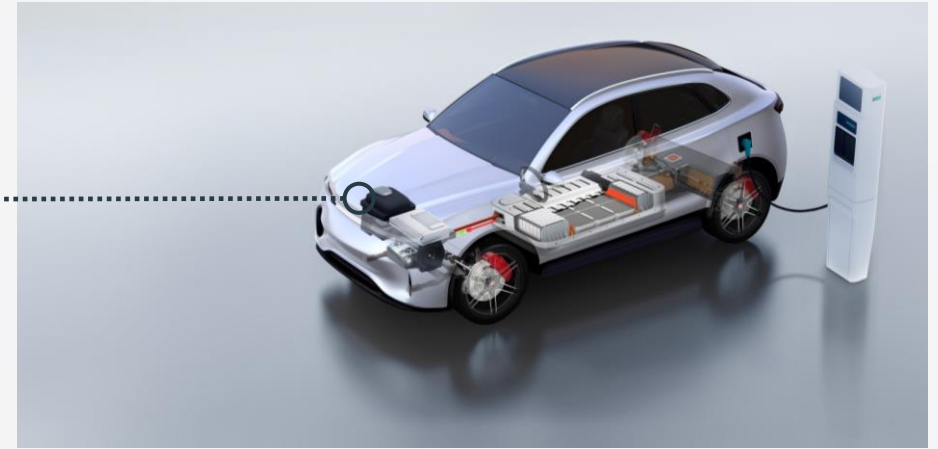


**SiC wafers**



**SiC power semiconductors**

## ELECTRICAL EXPERTISE



**Electric vehicles**

€200m-contract  
over 7 years for  
busbars on  
batteries (ACC)



Large range of  
dedicated EV  
fuses

