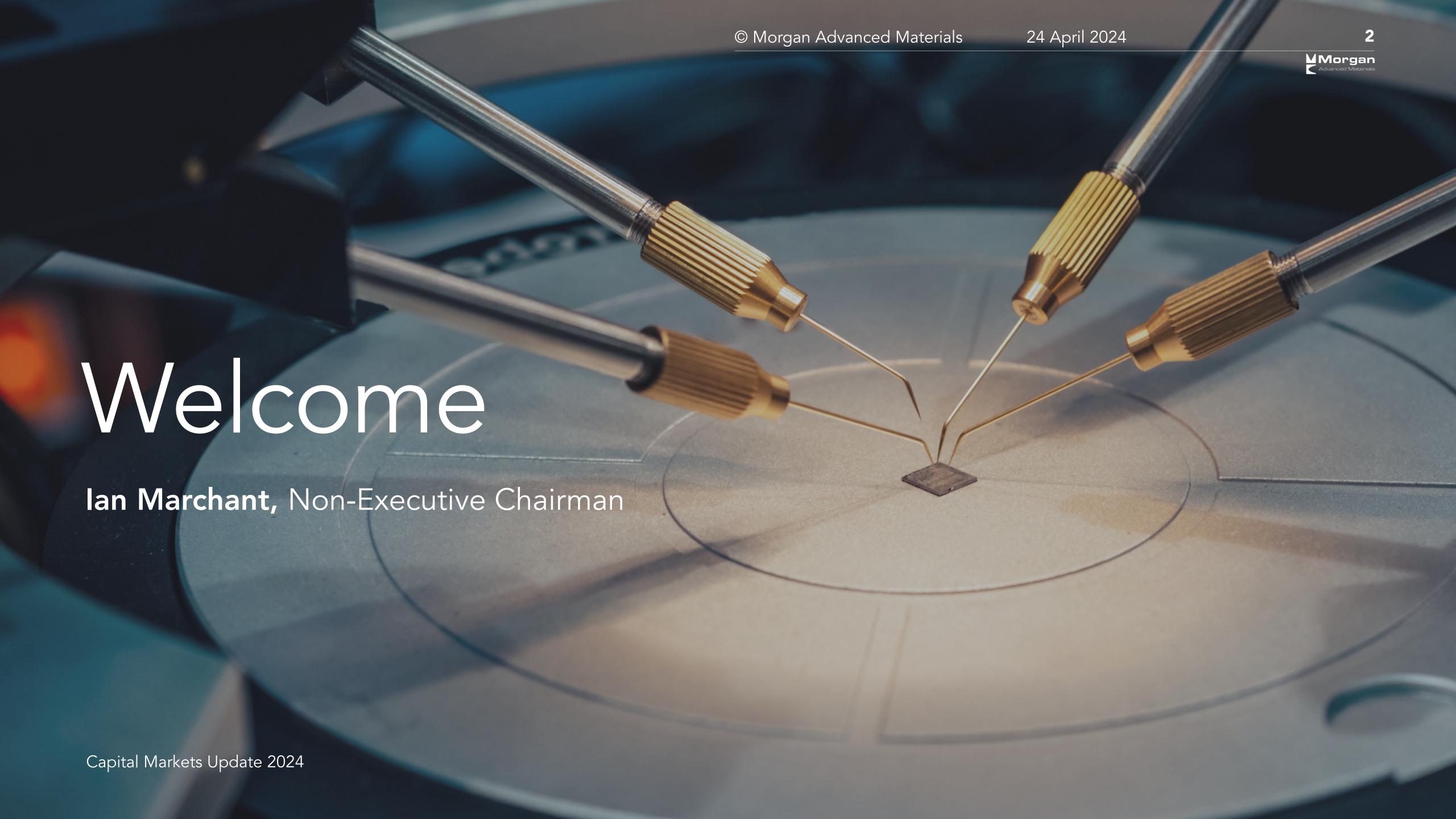
Capital Markets Update

# Accelerating Growth

Morgan Advanced Materials 24 April 2024







# Agenda

1. GROWTH, INVESTMENT AND RETURNS

Pete Raby, CEO



Richard Armitage, CFO

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2. OUR MARKET **POSITIONS** AND GROWTH

FASTER GROWING MARKETS – **SEMICONDUCTOR OPPORTUNITY** 

Wendy Pryce Lewis, Performance Carbon



CORE GROWTH -AEROSPACE, FIRE PROTECTION AND INDIA

John Righini, Technical Ceramics



Damien Caby, Thermal Products



**CONCLUDING REMARKS AND Q&A** 

Close and Drinks



## What we do

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

We create value through our long-term, trusted, relationships with customers and an extensive understanding of their needs

We use our deep materials expertise, R&D and testing capabilities and considerable production know-how to produce differentiated products that are integral to our customers processes and products

We have differentiated positions in our Faster Growing Markets: Semiconductors, Healthcare, Clean Energy, and Clean Transportation and across our Core Markets that we expect to grow strongly supporting robust organic revenue and profit growth



# Our investment proposition is stronger

Organic growth

Our organic growth will be towards the higher end of our 4-7% range over the next four years

2.Simplification

We have simplified the Group to improve our support to customers and reduce costs 3. Margin progression

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Margins are well underpinned and will progress towards the top of our 12.5%-15% range

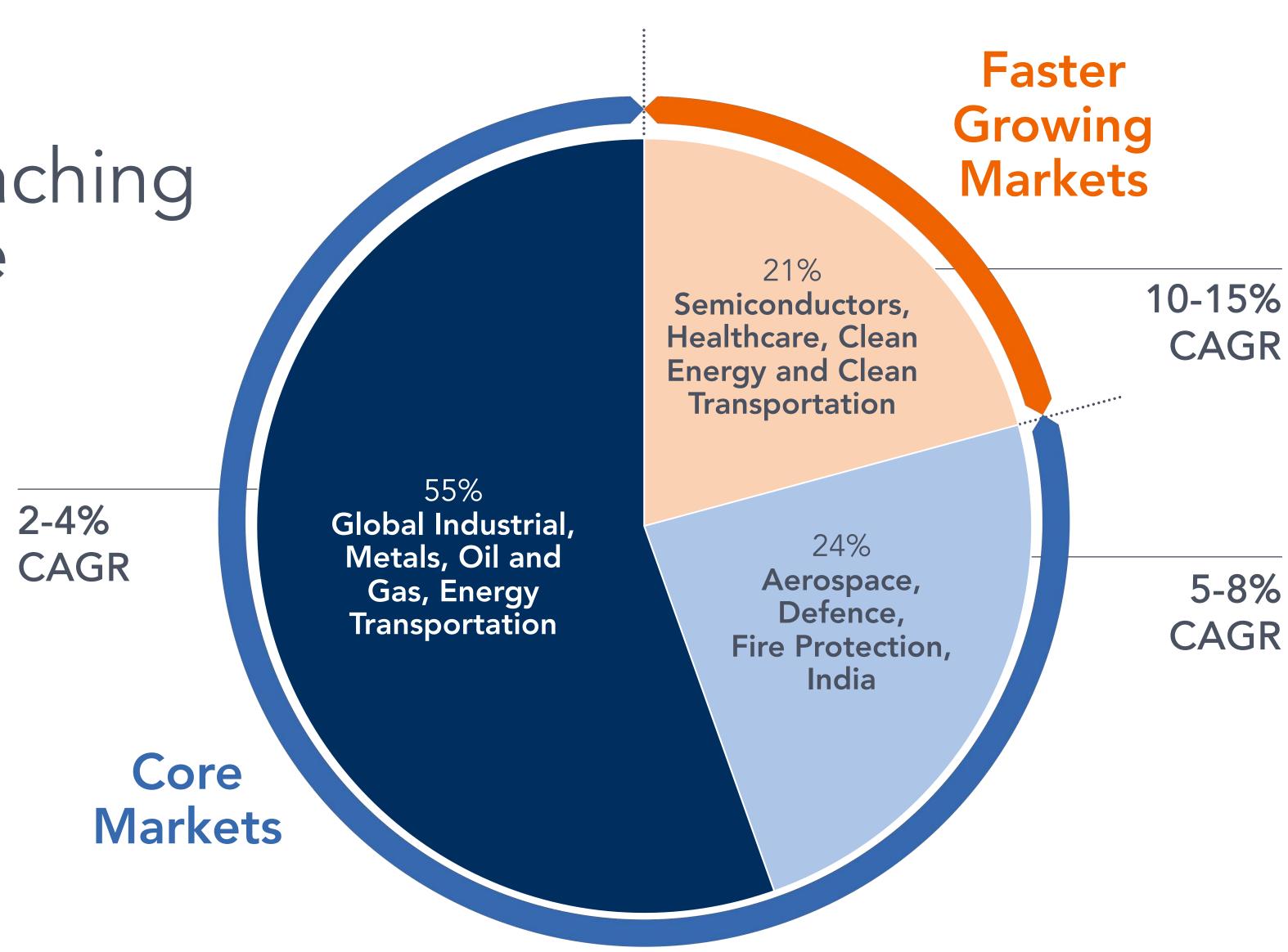
4. Capital allocation

The balance sheet is strong enabling us to fund rapid organic expansion and M&A

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High Growth Markets approaching 50% of revenue



### 1. Organic growth

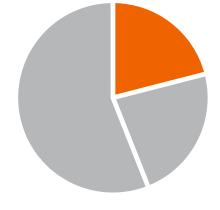
# Growth accelerating in semiconductors

Semiconductor revenues are 50% wide band gap SiC power electronics and 50% conventional processors and devices

There are robust drivers for semiconductor demand:

- The energy transition: Growth in electric and hybrid vehicles and grid power conditioning
- Digitisation: The ongoing digitisation and networking of devices
- Al: The growth in Al applications

Faster Growing Markets:

