



Resilient, Scalable Growth

Morgan Advanced Materials
Capital Markets Event

6 December 2022

Agenda

Part 1 – Introduction

WELCOME

Douglas Caster, Non-Executive Chairman 14:00

INTRODUCTION, STRATEGY & GROWTH

Pete Raby, CEO



FINANCIAL

Richard Armitage, CFO



Q&A 14:45

Break 15:15

Part 2 – Business drivers

FASTER GROWTH DEEP-DIVES

1. Semiconductors
2. Healthcare
3. Clean energy and transportation 15:30

Wendy Pryce Lewis
President Electrical
Carbon



John Righini
President Technical
Ceramics



Damien Caby
President Thermal
Ceramics



CORE

Damien Caby

CONCLUDING REMARKS

Pete Raby, CEO

Q&A 16:30

Close & drinks 17:00

Our Company

Our purpose is to use advanced materials to make the world more sustainable, and to improve the quality of life.

We are the global manufacturer of advanced carbon and ceramic materials for complex and technologically demanding applications.

We help our customers to reduce their energy consumption, emissions and operating costs with applications that frequently require extensive qualifications.

We are strongly positioned in fast growing markets, including Clean Energy, Clean Transportation, Semiconductors and Healthcare.

Leading global manufacturer of carbon and ceramic advanced materials

FY2021

Revenue

£950.5m

Adjusted operating profit

£124.5m

Adjusted operating margin

13.1%

ROIC

20.5%

1H2022

Revenue

£530.2m

Adjusted operating profit

£72.5m

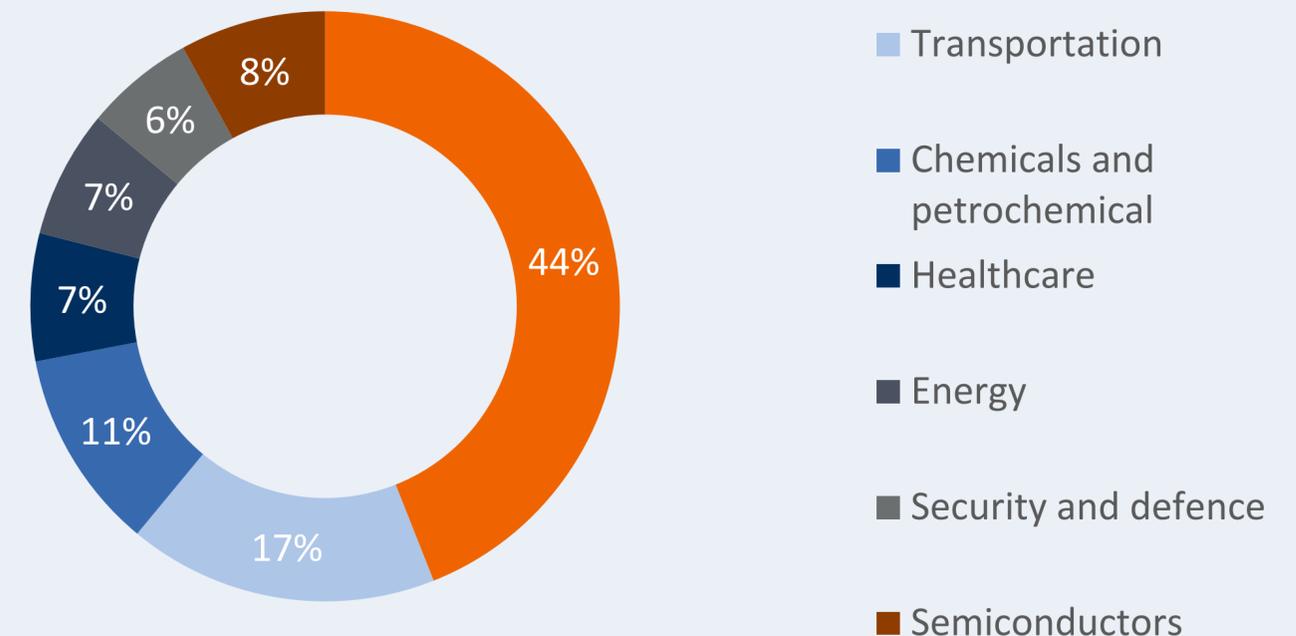
Adjusted operating margin

13.7%

ROIC

22.2%

Balanced diversified approach to end markets



Source: Company sales data H1 2022

Our business transformation

2016 – 2020

Simplify, strengthen and accelerate growth



Simplified through five divestments
 Increased investment in R&D and sales
 Strengthened leadership team
 Developed and executed growth strategies
 Returned business to organic growth

2020 – 2022

Resilience through the pandemic



Group restructuring and efficiency programme (2020) – expected to provide £23m of benefits in FY22
 Resilient margin and cashflows through the pandemic
 Strong and healthy balance sheet

2022+

Accelerated organic and acquisitive growth



Organic investment to accelerate growth in our core and faster growing markets
 Expand low cost manufacturing capacity
 Developing a strong acquisition pipeline, actively pursuing opportunities

Why Morgan?

1

Well positioned
in attractive, high-
growth markets

2

Leading, differentiated
market positions

3

Sustainable solutions
to support the energy
transition

4

Resilient Group
delivering attractive
through cycle returns

1.

Well positioned in attractive, high-growth markets

Supportive and powerful Mega-trends

1. Climate Change
2. Urbanisation
3. Growing & ageing middle class
4. Digitisation
5. Renewable energy
6. Resource scarcity

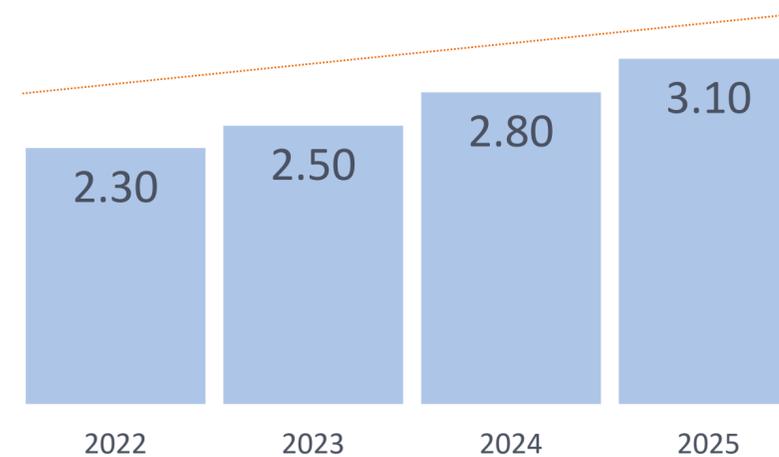
Semiconductors

TAM

£3.1 bn

CAGR

11.1%



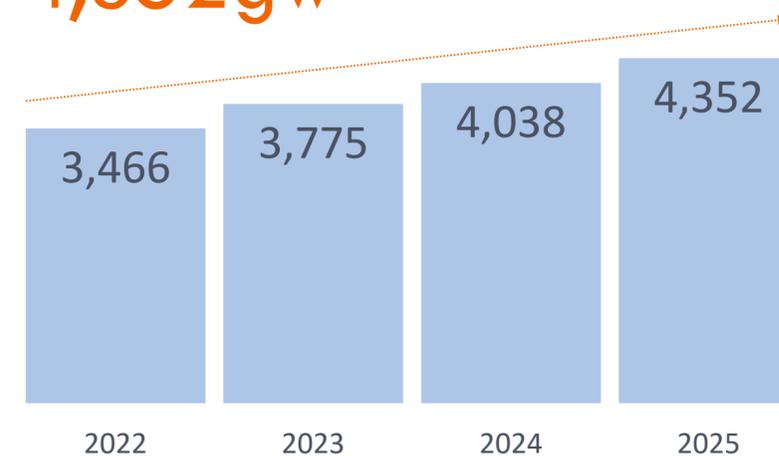
Renewable Power Generation

TAM

4,352gw

CAGR

7.9%



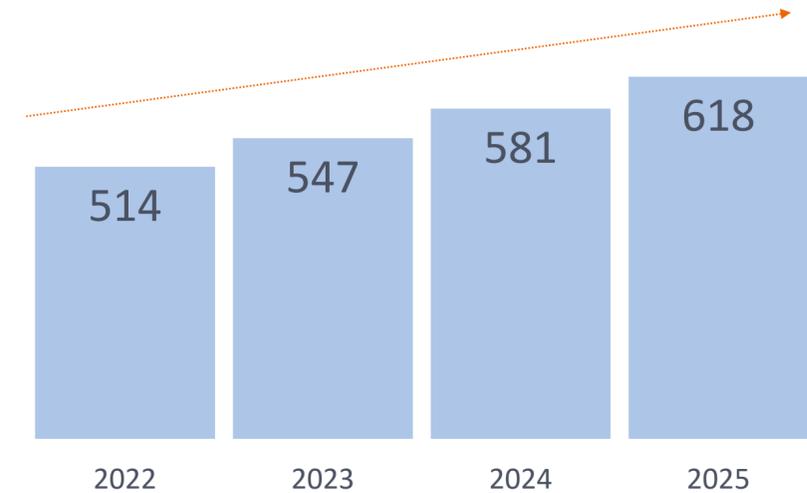
Healthcare

TAM

£618m

CAGR

6.4%



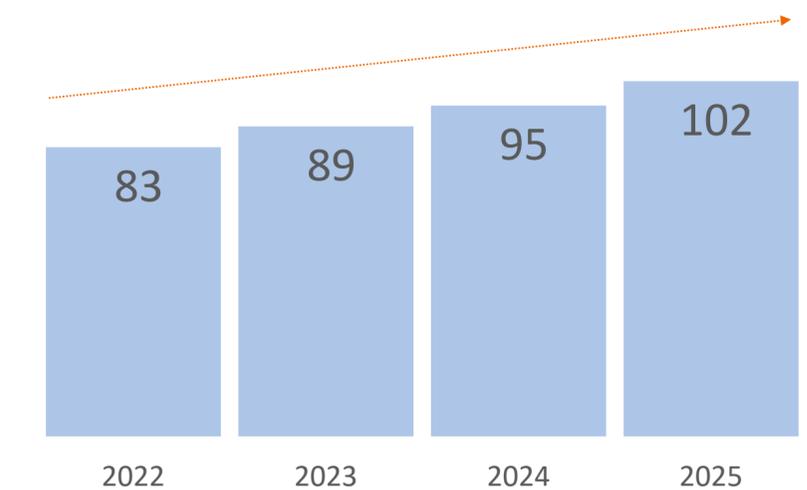
Electrified Rail

TAM

£746m

CAGR

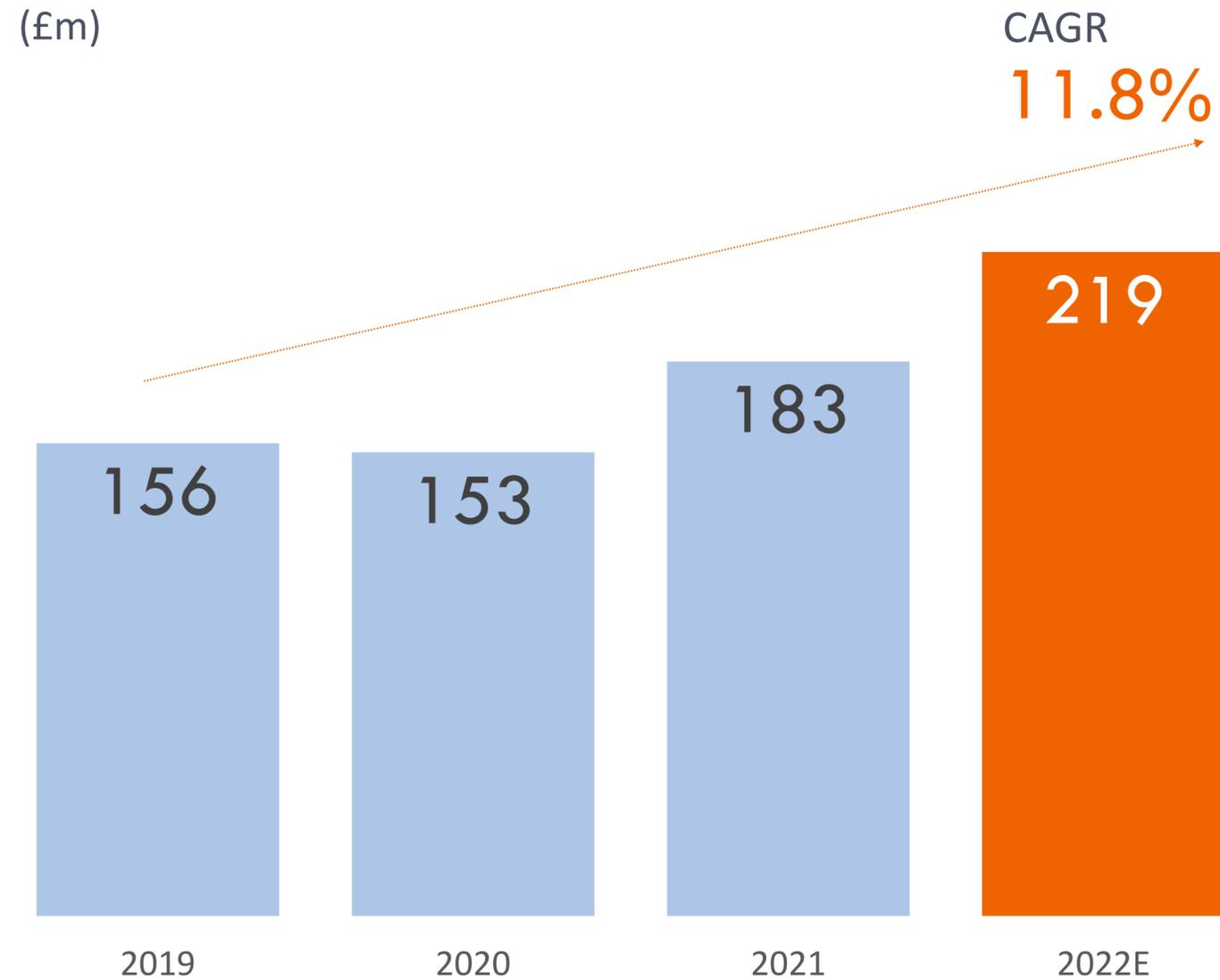
6.8%



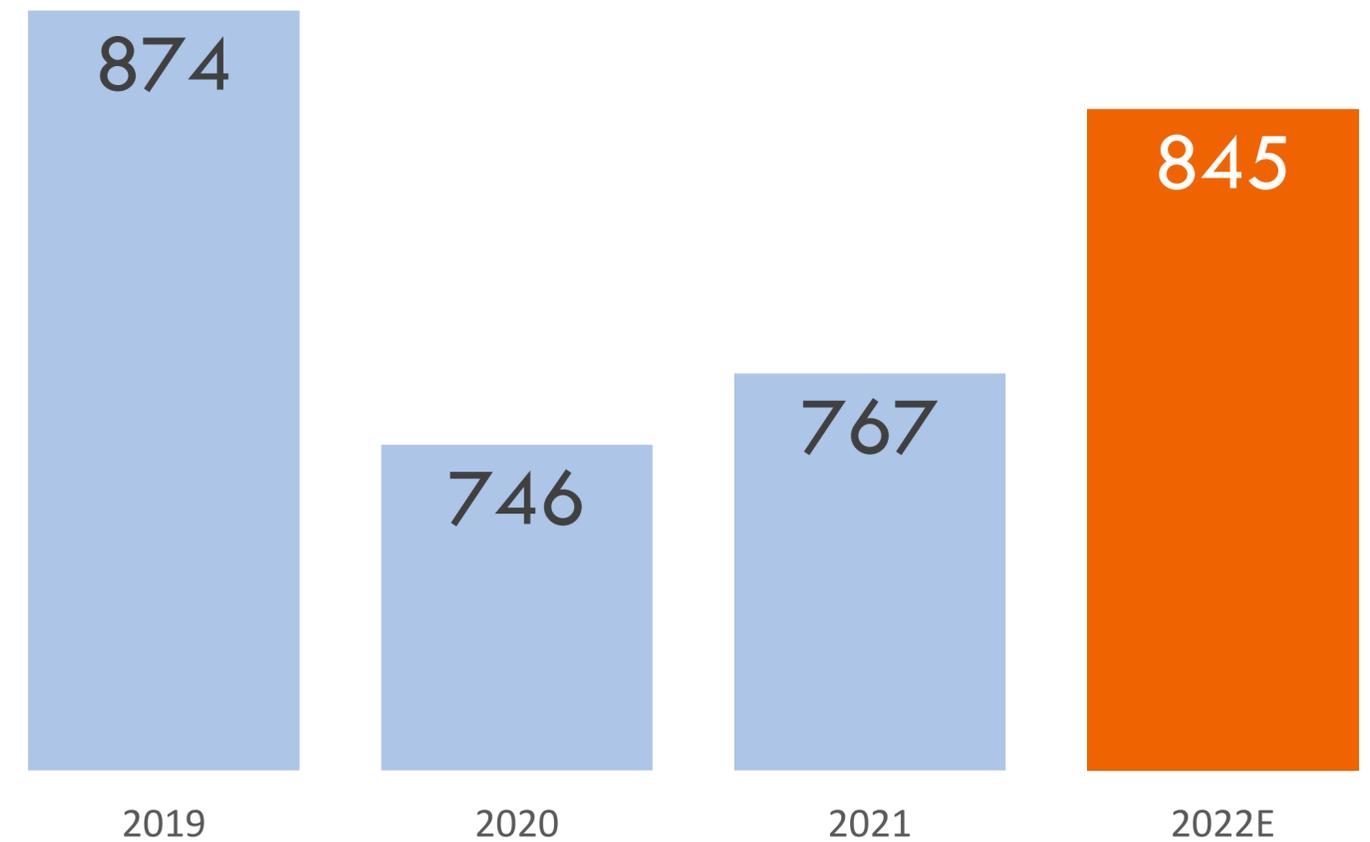
1.

