



Atlas Copco



Vacuum Technique

Geert Follens, Business Area President

Capital Markets Day 2022



VACUUM PUMP

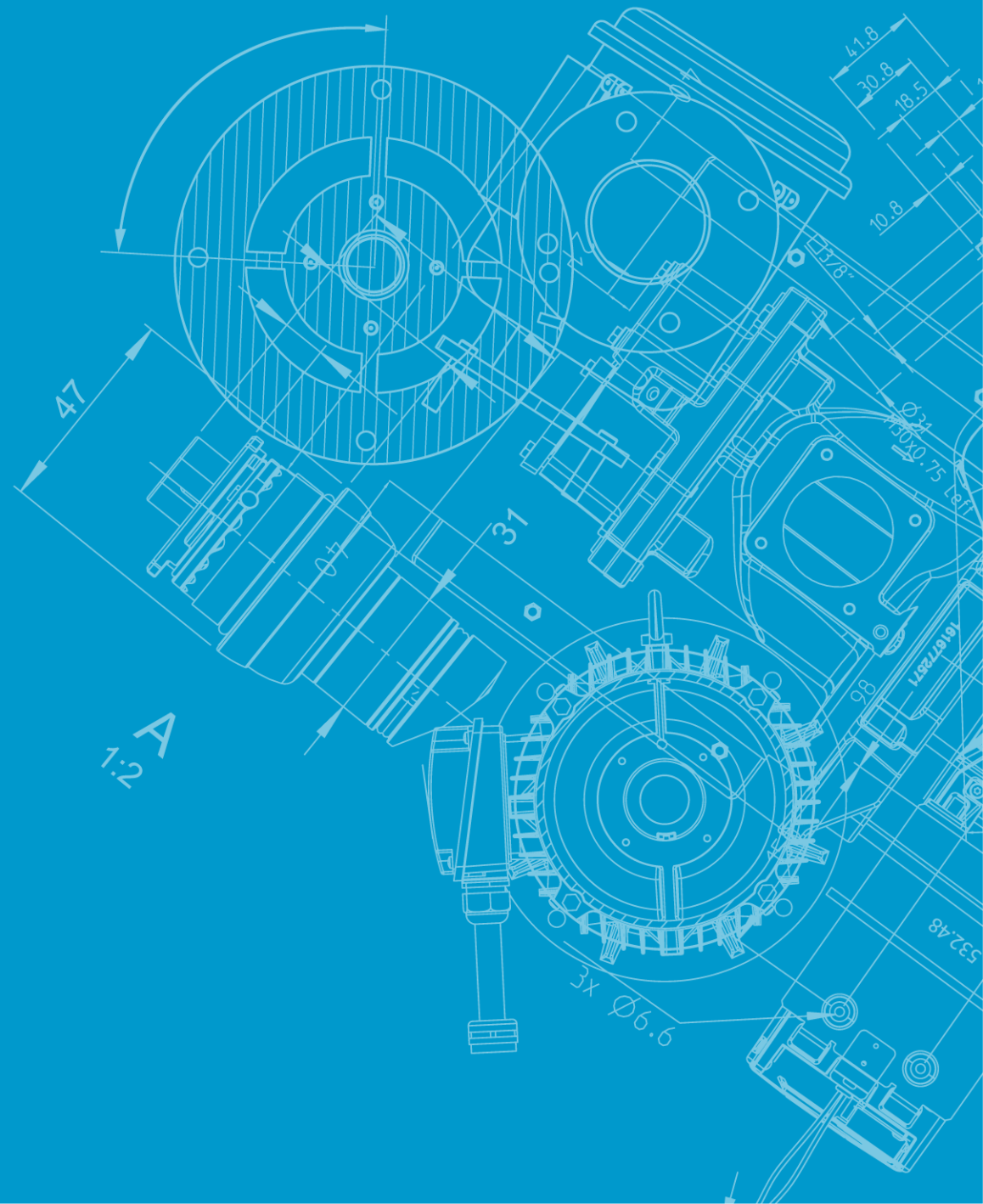
GHS 5400 VSD*