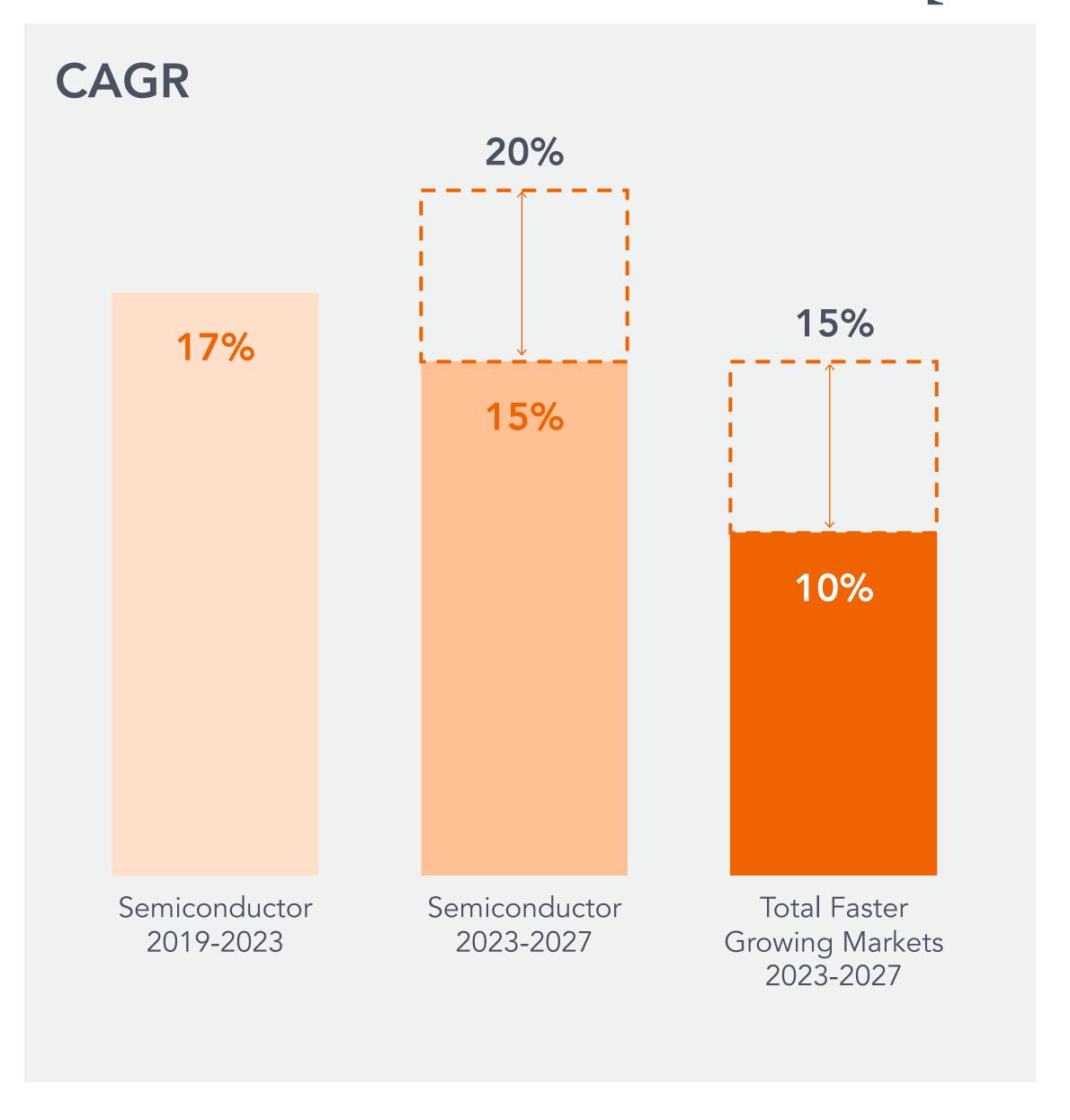


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### 1. Organic growth

# Core growth well underpinned

We expect Core to grow at or above the top of our guided 2-4% growth range driven by four Core markets representing around one third of our Core business:

- Aerospace
- Defence
- Fire Protection
- India

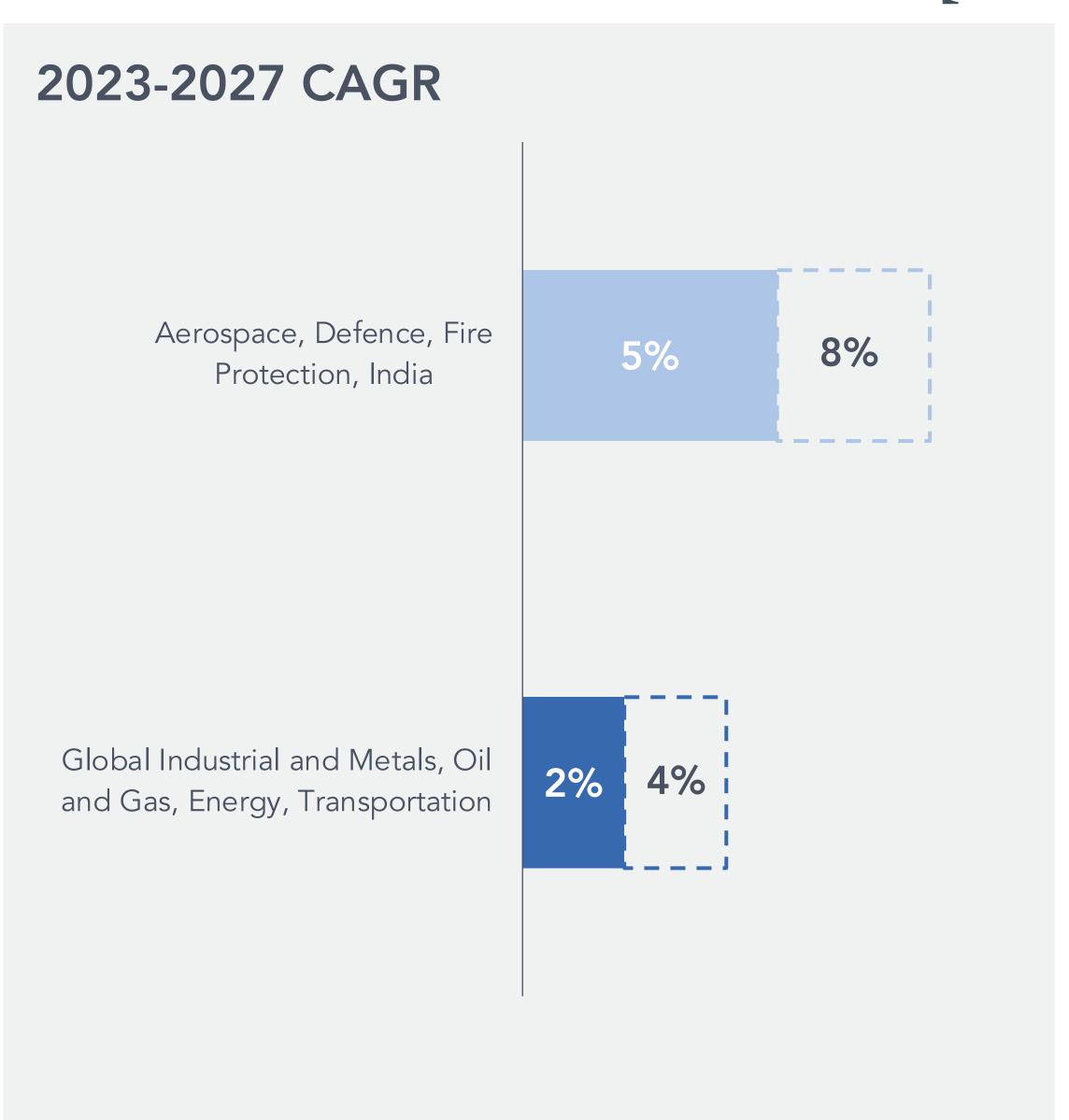
Core Growth Markets:

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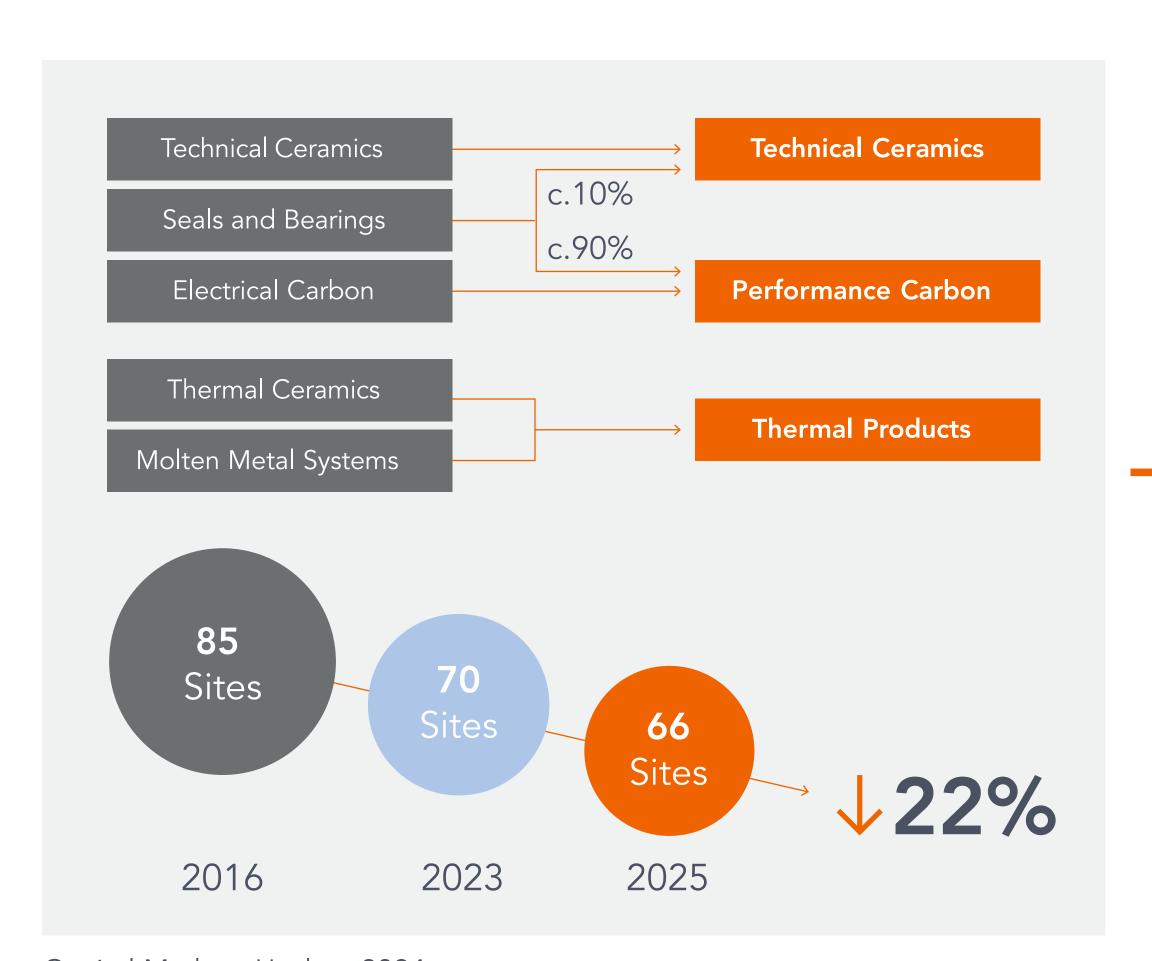
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### 2. Simplification

## Business simplification & cost savings



### Commercial & operational benefits:

- More efficient leadership structure, combining equivalent assets and processes
- Resources focused on most attractive growth opportunities
- Footprint optimisation allowing for more flexible use of capacity