Well positioned in attractive, high-growth markets

Revenue from faster growing markets (£m)



Revenue from core markets (£m)

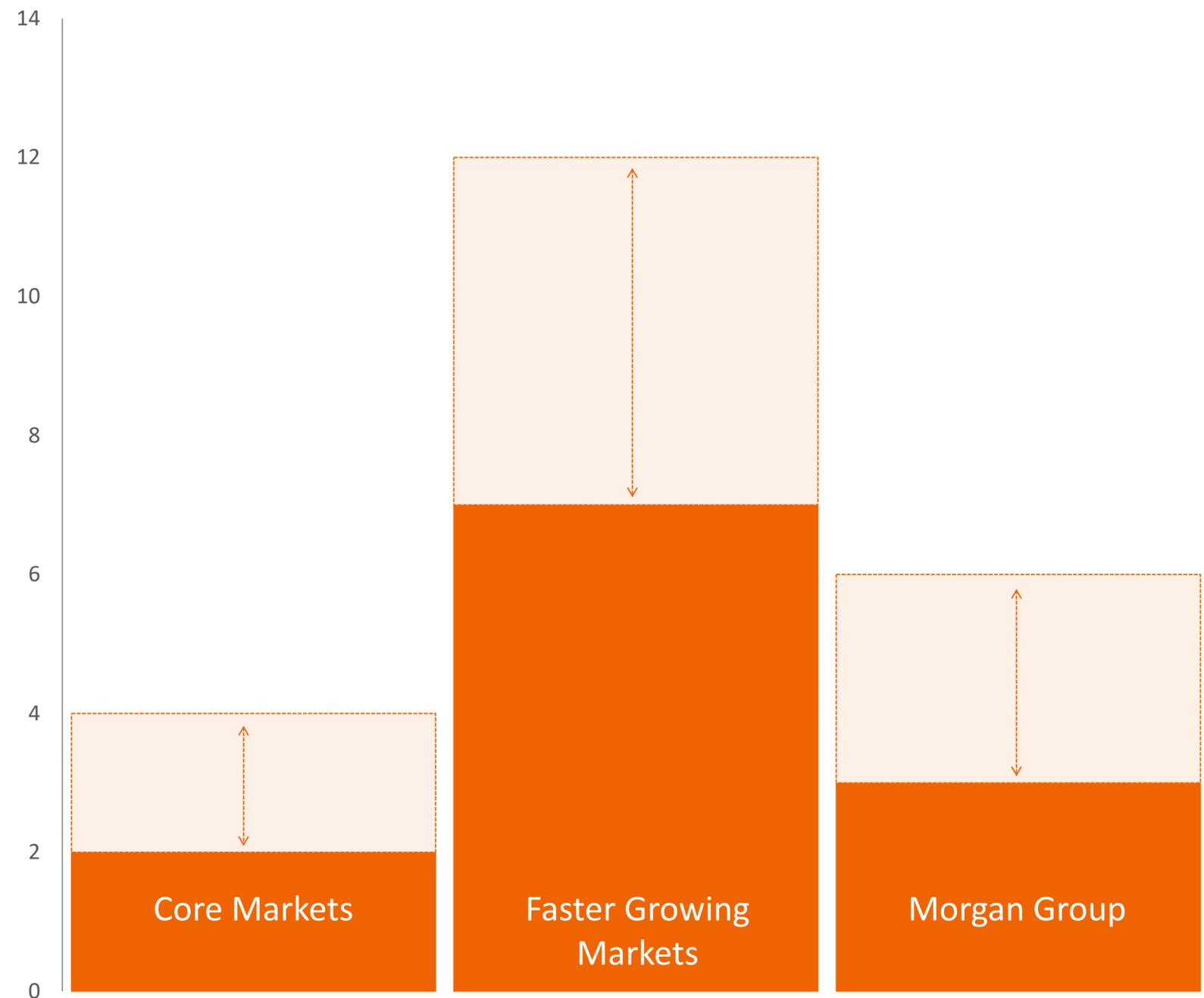


1.

Well positioned in attractive high-growth markets

- Revenue growth aligned to fast growing end markets for next five years
- Core critical to Morgan; providing strong base with a diversified and differentiated portfolio
- Strong cash generation from core markets enables investment in faster growing markets

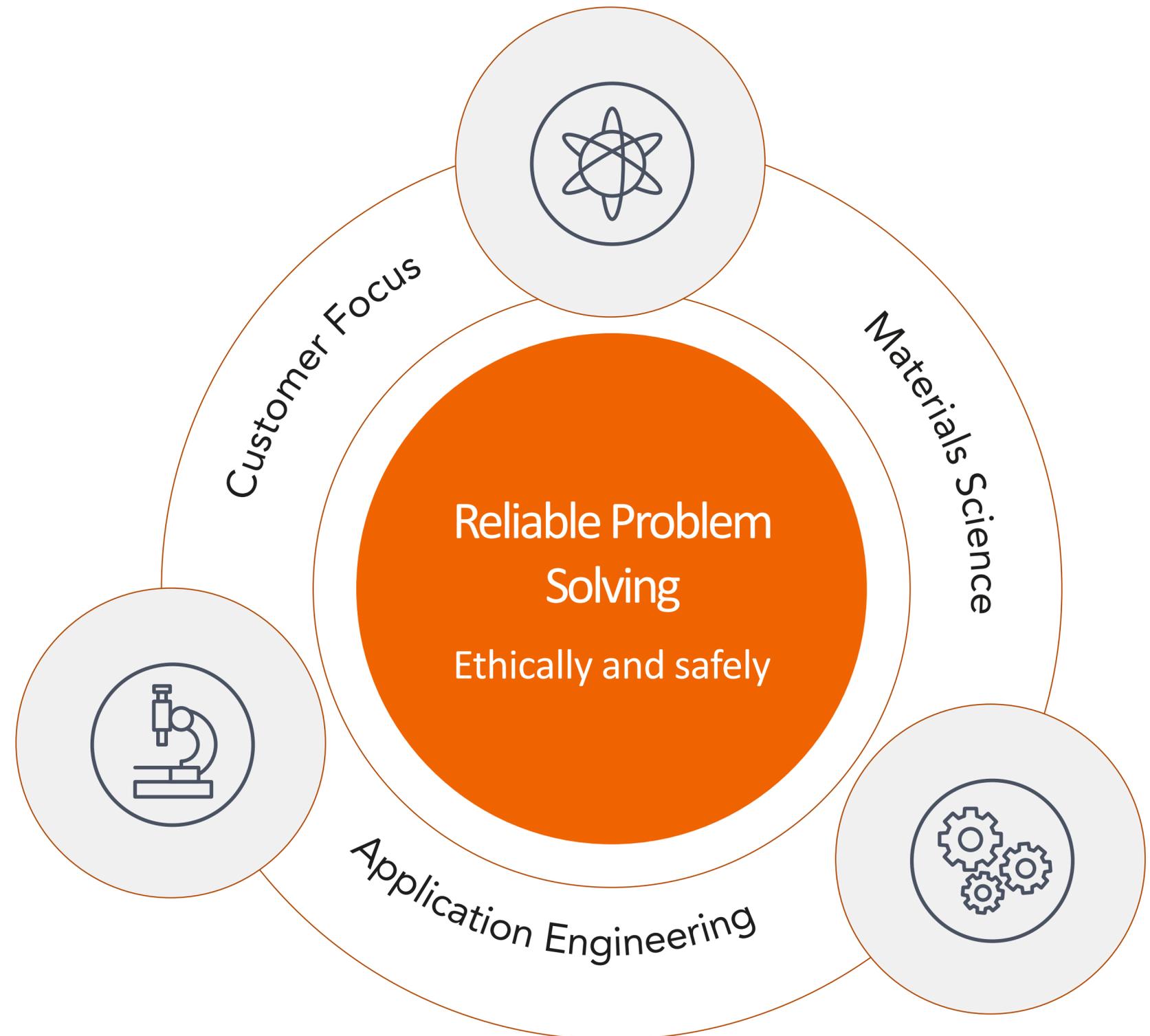
5-year indicative revenue growth rates (%)



2.

Leading, differentiated market positions

- Four Centres of Excellence driving innovation, margin expansion and growth
 - £28.5m R&D spend in 2021
 - 460 engineers and scientists
- Deep application engineering expertise turns our materials know-how into a manufacturable differentiated product
- Increasingly deep customer relationships generating new opportunities



2.

Leading, differentiated market positions

Market	Share of revenue (%) (H1 2022)	Market Position	Differentiation
Faster growing			
			L H
Semiconductors	8%	Emerging	
Healthcare	7%	Leader	
Clean energy + clean transportation	5%	Emerging	
	20%		
Core			
			L H
Industrial	30%	Leader/Top 3	
Metals	13%	Top 3	
Petrochemical	10%	Leader	
Aerospace	8%	Leader	
Other	19%	Top 3	
	80%		

3.

Sustainable solutions to support the energy transition

Our approach to sustainability

1. Enabling the energy transition through our products

+

2. Reducing our own environmental impact

Diversified portfolio of sustainable solutions

Aerospace: Leading materials for high efficiency engines

Clean energy: Increasing lifetime and performance of solar, wind and energy storage

Clean transportation: Superior materials for longer lifetimes

Healthcare: Best in class materials and miniaturisation technology

Semiconductors: Higher performance materials for the most demanding process steps

Industrial: Higher efficiency solutions for industrial customers

3.

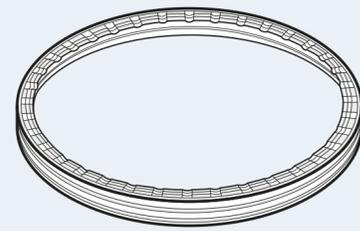
Sustainable solutions to support the energy transition

Case studies

Our products are enabling the energy transition

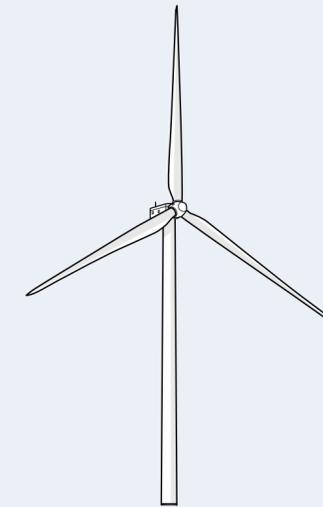
Through their life, our products typically save 10s or 100s of times the CO2 emitted in manufacture

1 Aircraft



We make main shaft seals, ceramic cores and accessory components, enabling the latest generation high temperature, high efficiency aircraft engines.

2 Wind Turbines



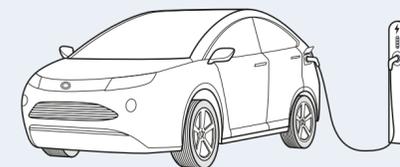
Leading brush grades for wind turbines offering longer lifetimes, and lower through life CO2 emissions.

3 Pantographs



We make high performance current collector strips that offer superior lifetimes and lower CO2 emissions for electrified metro and rail systems.

4 Semiconductors



We make a wide range of consumable components, key to the production of leading-edge semiconductors supporting digitization and the energy transition.

3.

Sustainable solutions to support the energy transition



Switch standard grid electricity to carbon free

First phase switching of gas to electric kiln

Process optimisation

Research technologies for high temperature kilning processes

Scope 3 planning

- We continue to make good progress against our 2030 carbon reduction target
- Our CO₂e has reduced by 40% from our 2015 starting point
- As of HY 2022, 48% of our electricity is from renewable (33%) and carbon free (15%) sources



4.

Resilient Group delivering attractive through cycle returns

Diverse end markets with early/late/counter cyclical characteristics provide market resilience

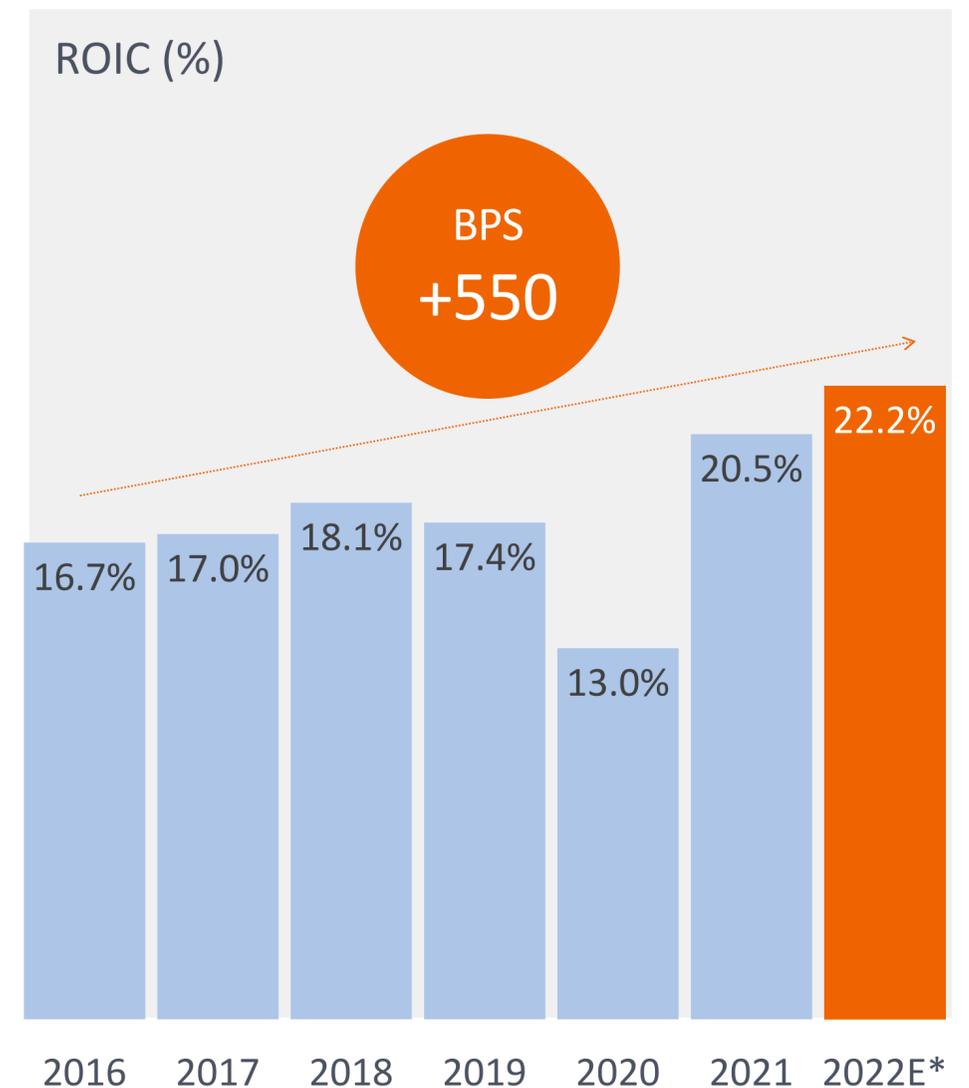
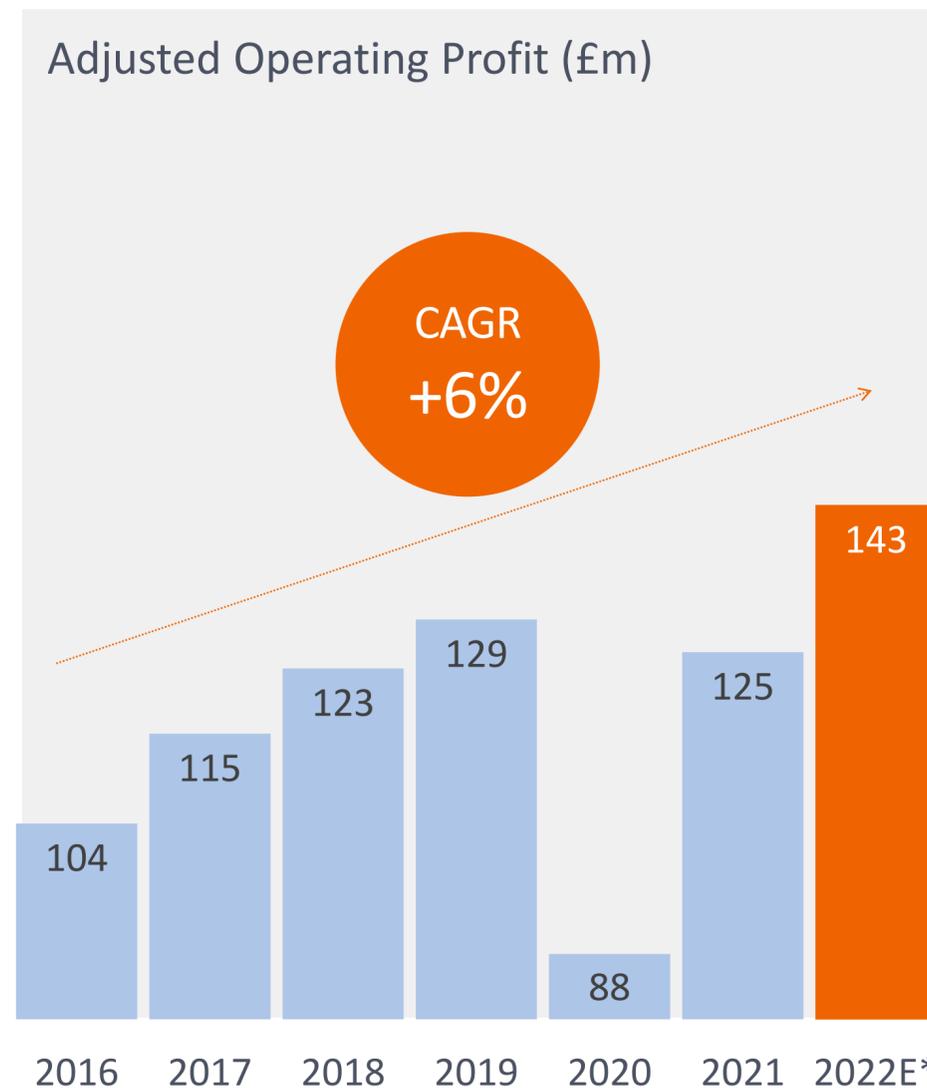
Diverse customer base

No single customer equates to more than **2%** of our revenues

Broad footprint provides geographic resilience

18
countries

70
manufacturing sites
worldwide



Why Morgan?