Agenda



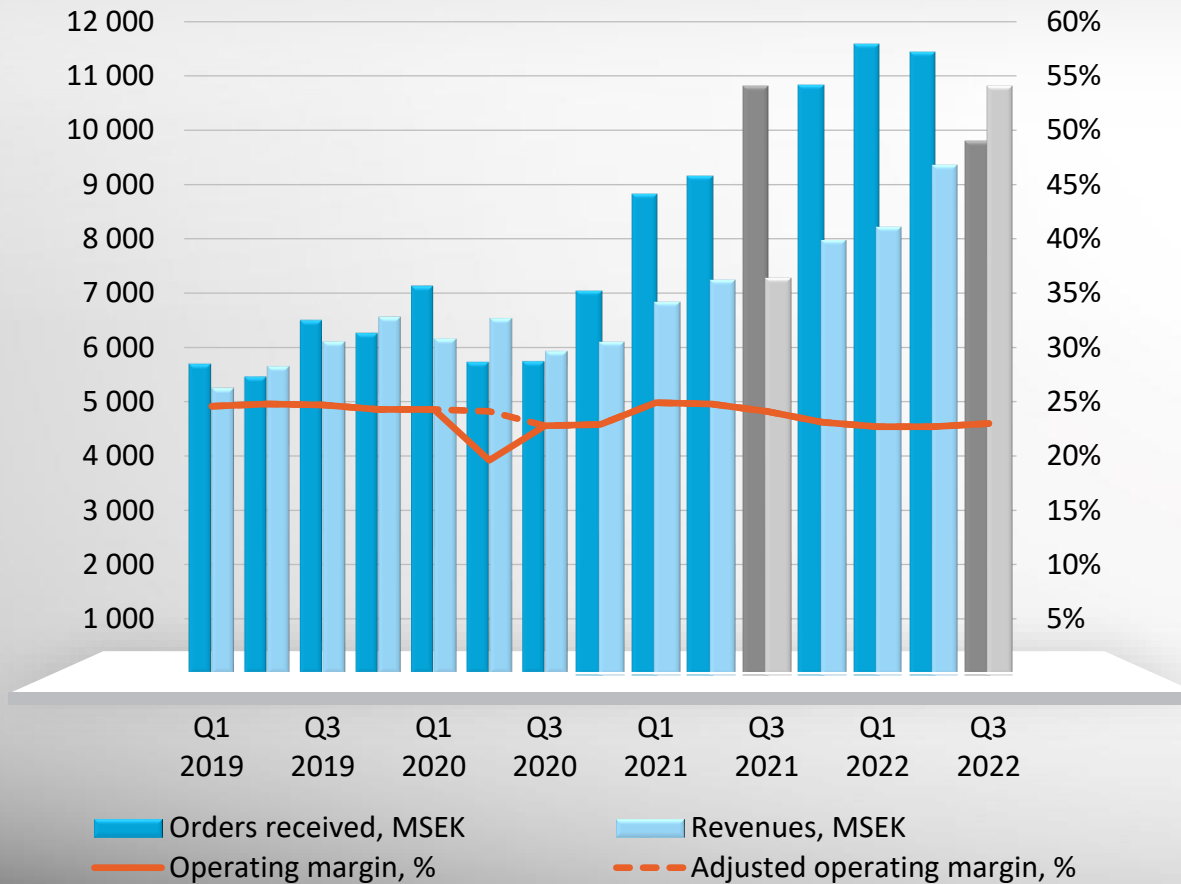
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- 4 An enabler of the transition to a low carbon society
- 5 Summary