#### Cost benefits:

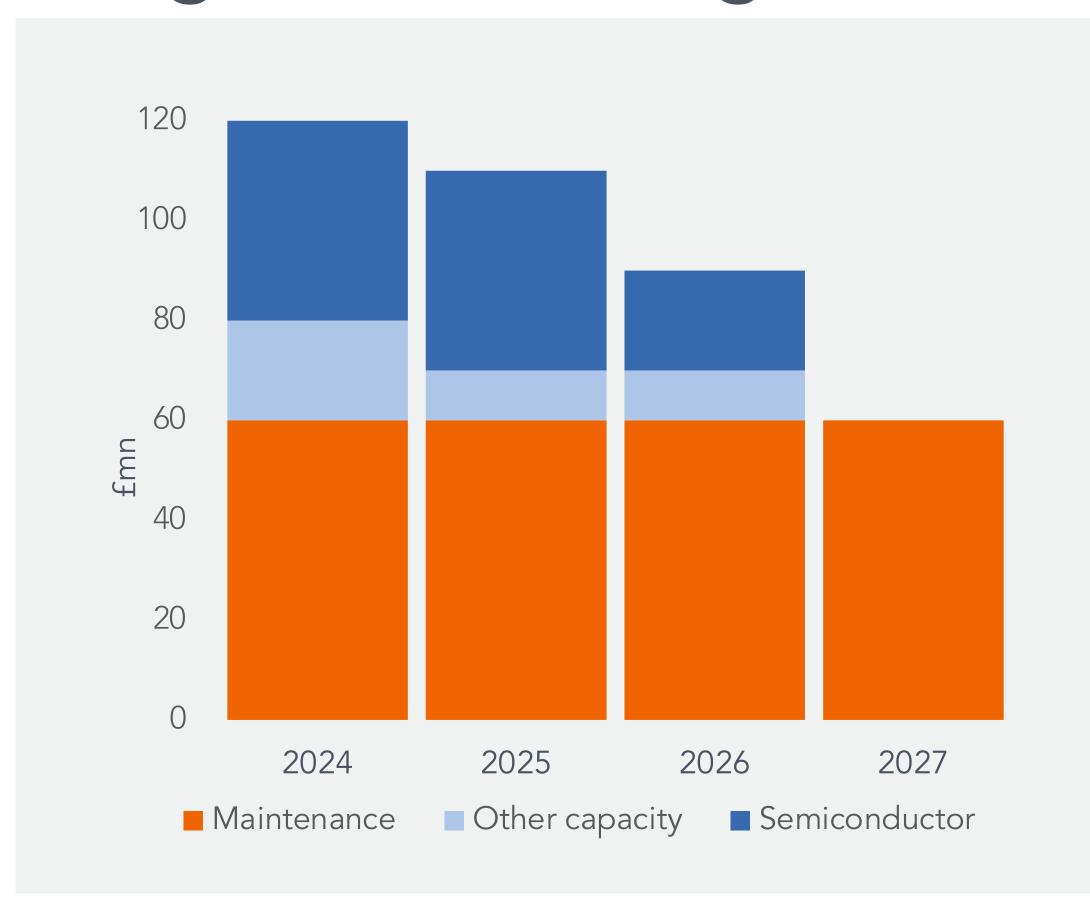
- Closure of four sites
- Savings of £10m per year
- £20m implementation costs
- Back-office and other simplification benefits

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### **Morgan**

### 3. Margin progression

# Efficient capital investment driving margin and strong returns

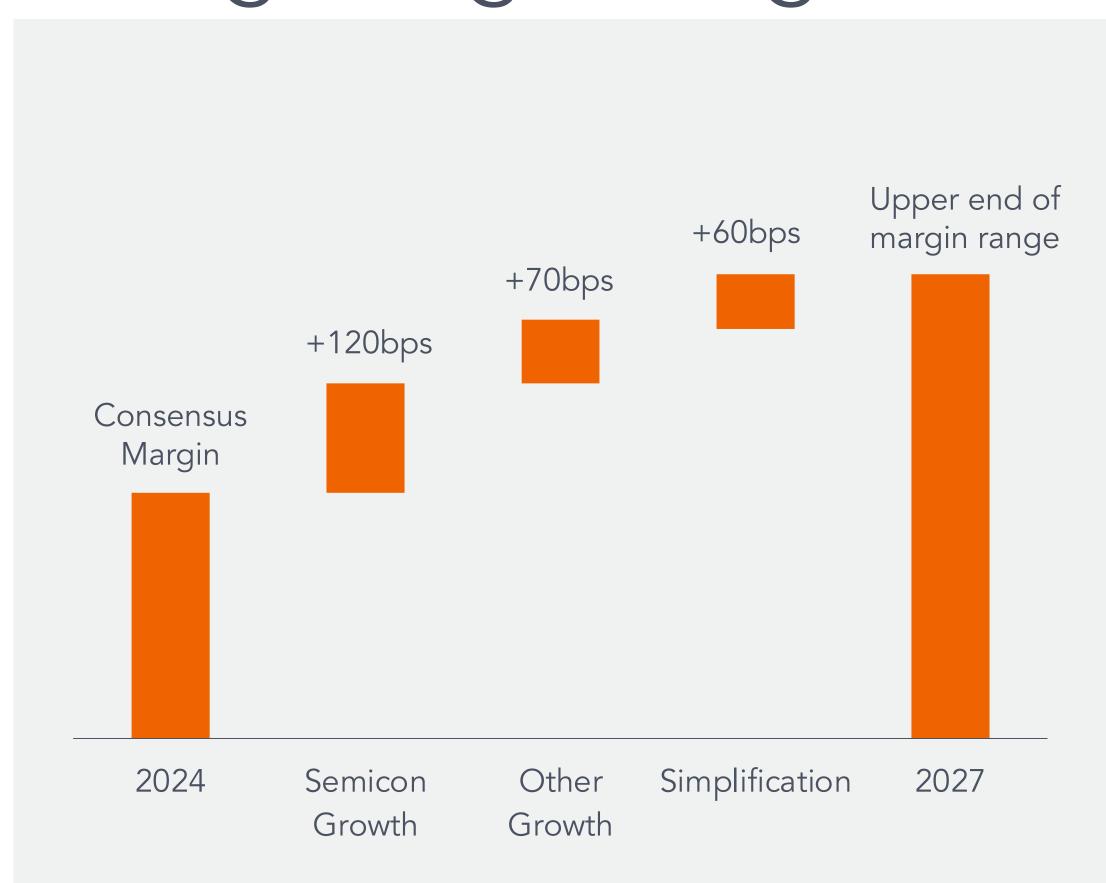


- Investment of £100m in Semiconductor capacity over 3 years, incremental investment at existing sites giving minimum 25% ROI
- Other capacity investment in Faster Growing Markets and Core estimated at £40m with minimum 20% ROI
- Maintenance capex at c.1.2x depreciation, includes ongoing enhancement to environmental footprint



### 3. Margin progression

## Confidence in continued margin progress through target range



- Semiconductor growth adding a minimum £80m of revenue and £25m of profit
- Other growth c.50% capex backed
- Simplification drops through by 2027
- Inflation continues to be recovered through continuous improvement and pricing



### 4. Capital allocation

### A&M

In depth strategic analysis refining our extensive pipeline list from 187 potential targets to 6 in discussion

### A disciplined approach to selection:

- Component manufacturers
- Access to faster growing markets
- Operations in US, Europe, Asia
- Unlikely to be a pure consolidation/synergy play
- Must add technical/product capability and/or enhance supply chain

#### Robust financial metrics:

- Attractive growth potential
- Financially stable with potential to enhance Segment margin
- ROI to exceed cost of capital in third full year
- Clear synergy cases developed
- Valuation range of current shortlist £25-£75m





### 4. Capital allocation

# Capital allocation prioritises growth and returns

1. Strong balance sheet

Removal of pension burden creates flexibility

2. Organic investment

Investment focused on growth and efficiency improvement

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3. Regular returns

Progressive dividend growth targeting adjusted earnings cover of c.2.5x

4. Inorganic investment

Returns to exceed cost of capital in third full year

5. Additional returns

Share buybacks as appropriate

Target leverage of 1.0x to 1.5x, or up to 2.0x post acquisition



# Upgraded financial framework

Delivering significant EPS growth	Clear through-cycle financial framework
Organic revenue growth	4-7% organic revenue growth (increased from 3-6%)
+	
Continuing profit growth	12.5% to 15% adjusted operating profit margin
+	
Accretive M&A	ROIC 17-20%
+	
Additional shareholder returns	Leverage of 1.0x to 1.5x, up to 2.0x post acquisition
Significant EPS growth	Enhanced EPS growth



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Faster Growing Markets

# Semiconductor opportunity

Wendy Pryce Lewis, Performance Carbon

### Introduction

Semiconductors is a fast-growing industry with exposure to several important macro drivers where we are at the forefront

We make highly technically differentiated products to meet the demanding requirements of the semiconductor industry

We have driven qualifications and new business over the last +10 years, and we are now #1 or #2 in our spaces with high market share and highly qualified positions

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Investing £100m to grow capacity, in line with market growth, to generate £80m revenue and +£25m profit by 2027



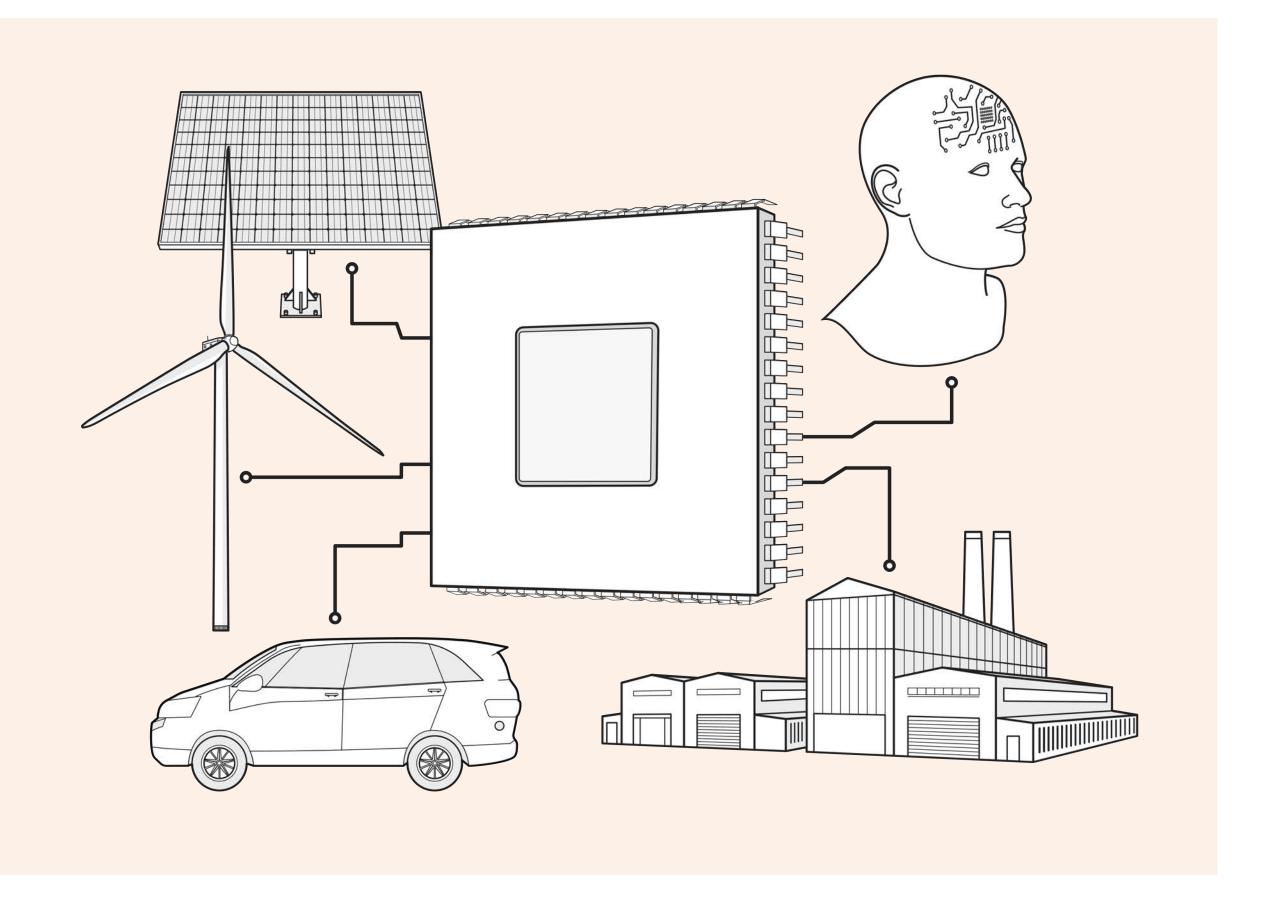
# A new phase of the digital revolution accelerating growth in Semiconductors