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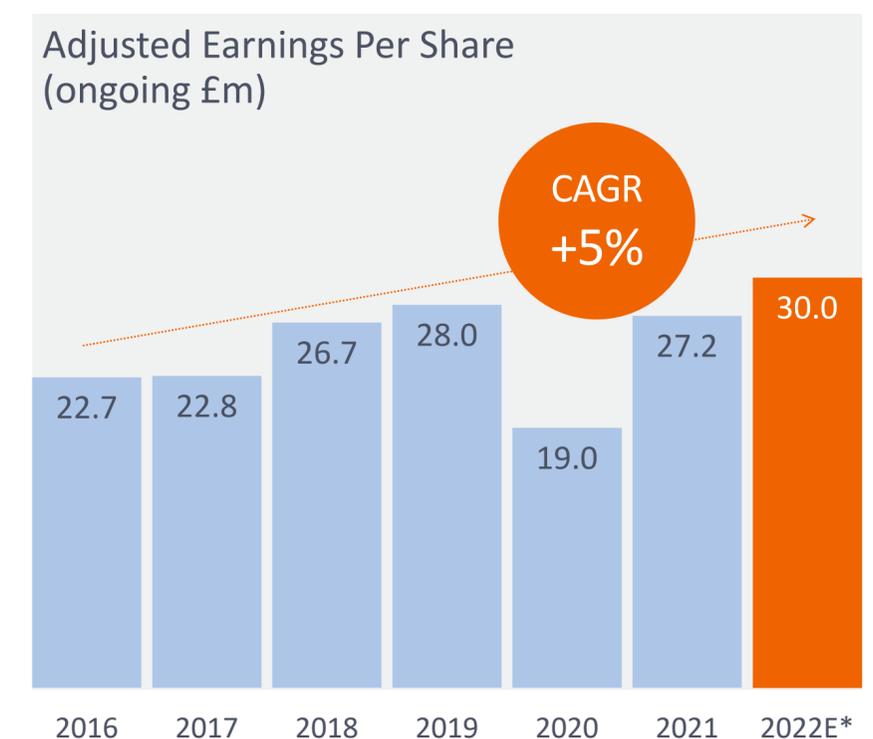
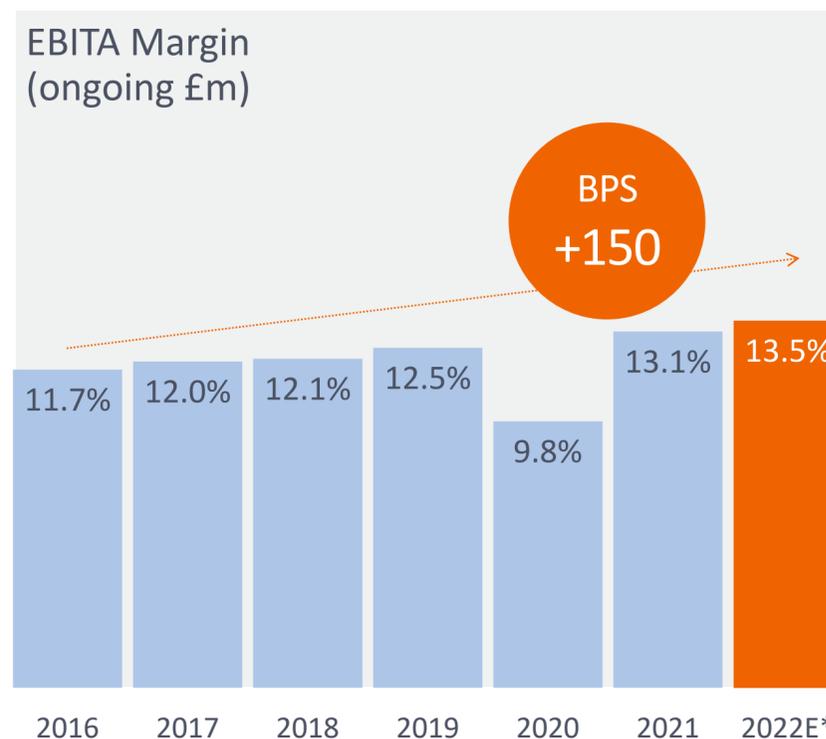
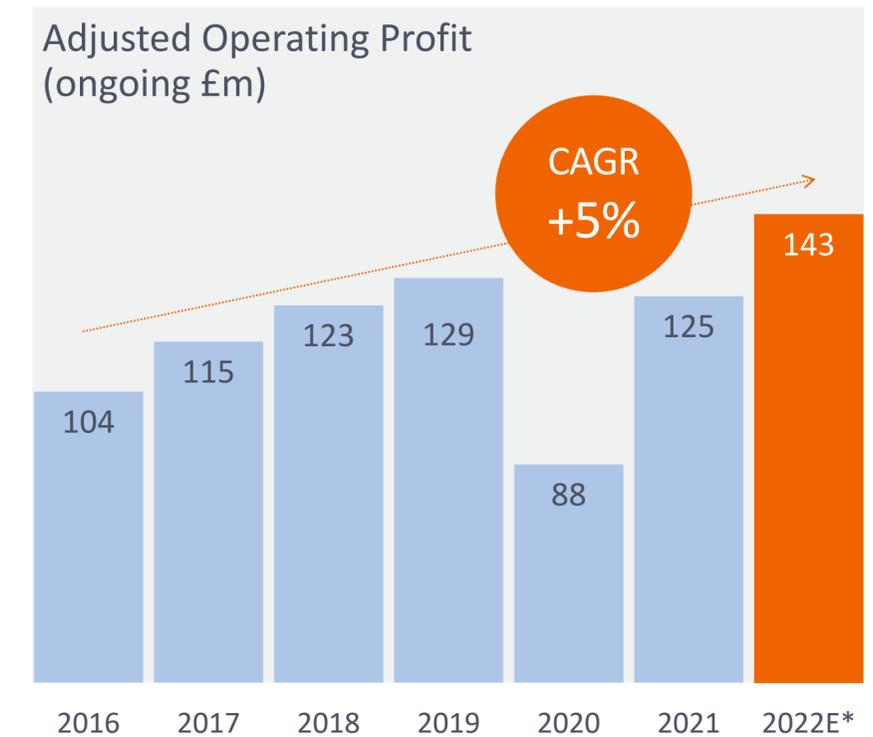
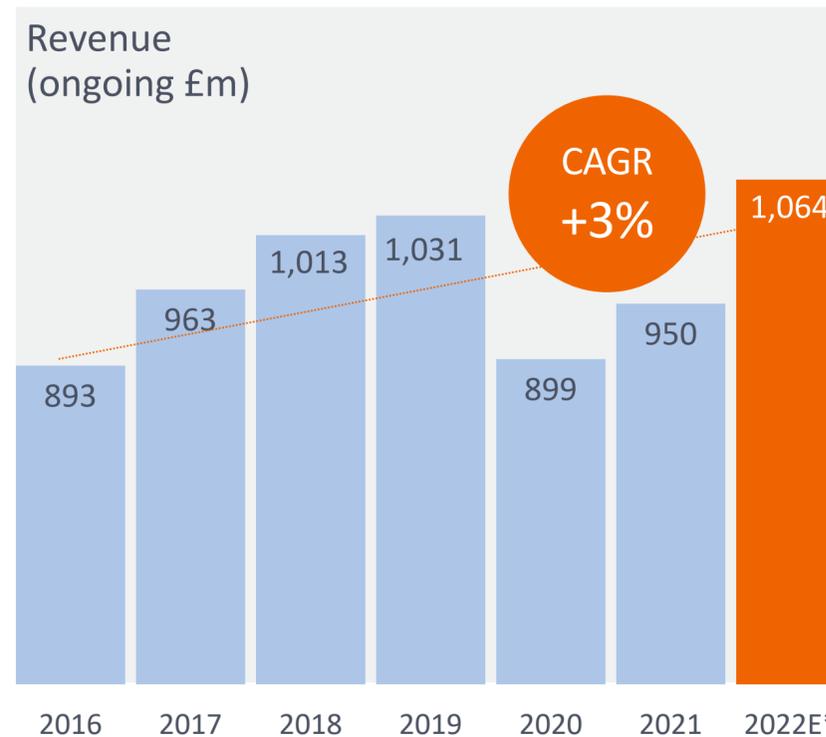
Resilient Group
delivering attractive
through cycle returns

Finance Framework and Priorities for Capital

Richard Armitage, Chief Financial Officer

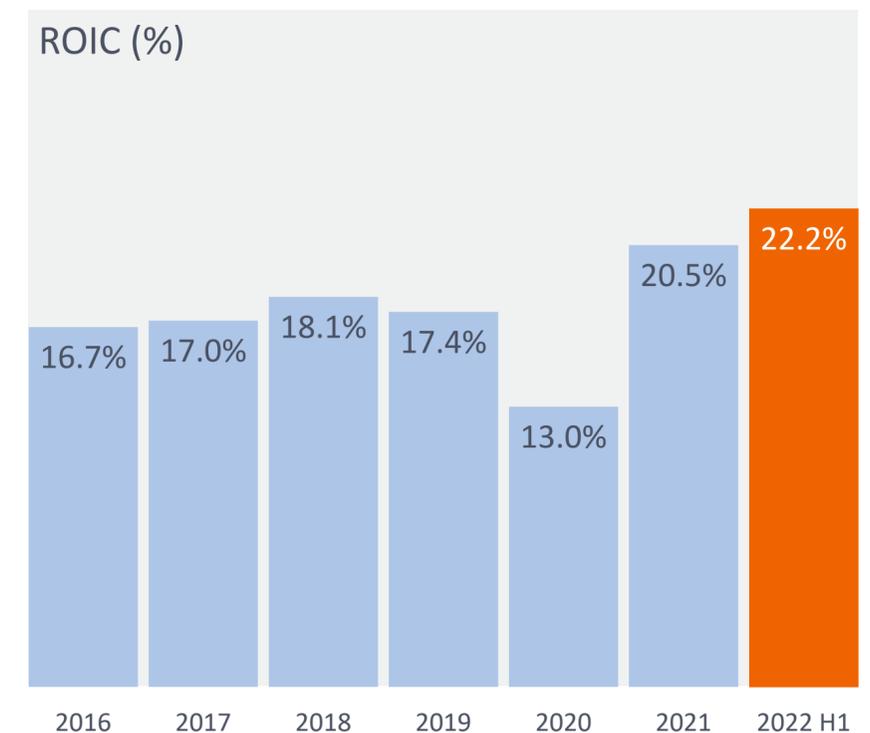
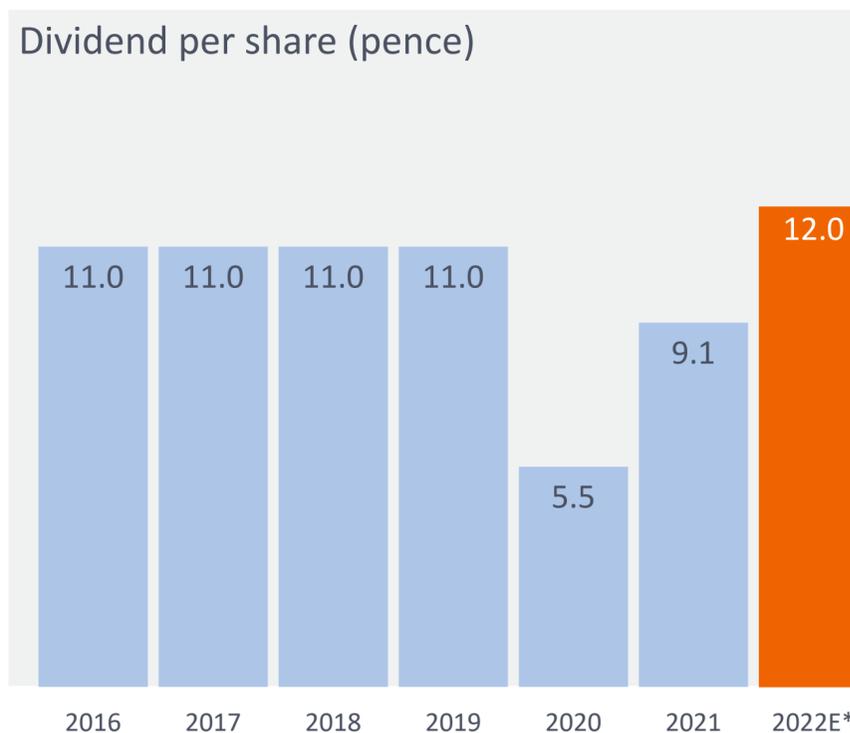
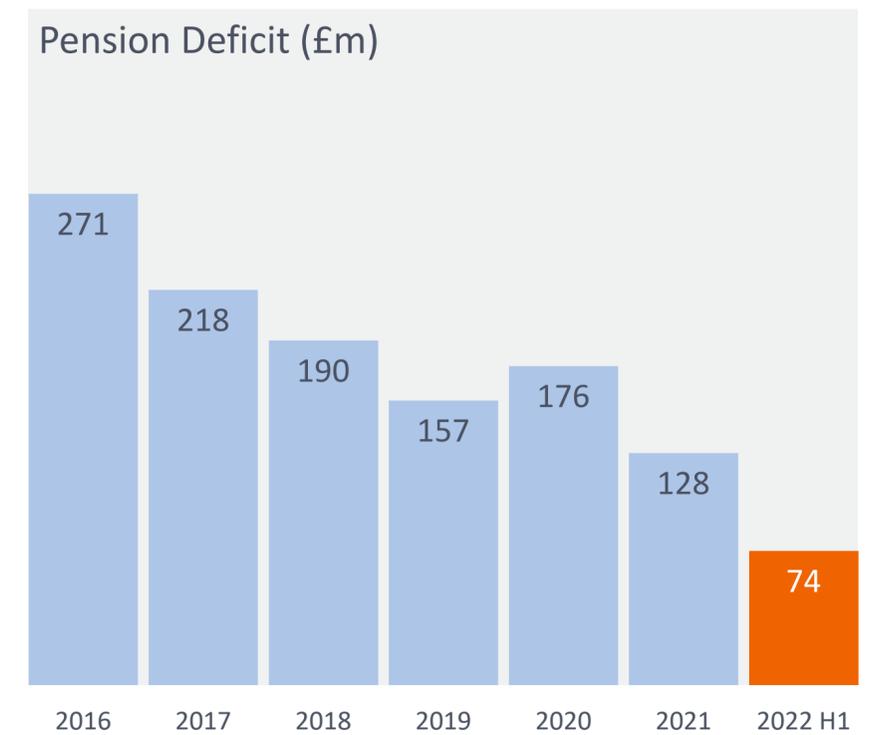
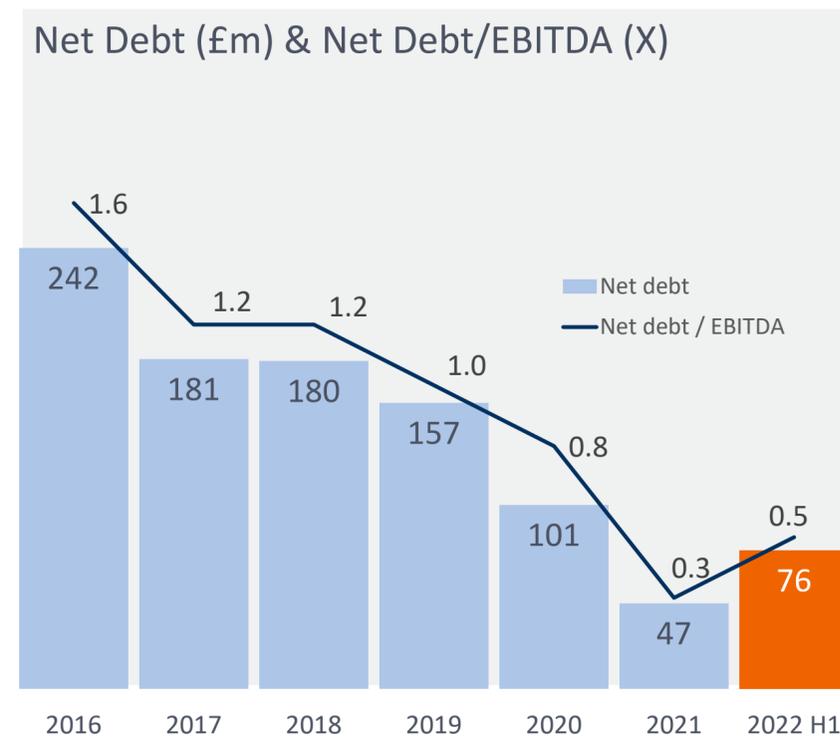
Resilient financial performance

- A stronger more dynamic business
- Delivering growth in underlying revenue and earnings since 2016
- Resilience through the pandemic; accelerated recovery after
- Inflation recovered in full
- Margin growth driving profitability
- Further improvement expected in FY2022



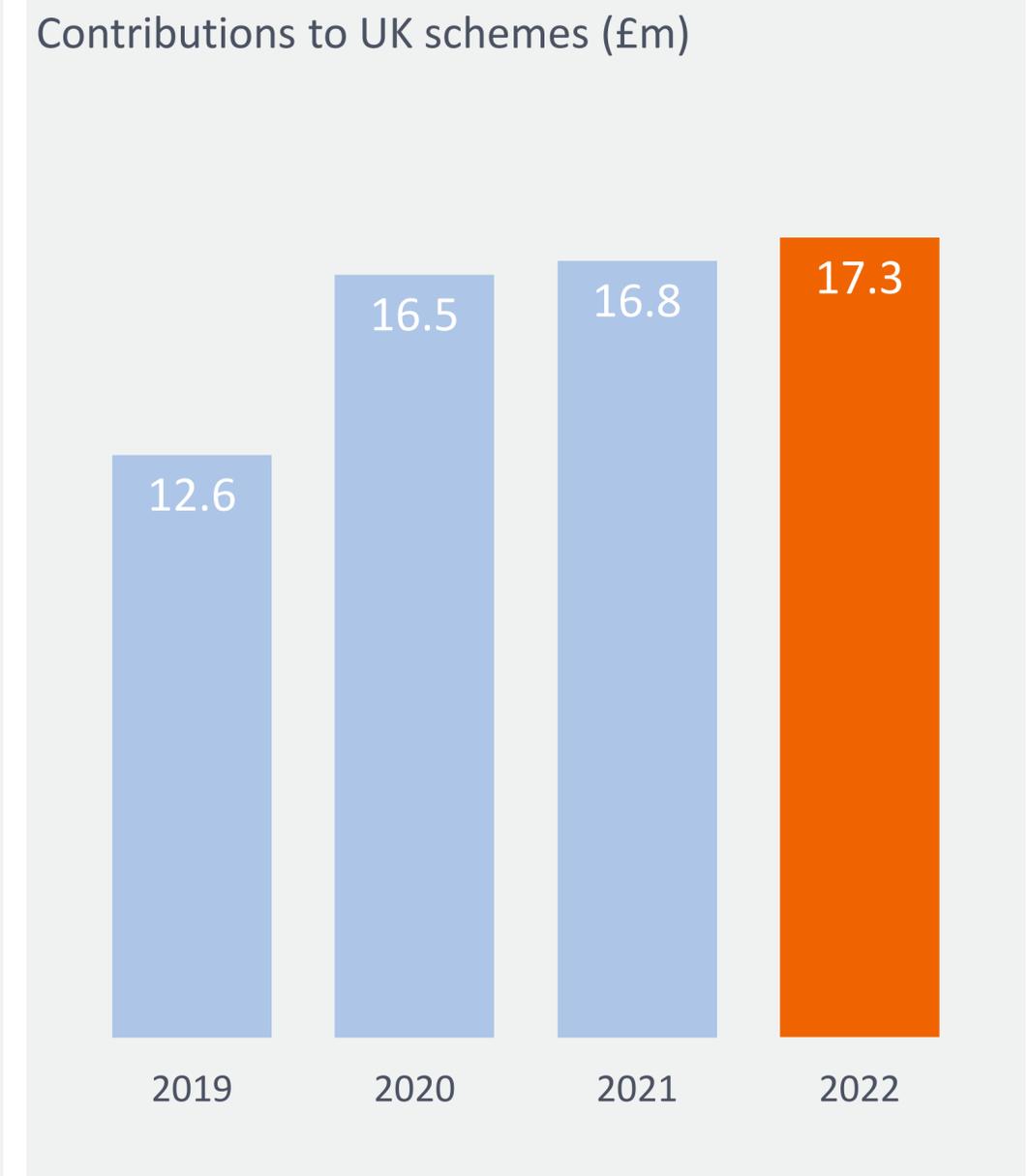
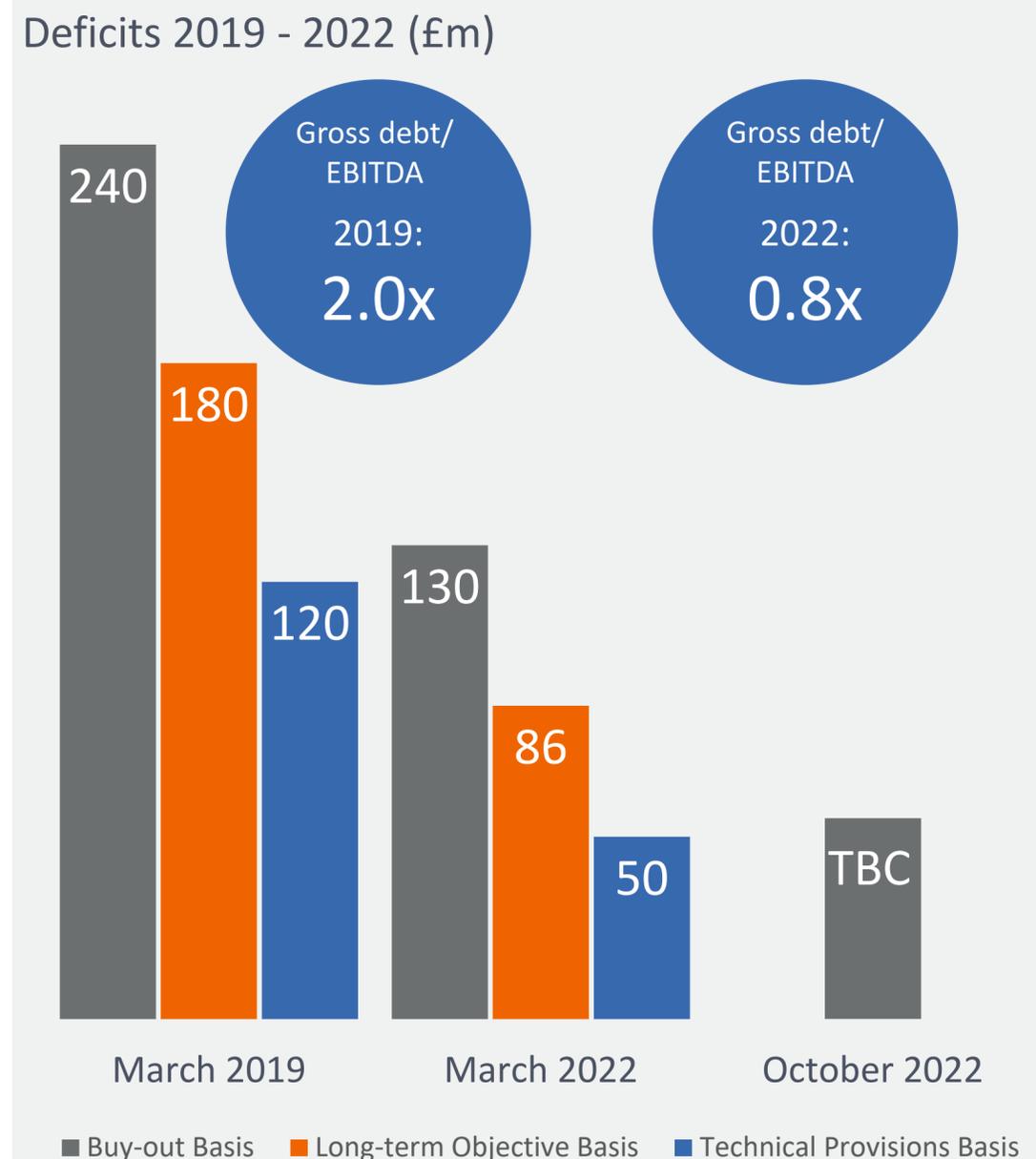
Significant improvement in balance sheet & ROIC