Facts in brief



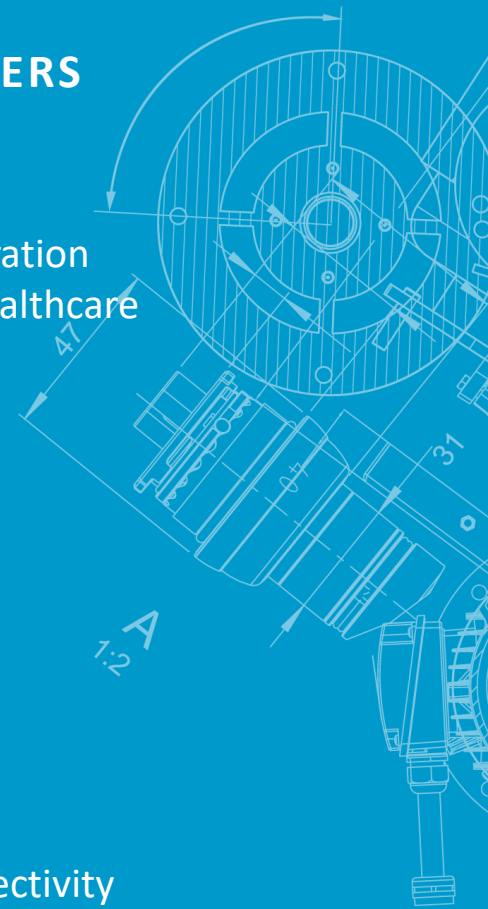
Vacuum Technique

ROCE
25%

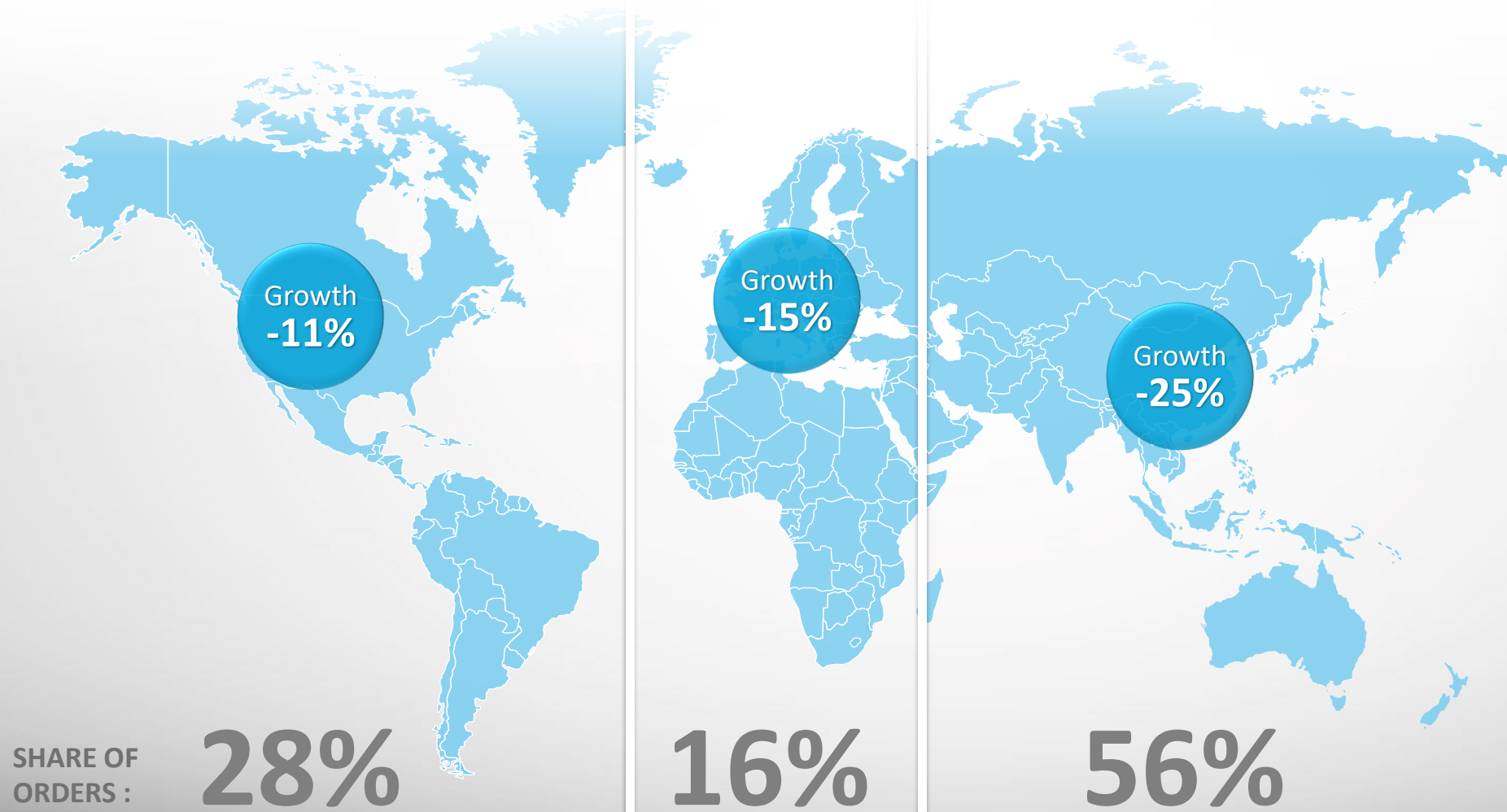


MARKET TRENDS / DRIVERS

- Semiconductor
 - Miniaturization
 - Machine-driven data generation
 - 5G, AI, VR, Automotive, Healthcare
 - Interconnectivity
 - Legislation
- Industrial Vacuum
 - Food regulations
 - Li-Ion batteries
 - Solar
 - Space
- Common Trends
 - Sustainability
 - Service – Up-time & Connectivity
- Geopolitics - Local for Local



Orders received July – September 2022 vs 2021

