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# Strategy for Sustainable Growth

Spectris Dynamics  
Capital Markets Day  
21 June 2023



# Agenda

## 08:30 Strategy for Sustainable Growth

Andrew Heath, Chief Executive



## 08:45 Spectris Dynamics – The Business

Ben Bryson, President,  
Spectris Dynamics



## 09:00 Virtual Test

Tony Spagnuolo, EVP Virtual Test,  
Spectris Dynamics



## 09:15 Digitisation

Thomas Lippok, Chief Strategy Officer,  
Spectris Dynamics



## 09:30 Break

## 09:45 Electrification

Tanneke Reinders, EVP Physical Test,  
Spectris Dynamics



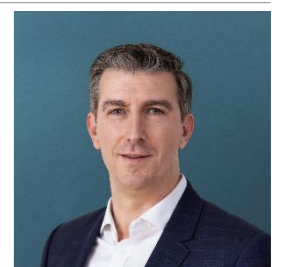
## 10:00 Automation

Kimberly Miller, EVP In Process,  
Spectris Dynamics



## 10:15 Spectris Dynamics – Strategy for Sustainable Growth

Ben Bryson, President, Spectris Dynamics



## 10:30 Q&A followed by product demonstrations

## 12:15 Wrap up and lunch







Andrew Heath, Spectris CEO

## Value Beyond Measure

Cleaner

Healthier

More Productive



# Key messages for today

## Spectris

A leading, sustainable, compound growth business



### Spectris Dynamics

Investing for growth

6-7% growth through cycle

20%+ operating margin

Strong progress

# Strategy for Sustainable Growth



Leading sustainable businesses



Compounding growth

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Purpose-led

Delivered through our business model

## Our Purpose

We are harnessing the power of precision measurement to make the world cleaner, healthier and more productive.



## Our Commitment

to being a sustainable business partner, investment proposition and employer



▶ Great businesses

▶ Structural growth markets

▶ Customer centricity

▶ Investing in growth

▶ Operational excellence

▶ Investing in our people

Underpinned by Our Values

Be True

Own it

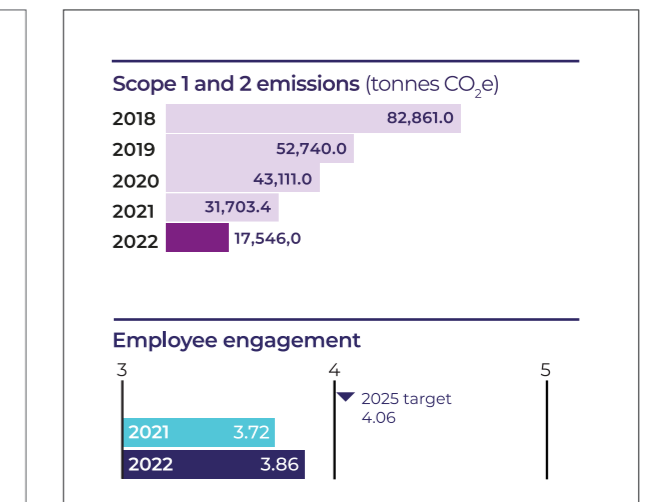
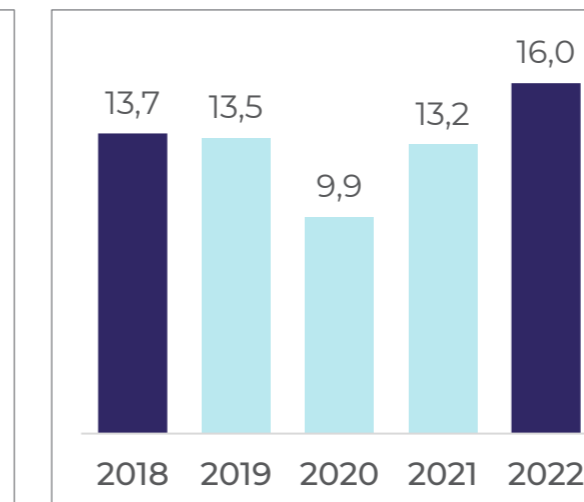
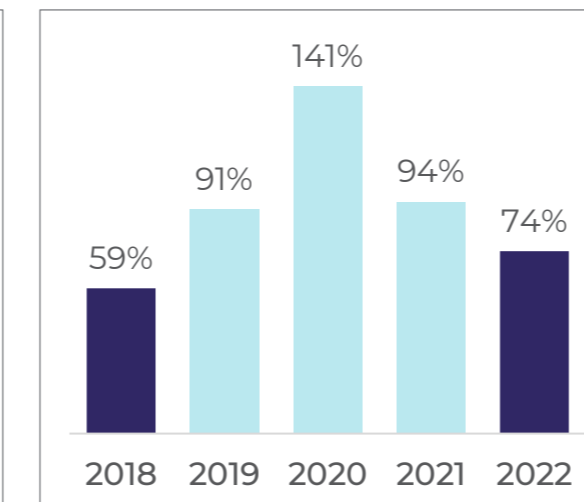
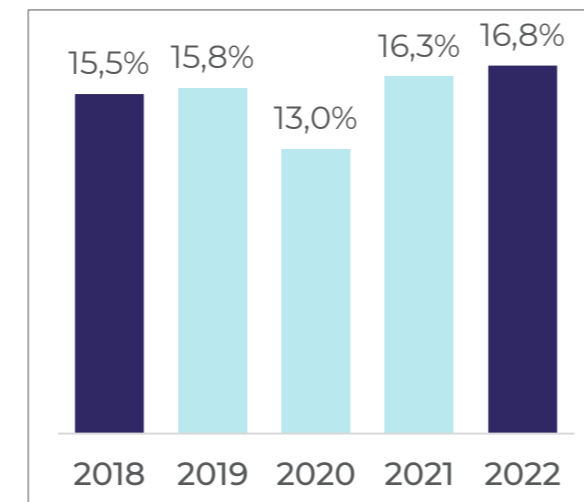
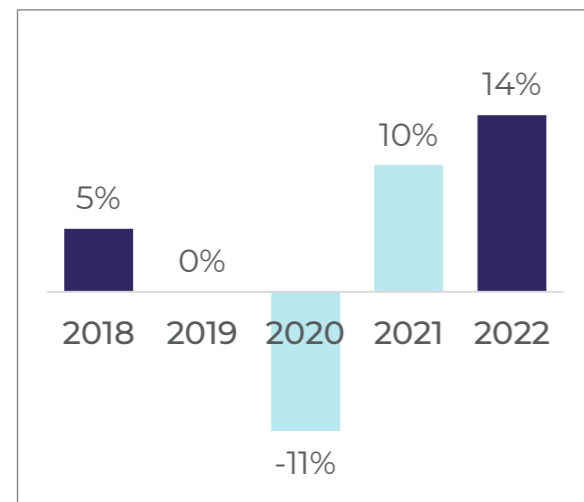
Aim High



# Transformed to deliver sustainable growth

Medium term framework

Organic sales growth	Adjusted Operating margin expansion	Adjusted Cash conversion	ROGCE	ESG
6-7%	20% +	80-90%	Mid-teens %	Net Zero ambition, Great engagement



Note: Net zero targets were set in 2020, Engagement targets were set in 2021. Scope 1&2 refers to market-based emissions

# Spectris Dynamics

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## Strong market positions ... compelling growth opportunities

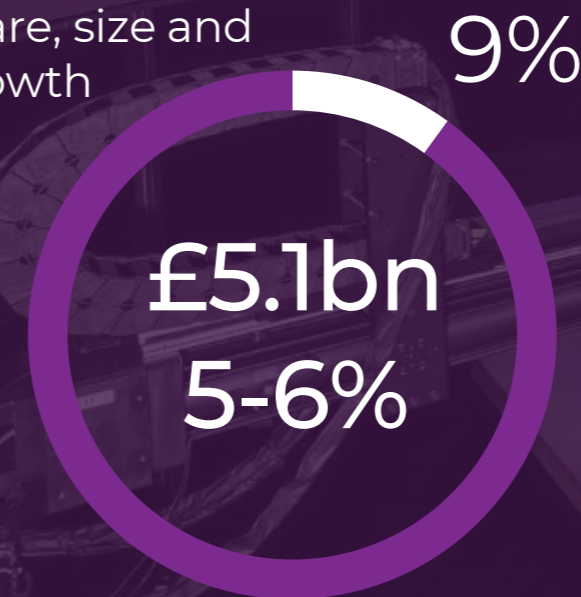
- Broadest offering in advanced high precision testing and measurement solutions
- Leading market positions in premium segments
- Significant opportunity to integrate both virtual and physical test
- We operate where superior quality, reliability and strong domain expertise are essential

### Leading positions

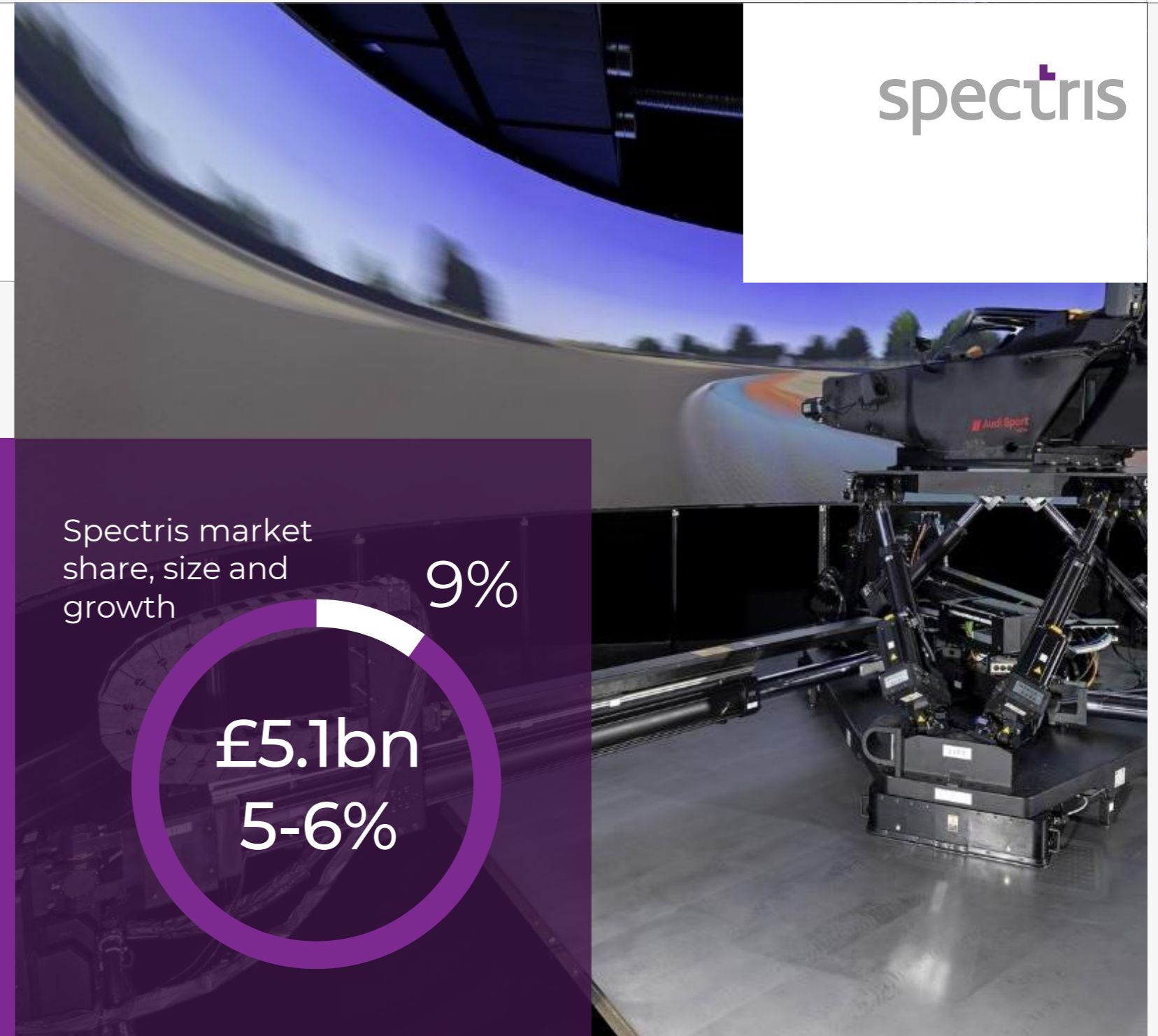
- High precision, physical test
- Premium virtual test (simulators and software)
- High speed, multi-channel data acquisition
- High precision sensors