- Net debt reduced to c.0.5x
- Substantial covenant headroom
- Cost of fixed rate debt 2.9%
- UK pension deficit reduced by £221m
- Dividend growth constrained by pension and then pandemic; new progressive policy
- ROIC improved to >20%



Removing the pensions burden

- Accelerated contribution of £67m agreed with trustee
- FCF improvement of £17m per annum
- Inflation & interest rate risk fully hedged with lower investment risk
- Scheme leverage maintained at c.2.0x
- An essential step towards buy-in/buy-out

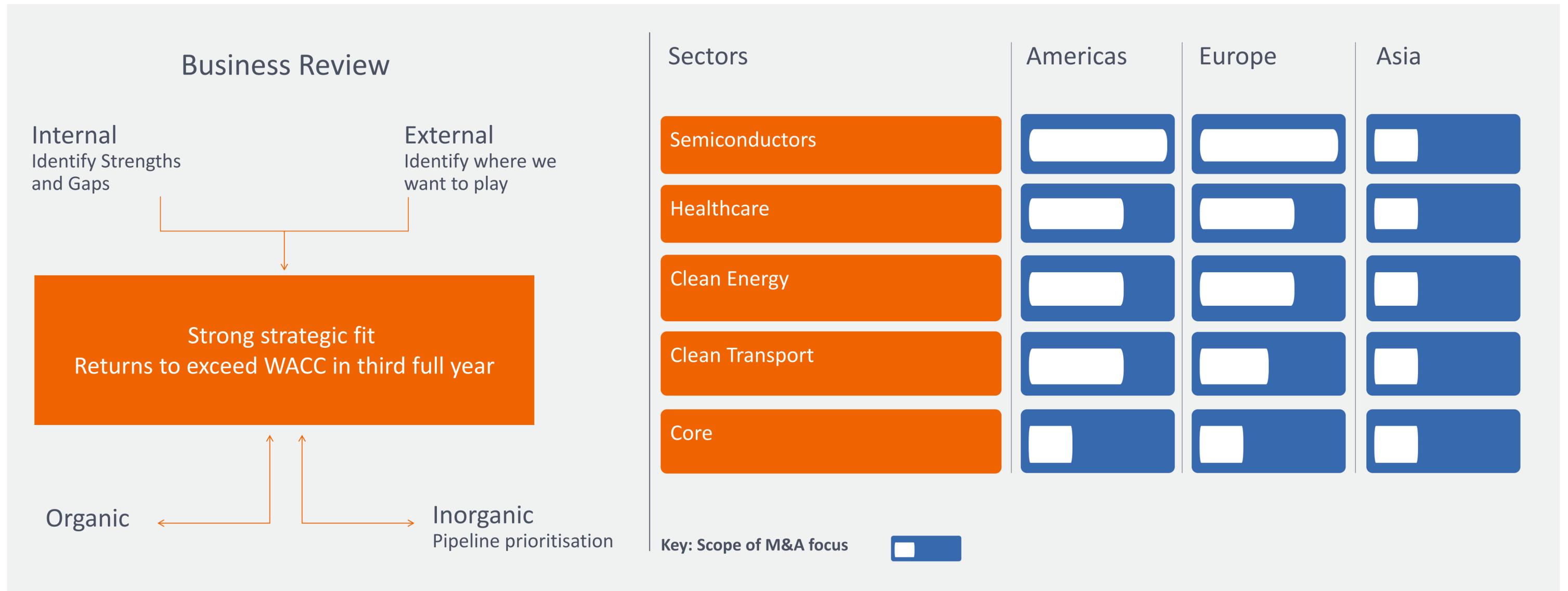


Capital allocation prioritises growth and returns



M&A

Strategic alignment thorough a disciplined approach to accelerate growth



A disciplined approach to delivering improving growth & returns

Delivering enhanced EPS growth

Organic revenue growth

+

Continuing profit growth

+

Accretive M&A

+

Additional shareholder returns

=

Enhanced EPS growth

Clear through cycle financial framework

3-6% organic revenue growth

12.5% to 15% adjusted operating profit margin

ROIC 17-20%

Leverage of 1.0x to 2.0x

Enhanced EPS growth

Q&A

Business drivers

Faster Growing Deep-Dives Semiconductors: Enabling a Rapidly Changing World

Wendy Pryce Lewis, President Electrical Carbon
John Righini, President Technical Ceramics

Semiconductors

We are outperforming the market in two attractive sub segments

1. Consumables for **Silicon** Semiconductor Fabrication

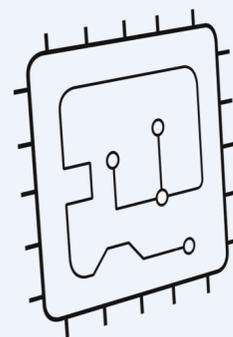
8%

CAGR 21-25

- Digitisation, connectivity and artificial intelligence macrotrends
- Leading edge semiconductors require new processing technologies
- Regional supply chain security

£2.5bn

Addressable Market 2025



2. Consumables for **Silicon Carbide** Semiconductor Fabrication

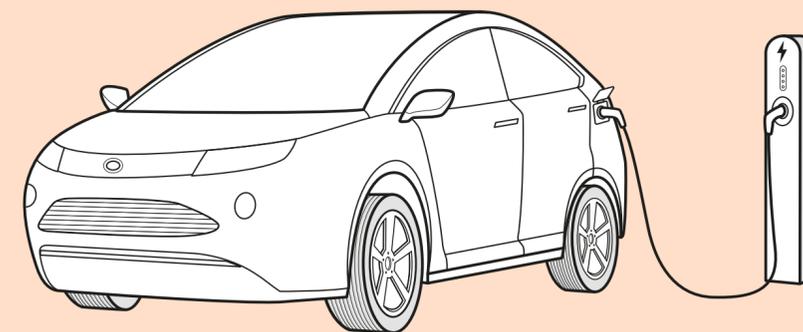
28%

CAGR 21-25

- Lighter, more efficient and compact power inverters in Electric Vehicles
- SiC more difficult to manufacture

£0.6bn

Addressable Market 2025

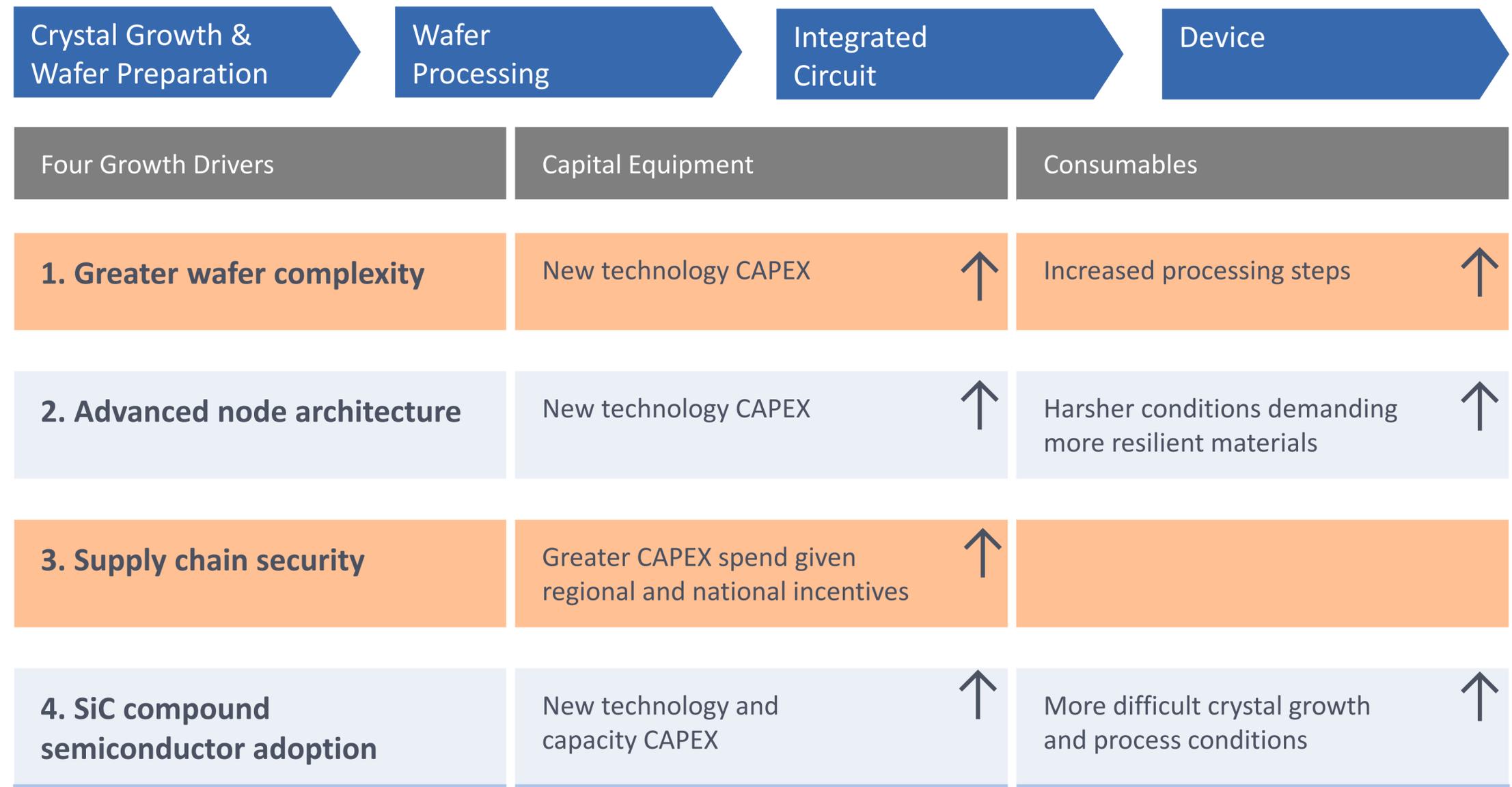


Competitors



Morgan Advanced Materials proprietary research
Yole Intelligence, Compound Semiconductor Market Monitor

Front-end processes experiencing transformational growth



Our participation aligns with the industry's front-end transformational growth drivers

Our materials and expertise enabling more complex and advanced processes

Morgan's diverse technologies advance fabrication

Crystal growth & Wafer preparation

Lithography

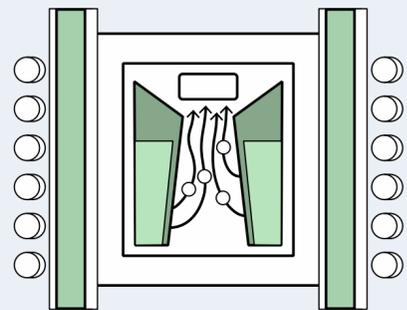
Etch

Ion Implant

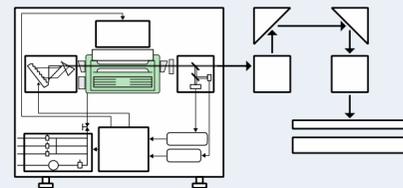
Deposition

Rapid Thermal Processing

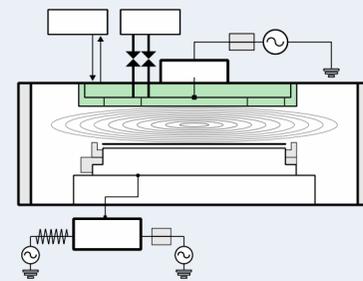
Crystal Growth & Wafer Fab Equipment



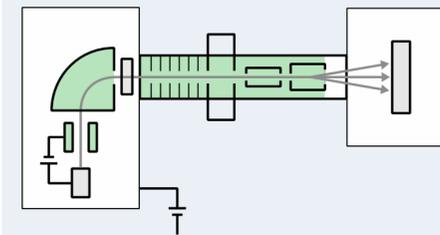
- 3000C Furnace insulation
- Porous graphite hot zone
- High purity source materials



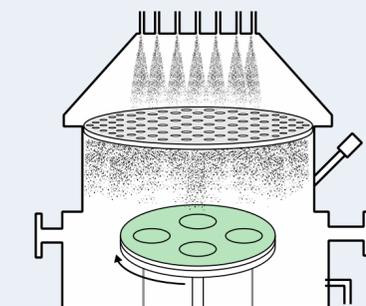
- UV waveguides



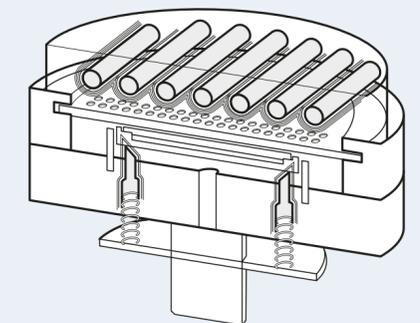
- Focus rings and shower heads



- Beamline graphite guides
- Shield rings
- Alumina insulators



- SiC wafer susceptors
- Shield and chamber rings, sputtering targets



- Braze alloys

Morgan's diverse technologies advance fabrication

Advanced silicon and compound semiconductors

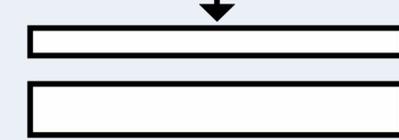
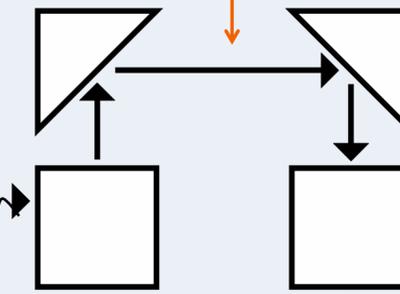
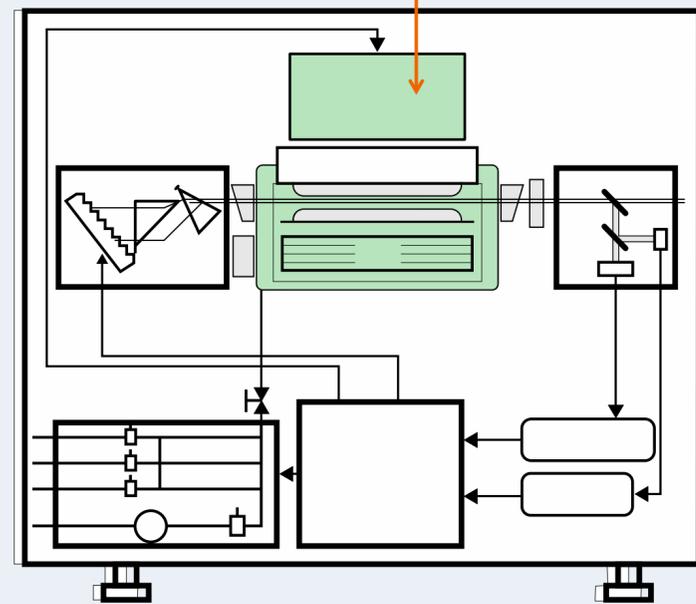


High-precision & resilient light source chamber components deliver process stability in a challenging environment

Ceramic UV laser chamber components

Pulse power module components

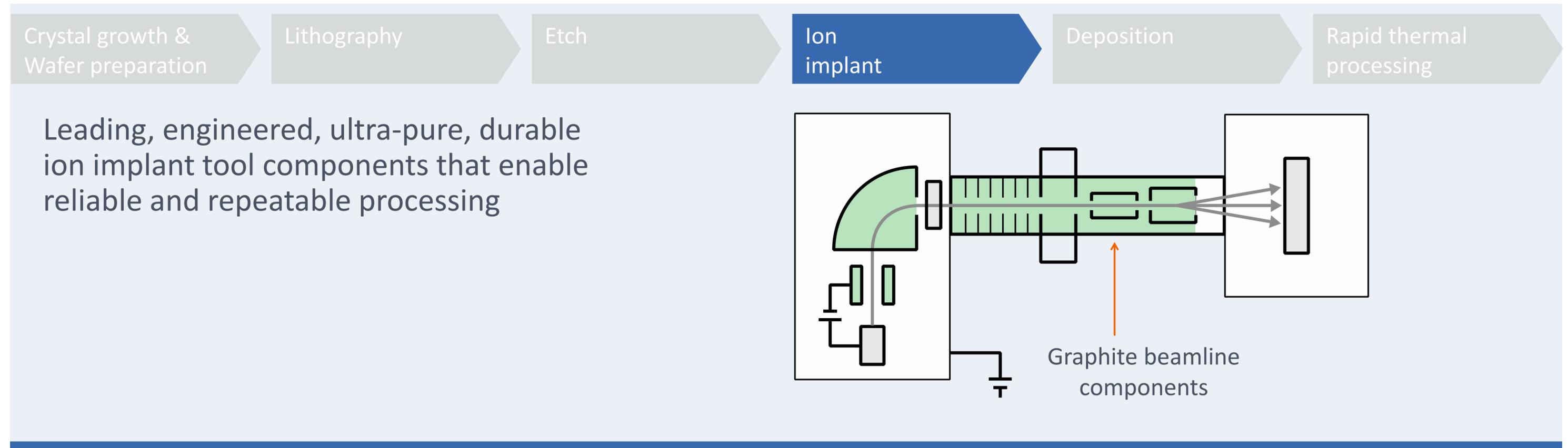
Mirror / Reflector



Wafer
Carrier

Morgan's diverse technologies advance fabrication

Advanced silicon and compound semiconductors

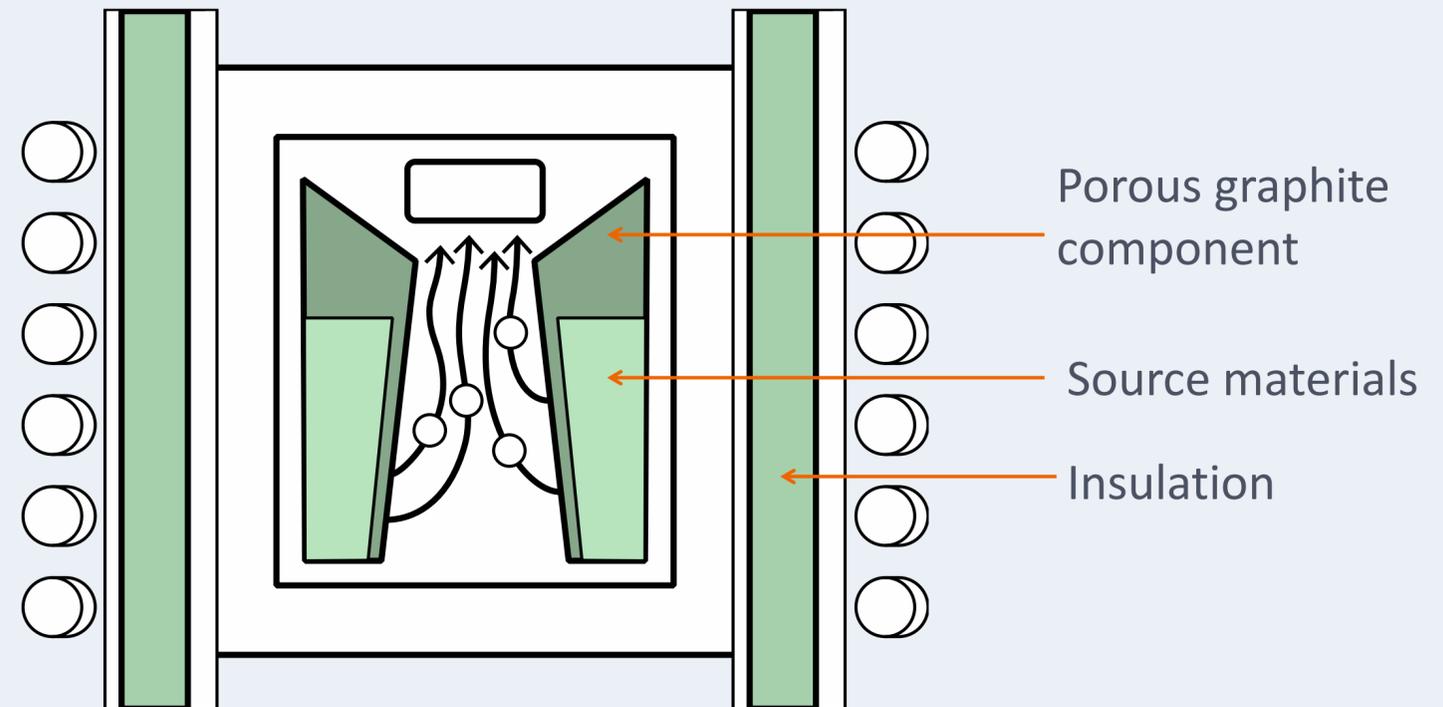


Morgan's diverse technologies advance fabrication

Advanced silicon carbide semiconductors



Leading graphite products that improve crystal quality and yield during physical vapour transport boule manufacturing