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## c.£4bn

Total graphite + ceramics market, 2027

- Our world is becoming more digitally-enabled, interconnected, and intelligent, powered by clean electricity
- Our materials are at the heart of this evolution





# Two attractive growth markets where Morgan's consumable products enable production of advanced wafers and chips

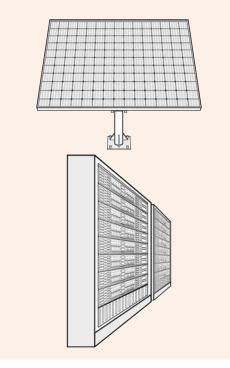
### 1. Silicon Semiconductor

# 11% CAGR 2023-27 Silicon semiconductor devices

- Growing macrotrends in digitisation, connectivity and Artificial Intelligence
- Development of new processing technologies for leading edge semiconductors
- Increasing investment in regional supply chain security and domestication of technology and manufacturing

### 2. Wide Band Gap (WBG) Semiconductor SiC & GaN

29%
CAGR 2023-27
WBG Power
electronics
devices



- Recent adoption in electric vehicles has proven viability, driven improved quality and reduced cost
- Growing end-market demand and penetration
  - Power conversion: EVs, renewable energy, power grids, industrial motor drives, AI & data centre power, consumer fast chargers
  - Telecommunications: 5G telecom infrastructure, satellite communications, radar

Sources: EY/IDC Worldwide Semiconductor Market Forecast, Yole Intelligence



# WBG power devices gaining share in growing end markets

Power conversion efficiency is the key driver for penetration of WBG power devices in growing end markets: including EVs, grid scale renewables, green industrial power and AI

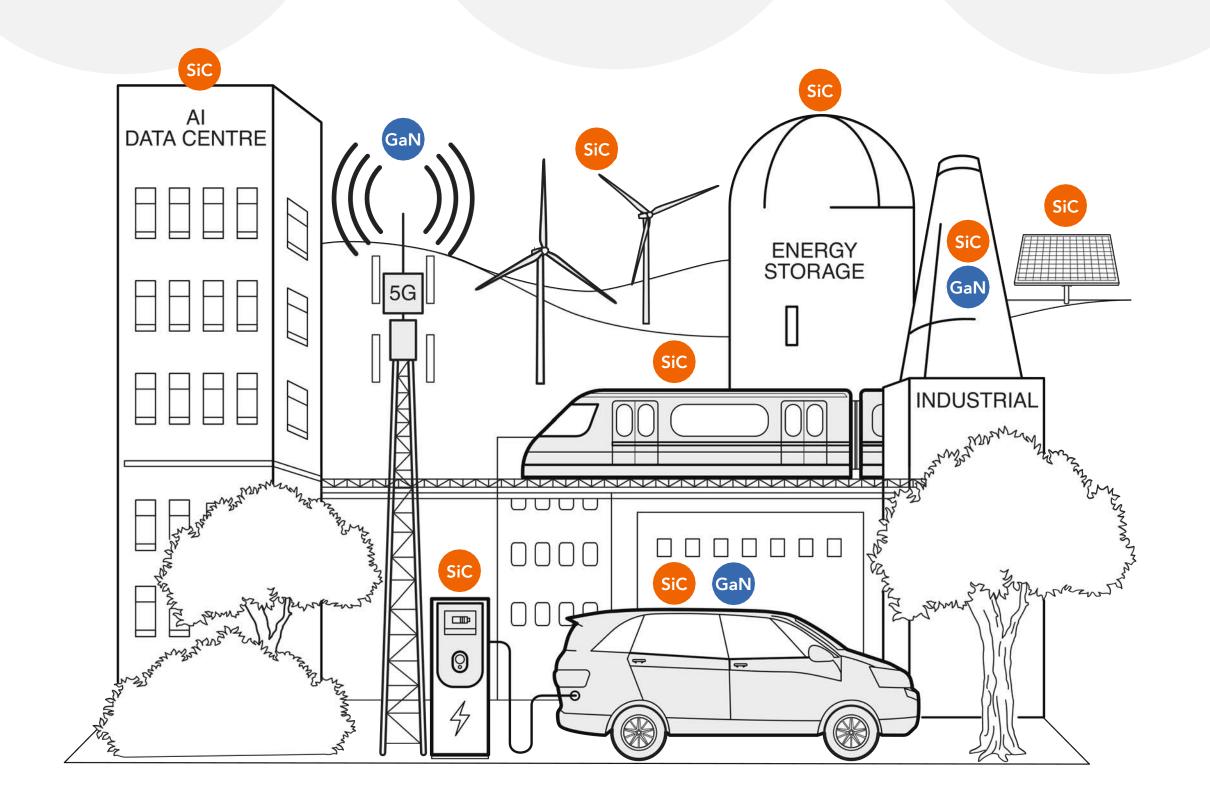
>6X
WBG power device market growth in last 4 years

20-26%

CAGR in end use markets, e.g. energy storage,

data centres

>30%
WBG share in power device market





# Our extensive portfolio is used across the value chain

We make components with advanced materials that our customers rely on to develop the world's most sophisticated chips

We benefit from the recurring sales of our highly qualified products:

- Our advanced material components are replaced with regular frequency and in some cases are consumed in the process
- We develop bespoke solutions with customers that require lengthy qualification processes

### Semiconductor technology







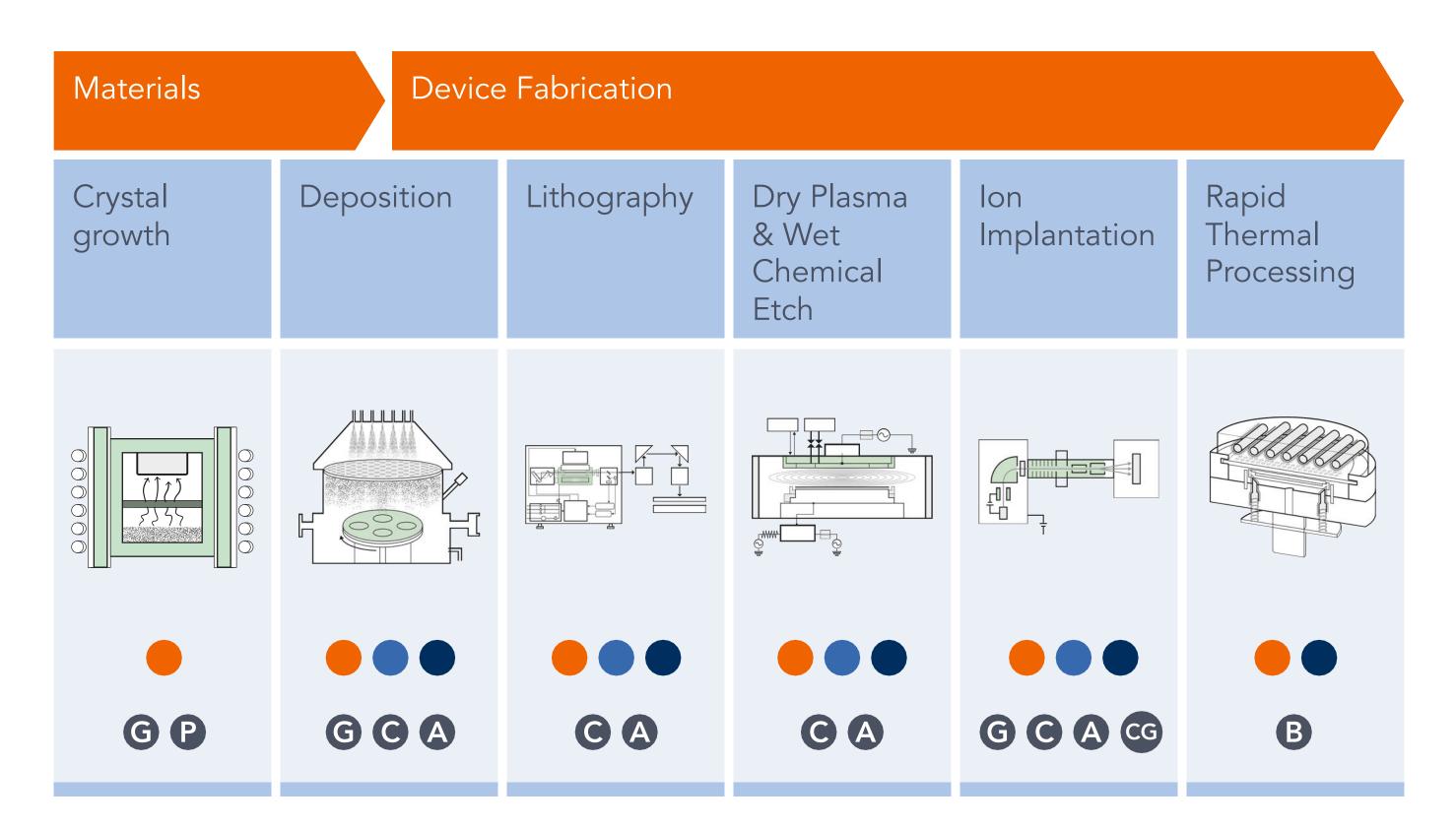
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G Graphite Solutions C CVD-SiC A Alumina B Brazed metal alloys P Purified source powders

**CG** Coated Graphite





## Value we bring our customers

### Two examples

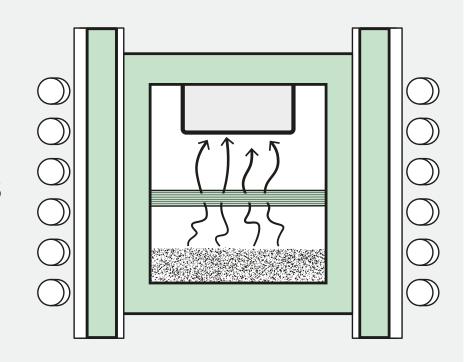
### SiC Crystal growth process

Morgan's bespoke products bring consistency and stability to improve crystal reproducibility and quality

> 80% of top wafer makers now use Morgan products to optimise yield and reduce cost of this process, several supported by long term supply contracts

### Our products include:

- Graphite high-temperature insulation
- Porous graphite membranes
- Isographite components
- Graphite and SiC source powders



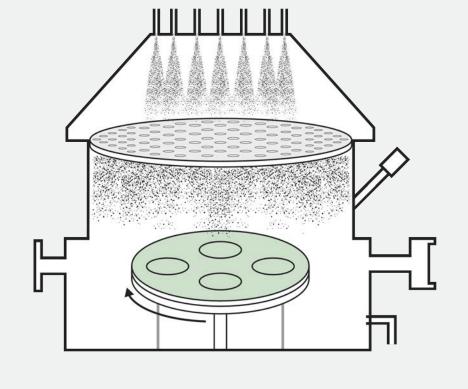
### **Epitaxial deposition**

Morgan's custom machined products enable improved consumable lifetime, reduced chamber downtime and optimised yield, with chemical compatibility and a high level of purity

Our CVD SiC chamber components are used in > 30% of today's SiC and GaN epitaxy reactors

Our products include:

- CVD SiC wafer susceptors
- Shield and chamber rings
- Sputtering targets





### How we create value in semiconductors

Enabling customers to improve yield

### Distinctive capabilities

- From control of microstructure and purity
- Reliable, consistent-in-application and volume products to the demanding semiconductor industry
- Strong, embedded customer relationships with vertically integrated partners
- Strong R&D focus with deep alliances in this space