- Grew 15.6% in 2022
- CAGR of 4.7% since 2019
- Operating margin target 20%+

Spectris market share, size and growth



*Sources: ITR, PMI, Ifo index, advisor research, internal analysis*





# Spectris Dynamics Business

Ben Bryson



# Ben Bryson, President, Spectris Dynamics



- Joined Spectris in January 2020
- Appointed President of Spectris Dynamics in January 2022
- Brings over twenty years of global leadership experience in industrial manufacturing organisations
- Prior to joining Spectris, Ben held a number of senior positions at Eaton and Honeywell Aerospace





# The Spectris Dynamics Executive team



**Ben Bryson**  
President



**Tony Spagnuolo**  
EVP, Virtual Test



**Tanneke Reinders**  
EVP, Physical Test



**Kimberly Miller**  
EVP, In-Process



**Steen Pinnerup**  
Chief Financial Officer



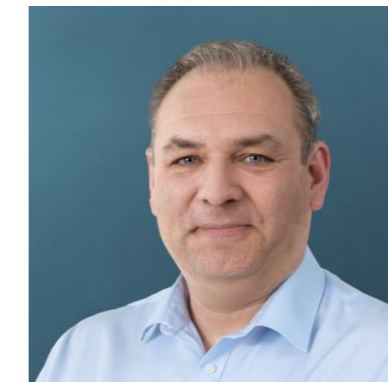
**Ruth Bastian**  
Chief People Officer



**Adam Forde**  
Chief Digital Officer



**Thomas Lippok**  
Chief Strategy Officer



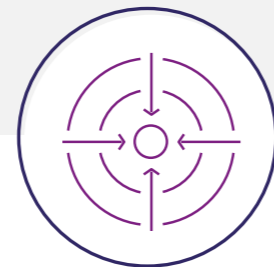
**Simon Bosket**  
Chief Operations  
Officer



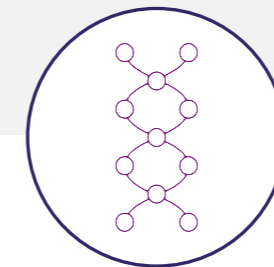
**Nina Rosen**  
General Counsel and  
Head of Compliance



An **established leader** and domain experts in **premium** virtual test, software, data acquisition, sensing



Well positioned in **attractive markets** supported by sustainable **mega-trends**



Strengthening **customer offering** – integrated virtual and physical test solutions, and **software-oriented** strategy



Delivering **above market growth** with **strong margin expansion** through the cycle

6-7% organic sales growth through cycle

Operating margin expansion to 20%+

**Empowering innovators for a cleaner, healthier and more productive world**



# A global leader in advanced integrated physical & virtual testing and measurement

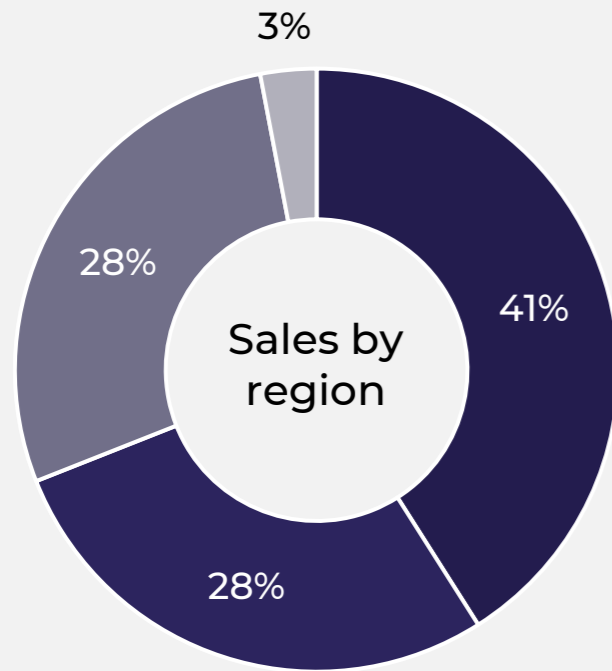
Innovating for more than 75 years

35,000 Customers served

Customers in 50+ countries

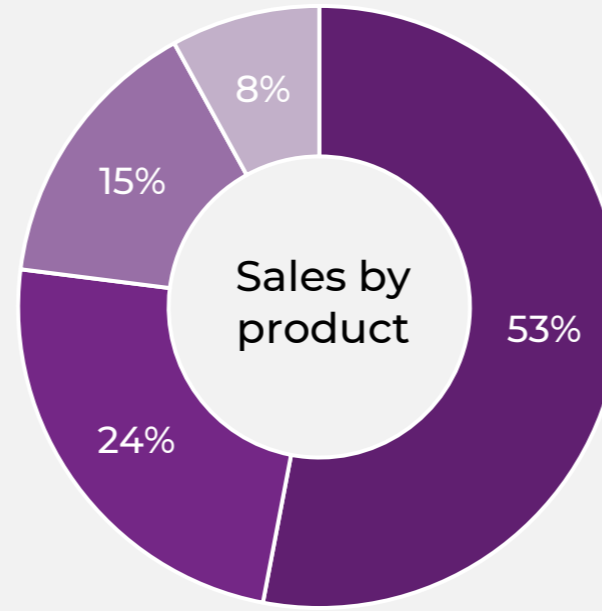
~3,500 Employees

1,000+ Customer facing employees



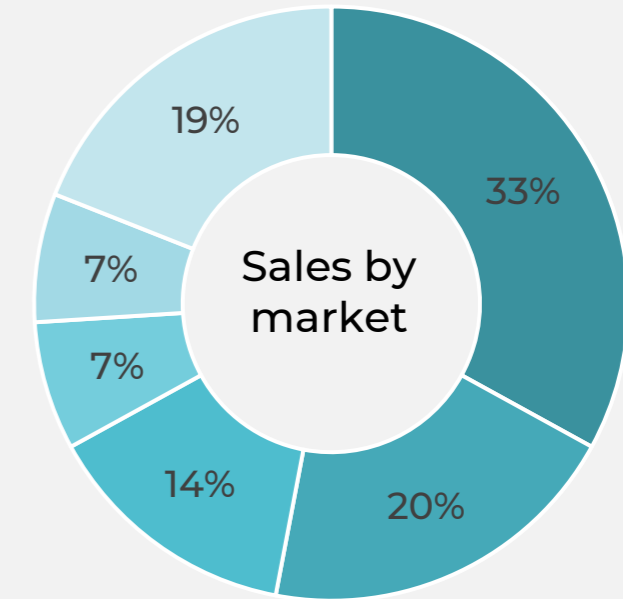
■ Europe ■ Asia  
■ North America ■ ROW

£492m  
2022 sales



■ Sensors ■ Data Acquisition  
■ Software ■ Virtual Test

15.0%  
2022 adj. operating margin



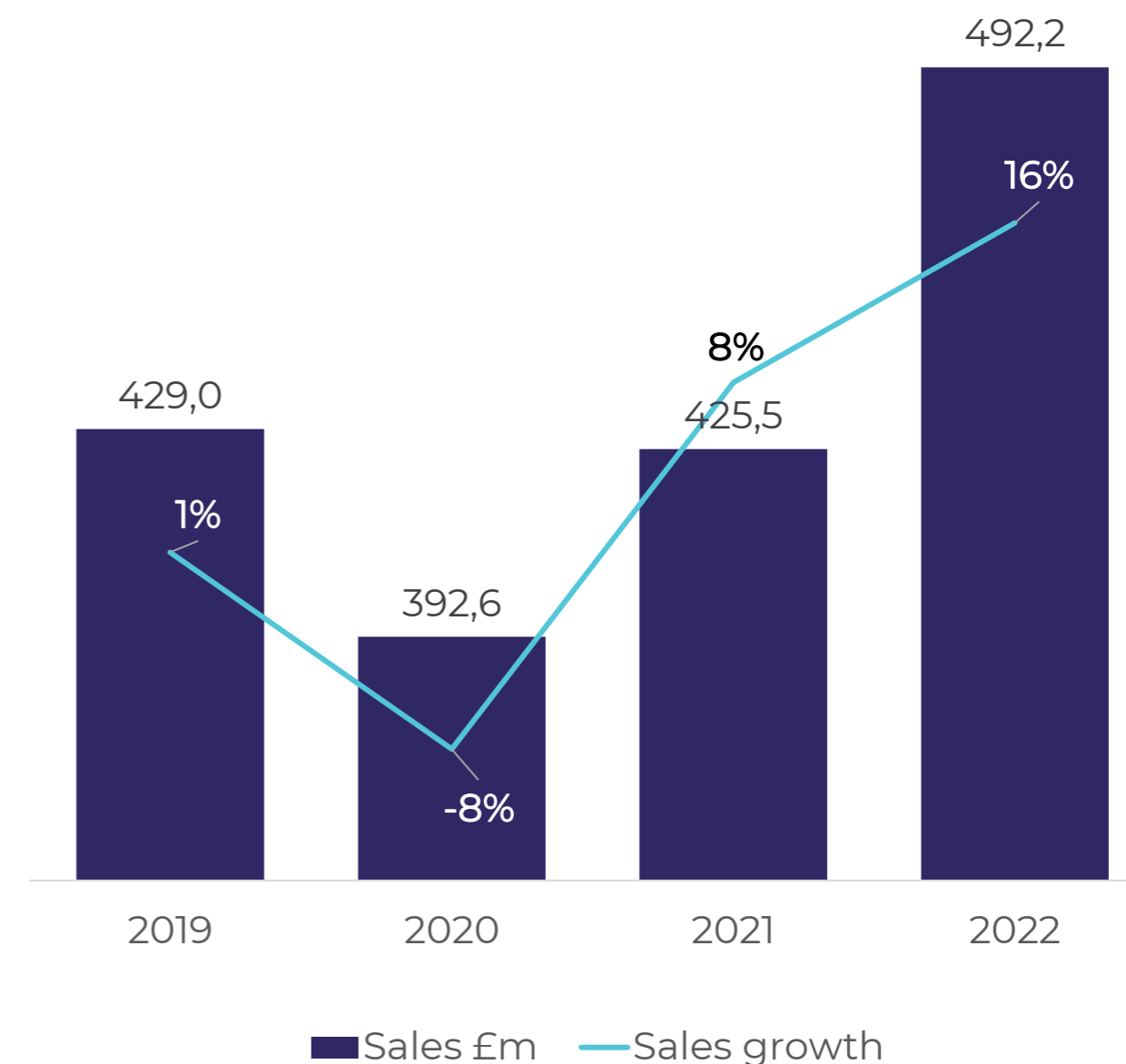
■ Automotive ■ Machine manufacturing  
■ A&D ■ Electronics  
■ Academia ■ Other

~£75m  
Software sales

# Major progress over the last four years with significant future potential

- Merger of two companies and strategic M&A to form leading test and measurement business
- One team with strong leadership
- Delivered 4.7% sales CAGR since 2019
- Creation of virtual test business through M&A
- Customer lifecycle-focused
- Lean mindset through Spectris Business System

Dynamics – reported sales growth



# Spectris Dynamics – empowering the innovators

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R&D: Accelerate product innovation



Advanced virtual testing



Physical testing

In-process: Enhance processes and assets



Process & product quality



Asset optimisation

Seamless integration – Closed loop

Integrated data analytics and management software, solving the big data challenge



# Supporting our customers through the entire lifecycle

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A key source of competitive advantage