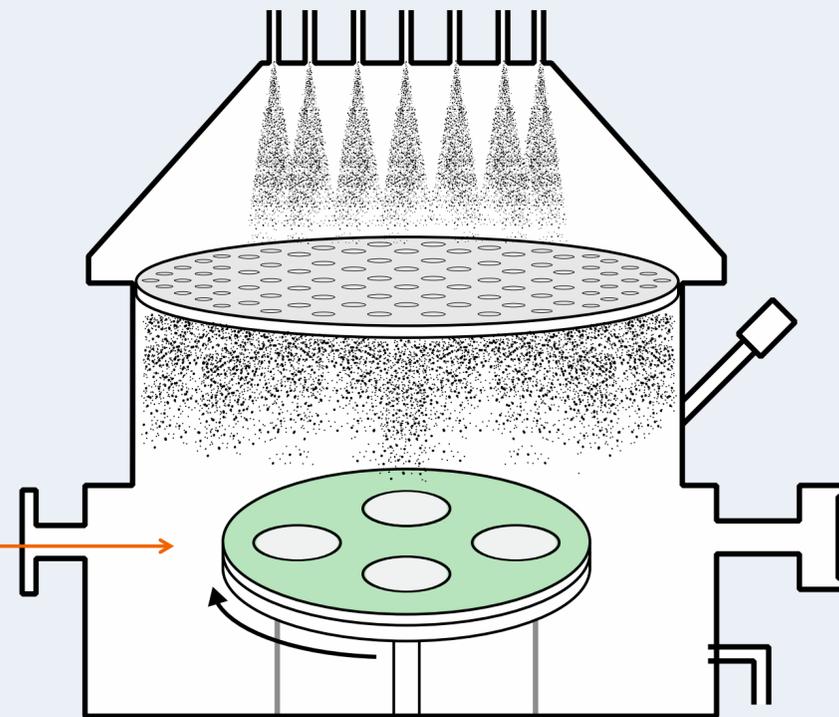
Morgan's diverse technologies advance fabrication

Advanced silicon carbide semiconductors



Thermally and chemically stable products to withstand harsh conditions enabling precision deposition on compound semiconductors

Silicon carbide susceptor



Customers trust Morgan to meet their growth needs in SiC semiconductors



Material Science

- Material customisation: purity & performance
- Consistent and repeatable properties at sales



Application Engineering

- Process simulation
- Rapid Prototyping



Customer Focus

- Precision manufacturing
- Expanded capacity to match growth

CEO of Major SiC Wafer Supplier:

“During this time of tremendous growth in the silicon carbide industry, it’s important that we select business partners who share our vision and can support this level of growth momentum. Morgan Advanced Materials is becoming a preferred partner thanks to its aggressive technology development and capacity expansion plans.”

Leading Semiconductor Material Manufacturer:

“Morgan Advanced Materials is a highly innovative company and has been a reliable business partner for many years. We would like to thank Morgan for the very good cooperation and the strong support in expanding our business.”

Through execution of our **semiconductor strategy**, we expect to continue delivering **above market growth**

- Morgan is well positioned with leading products in fast growing spaces across front-end manufacturing for Si and SiC semiconductors
- Differentiated through our advanced materials, application engineering approach and close customer relationships
- Morgan is actively supporting the fast growth in this space:
 - Plan to invest approximately £60m in further capacity over the next few years

Faster Growing Deep-Dives Healthcare: Improving Quality of Life

John Righini, President Technical Ceramic

Passion for Healthcare

**Ageing
Population**



**Growing
Middle Class**



**Innovative
New Therapies**



**Greater
Access to Care**



Healthcare

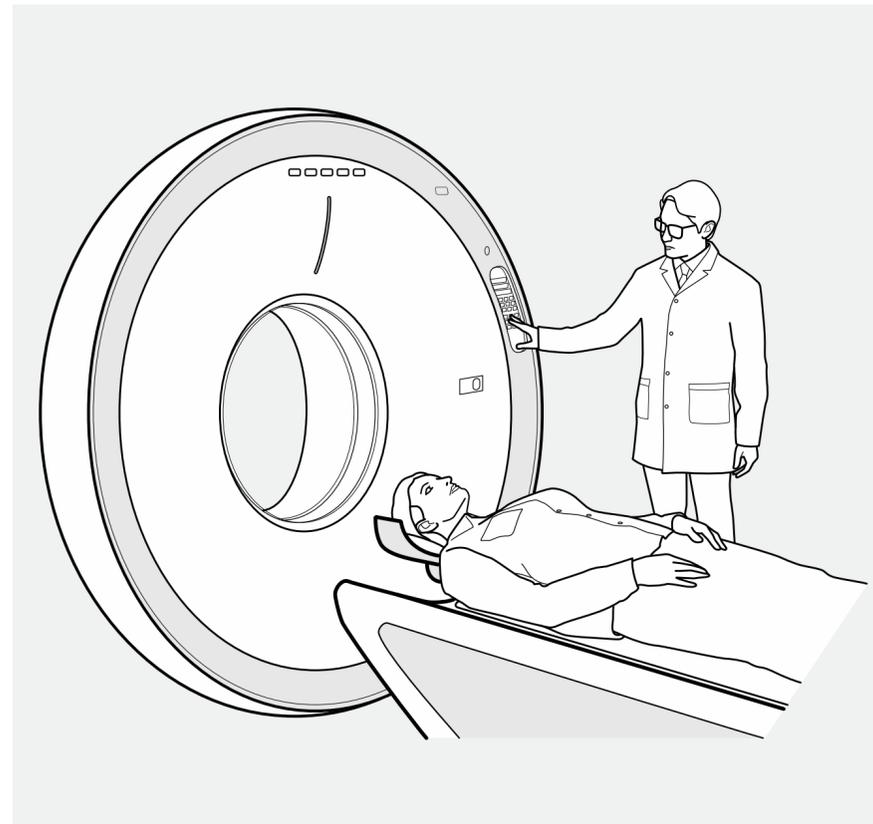
A resilient and attractive segment where we expect to deliver above market growth

6.4%
CAGR 21-25

£618m
Addressable
Market 2025

Medical devices include a diverse set of technologies that support delivery of therapies

- Improve treatment outcomes
- Reduce the cost of health and wellness
- Expand treatment pathways and therapy options



Competitors

COORSTEK

KYOCERA
The ECO Laser Printer.

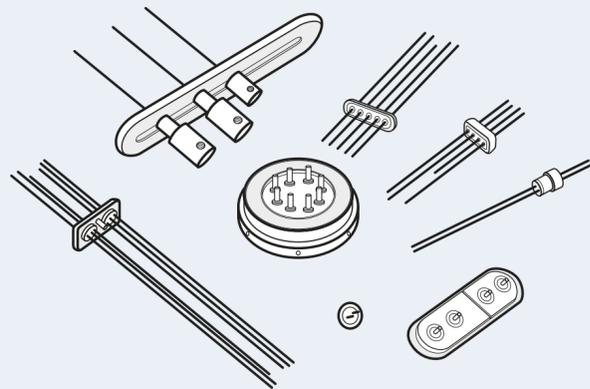
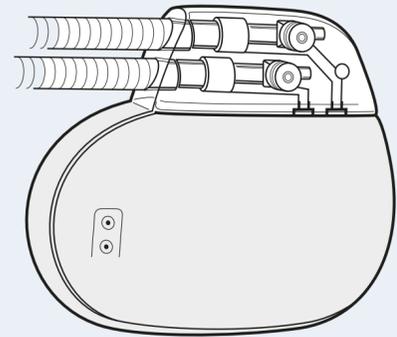
CeramTec

integer

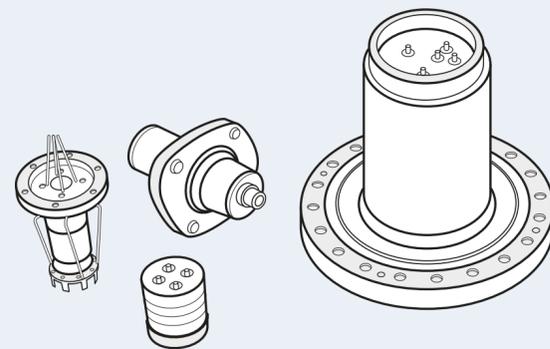
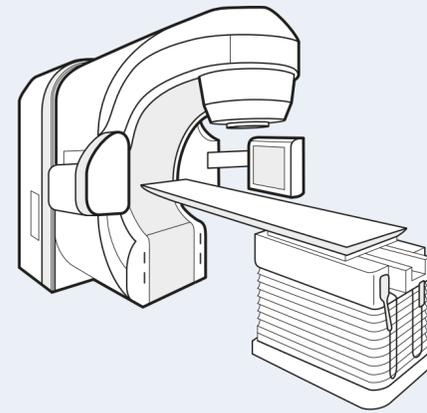
We are a trusted partner

To our broad customer base

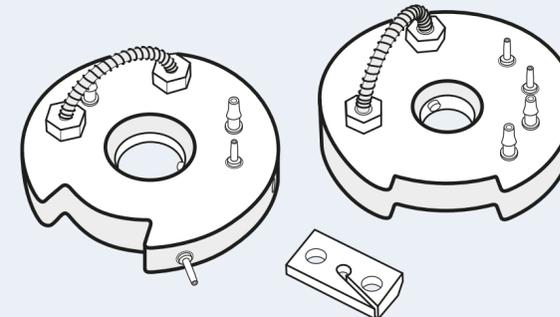
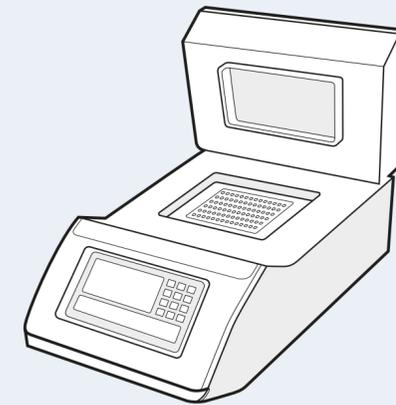
Active Medical Implants



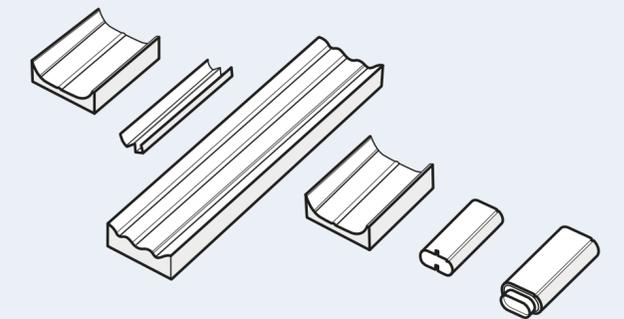
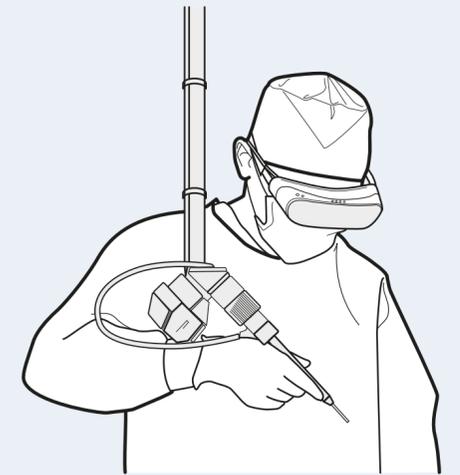
Medical Imaging & Oncology



Diagnostic & Analytical Equipment



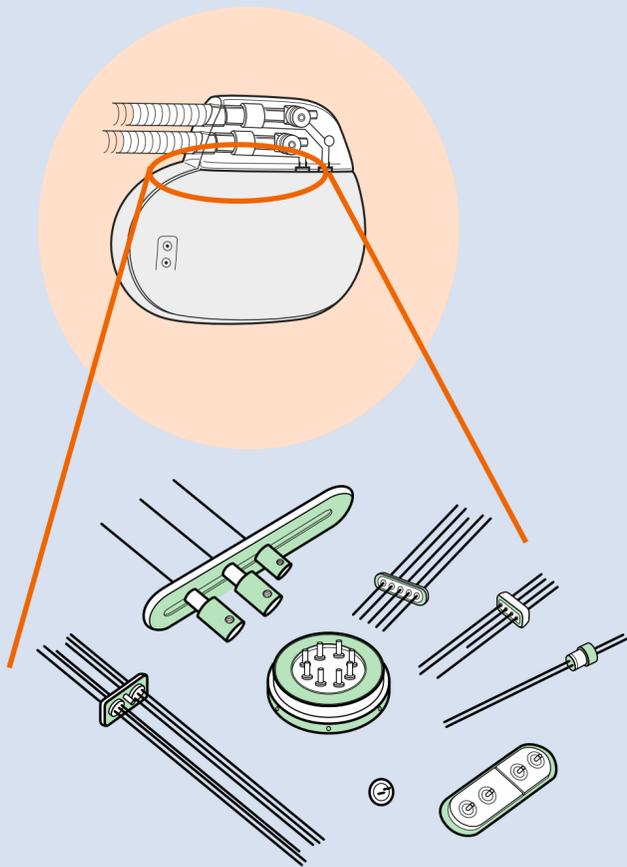
Surgical Equipment



Implantable feedthroughs technology

Support new & innovative treatments

1. Customised solutions for new therapies
2. Enabling safe and hermetic technology miniaturisation
3. Development partner from prototype to production



Cardiac

- Rhythm management (CRM)
- Left ventricular assist (LVAD)
- Monitoring/recording

Incontinence

- Sacral nerve
- Tibial nerve

Ambulatory

- Mobility
- Sensing/Touch

Brain Interface

- Brain-machine interface (BMI)
- Drug resistant depression
- Cancer treatment
- Epilepsy

Hearing

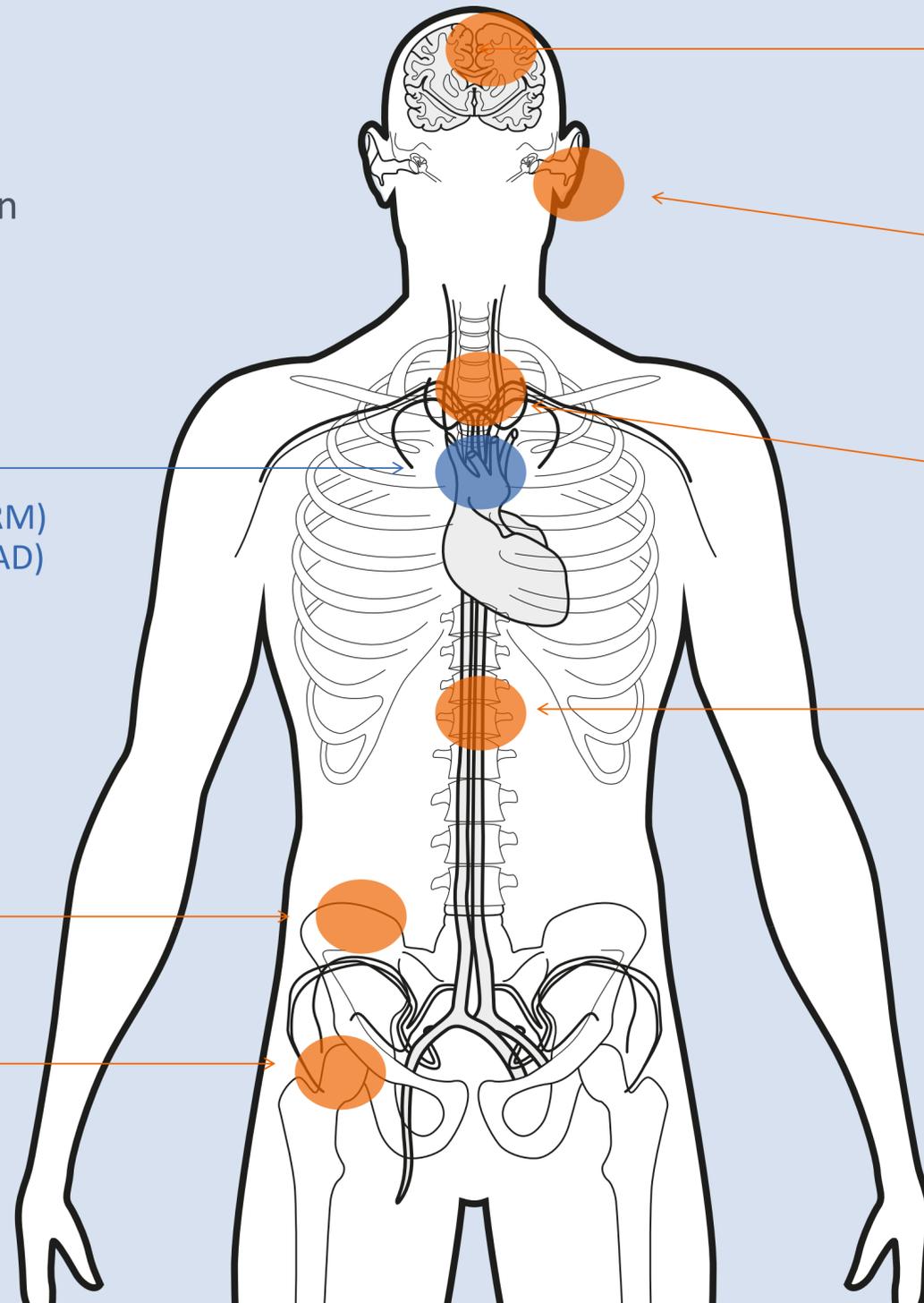
- Cochlear
- Auditory brainstem
- Middle ear
- Bone conduction