### Value creation levers

- Diverse product offering and strong product pipeline
- Long-term supply agreements with leading silicon carbide customers
- Our strong balance sheet allows us to invest capital the market needs now with excellent ROI





## Key takeaways – Semiconductor

- CAPEX to double capacity overall, supported by long-term supply agreements and partnerships with SiC industry leaders and research partners
- Our efforts advance our world from digitisation to AI and EV to green industrial power
- Helping produce leading semiconductor materials by increasing yield, ensuring accuracy, consistency and purity
- Working to grow into more adjacent applications through organic and inorganic efforts
- Semiconductor segment has underpinned our Fast Growth Markets success and is poised to accelerate
- Morgan is at the forefront, driving the future of the semiconductor industry

£100m

Capex investment underway

Estimated

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+£80m

additional revenue from investment

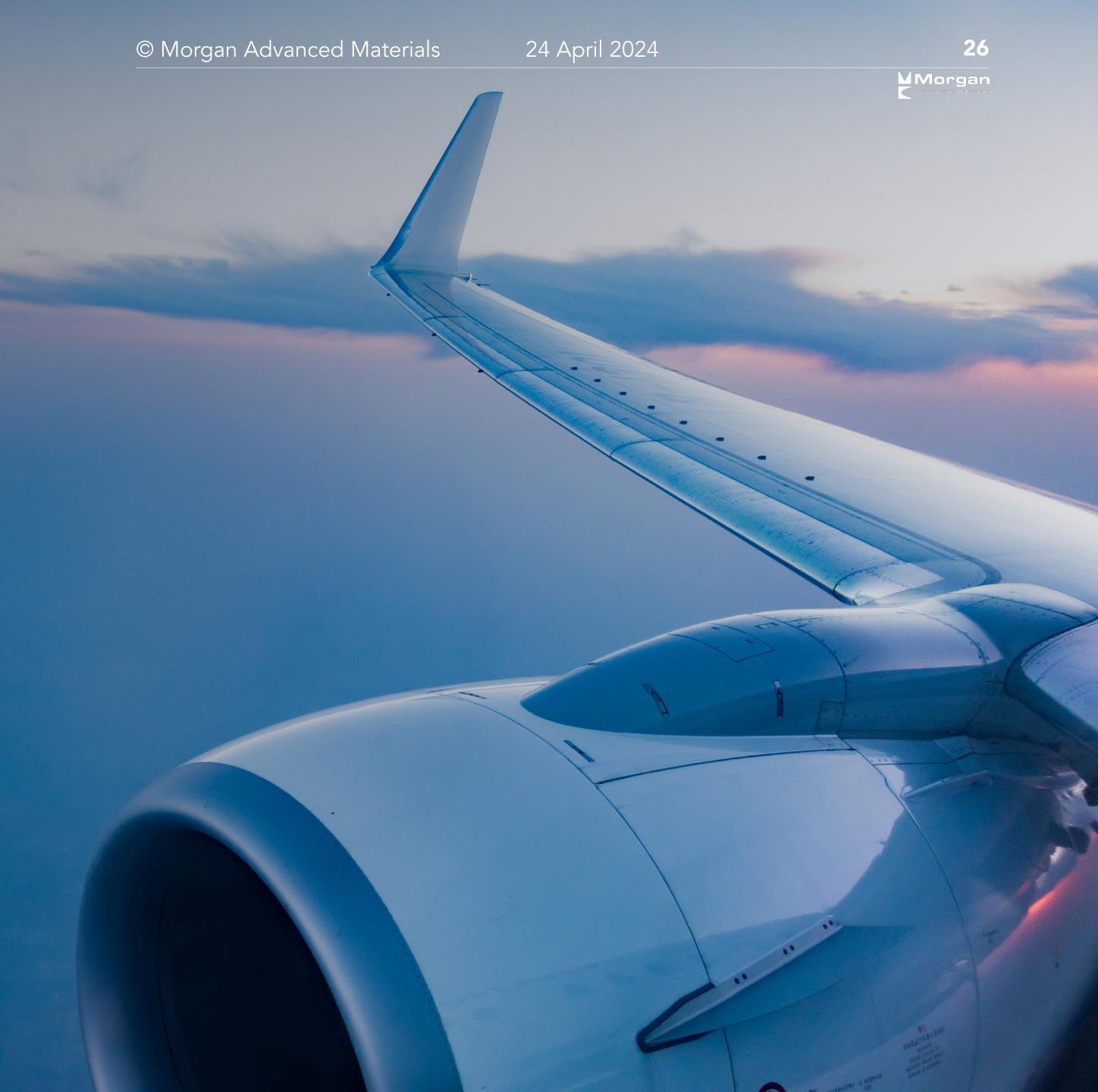
Expected at least

in incremental profit by 2027

# Core Growth

# Aerospace

John Righini, Technical Ceramics





# Aerospace is a significant and growing market opportunity

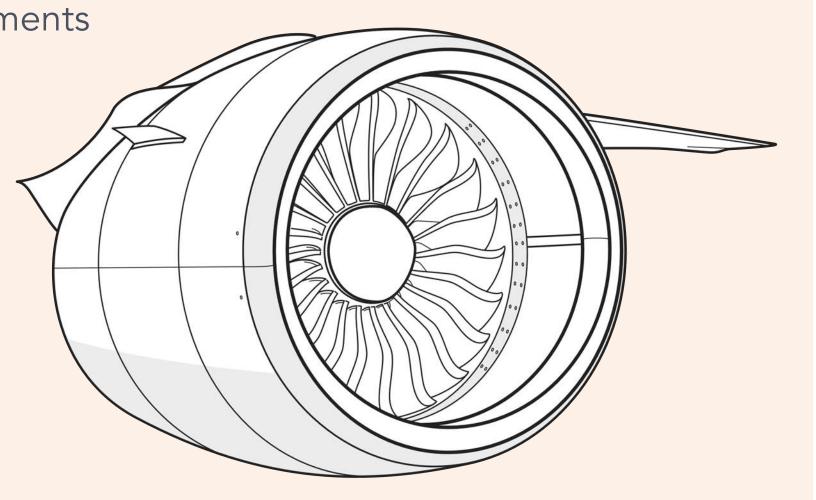
7.9%

Market CAGR 2023-27

£0.5bn

Addressable Market, 2027

- We supply a wide range of highly differentiated products in the aviation and space markets
- We address increasingly challenging customer requirements using proprietary materials and processes, tested to exacting standards
- We have very long-term relationships with customers with products that provide annuity revenue streams
- Innovation and R&D translating into new growth opportunities



Long-term structural demand drivers in Aerospace

World Economic Growth



Increasing demand for business and leisure travel



**Global Trade** 





## How we create value in Aerospace

Our differentiated process, engineered-to-order

- 1. Customers bring us their toughest material challenges
- 2. We work together with them to design the best solutions for their needs
- 3. This requires tremendous insight and intimacy to deliver performance at strict tolerances and standards
- 4. Once Morgan have provided a solution, revenue comes from new builds and replacements for the installed base
- 5. Successfully delivering on-time and at quality opens the door to repeat business
- 6. The cycle repeats as new iterations are brought to market

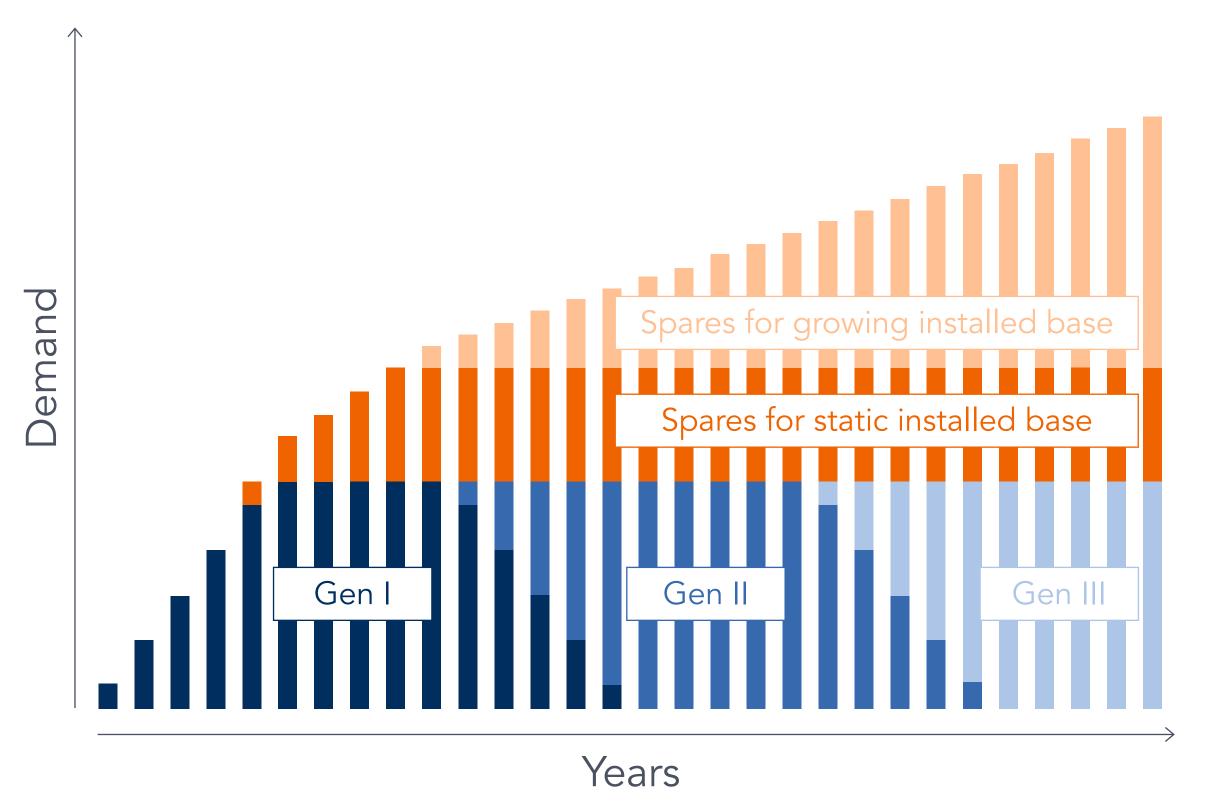




# Replacement demand supports resilience

Innovative solutions generate durable returns and long-term customer relationships