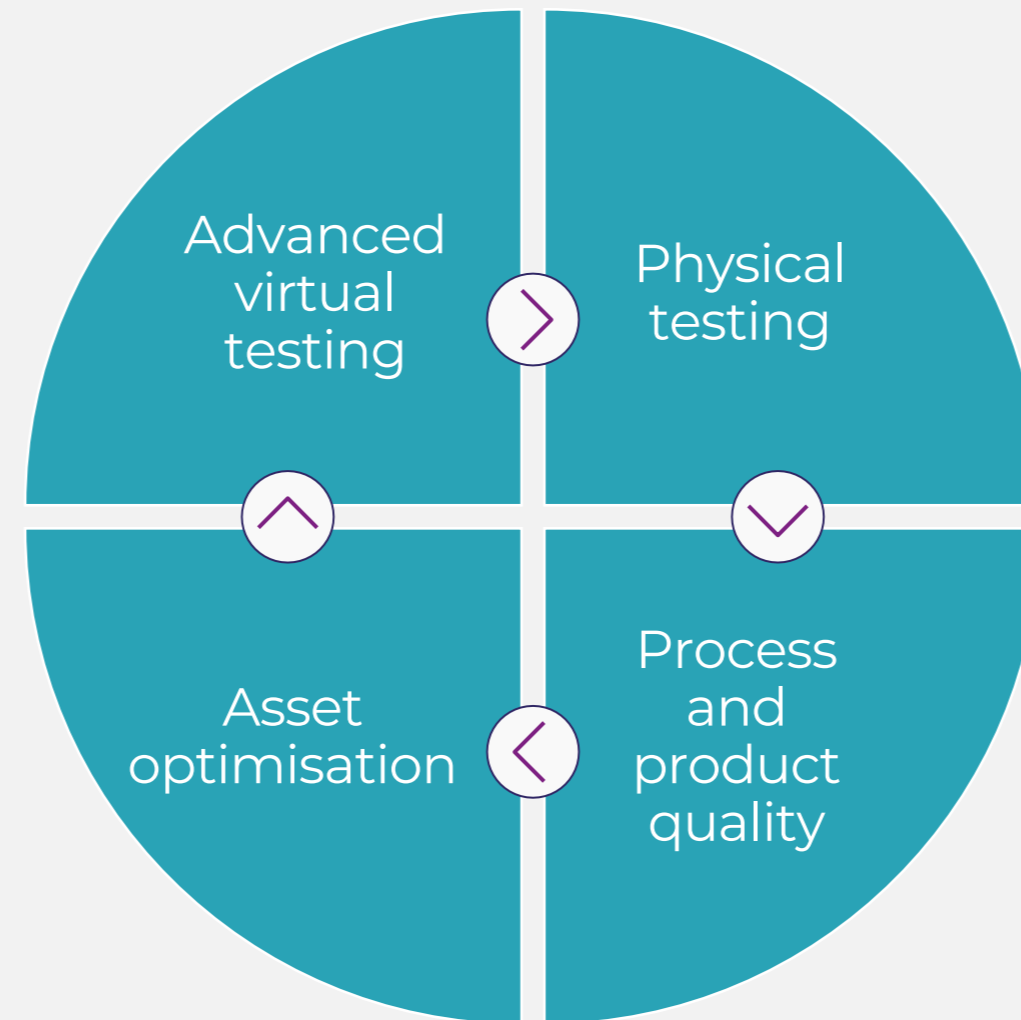


Speed of innovation

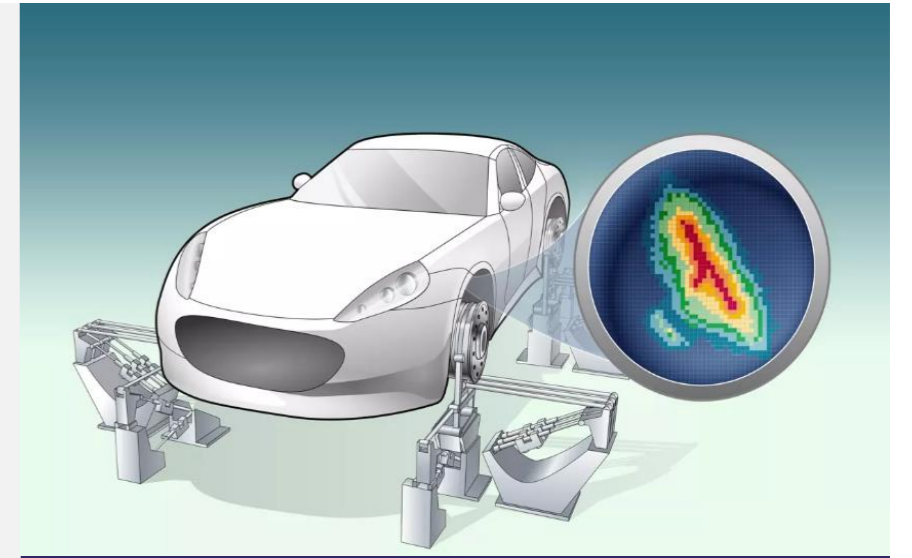


Product reliability confidence

Accelerate product innovation



Enhance processes and assets



Efficient and precise testing



Smart and high-quality sensing

# Leading player in premium segments with 9% overall market share

Addressable market – market share

Addressable market – by product



Only player active across all segments

Highly fragmented market; opportunity for growth

Leading positions with premium offering

Focused on segments with strong structural trends

# Focused on premium, high-growth end markets

End market by size	Dynamics Revenue split	Growth drivers	Mega-trend			
			Virtual test	Electrification	Digitisation	Automation
Automotive R&D £1.7bn	33%	<ul style="list-style-type: none"> <li>Growth in electric vehicles</li> <li>Adoption of virtual test</li> </ul>				
Machine Manufacturing £1.4bn	20%	<ul style="list-style-type: none"> <li>Smart manufacturing</li> <li>Managing useful life of high value assets</li> </ul>				
Aerospace & Defence £0.7bn	14%	<ul style="list-style-type: none"> <li>More sustainable civil aerospace</li> <li>Commercial space growth</li> <li>Global defence spending</li> </ul>				
Electronics £0.4bn	7%	<ul style="list-style-type: none"> <li>Voice controlled devices</li> <li>Higher quality signals</li> </ul>				
Other £0.9bn	26%	<ul style="list-style-type: none"> <li>Structural health monitoring for critical assets</li> <li>Advanced research</li> </ul>				



# Growth supported by four, global mega-trends

1

## Virtual test

Shift towards virtual innovation

2021 sales ~£40m  
2022 sales ~£60m



- Faster development
- Lower cost R&D
- New technologies

2

## Digitisation

Domain insights & data management

2021 sales ~£60m  
2022 sales ~£75m



- Efficiency in engineering
- Closing the loop
- Harmonised data
- Data volume

3

## Electrification

Mobility and energy transition

2021 sales ~£52m  
2022 sales ~£60m



- Maximising range
- Design dynamics
- The knowledge gap

4

## Automation

Enhance productivity in connected world

2021 sales ~£28m\*  
2022 sales ~£40m



- Interconnected manufacturing
- Increasing input costs
- Scarce resources





# Virtual Test

Tony Spagnuolo



# Tony Spagnuolo EVP, Virtual Test



- Joined Spectris in 2019
- Appointed EVP for Virtual Test in January 2023, having been with HBK since 2019 as VP, Business Development for VI-grade
- Senior sales and business development leadership roles in a number of high-tech software and engineering firms



# Automotive is facing major disruption

## Shift to EVs

60% of new cars must be electric to reach net zero target

## Software-Driven

Cars are now computers with wheels

## Increased Complexity

The number of controllers is growing

## New Disciplines

ADAS\* are becoming part of our cars

## Some Requirements More Challenging

Ride quality for EVs

## Save Cost and Time

EV transition force change in structural costs

# We have created a leader in virtual test and real-time simulation

## Grown from £11.5m to £61m in four years

- Four acquisitions as part of buy-and-build strategy:
  - VI-grade – real-time simulation and software
  - RightHook – synthetic environments, traffic and sensor fusion
  - Imtec – simulator design and construction capability
  - Concurrent – real-time software for hardware in the loop systems

## Double size of business over next 5 years

- Less than 10% of new product development uses simulators
- EVs to increase to 60% by 2030
- Software R&D to increase to 50% by 2030
- Dependency on physical prototype too expensive



2018

2019

2020

2021

# Spectris Dynamics is a leader in the transformation of vehicle innovation



Dream it!



Build it!



Drive it!



# Spectris Dynamics is a leader in the transformation of vehicle innovation



Dream it!



Drive it!



Build it!



Spectris Dynamics is a leader in the transformation of vehicle innovation

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**DRIVE**  
YOUR PROTOTYPE

**FASTER  
EASIER  
SAFER**



**BUILD**  
YOUR VEHICLE

# Providing a premium offering across simulators, software and data analytics

## Simulators

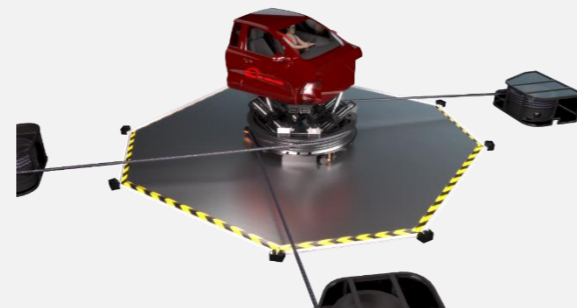
*Compact* – allows rapid test



*Static* – real-life cockpit and immersive screen



*Dynamic* – motion, visuals and sound



## Hardware-in-the-loop

- Hybrid prototypes when components become available
- Works in conjunction with simulators & software



## Software

- Modelling all important components: vehicle, road, driver, traffic
- Accurate representation of the real world and digital twin



Multi-attribute

Scalable

Configurable



# Bringing significant value to our customers – Ford

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# Bringing significant value to our customers



2x faster



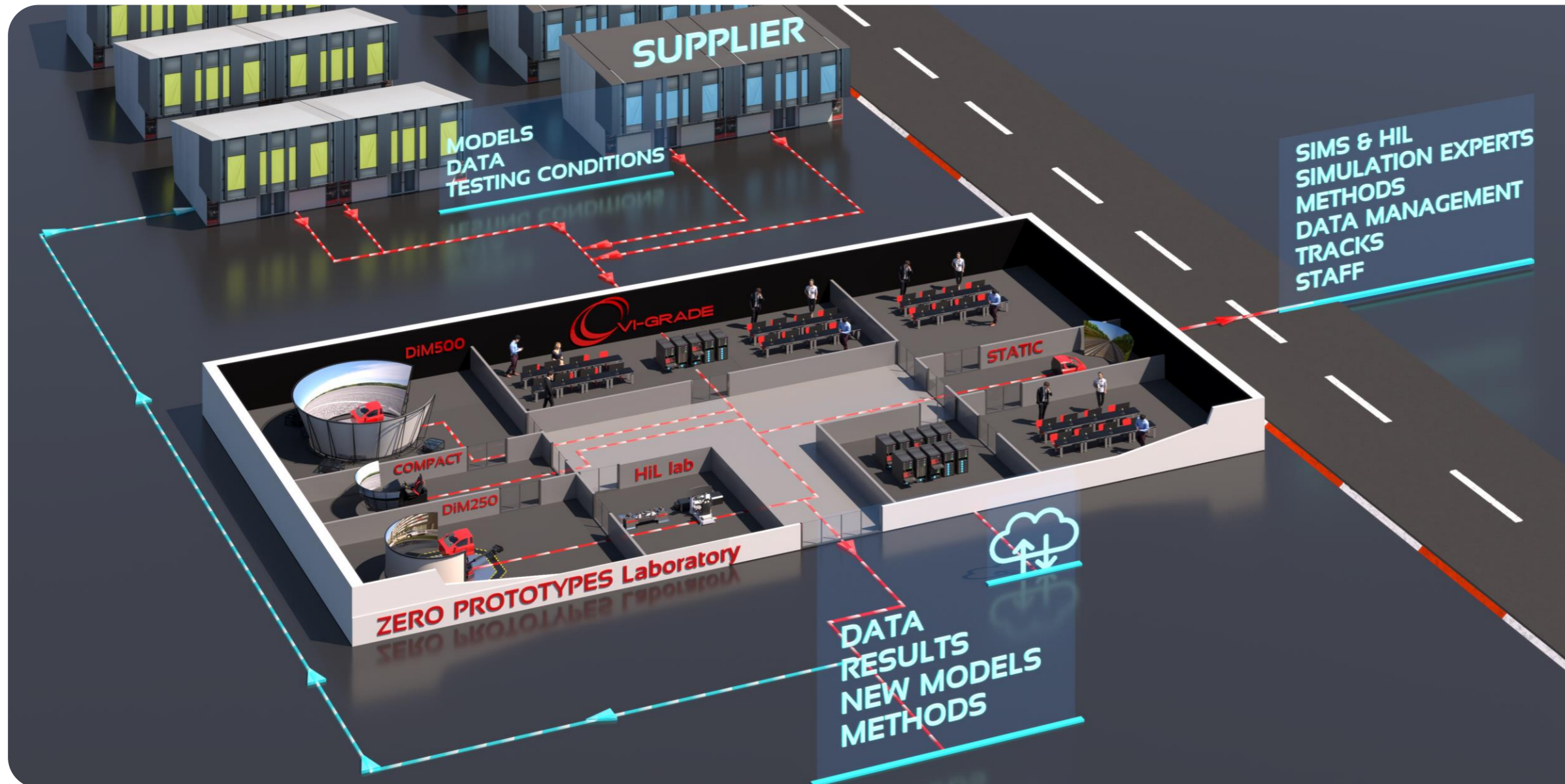
20% less cost



14x less emissions



# Building the capability to further accelerate virtual test for the future



Accelerates innovation

Increases collaboration

Reduces risks



# Virtual Test – accelerating innovation in automotive

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## Customer challenges

- Launch products significantly faster
- Lower cost to develop
- Digitalisation and virtualisation of testing
- Implementing new technologies like ADAS