Sleep Aponea

- Obstructive (hypoglossal nerve)
- Diaphragm pacing (phrenic nerve)

Pain Management

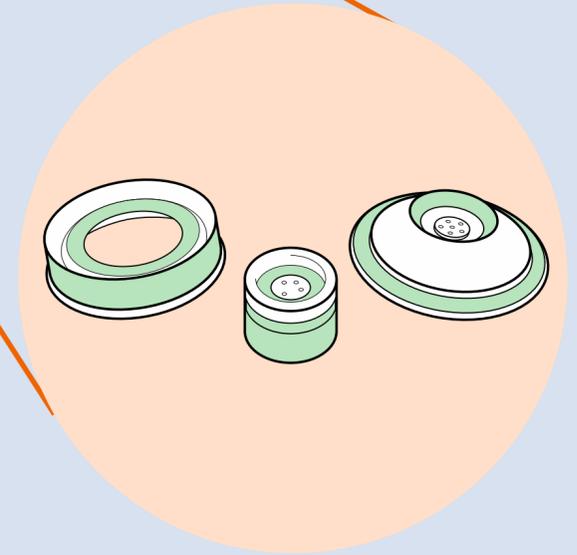
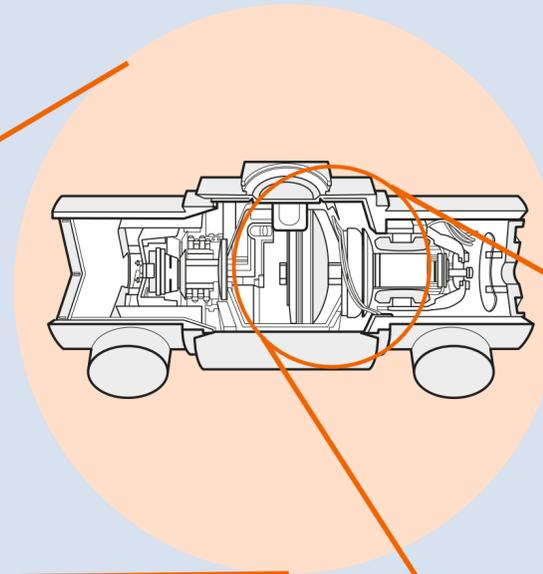
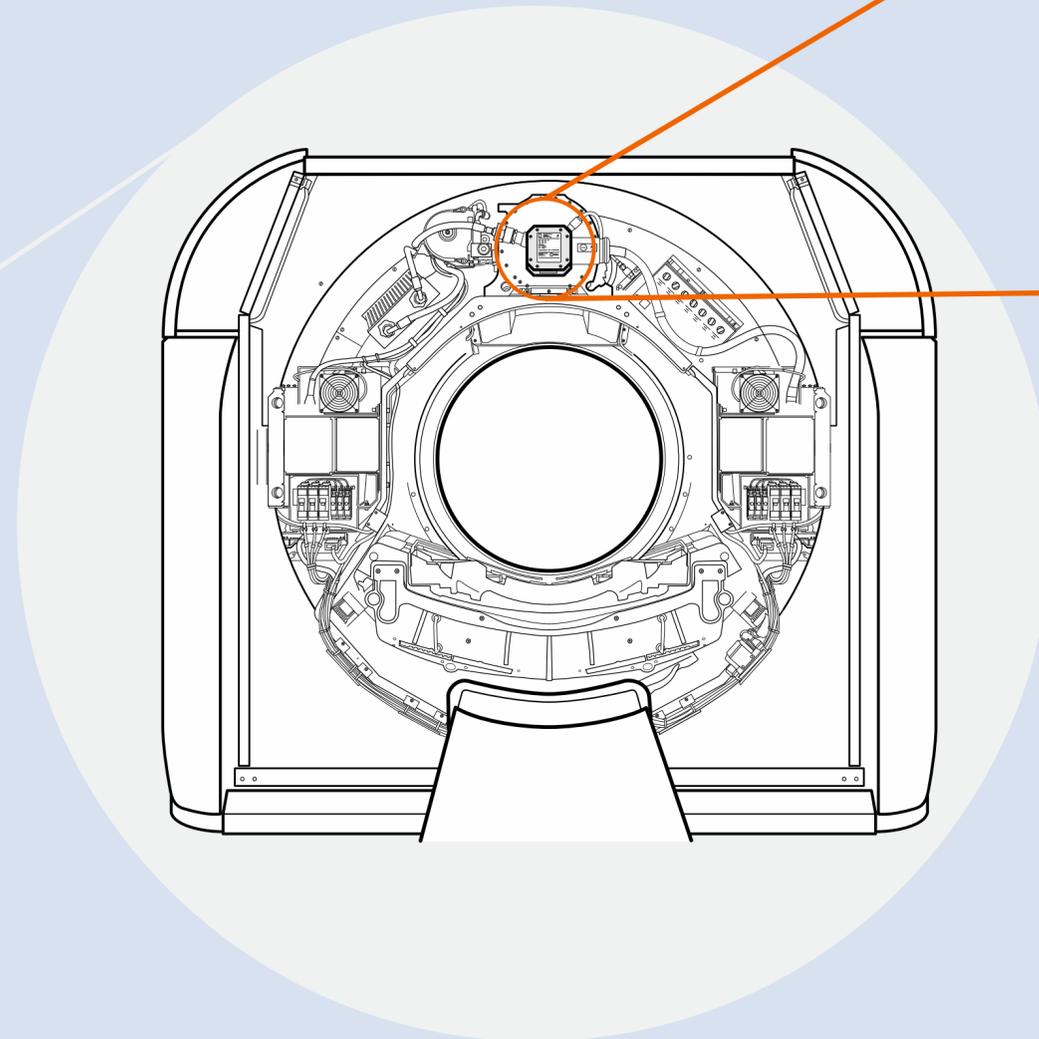
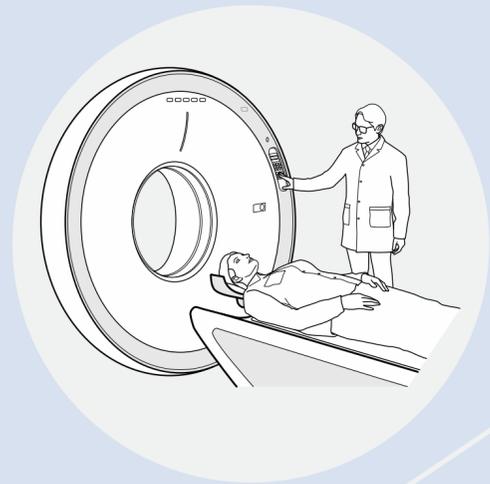
- Spinal cord stimulation (SCS)
- Sciatic nerve stimulation



Key: ● Neuromodulation ● Cardiac

Our imaging solutions

Play a key role in ensuring diagnostic and treatment delivery

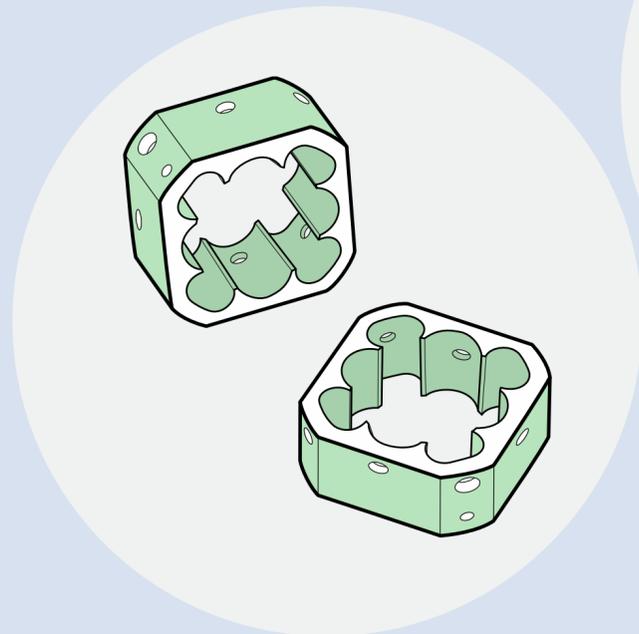


Bare ceramics and metalised components

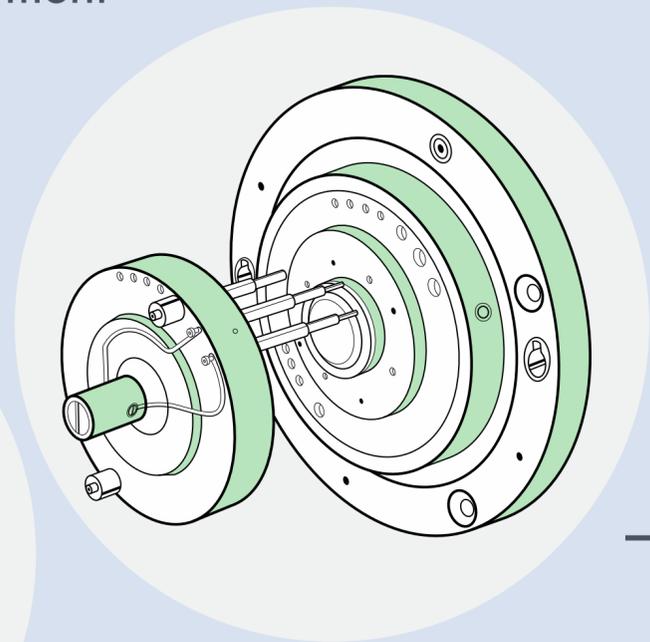
- 1. Greater power density for better diagnosis and treatment
- 2. Increased production yields
- 3. Better equipment up-time improving patient serviceability

Critical components

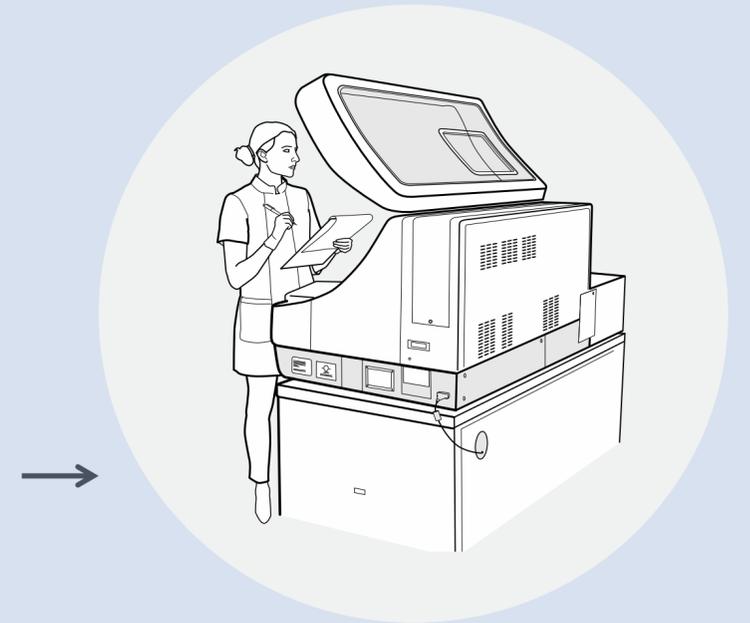
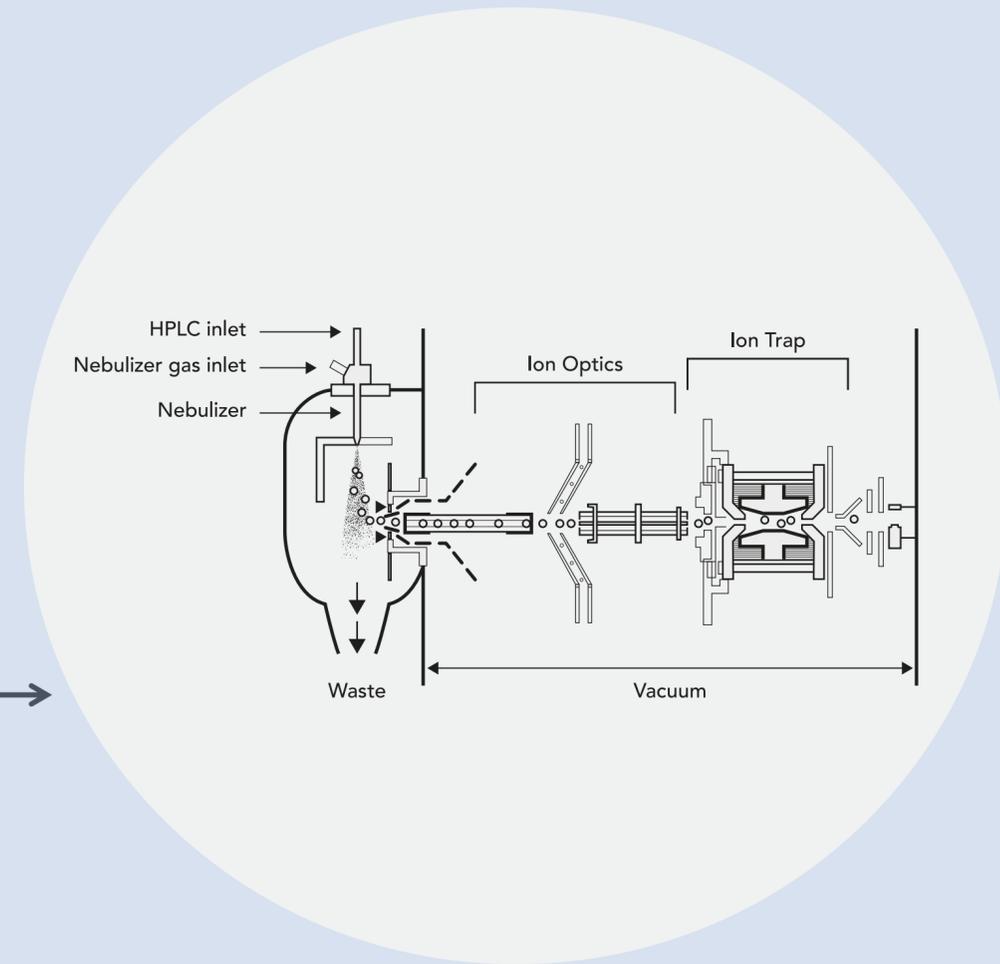
In analysis and dispensing of body fluid for diagnosis and treatment



Ceramic Quadrapole Spacers



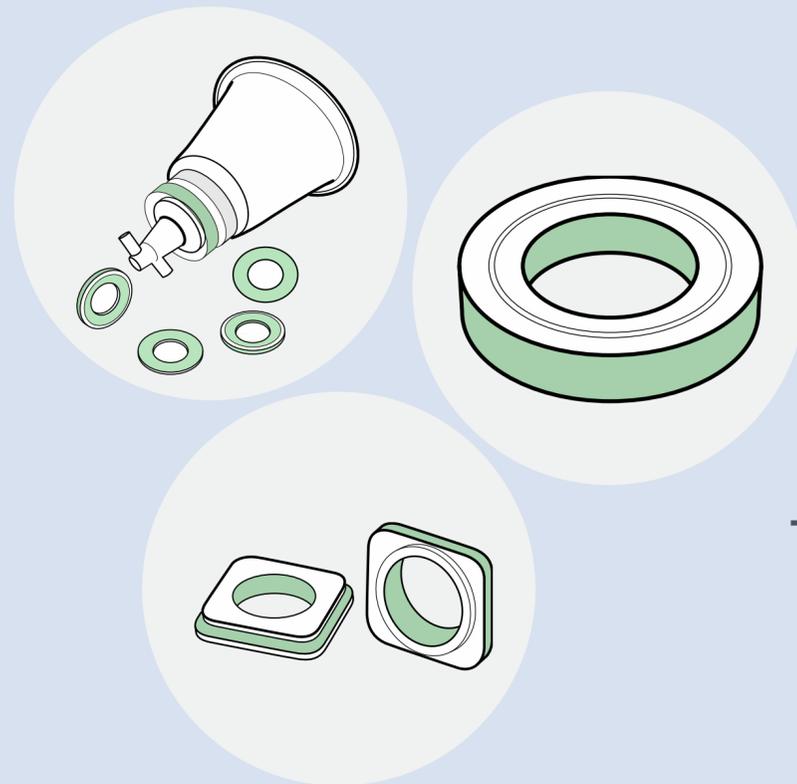
Ceramic Metalized Orifice Assembly



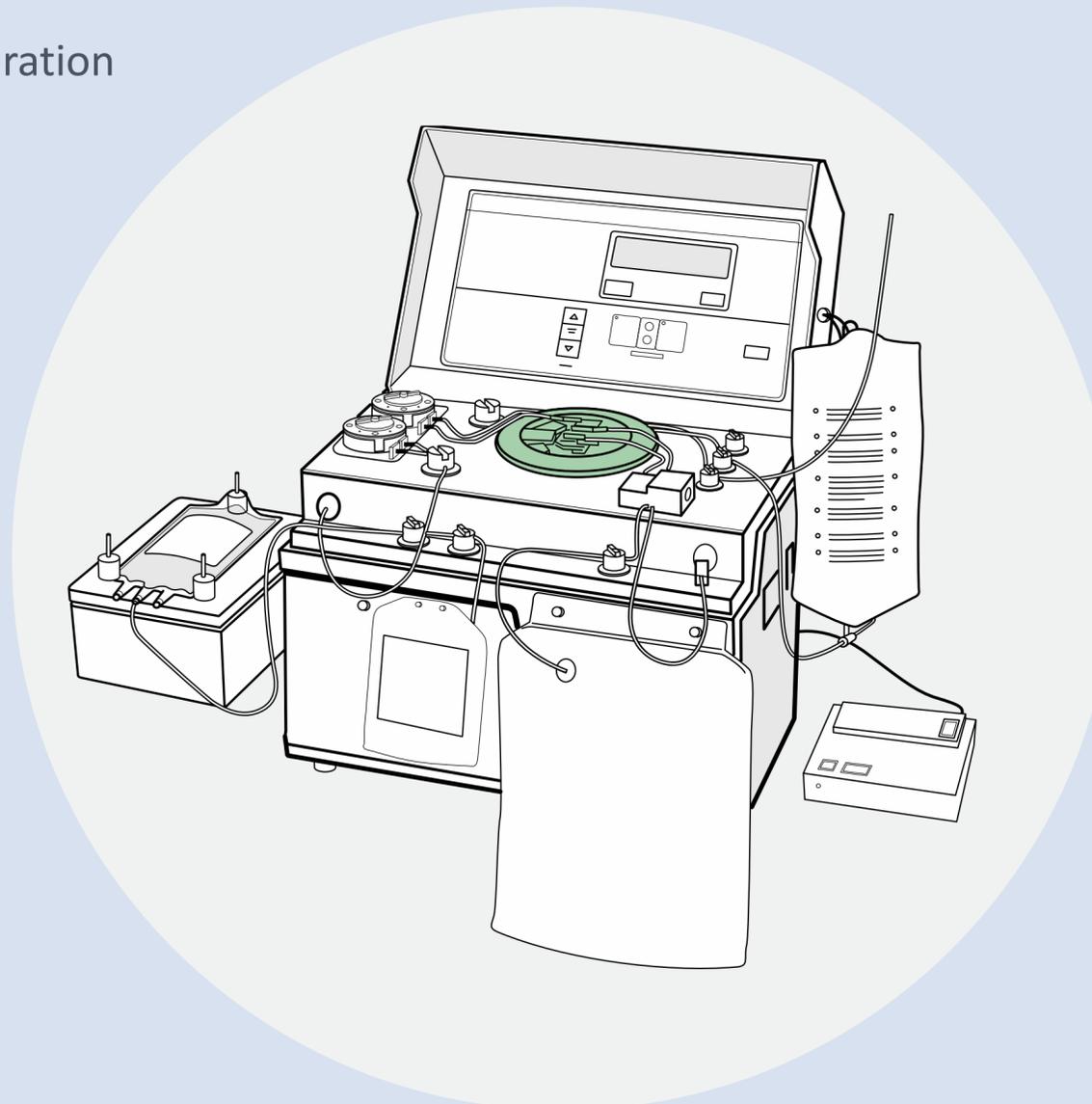
1. Robust ceramic materials for longer-life solutions
2. Custom engineered material solutions for improved analysis quality
3. Tight-tolerance components increase equipment precision and reduce analysis time