### Demand annuity stream example

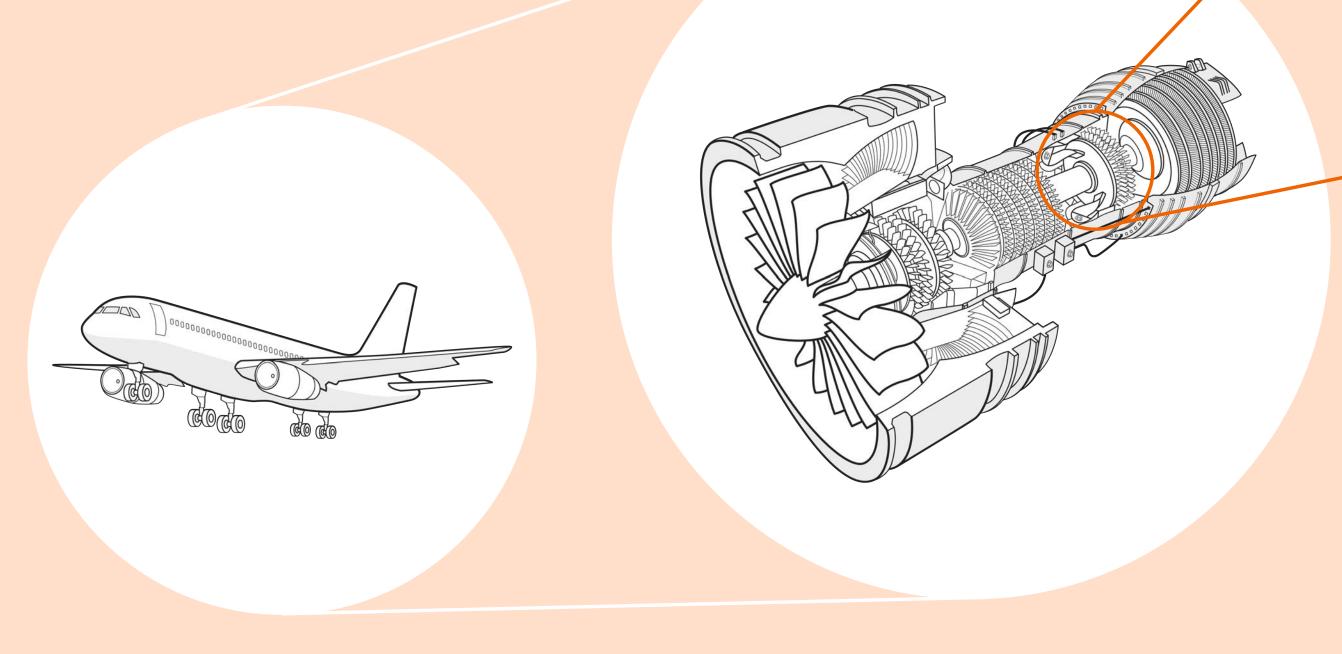


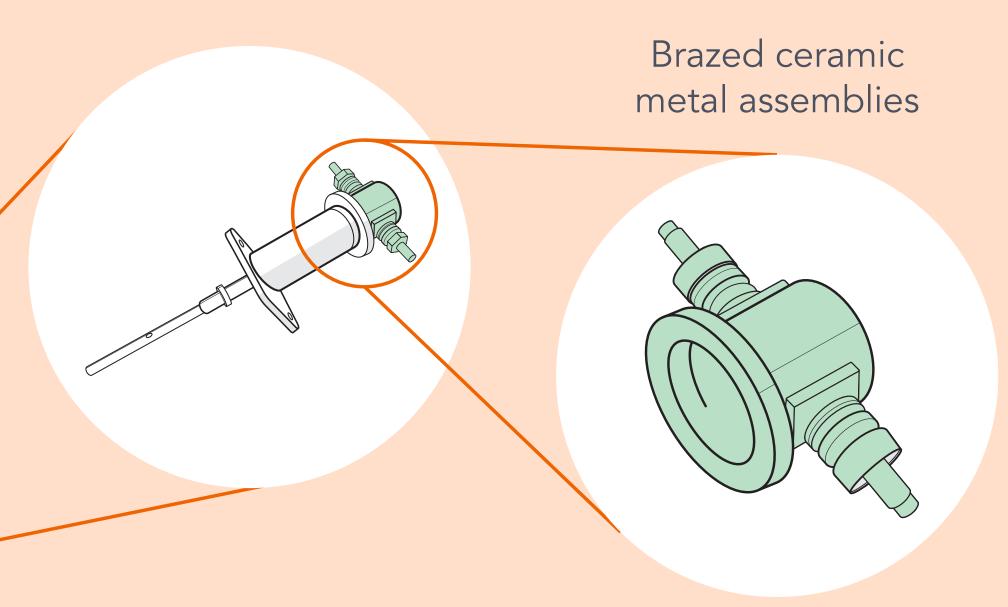
Segment	Aerospace
Platform	Civil Aircraft Engine
Different generations	10+
Production years	49
New engines built per year	~1,700
Lifetime units produced	30,000+
Currently in operation	28,000+

# Value we bring our customers

Feed throughs for temperature monitoring

Our Aero Engine Solutions play a key role in improved engine efficiency & reliability



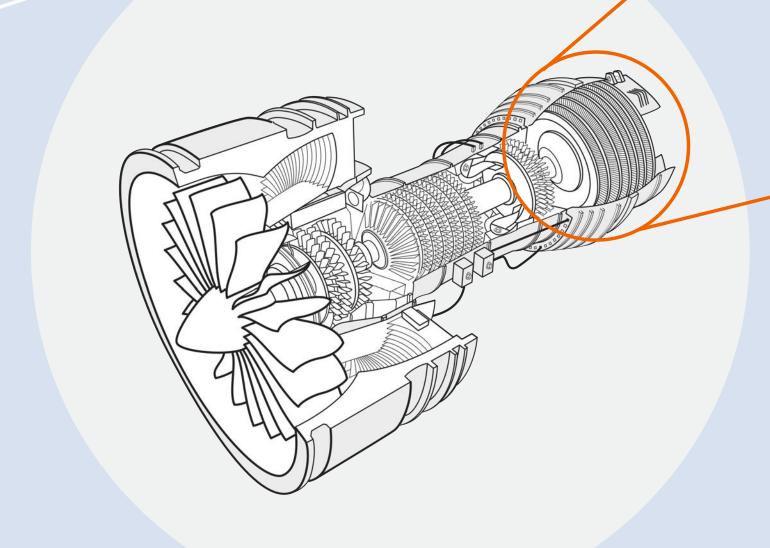


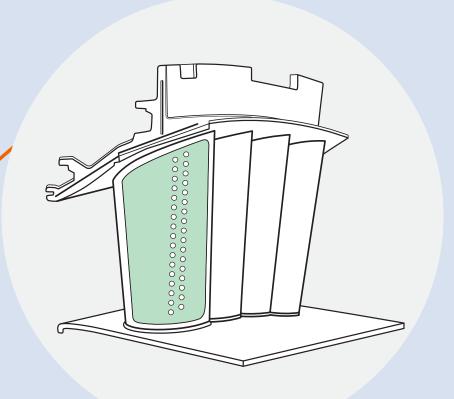
- 1. High thermal resistance for extended lifetime enables reliable monitoring of engine turbine temperatures critical for maintaining engine efficiencies
- 2. Ceramic-metal joints remain hermetic after 1,000's of hours of extreme thermocycling reducing maintenance costs

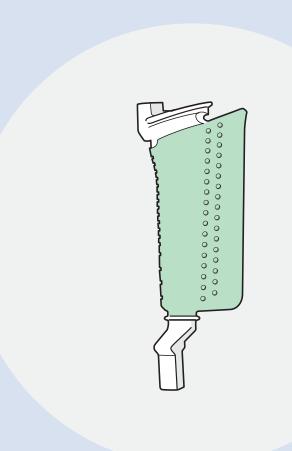
## Value we bring to our customers

Ceramic cores for casting advanced engine components

Industry leading ceramics enable efficient production of leading edge designs







Ceramic core

- 1. Enabling the manufacturing of increasingly complex core features that improve efficiency
- 2. Core stability during casting processes enable improved casting yields
- 3. Specific ceramic formulations enable single crystal casting



# Key takeaways – Aerospace

We expect the aerospace market to grow strongly in the next four years

We're well positioned to grow with the market and win share following investments in the last five years

Our technologies are integral to our customers' product and operational performance

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Our products are consumables driving repeatable annuity revenue streams



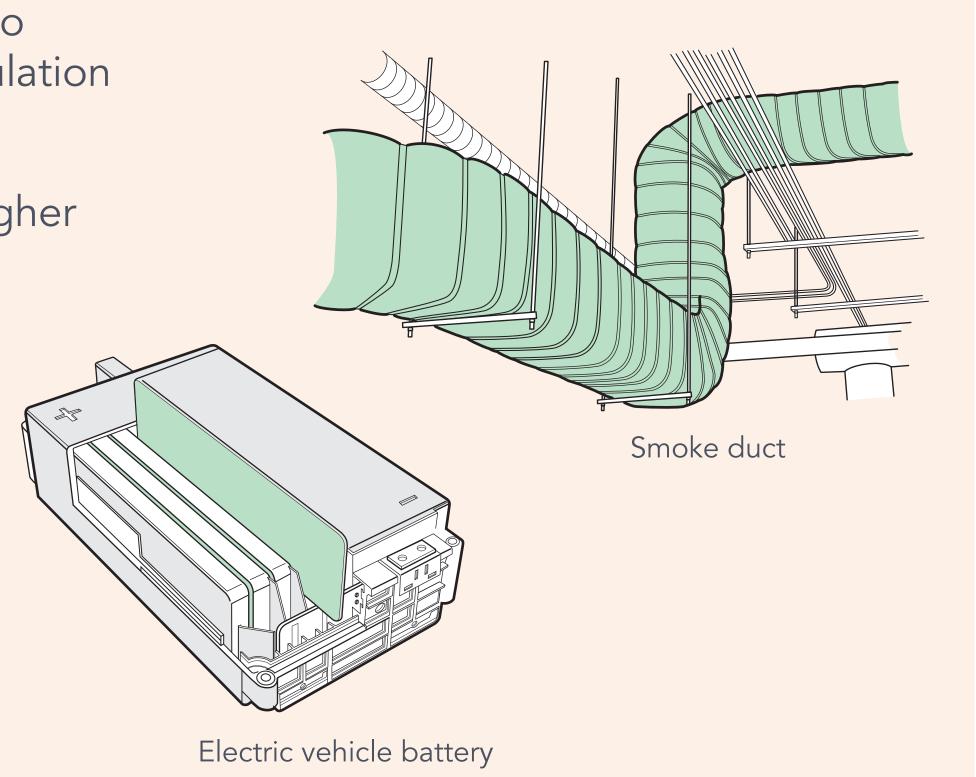
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# Fire Protection market is large and growing driven by urbanisation and regulation

## c.£1bn

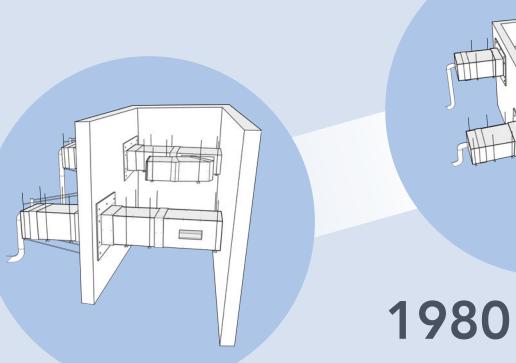
Addressable market

- There is an increasing requirement globally to protect life and critical infrastructure as population densities of urban areas continue to grow
- New standards require protection against higher temperature fires for longer periods of time
- We supply a range of applications: offshore oil and gas platforms, shipping and navy vessels, EV batteries, life safety systems and kitchen and smoke ducts
- Solutions are engineered, assembled and certified to fulfill the needs for demanding, complex customer requirements