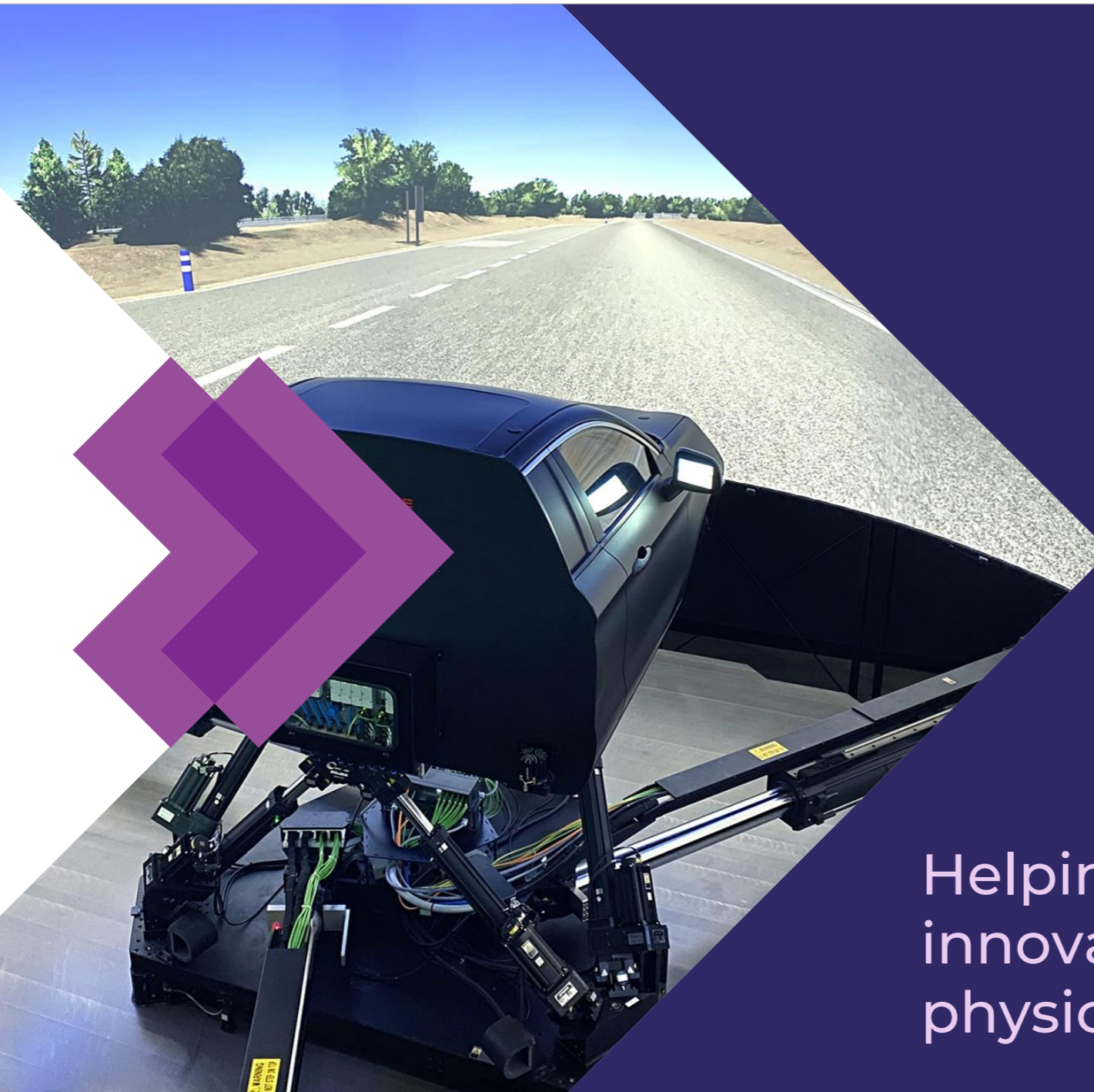


2021 sales ~£40m  
2022 sales ~£60m

## Spectris Dynamics solution

- Fully scalable and configurable
- Real-time software
- Simulators immerse ‘Driver and Hardware in the Loop’
- Calibrated sound and vibration with full motion simulation

Helping customers to accelerate innovation by integrating the physical and virtual environment





# Digitisation

Thomas Lippok



# Thomas Lippok, Chief Strategy Officer, Spectris Dynamics

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- Started as Head of Customer Projects Delivery & Systems in 1999
- 2003-2011 – Director of Support and Services
- 2011-2018 – VP of Sales for EMEA and SAM
- 2019-2021 – SVP Product Management, Marketing and Strategy
- Prior to Spectris, held various roles at Procter & Gamble Paper Products Manufacturing



# Digitisation continues to accelerate innovation and product development

- 1 Product development increasingly based on simulation and computer-aided engineering
- 2 Solutions now created in the digital world with more physical parameters simulated and tested simultaneously
- 3 Accelerated development combined with increasing asset intelligence creates data with greater volume, velocity and variety



**Creating a data challenge: Volume, Velocity, Variety**

# Spectris Dynamics solves the data chaos challenge



1

Connected systems for seamless data integration



2

Effective tools for more efficient collaboration



3

Validate virtual and physical testing seamlessly



**The answer: connect and collaborate**



# Helping Peugeot Citroen investigate and predict fatigue life during design

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## Customer Challenge

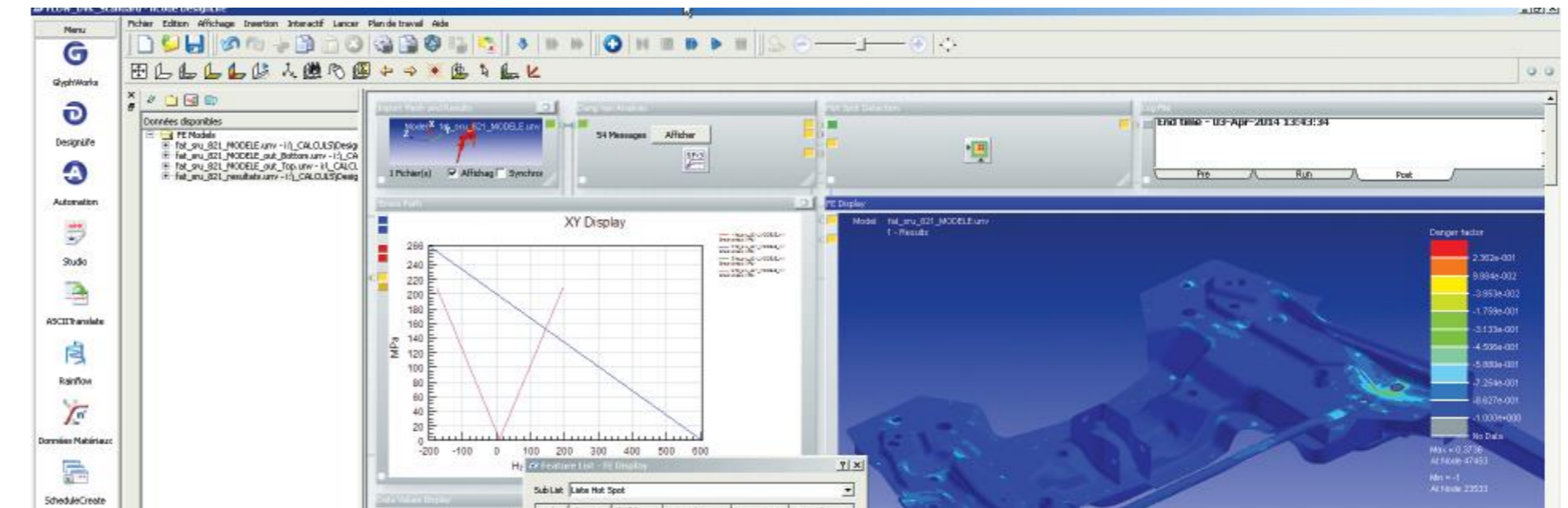
## Spectris Dynamics solution



PSA PEUGEOT CITROËN

Existing tools for fatigue analysis did not meet customer needs:

- Output not directly correlated to predictions of fatigue life
- Speed of design process too slow
- Upgrade required while utilising historic data and results



Upgrade to HBK nCode Designlife

- Proven and user-friendly fatigue analysis toolset
- Connecting seamlessly with historic data
- New and faster methodologies developed
- More accurate results
- Significant cost and time savings

# Helping Rolls Royce reduce risk of failure through standardised FMEA\* process

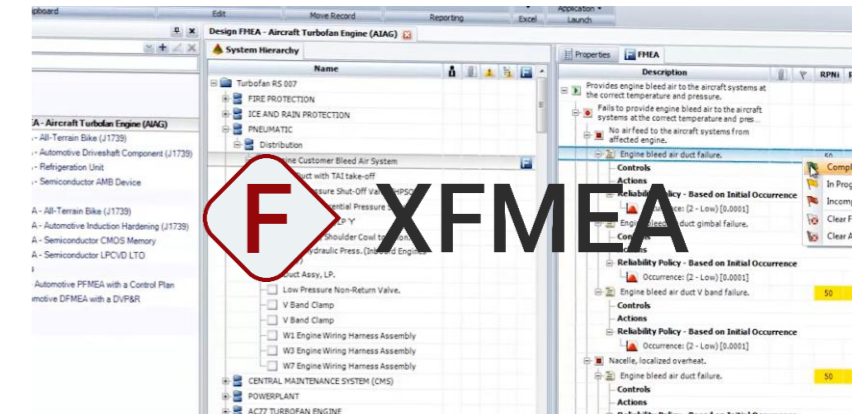
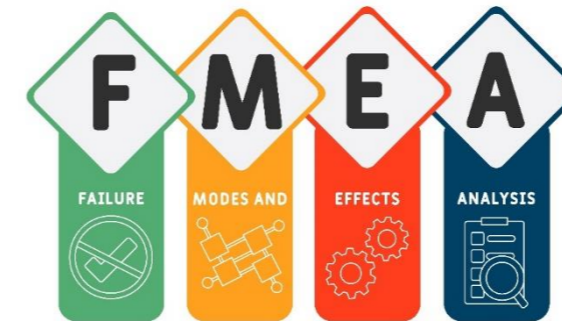
## Customer Challenge



Increasing engineering efficiency with better tools to collaborate, while continuing to reduce risk of failure:

- Previous solutions made collaboration difficult
- Requirement for better integration of processes and information in reliability engineering