Analytical and Diagnostic Equipment: Haematology

- 1. Improved ceramic wear characteristics for safer seals
- 2. High quality material surface finish for low-friction operation
- 3. Volume manufacturing to support one-time use



Haematology Ceramic Seals



Through our healthcare strategy, we expect to continue delivering above market growth

- In a demanding healthcare solutions market, Morgan's portfolio of biocompatible materials, expertise and customer focus drives future growth
- Our innovation roadmap has expanded our new business pipeline 5x over last 4 years
- Continue to partner with customers and search for new growth opportunities:
 - Organically through application adjacencies and new geographies
 - Inorganically with bolt-on of unique material and process technologies to unlock incremental value

Faster Growing Deep-Dives Clean Energy and Clean Transportation: Driving the Clean Energy Transition

Damien Caby, President Thermal Ceramics

Clean Energy and Transportation

An exciting growth sector where we expect to deliver above market growth

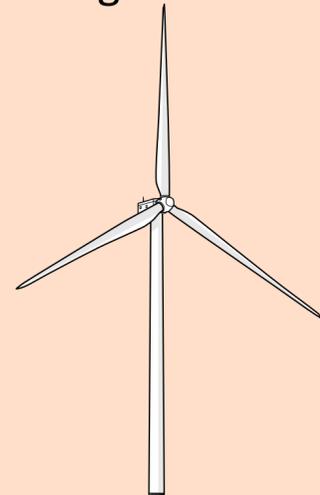
Clean Totals

9%
CAGR 21-25

£430m
Addressable
Market 2025

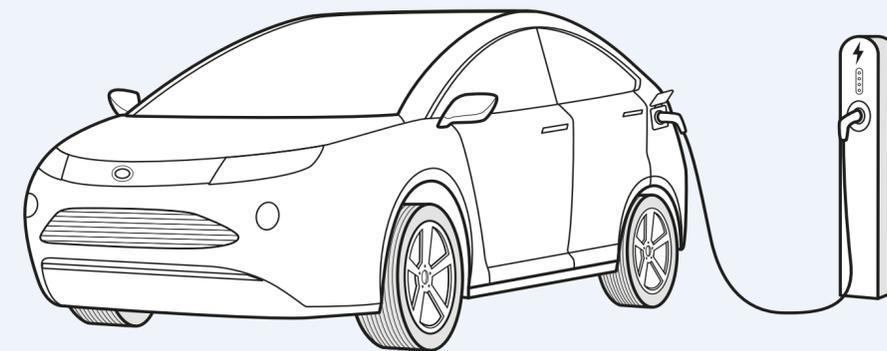
Clean Energy

- Decade of rapid renewables growth, led by solar (19% CAGR) and wind (13% CAGR)
- Intermittent power generation requires large scale power storage



Clean Transportation

- Massive rail electrification and EV transition in the drive to net zero
- Urbanisation driving expansion and modernisation of metro rail systems



Competitors

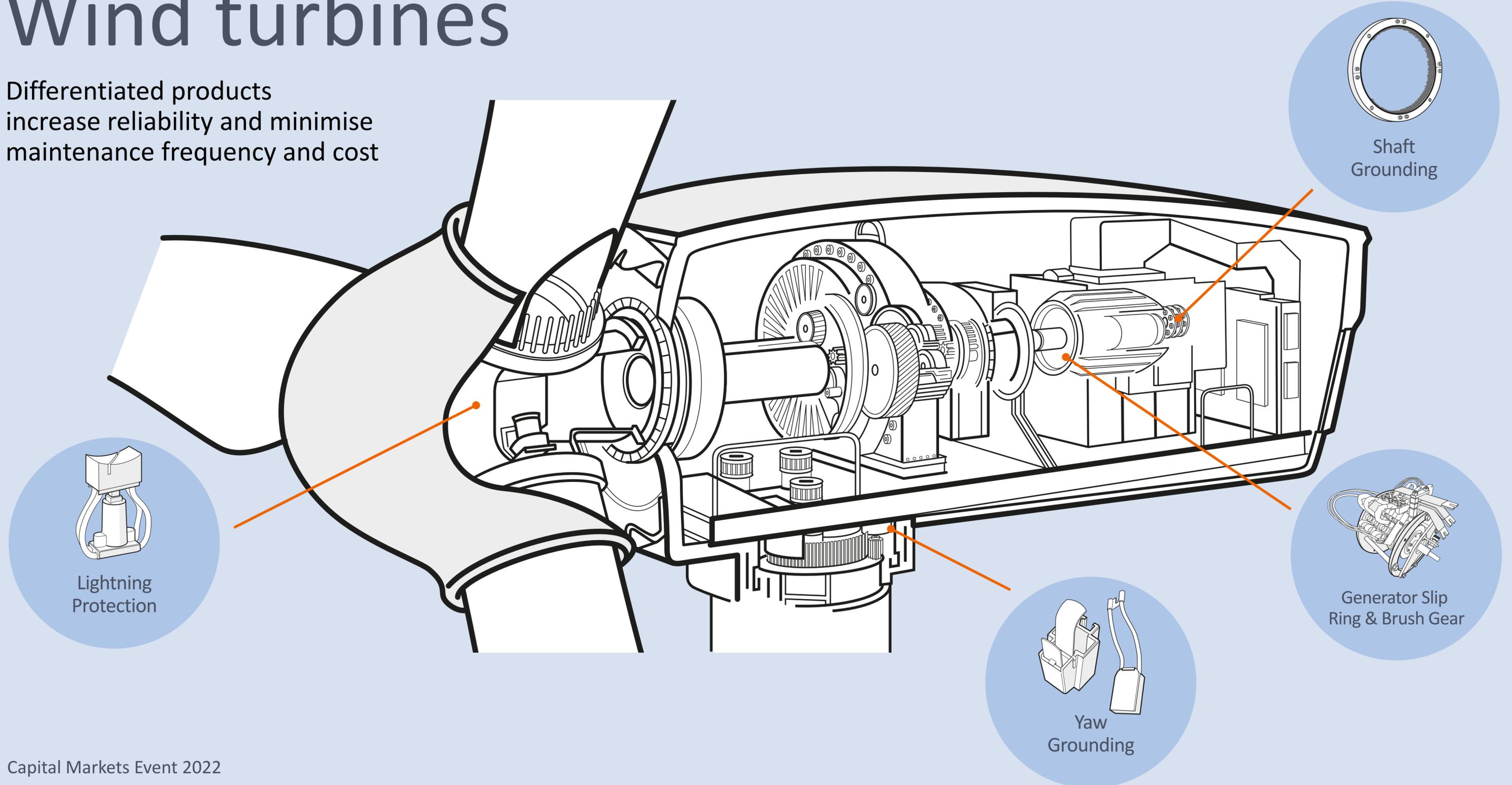


Morgan in clean energy, energy storage and clean transportation



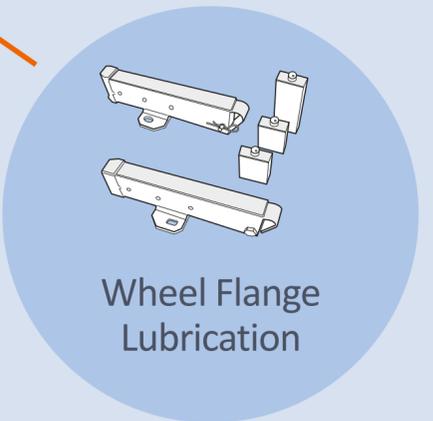
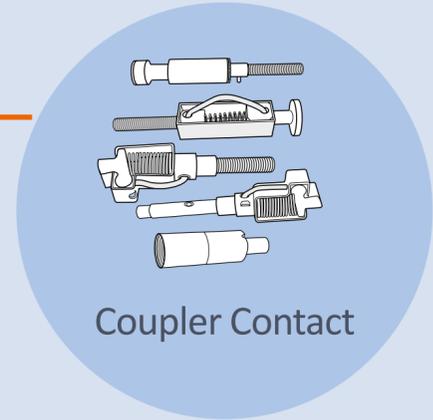
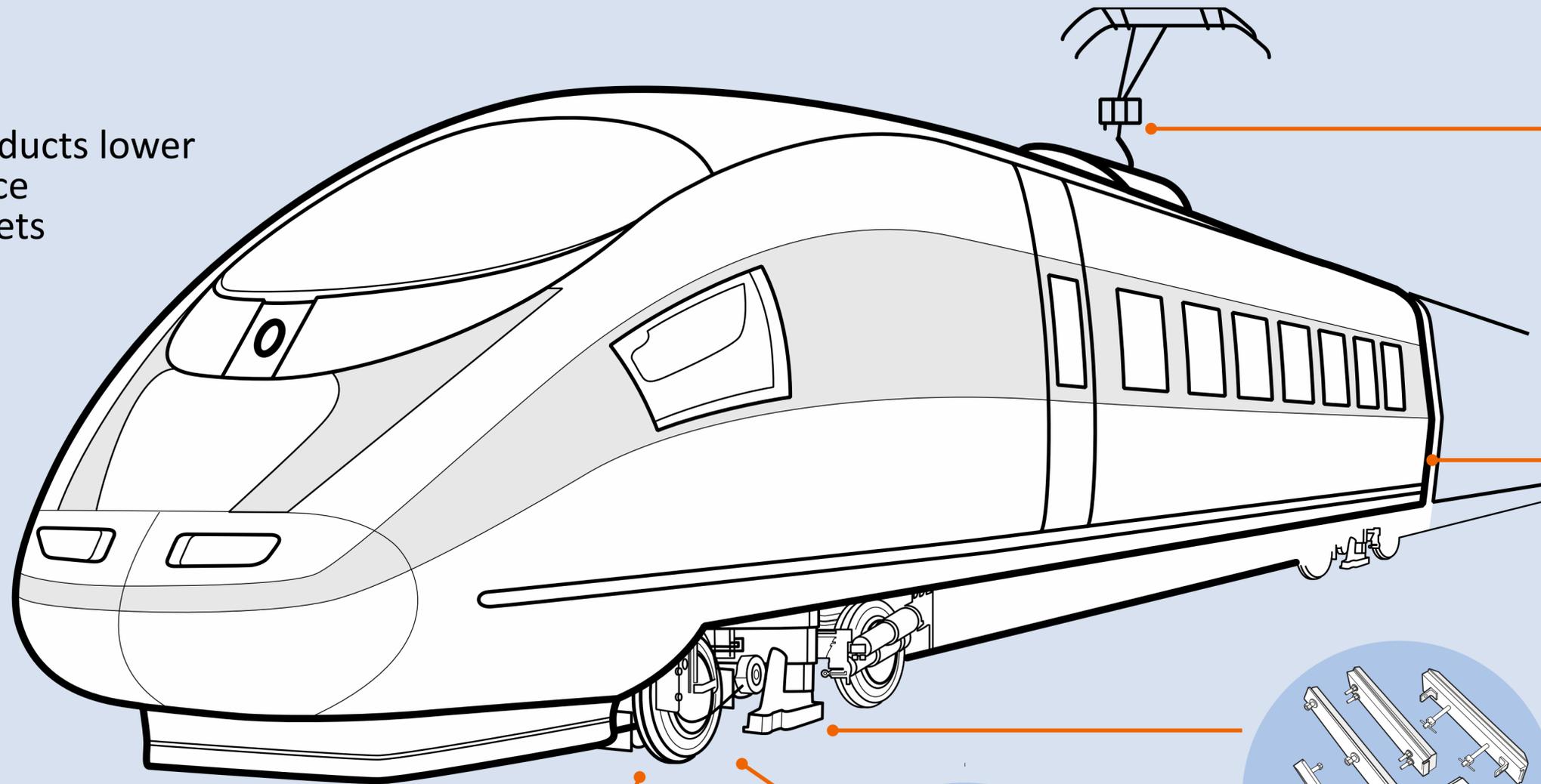
Wind turbines

Differentiated products increase reliability and minimise maintenance frequency and cost



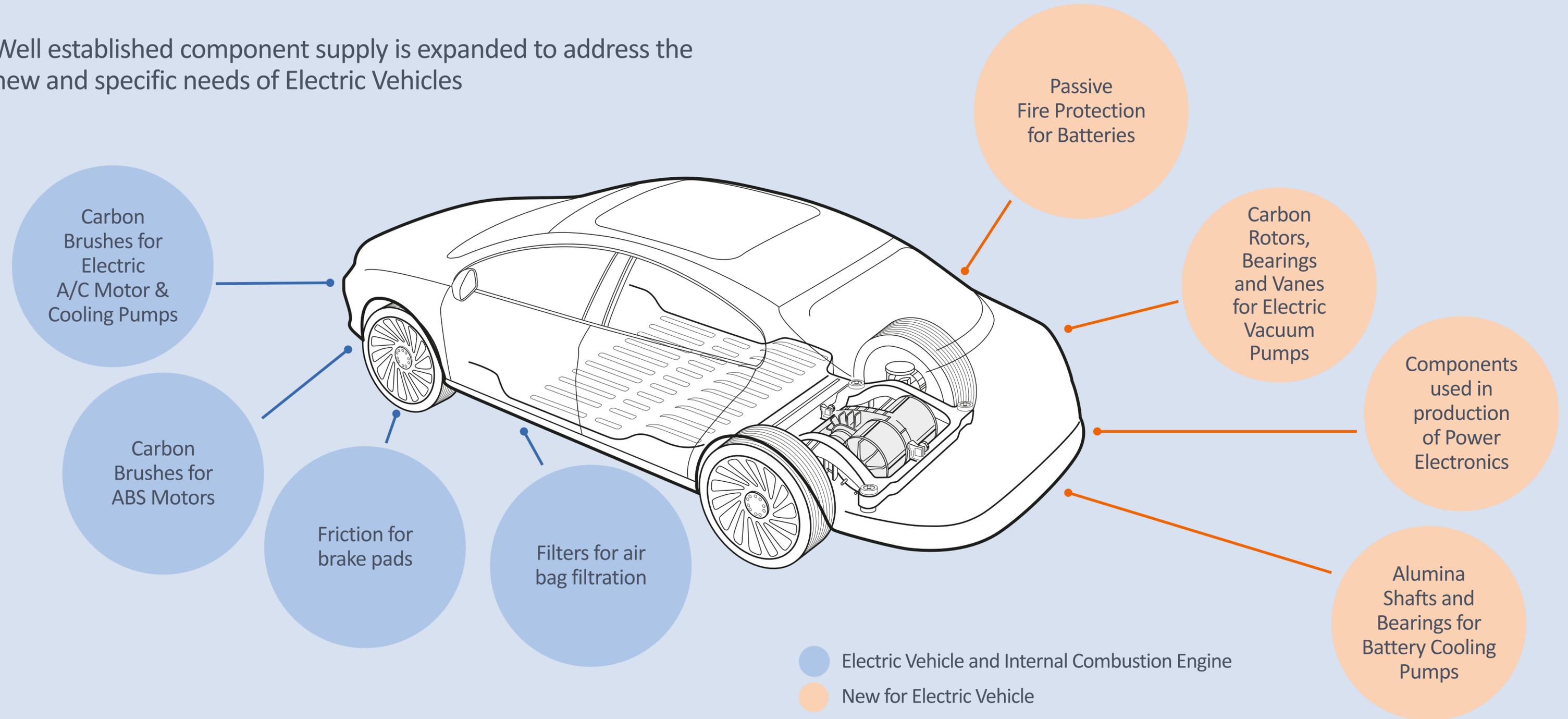
Rail

Highest performing products lower operational costs, reduce destructive current upsets and minimise ongoing maintenance costs



Automotive

Well established component supply is expanded to address the new and specific needs of Electric Vehicles



Through our clean energy and transport strategies, we expect to continue delivering above market growth