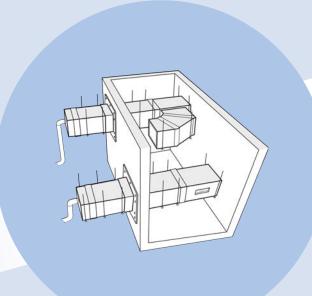


# Tightening regulatory environment driving growth

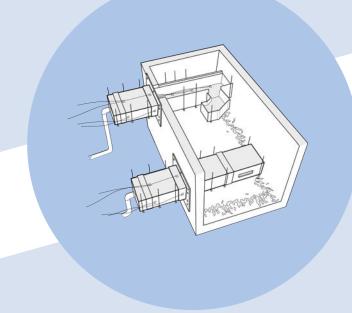


1970

**External fire horizontal duct** BS 476 Part 8 – 1972

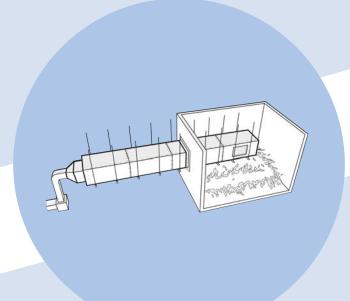


Internal and external fire BS 476 Part 24 - 1987 ISO 6944 – 1985



1990

**External and internal fire** w/ hot gas extraction EN 1366-1 - 1999 ISO 6944 - 2008



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Today

**External and internal fire** w/ hot gas extraction w/ max. deformation EN 1366-8 - 2004

Stricter performance requirements and broader test conditions

2021

Europe Ductwork test 120 min vs 90 min

2024

UAE Ductwork test 1000°C vs 300°C

### How we create value in Fire Protection

Solutions for safety and regulatory critical challenges in selected high growth, high demand market areas

### Distinctive capabilities

- Complete portfolio underpinned by proprietary product and manufacturing technologies
- Global network of application specialists and testing facilities
- Strong customer relationships and networks of fabricators and installers
- Scalable global manufacturing of materials and components

#### Value creation levers

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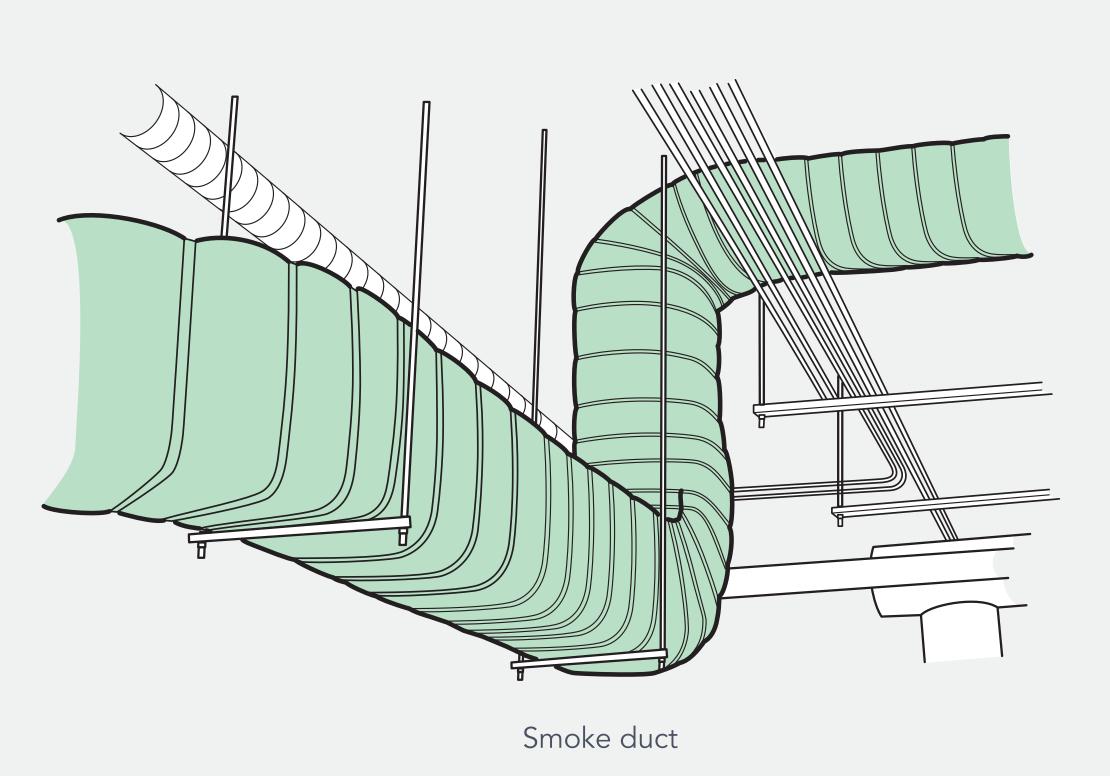
- Go-to-partner in targeted high growth, high demand market areas
- Agile customer-backed innovation
- Optimal product selection and combination, unconstrained by product availability
- Own portfolio of certifications for speed-tomarket and lasting competitive advantage
- Fast, reliable and cost-effective delivery



## Value we bring our customers

Passive fire protection of smoke ducts

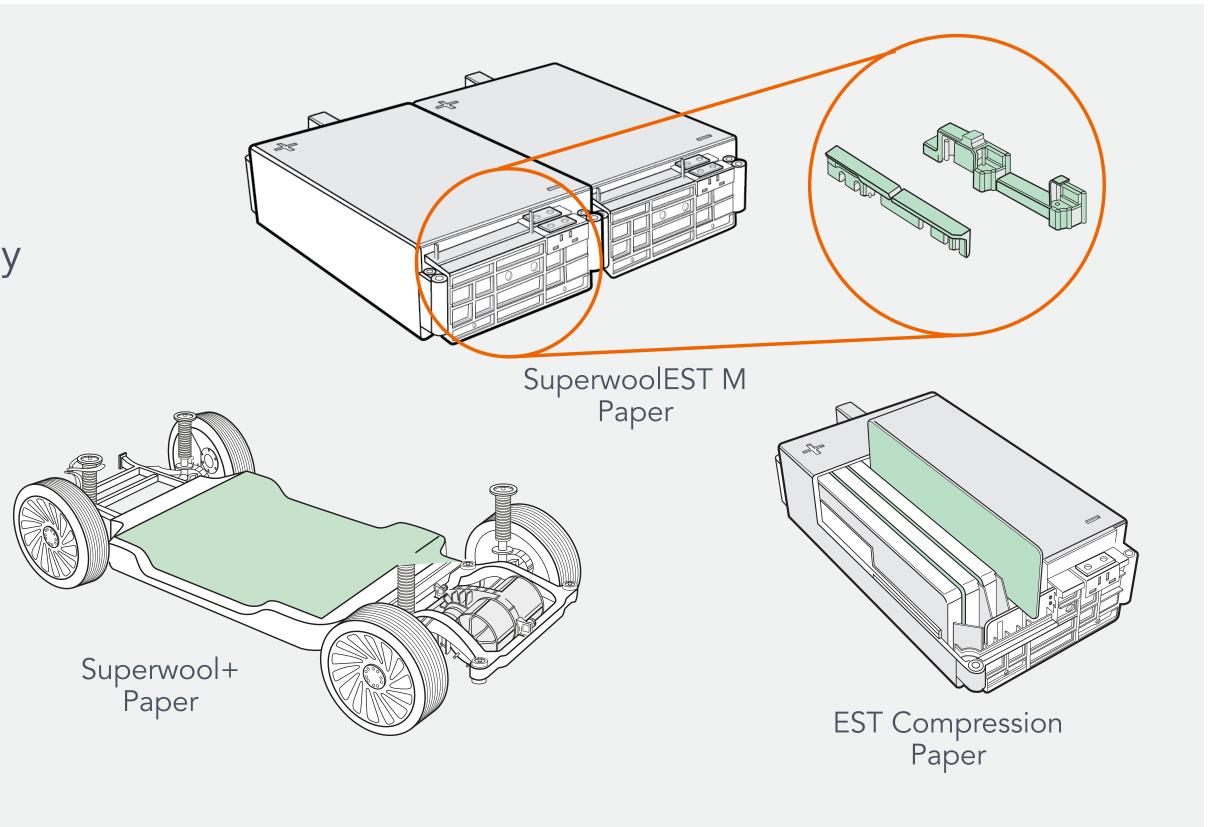
- Third-party certified performance according to local building code in target geographies
- Extended local ecosystems
  - Training of fire protection industry professionals on how to meet the changing regulations
  - Network of local fabricators and installers, seamless delivery and installation
- Innovation to meet tougher standards without compromising building design and costs
- Progressive expansion of geographic reach



# Value we bring our customers

Fire protection for lithium ion EV batteries

- Early into the market based on our customer relationships
  - Ceramic paper for pack-level protection cut to design and conditioned for fast and easy assembly
  - New line in China in Q3 2024
- Co-engineered tight tolerance complex shapes for pack-level protection
- Multi-functional compression paper for individual cells protection accommodates cyclic swelling





## Key takeaways – Fire Protection

Market is large and growing driven by regulatory change

Certification to stringent standards provide high barriers to entry

We work closely with an ecosystem in each market to develop and deliver leading solutions

Our differentiated materials, customer positioning and manufacturing scale position us to grow faster than the market





# Huge market opportunity in India driven by large investments in capacity and building safety

£200m

Addressable market

8%

Steel production CAGR 2024-2029

5%

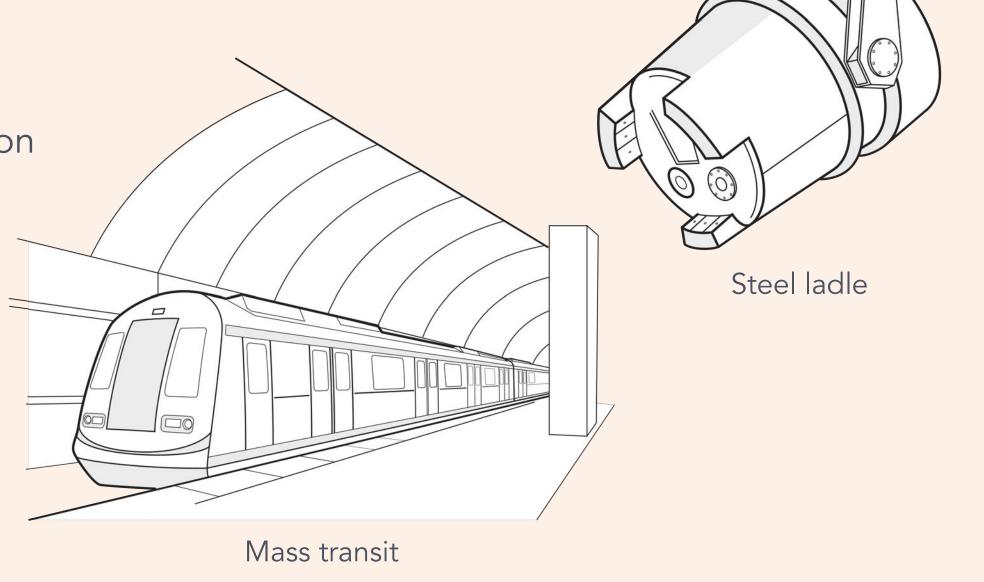
Ethylene production CAGR 2024-2029

#### Strong growth of manufacturing and infrastructure

- Significant large petrochemical capacity in construction to be built by 2028
- Preferred location for building yards of prefabricated processing equipment modules
- Energy efficiency driving new investment,
   benefitting all our applications in thermal insulation
- Rapid development of urban infrastructure
- Building safety and regulation an increasing priority for government and corporates

#### We are well positioned

- 40 years of manufacturing in the country
- Strong growth since 2019





### How we create value in India

Supporting the rapid development of India's industry and infrastructure with life and energy saving thermal solutions