## Spectris Dynamics solution **ReliaSoft**

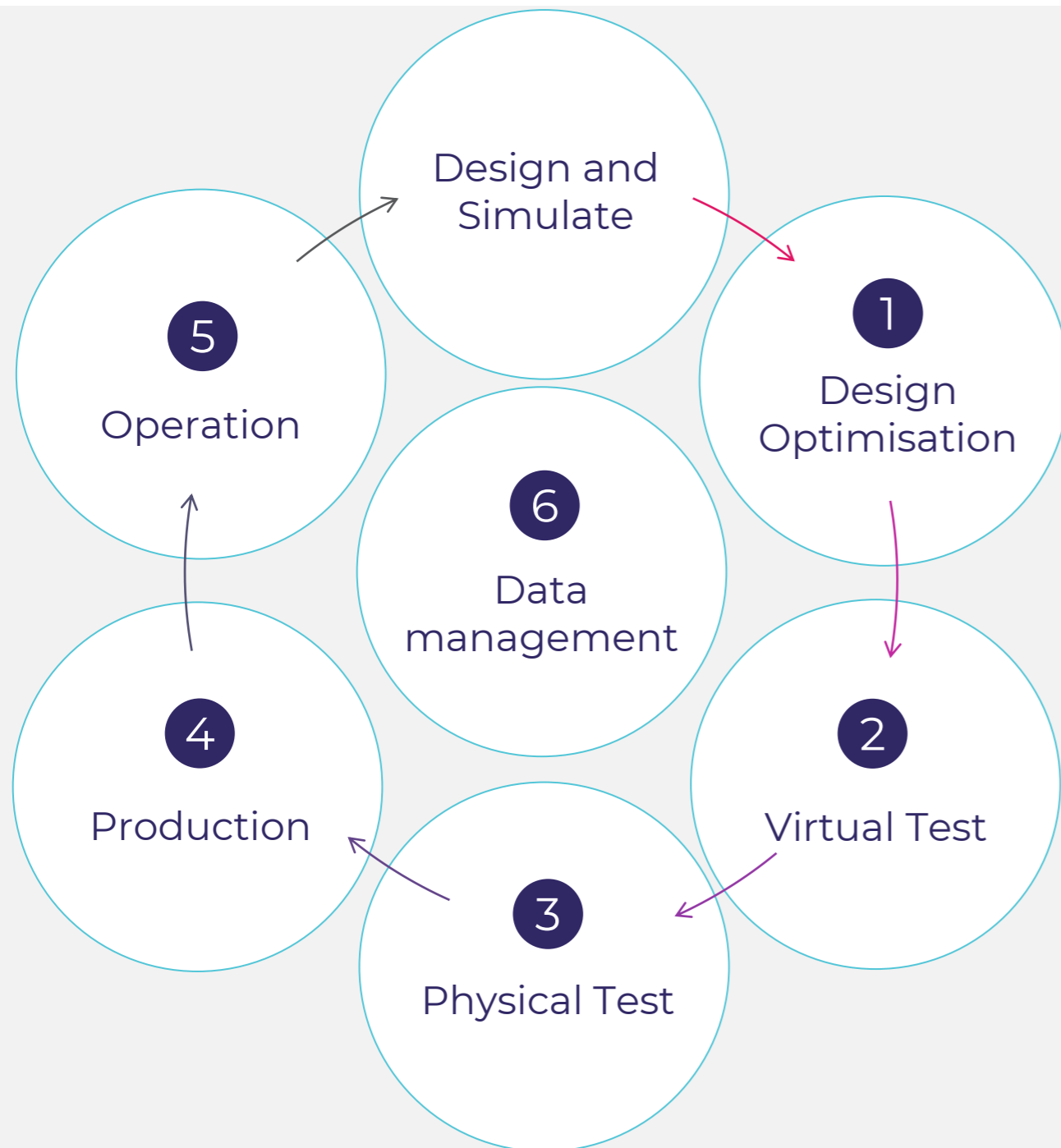


Implemented Design-FMEA and Process-FMEA using ReliaSoft XFMEA:

- Reduced corporate effort for FMEA by 40 to 50%
- Improved design decisions
- Removed redundant processes and maximized re-use of design information



# Today we solve customer challenges across various stages of the product lifecycle...



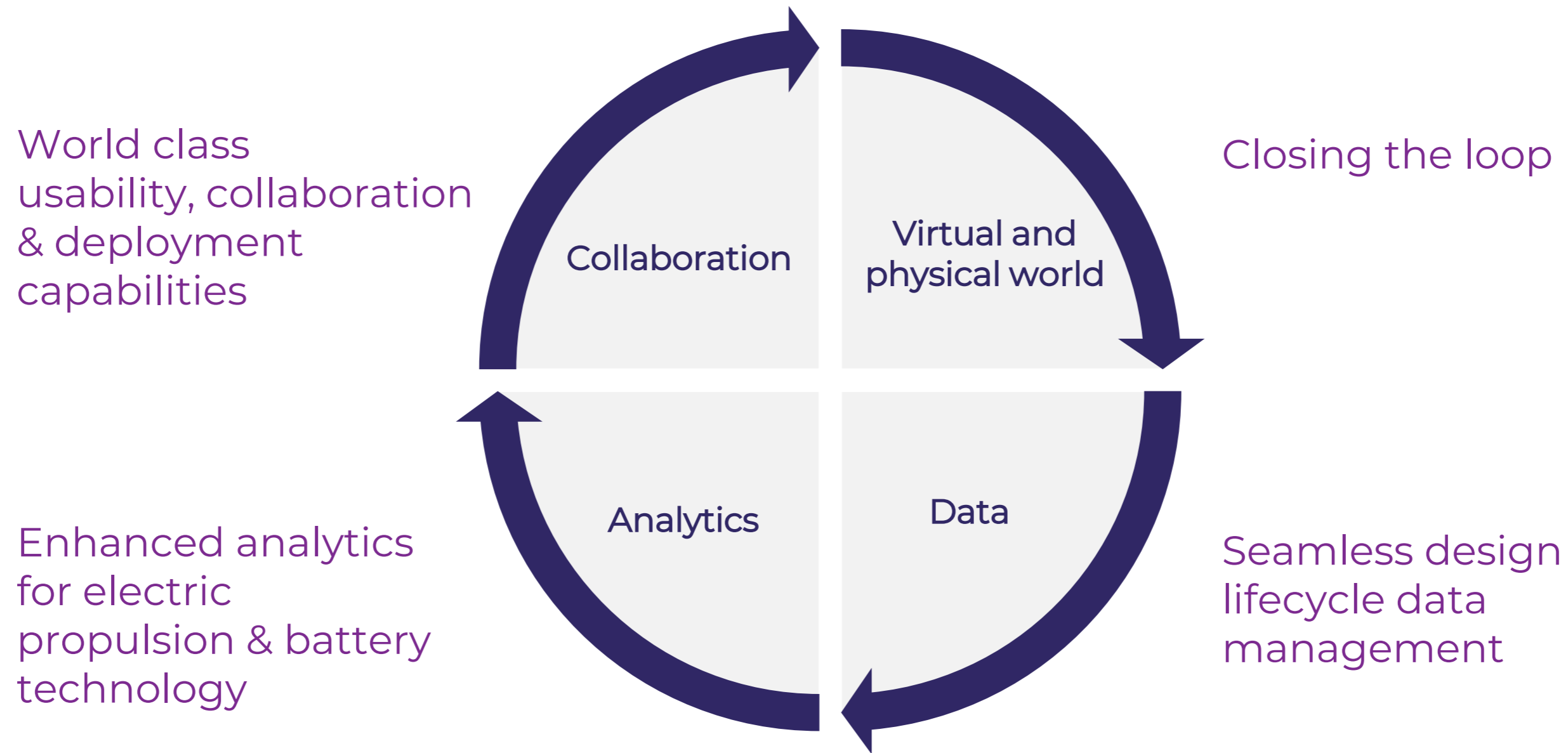
- 1 Ensuring reliability and durability of designs
- 2 Enable “X-in-the-loop” testing for early insights
- 3 Validate designs with precise insights from physical testing
- 4 Ensure production quality and efficiency
- 5 Gain insights into assets in operation
- 6 Create insights and results from data across the entire design cycle

## Our solutions

 DesignLife	
 GlyphWorks	
 VI-DRIVESIM	
 DRIVER-IN-MOTION	Powered by 
	
	
	
	

# Spectris Dynamics – solving the data challenge with a connected and collaborative ecosystem

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Empowering the Innovators with actionable data insights from simulation, virtual and physical tests



# Digitisation – increasing speed and reducing cost of innovation with software solutions

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## Customer challenges

- Efficiency in engineering teams
- Seamless virtual and physical testing
- Connections between simulation, testing and analytics data
- Volume of data



2021 sales ~£60m  
2022 sales ~£75m

## Spectris Dynamics solution

- Enable collaboration with great usability
- Manage data over the development lifecycle
- Enhanced analytics for key applications
- Closed loop between virtual and physical test

We help customers to innovate with software solutions, underpinned by domain expertise

# Electrification

Tanneke Reinders





# Tanneke Reinders, EVP Physical Test, Spectris Dynamics

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- Joined Spectris in 2018
- Previously Vice President Corporate and Business Development at Malvern Panalytical
- Appointed EVP for Physical Test in January 2023
- Over 20 years' international experience in B2C and B2B markets in various industries, including automotive

# Electrification is driving the transformation of mobility for a cleaner world

Supporting our customers in the Electrification of Automotive and Aerospace

## Automotive

Investing \$626 billion to develop EVs

By 2030 EVs >60% of vehicles sold

## Aerospace

\$3.7bn invested in the eVTOL industry in 2021

~200 companies pursuing more sustainable propulsion projects



# We are solving our customers' challenges across automotive and aerospace

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Extending the range of electric vehicles

Lighter designs without compromising safety

Develop optimal propulsion system to lower emissions

Passenger comfort, including noise reduction





# Automotive – Optimising EV range

Complete electric powertrain testing



- Optimising efficiency of the Electric powertrain
- Fastest power analyser on the market
- Industry-leading algorithms
- Better data and faster insights

Sensors



TI2HP Torque Sensor



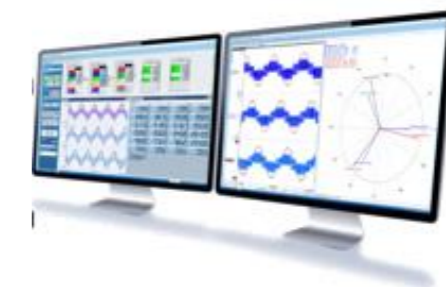
Data Acquisition



Genesis HS DAQ



Software

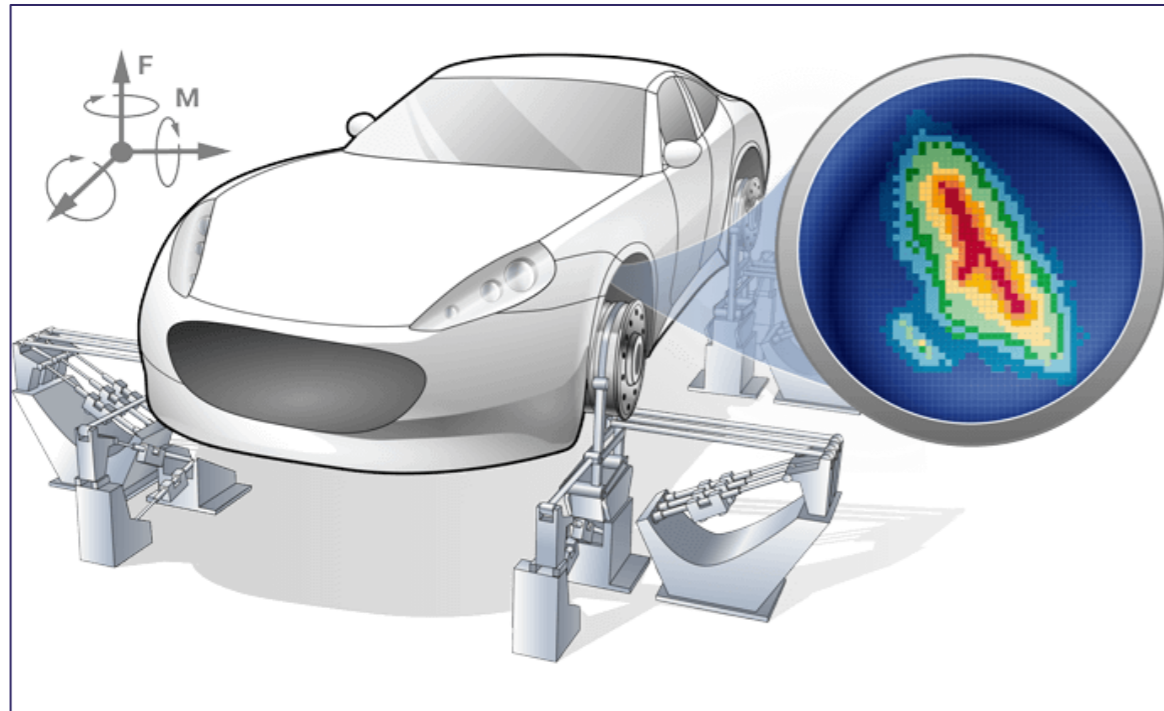


Perception EPT Software



# Automotive – Solving challenges of EV designs

## Testing for structural durability



- Electrification impacts structure, noise, durability
- The expert in vibrational sensing
- Solutions encompass the entire product offering
- Highest level of precision, reliability and efficiency
- Global service and support