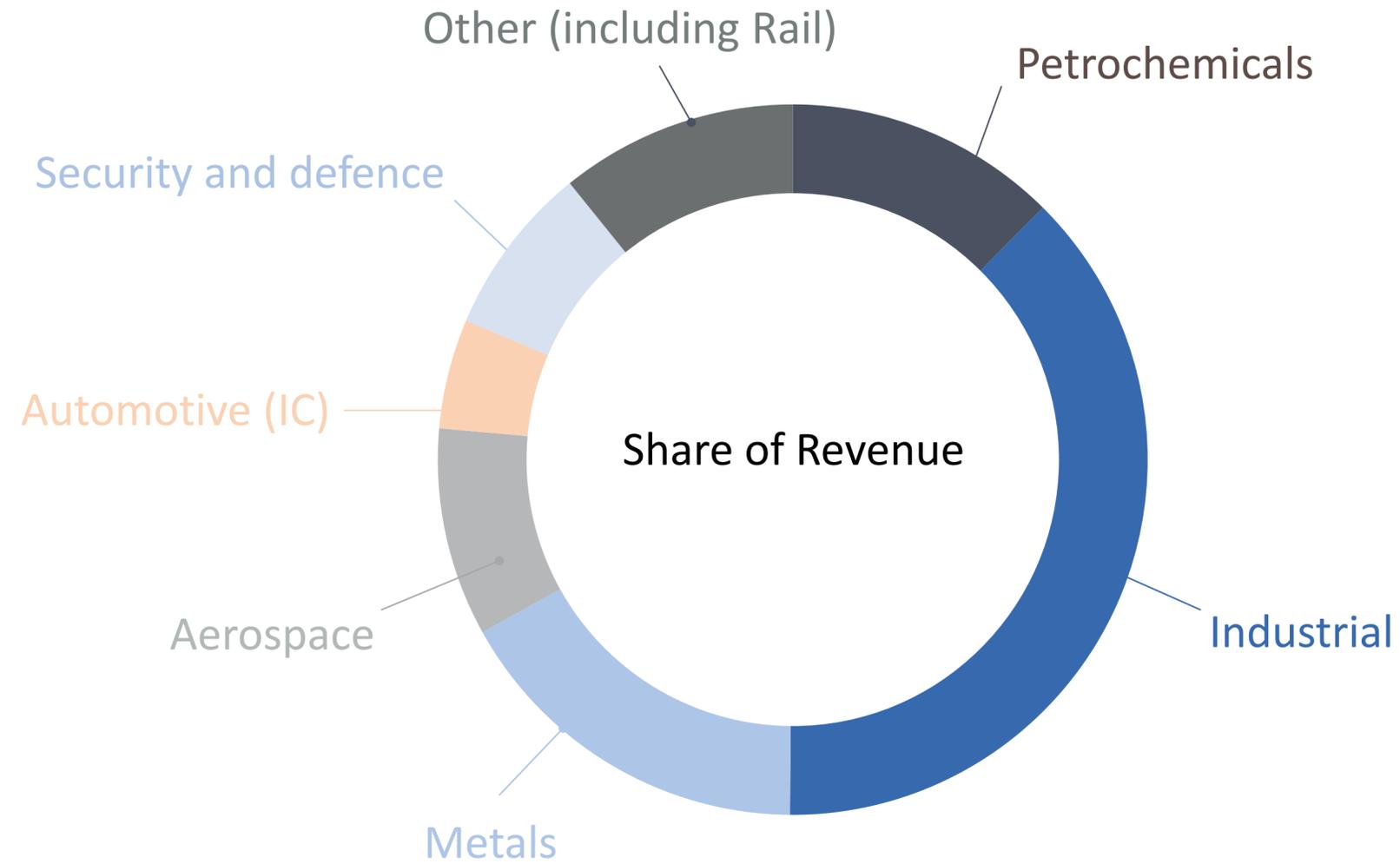
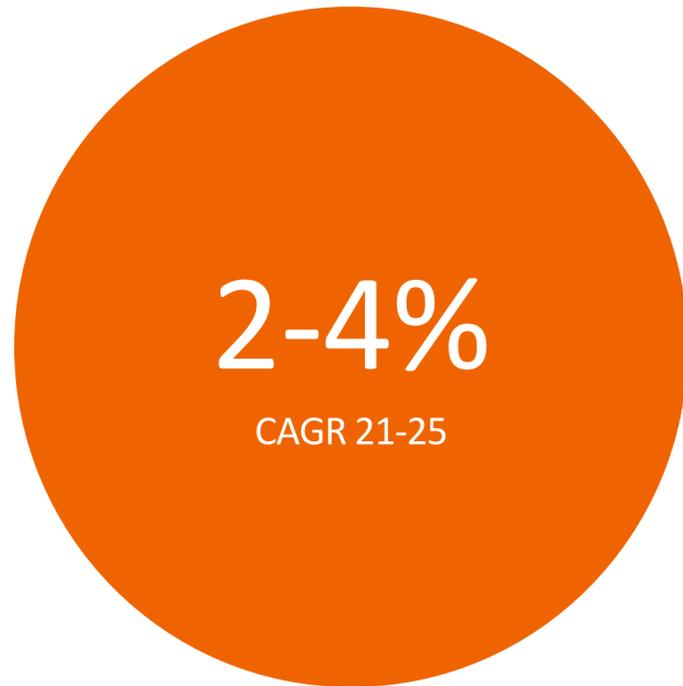
- We are design partners for our customers
- We invest in end applications testing
- We develop and offer novel, technically differentiated materials
- We keep in close contact with the markets developing innovative new solutions
- We continually invest in expanding our capacity to meet growing demand

Core: Improving the Sustainability of Global Industry

Damien Caby, President Thermal Ceramics

Our core portfolio

Core portfolio is diversified and differentiated with all markets forecast positive growth outlook



Competitors

Thermal

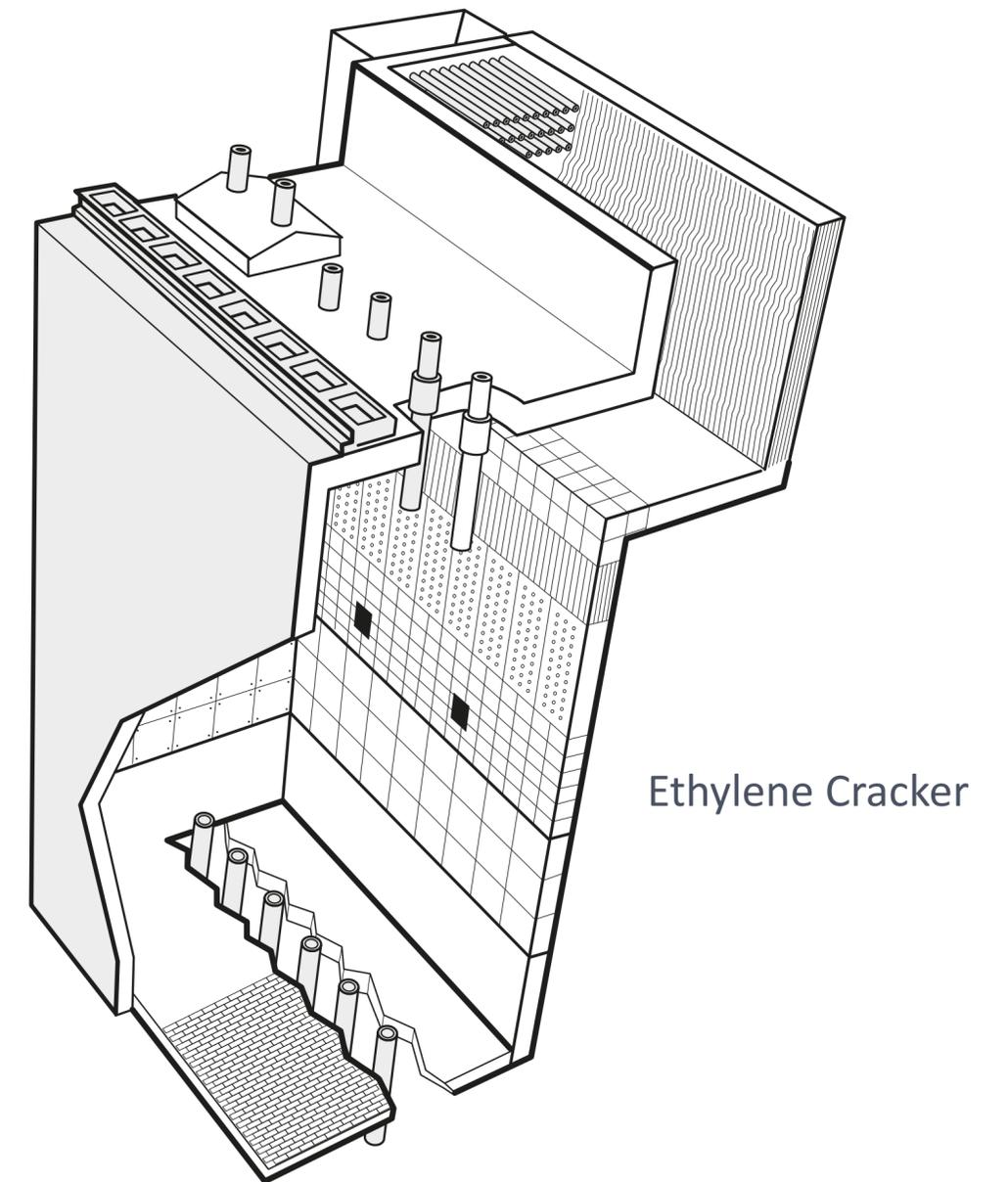
Carbon

Technical

Thermal Management Solutions for the Petrochemical Industry

We engineer high temperature insulation solutions from a wide range of materials to maximise throughput efficiency and minimize carbon footprint

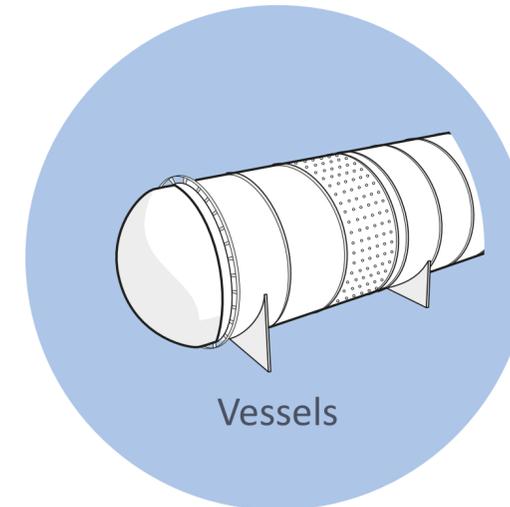
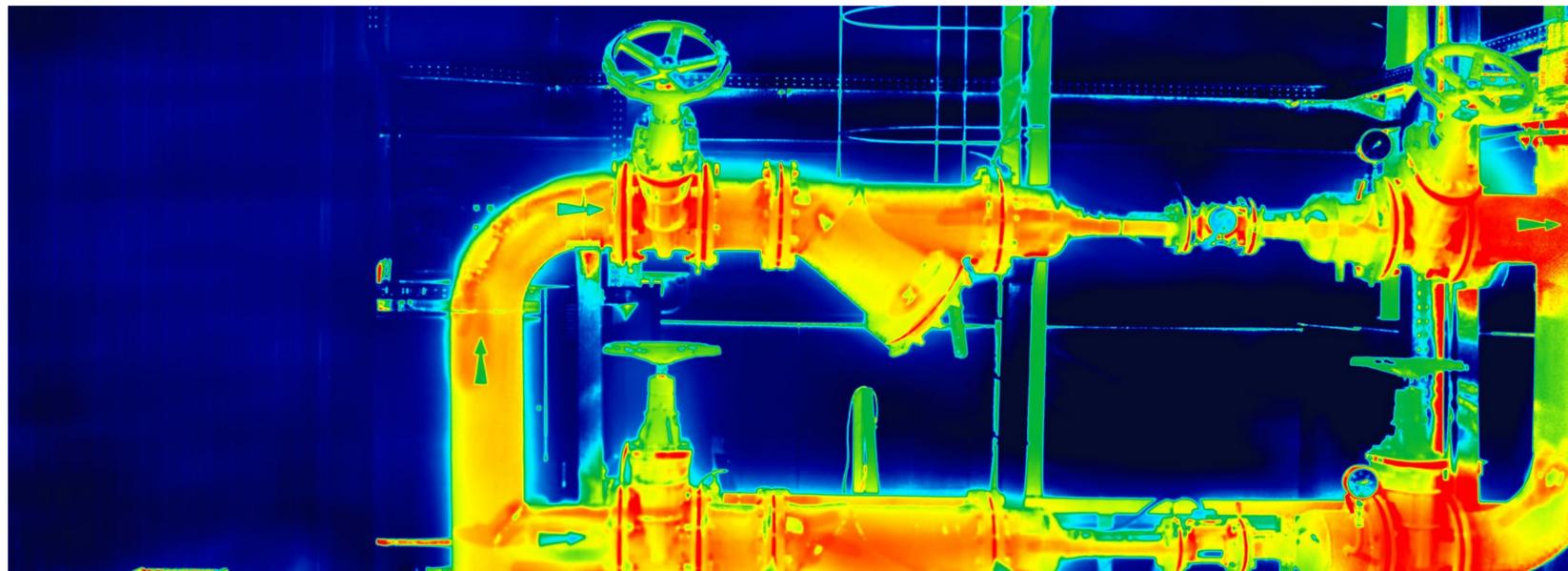
- Insulating Fire Bricks
- Mortars and Coatings
- Pyro-Bloc™ fibre Modules
- Folded and Stack fiber modules
- Monolithics / Castables
- Insulating blocks & Microporous
- Fibre Blankets and Papers
- Vacuum Formed Shapes



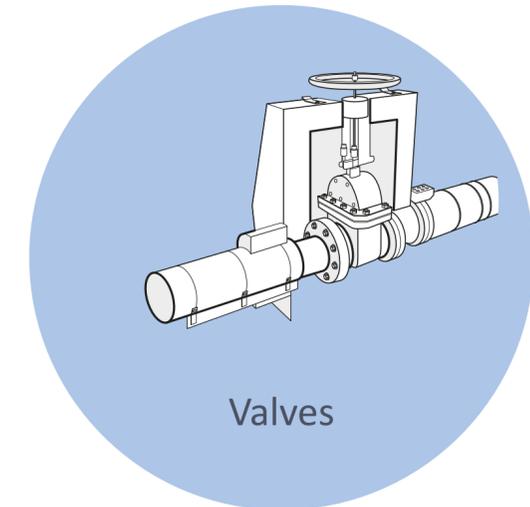
Fire Protection for Life and Assets

We combine industry-leading refractory insulation materials and thermal design expertise into fire protection products that provide evacuation time and asset protection against catastrophic structural failure

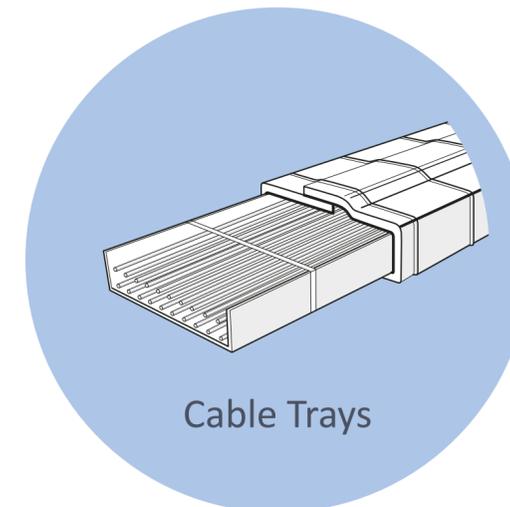
Thermal Design and Engineering



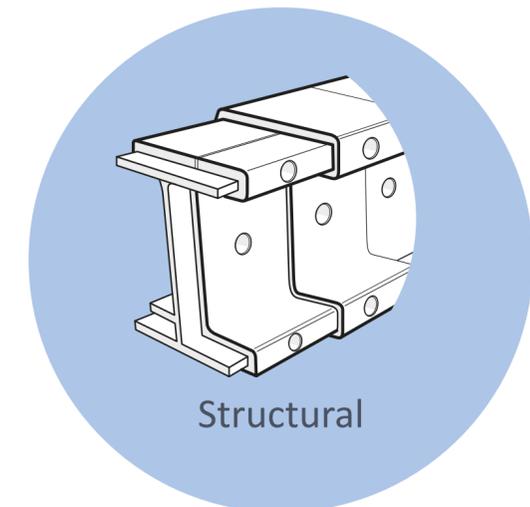
Vessels



Valves



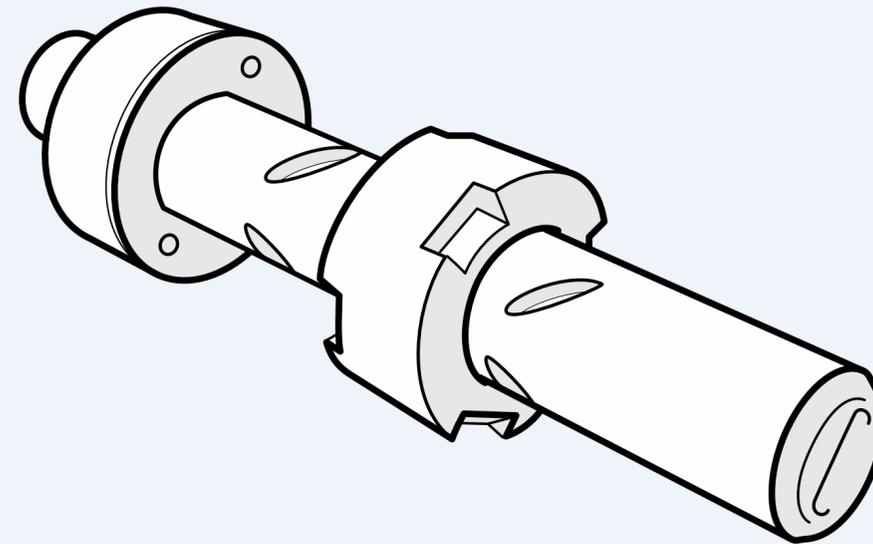
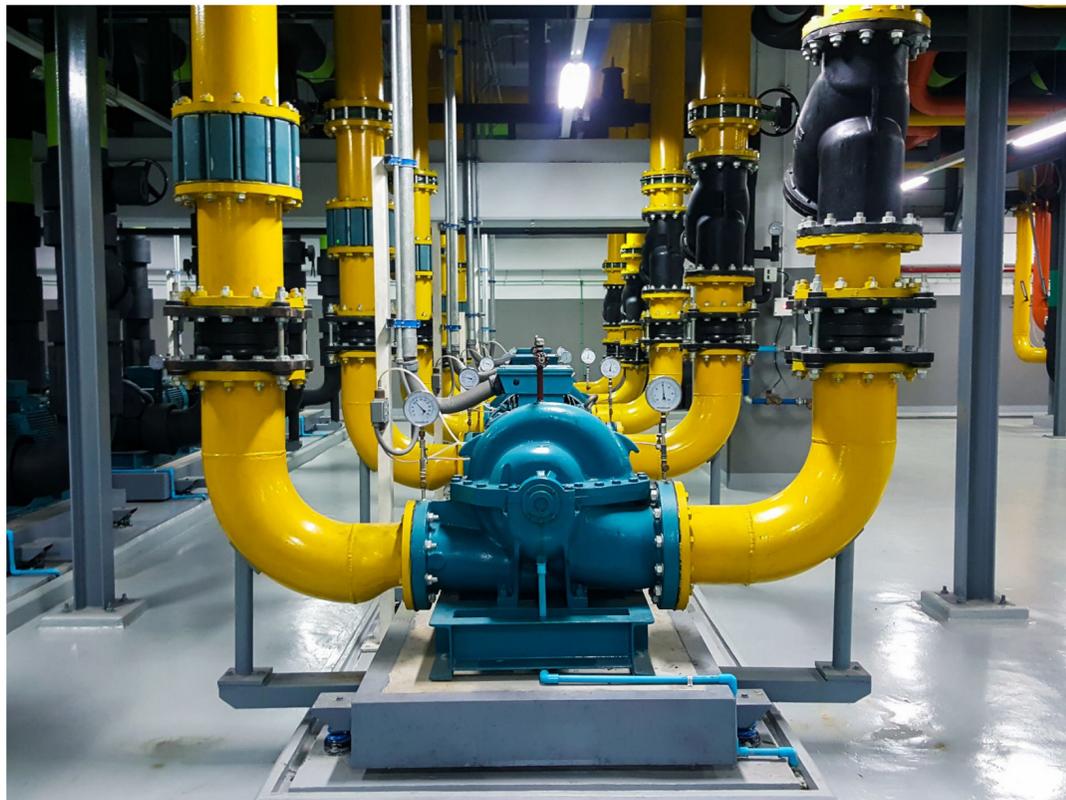
Cable Trays



Structural

Load Bearing Systems for Pumps

We design from long lasting material combinations and manufacture to tight tolerances full load bearing systems to increase reliability and reduce energy consumption



Ceramic Shaft and Bearings

Our core business will remain strong and outgrow its underlying markets

- Our core markets are growing, diverse and resilient
- We hold leading market positions with strong customer loyalty
- We continuously develop new solutions in collaboration with our customers by combinations of our broad portfolio and new materials
- We are well placed to increase our market share with bespoke insulation systems for the specific needs of the low carbon economy

Key Takeaways

Pete Raby, CEO

Summary

We have transformed the business over the last 7 years. The business is better performing and more resilient.

Our investment proposition is clear:

1. We are well positioned in attractive, growing markets
2. We have leading, differentiated products
3. We are providing sustainable solutions to support the energy transition
4. We are resilient, delivering attractive through cycle returns

We have a clear capital allocation framework to prioritise growth and returns and a clear medium term financial framework for our performance through the cycle:

- 3-6% organic revenue growth
- 12.5-15% adjusted operating profit margins
- 17-20% return on invested capital

This organic performance plus M&A or additional shareholder returns will deliver enhanced EPS growth.

All delivered within a clear capital allocation framework prioritising growth and returns, whilst maintaining a strong balance sheet.

Q&A

Contact

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morganadvancedmaterials.com