#### Distinctive capabilities

- Complete portfolio of insulating materials used above 800°C
- Largest domestic manufacturing of fibre products with superior performance and quality – new fibre line in 2024
- Products specified by major licensors and OEMs at international standards
- In-country advance modelling, design, supply, installation, end-of-life removal of full insulation solutions in demanding applications

#### Value creation levers

- Insulation for new builds with optimal design and state-of-the-art technology
- Design-to-deliver service for equipment pre-fabricated in India
- Natural go-to supplier for replacements for the installed base
- Reliable and cost-effective delivery
- Localisation of production
- Accretive growth in fire protection India a key target

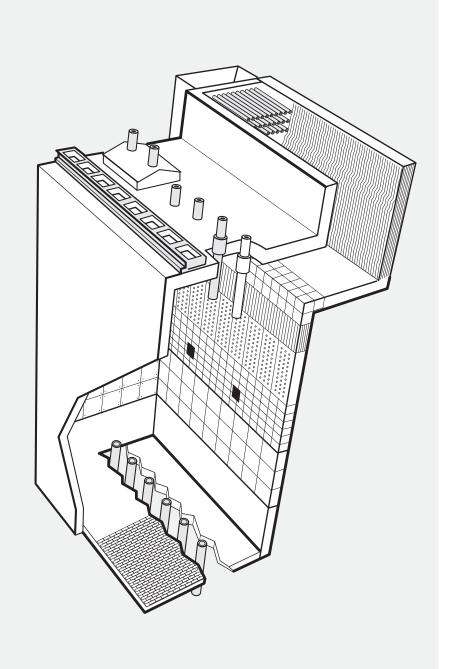




# Value we bring our customers

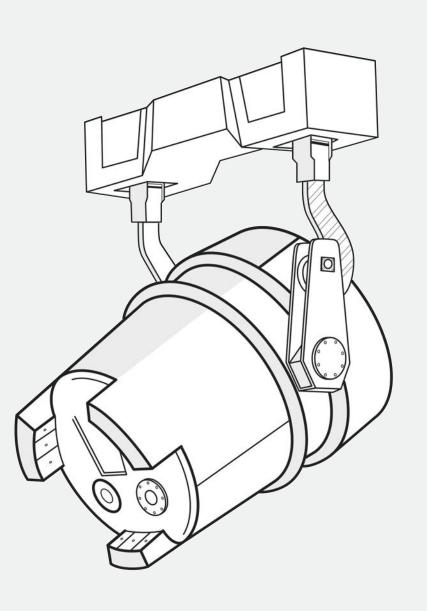
# Fuel consumption and safety of an ethylene cracker

- Challenge: Petrochemical operator concerned about safety and fuel consumption
- Action: Clarified pain points, completed full thermography assessment, developed alternative design with better performance fitting the existing equipment
- Outcome: The extra cost had a payback of less than one year



# Service Life and safety of hot metal ladles

- Challenge: Leading Indian steel maker found cracks in ladle shell due to thermal shocks
- Action: Designed and trialled a composite solution of ceramic fibre and microporous boards
- Outcome: Cold face temperature reduced by 40°C and no crack on shell applied across all seven ladles in the plant and ongoing horizontal deployment across all other plants





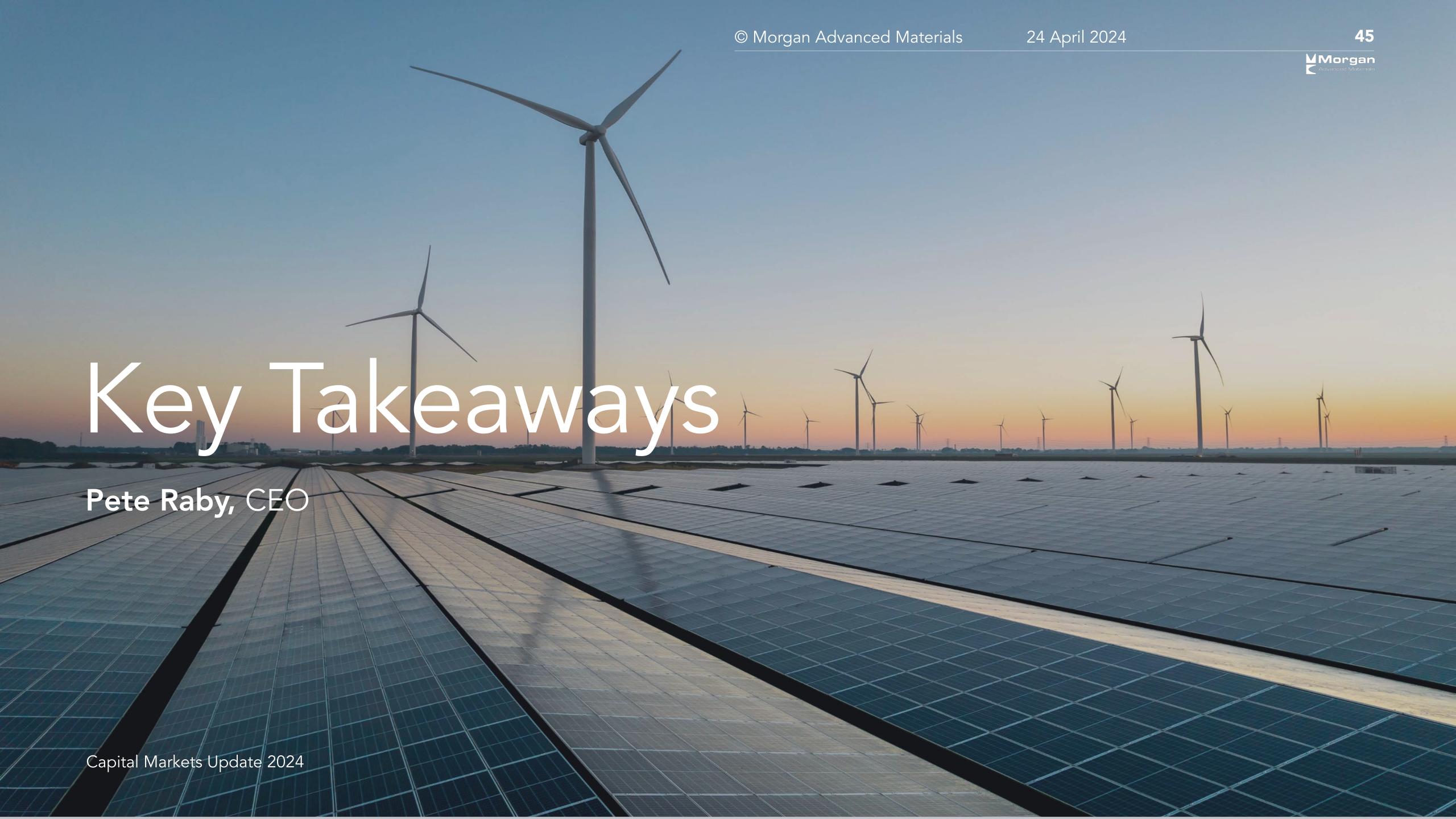
## Key takeaways – India

We have a leading position in a growing country

Our compliance with international standards and extensive local design, engineering and installation capabilities set us apart from local competition

We are adding capacity in response to high demand and bringing products from our international portfolio for local manufacture

We are well-placed to grow rapidly in the coming years





# Our investment proposition is stronger

1.
Organic growth

Our organic growth will be towards the higher end of our 4-7% range over the next four years

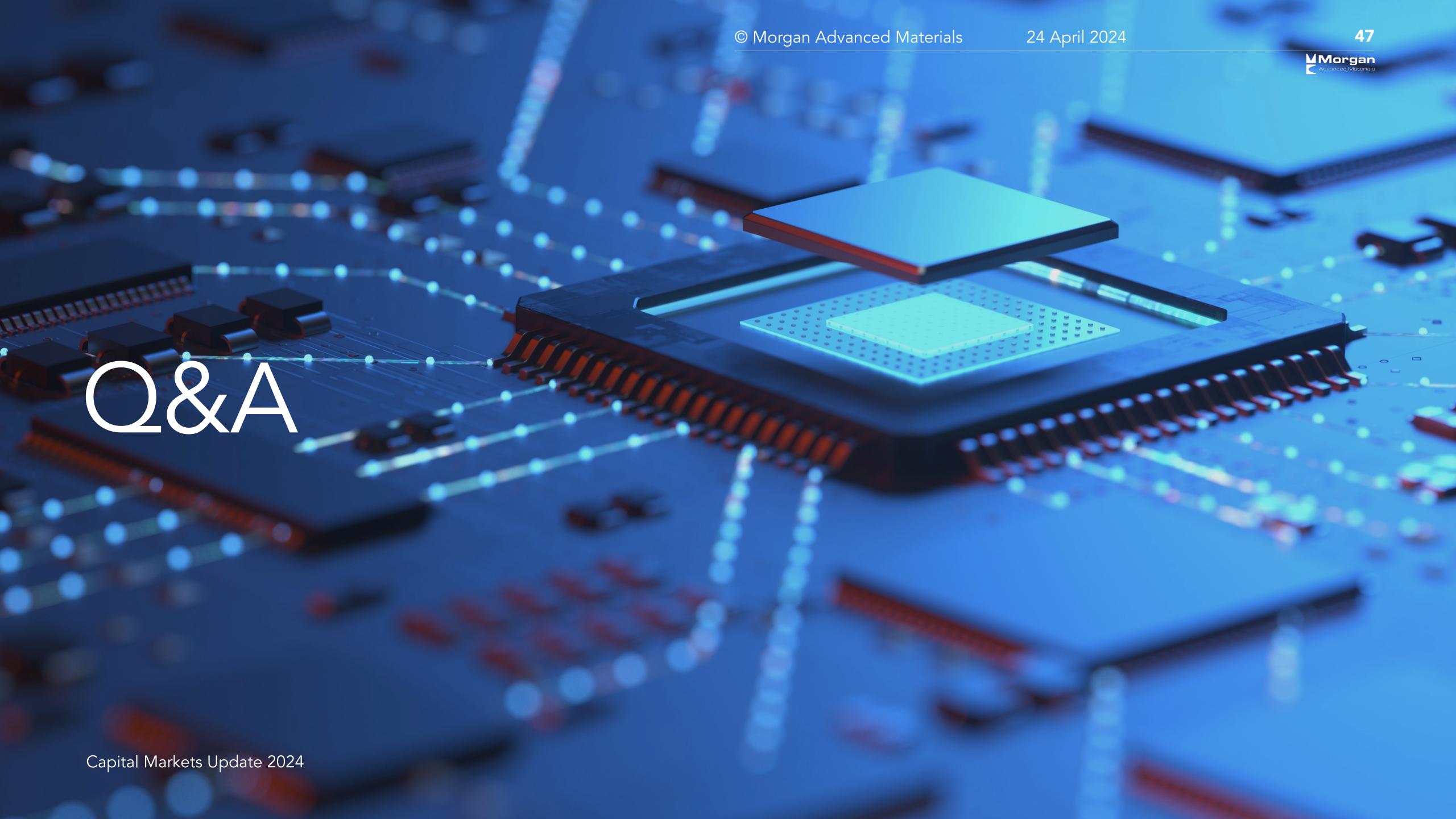
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We have simplified the Group to improve our support to customers and reduce costs 3. Margin progression

Margins are well underpinned and will progress towards the top of our 12.5%-15% range

4. Capital allocation

The balance sheet is strong enabling us to fund rapid organic expansion and M&A



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24 April 2024

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