### Sensors



Accelerometers



### Data Acquisition



LANXI DAQ



### Software



BK Connect Software

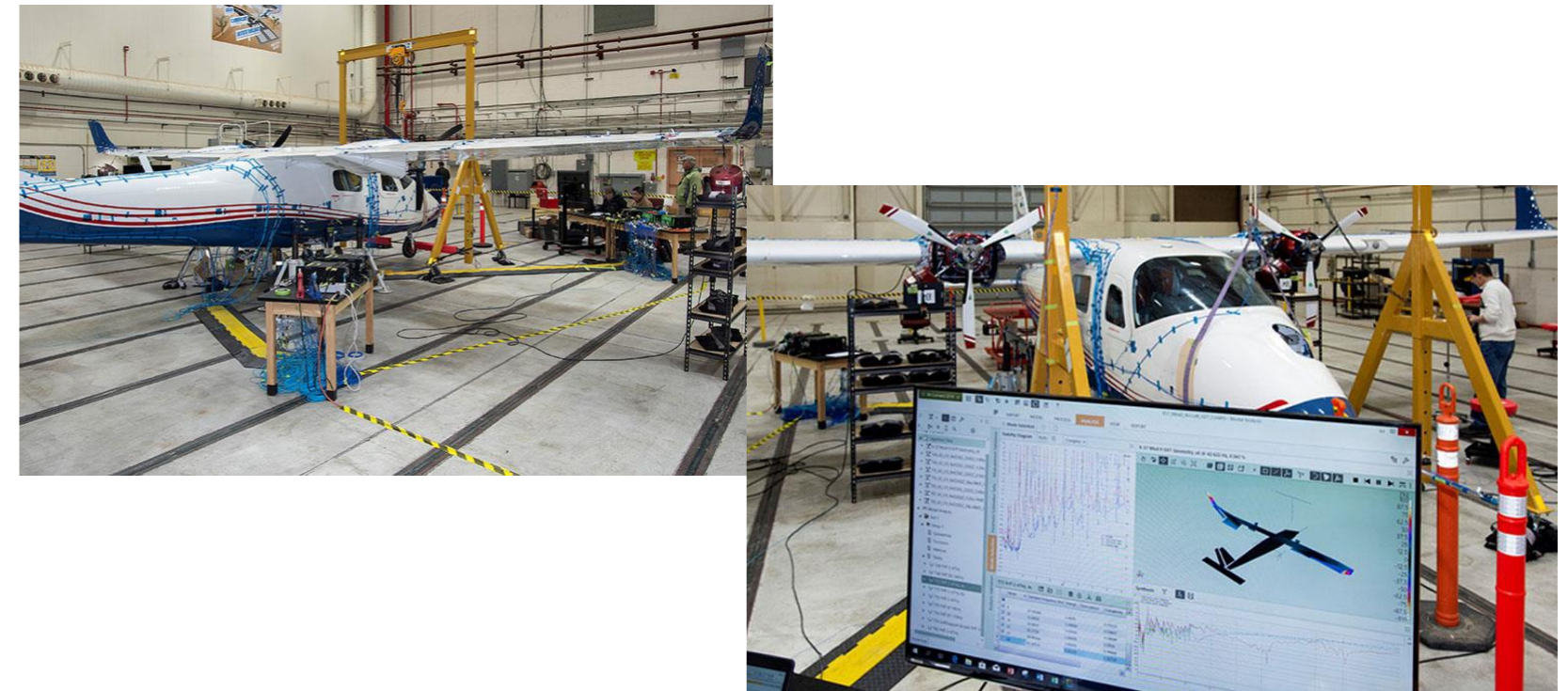
# Aerospace – ensuring airworthiness for NASA's electric aircraft

## Customer challenge



- X-57 Maxwell is NASA'S first all-electric X-plane
- Ground Vibration Tests represent a key milestone to allow it to take to the air

## Dynamics solution



- 191 test runs done with our sensors, data acquisition and software
- One solution to measure and analyse seamlessly
- Key insights to improve aircraft design for a safe first flight



# Electrification – advancing the development of EVs

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## Customer challenges

- Maximising range
- Design dynamics of electrified vehicles
- The knowledge gap in engineering workforce



2021 sales ~£52m  
2022 sales ~£60m

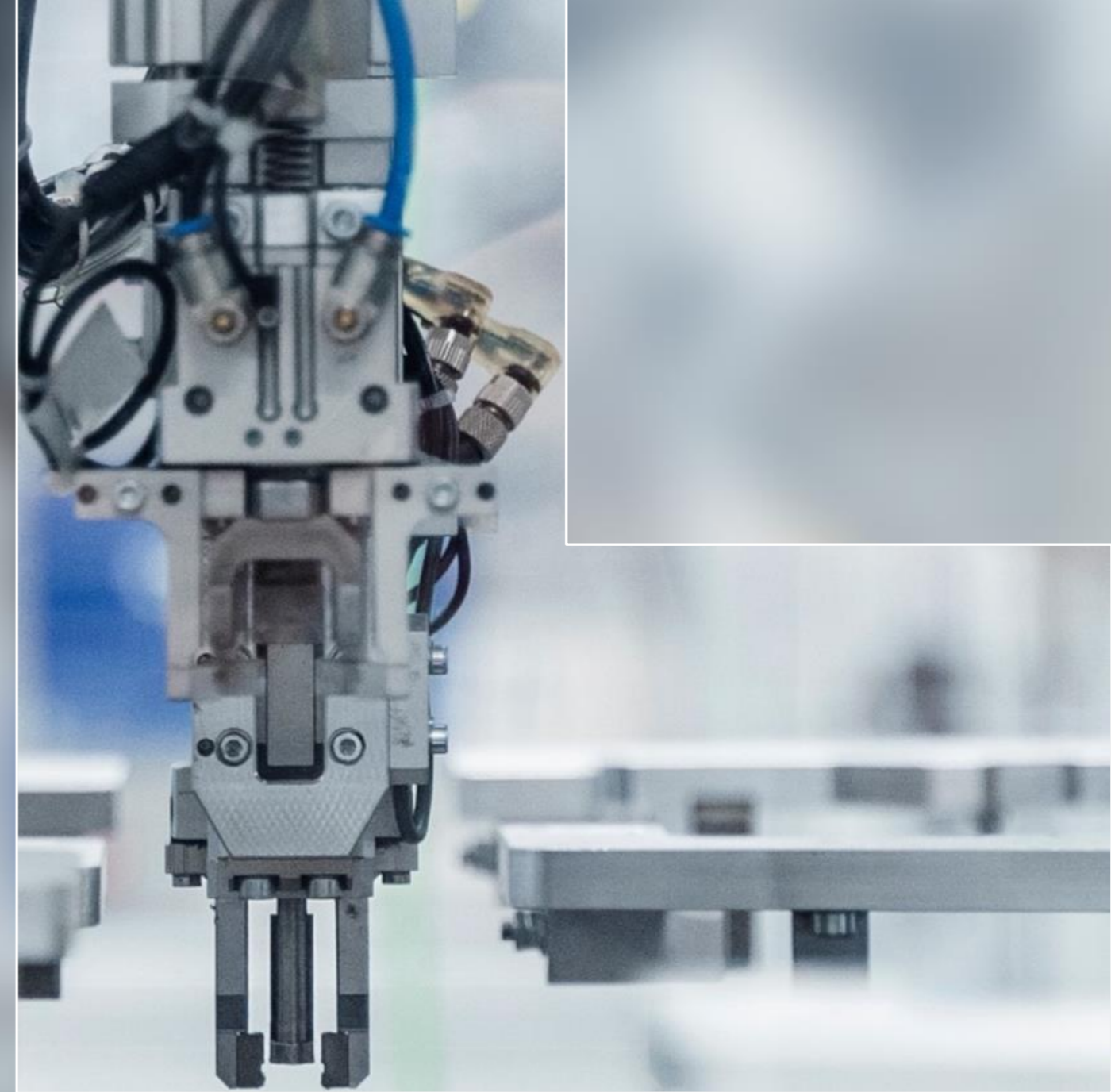
## Spectris Dynamics solution

- Electrical powertrain testing
- Battery development and electrification testing
- Structural & durability testing
- Precision end of line testing

We help customers in mobility and energy transitions for a cleaner world

# Automation

Kimberly Miller





# Kimberly Miller, EVP In-Process, Spectris Dynamics

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- EVP In-Process, Spectris Dynamics
- Joined Spectris as Head of Product Management in June 2021
- Various manufacturing and operational roles at global organisations such as AAR, AirLiance Materials, Rexnord and NTN

# Automation provides a significant opportunity

Labour scarcity, higher input costs, more connected factories and competition is driving a growing need for productivity, digital connectivity and automation



Served Addressable Market\* (SAM)

c.£1bn



CAGR\*\*  
(Period 2022-2027)

>10%

\* Including Robotic End-of-arm Tooling (EOAT); Sensors for Discrete Control; and Smart sensors

\*\* Including Smart Sensors and OEM Sensors revenue

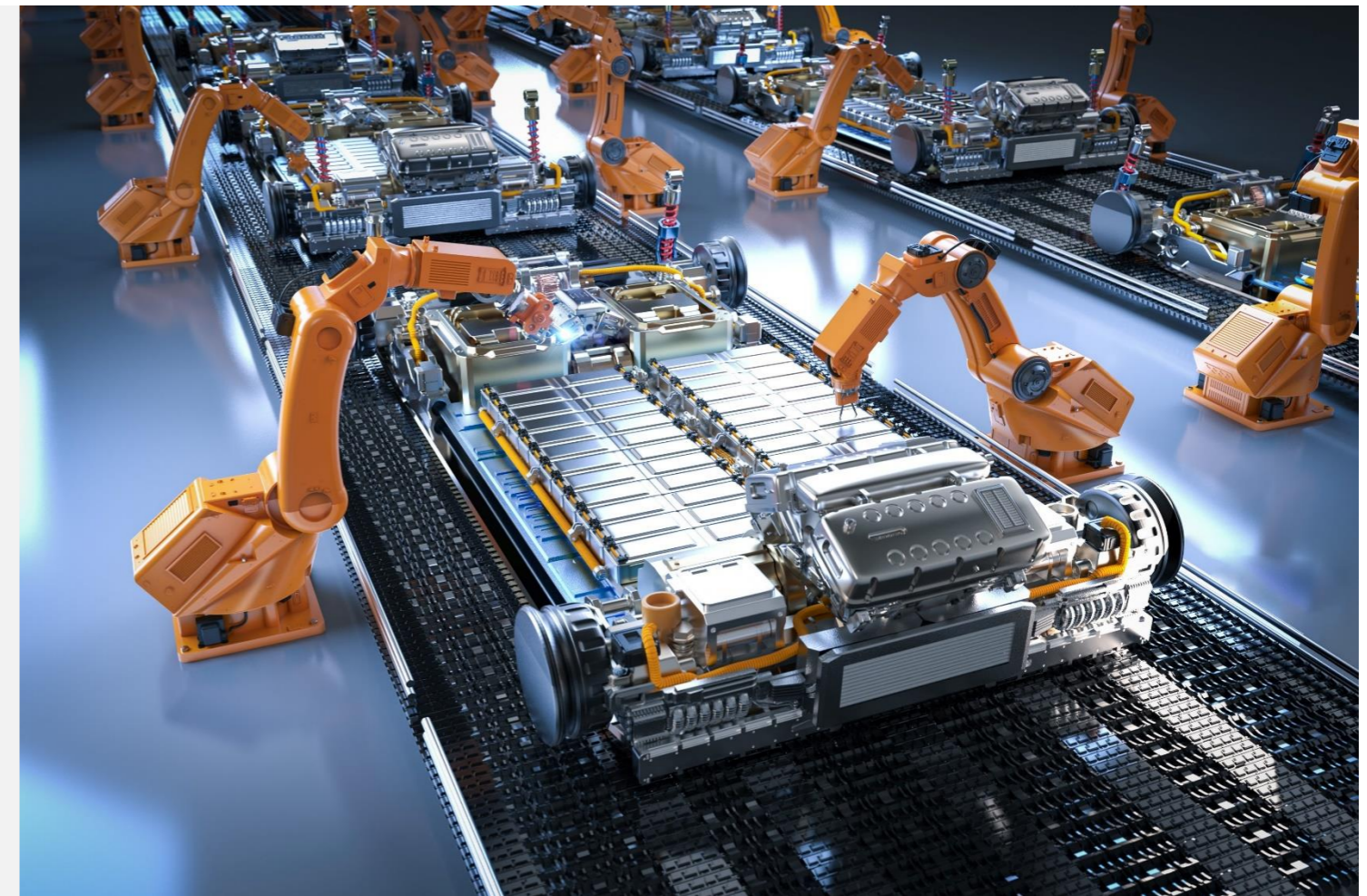


# We are well placed to solve customers' productivity challenges

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## Customer needs and challenges

- Reduce waste and save costs
- More efficient processes
- More automated assembly processes
- Reduce product variation and improve quality





# Spectris Dynamics provides turnkey solutions supporting automation-centric applications

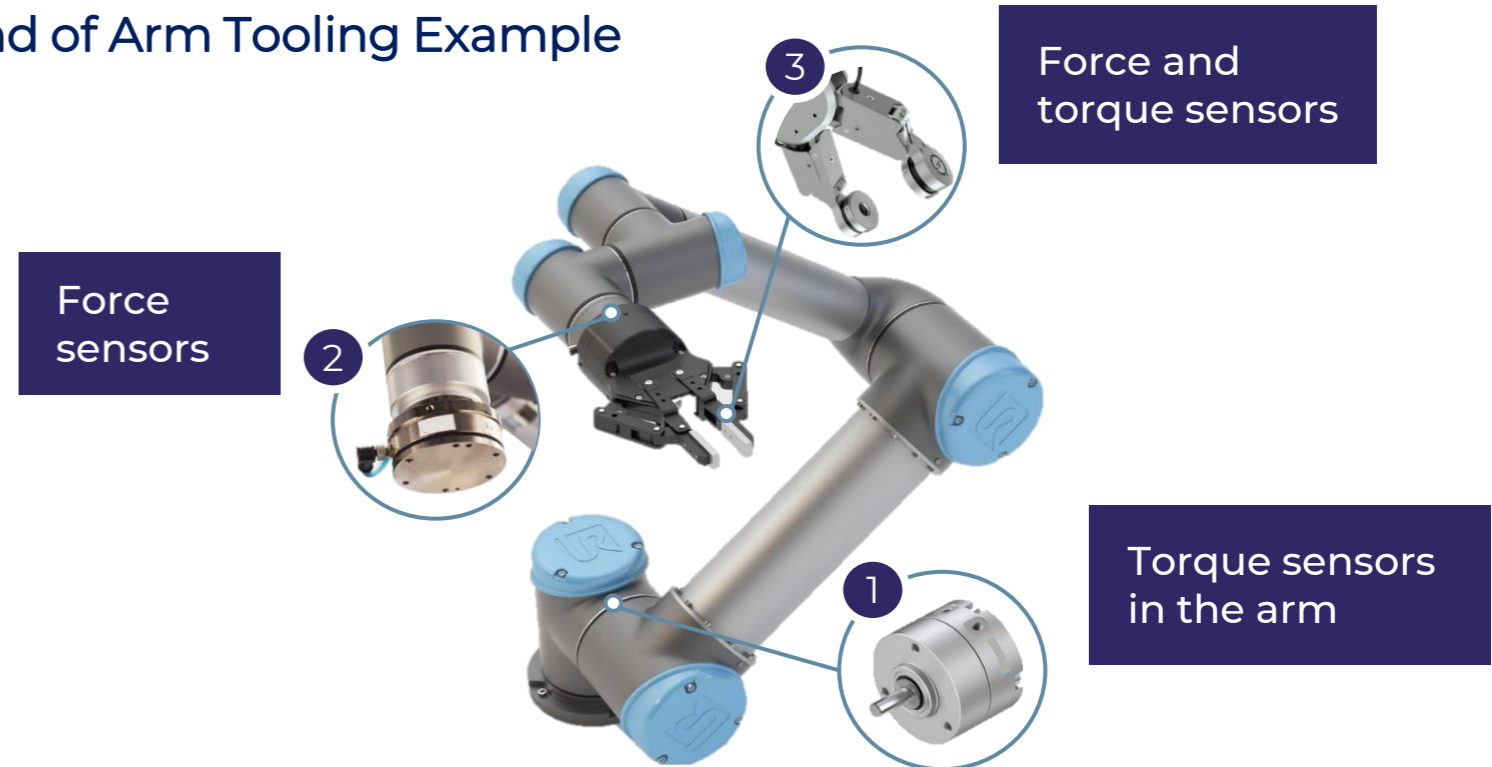
**Smart Sensors** – Enhanced flexibility, higher speed and increased efficiency in the production process

**OEM Sensors** – Custom sensing solutions that deliver data for real-time feedback and control



Enables customers to adopt customised sensing, providing more precise solutions and widening the field of applications

## End of Arm Tooling Example





# Smart Sensors – enabling industrial processes to achieve improved productivity

Supporting the Food and Beverage industry to design a weighing filler with exceptionally high precision and output rate

- Leader in the production of packaging machines for the food & beverage industry
- Developed weighing filler with our Smart sensor technology
- Achieve precise filling weights in the shortest possible cycle time
- Our digital FIT load cell was the ideal solution for meeting the customer's requirements

## Customer benefits

- Reduced waste
- Reduced cost
- Increased uptime



# OEM sensors – supporting a healthier and more productive world

Spectris Dynamics helps a customer to incorporate high precision pressure sensors in its staplers for critical surgical operations

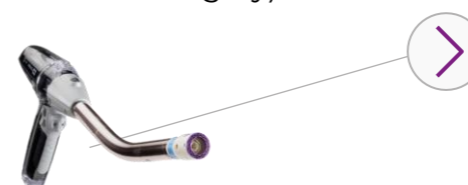
- Leader in medical equipment developing a new product range of high-precision staplers used in surgery
- Provide consistent staple performance over a broad range of tissue thicknesses
- Our OEM Sensors provide a tailored sensing solution that enables the precise measurement of clamping force applied to tissues and organs



## Customer benefits

- Increased insights
- Increased precision / less invasive
- Better patient outcomes

Circular stapler  
(for colorectal surgery)



Adapter structure



OEM Sensor





# Automation – enhancing processes and assets

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## Customer challenges

- Increased complexity of interconnected manufacturing environments
- Increasing input cost and scarce resources require automation



2021 sales ~£28m\*  
2022 sales ~£40m

## Spectris Dynamics solution

- Bring intelligence to the point of measure
- Simplify machines
- Precision increases productivity
- Adapts customer hardware to become the sensor

We increase productivity in an increasingly automated and connected world

# Spectris Dynamics Growth

Ben Bryson





# Mega-trends underpin growth and where we are focusing our R&D investment

Virtual Test

Digitisation

Electrification

Automation

# Investing in R&D to drive organic growth

~8% R&D as % sales

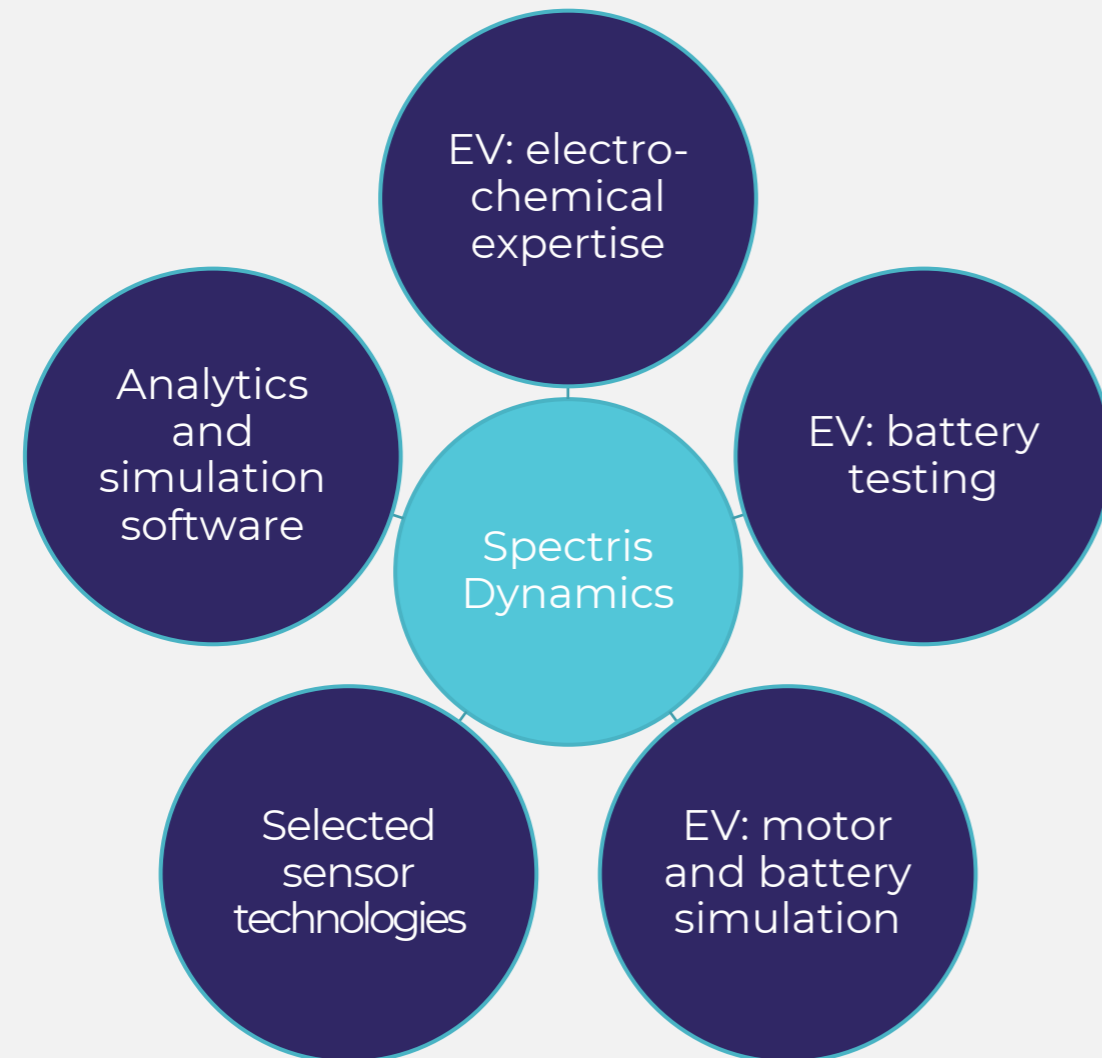
~35% Vitality index

	Investment area	Description
1	Expand Virtual Test	<ul style="list-style-type: none"><li>- Immersive software and real-time computation</li><li>- Advance the “Driver-in-the-loop” and “Hardware-in-the-loop”</li></ul>
2	Advance software	<ul style="list-style-type: none"><li>- Simulation solutions and data management</li><li>- Launched data management platform</li><li>- Investing in analytic software</li></ul>
3	Fusion & Advantage	<ul style="list-style-type: none"><li>- Unified data acquisition hardware and software platforms</li><li>- High-speed, multi-channel; seamless integration with our sensors</li></ul>
4	Electric Powertrain	<ul style="list-style-type: none"><li>- Most precise solution on the market</li><li>- Analyses power across the motor, inverter and battery</li></ul>
5	Smart sensors	<ul style="list-style-type: none"><li>- Apply firmware and software to precision sensors</li><li>- Integrate data acquisition and processing power</li></ul>
6	OEM sensors	<ul style="list-style-type: none"><li>- Create insights into processes and assets for OEM customers</li><li>- Transform parts into sensors</li></ul>



# Compounding growth through a disciplined approach to M&A

Enhance leading position by adding further technology and capability within domains of: electrification, analytics & simulation software and sensor technologies






## Building a Virtual Test business

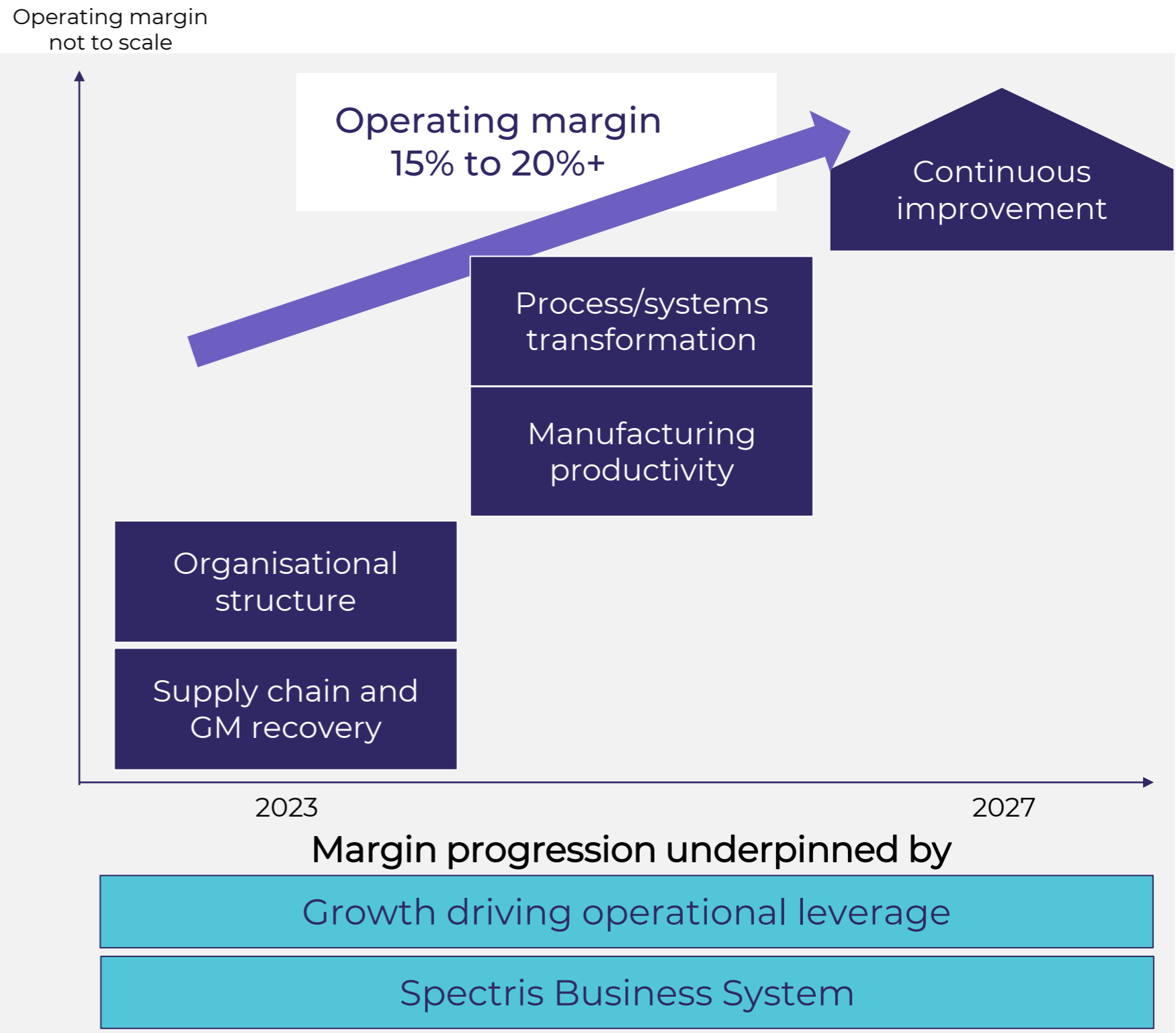


## Strengthening sensor and data acquisition offering



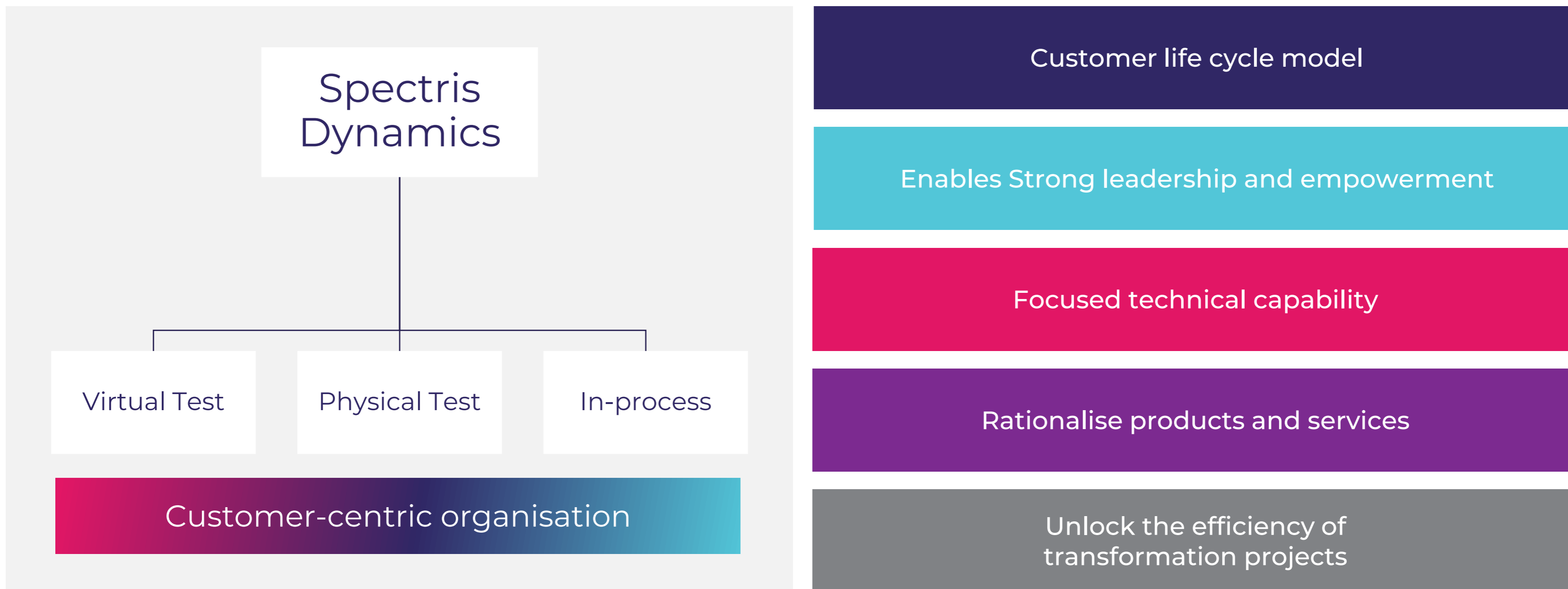
# Initiatives underway to drive margin expansion to 20%+

 <b>Growth</b>	<ul style="list-style-type: none"> <li>- 6-7% through cycle sales growth</li> <li>- Revenue drop-through</li> </ul>
 <b>Operating model</b>	<ul style="list-style-type: none"> <li>- Organisational restructure aligned with customer life-cycle</li> </ul>
 <b>Business transformation</b>	<ul style="list-style-type: none"> <li>- Latest SAP, cloud-based systems</li> <li>- Salesforce.com and e-commerce</li> </ul>
 <b>Spectris Business System</b>	<ul style="list-style-type: none"> <li>- Lean tools</li> <li>- Continuous improvement culture</li> </ul>





# Margin expansion – organisational alignment and a winning culture



# Margin expansion – business process transformation

## Investing in business processes

- One common set of global processes
- Moving from 9 separate ERPs to a single, scalable and agile solution
- Deployment of Salesforce.com and consolidation of e-commerce systems and tools
- Implementation through 2024



## Delivering clear and tangible benefits

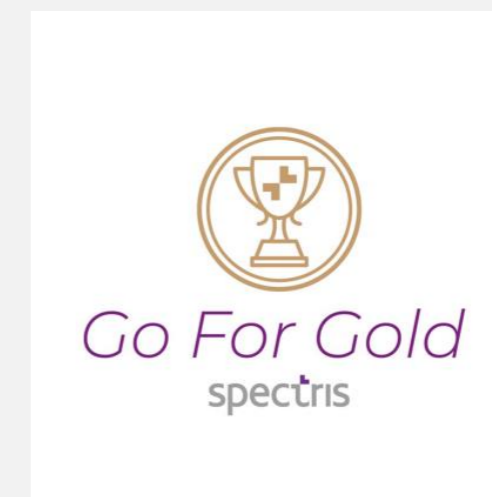
- Increase efficiency of business transactions
- Improve margin and lower working capital
- Simplify, standardise and automate processes
- Enhance customer service and support
- Increase engagement supporting *'Great Place to Work'* ambition
- Improve agility to support M&A

**Single ERP and common processes delivers 150bps of margin**



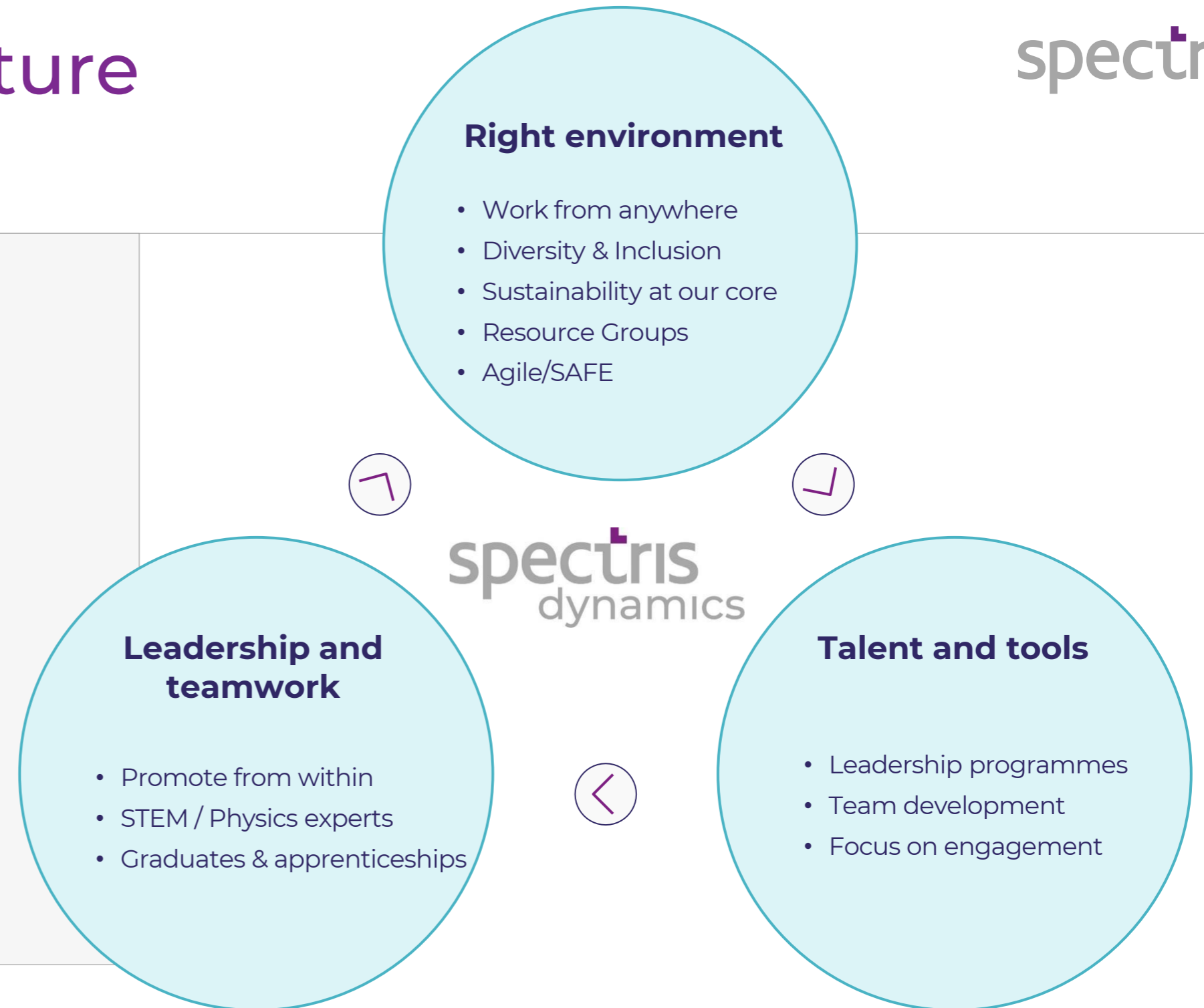
# Margin expansion – lean mindset through the Spectris Business System

Objective	Impact area	Description
Culture	<ul style="list-style-type: none"> <li>- Lean operations &amp; supply chain</li> </ul>	<ul style="list-style-type: none"> <li>- Lean tools</li> <li>- Kaizen events</li> <li>- Continuous improvement culture</li> </ul>
Growth	<ul style="list-style-type: none"> <li>- Lead time reduction</li> <li>- Model line sensors</li> </ul>	<ul style="list-style-type: none"> <li>- Lead time reduction</li> <li>- Value streams optimised for cycle time</li> </ul>
Profit	<ul style="list-style-type: none"> <li>- Increased productivity</li> <li>- Supply chain excellence</li> </ul>	<ul style="list-style-type: none"> <li>- Global supply chains</li> <li>- Targets set at plant level</li> <li>- Automation of processes</li> <li>- Drive OTR culture</li> </ul>
Cash and Efficiency	<ul style="list-style-type: none"> <li>- Working capital optimisation</li> </ul>	<ul style="list-style-type: none"> <li>- Global material balancing</li> <li>- ERP alignment via SIOP</li> </ul>



# Investing in talent and culture

- Great team, top talent
- High performance culture
- Focus on sustainability
- Exciting opportunity with great potential



**Spectris Dynamics: A Great Place to Work**

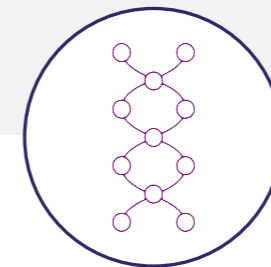




An **established leader** and domain experts in **premium** virtual test, software, data acquisition, sensing



Well positioned in **attractive markets** supported by sustainable **mega-trends**



Strengthening **customer offering** – integrated virtual and physical test solutions, and **software-oriented** strategy



Delivering **above market growth** with **strong margin expansion** through the cycle

6-7% organic sales growth through cycle

Operating margin expansion to 20%+

**Empowering innovators for a cleaner, healthier and more productive world**