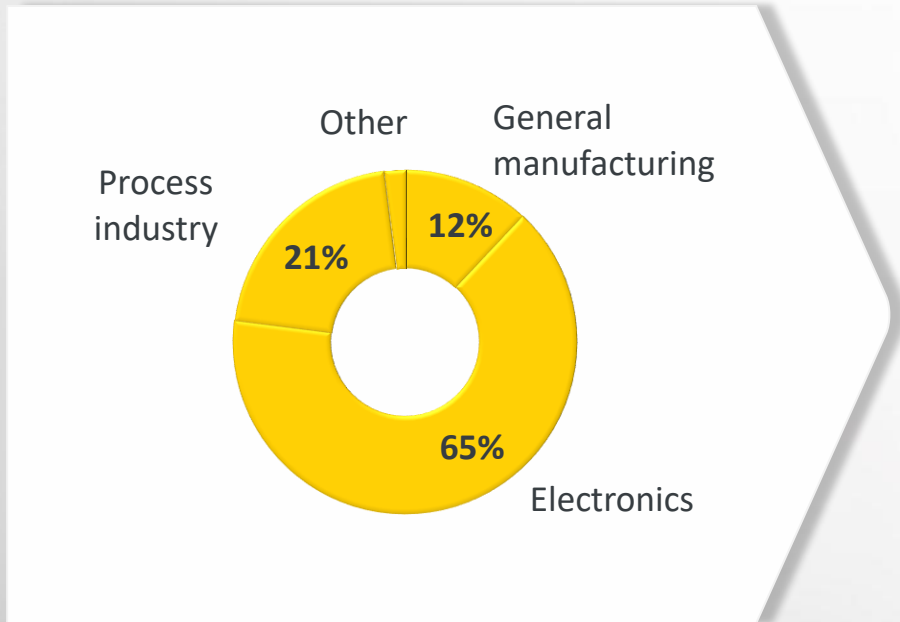


* Growth in local currency.

The market we operate in

ORDERS RECEIVED

January – September 2022



ELECTRONICS

- Machine data and interconnectivity driven
- Revival of 200mm fabs for complicated/IOT chips
- Harsher processes
- More foundry players, local for local
- Capacity and Agility take share

PROCESS INDUSTRIES

- Increasing market share across the process industry – food, chemical refining, and metallurgy
- Extensive range of applications in food sector – e.g., canning, packaging, and freeze drying

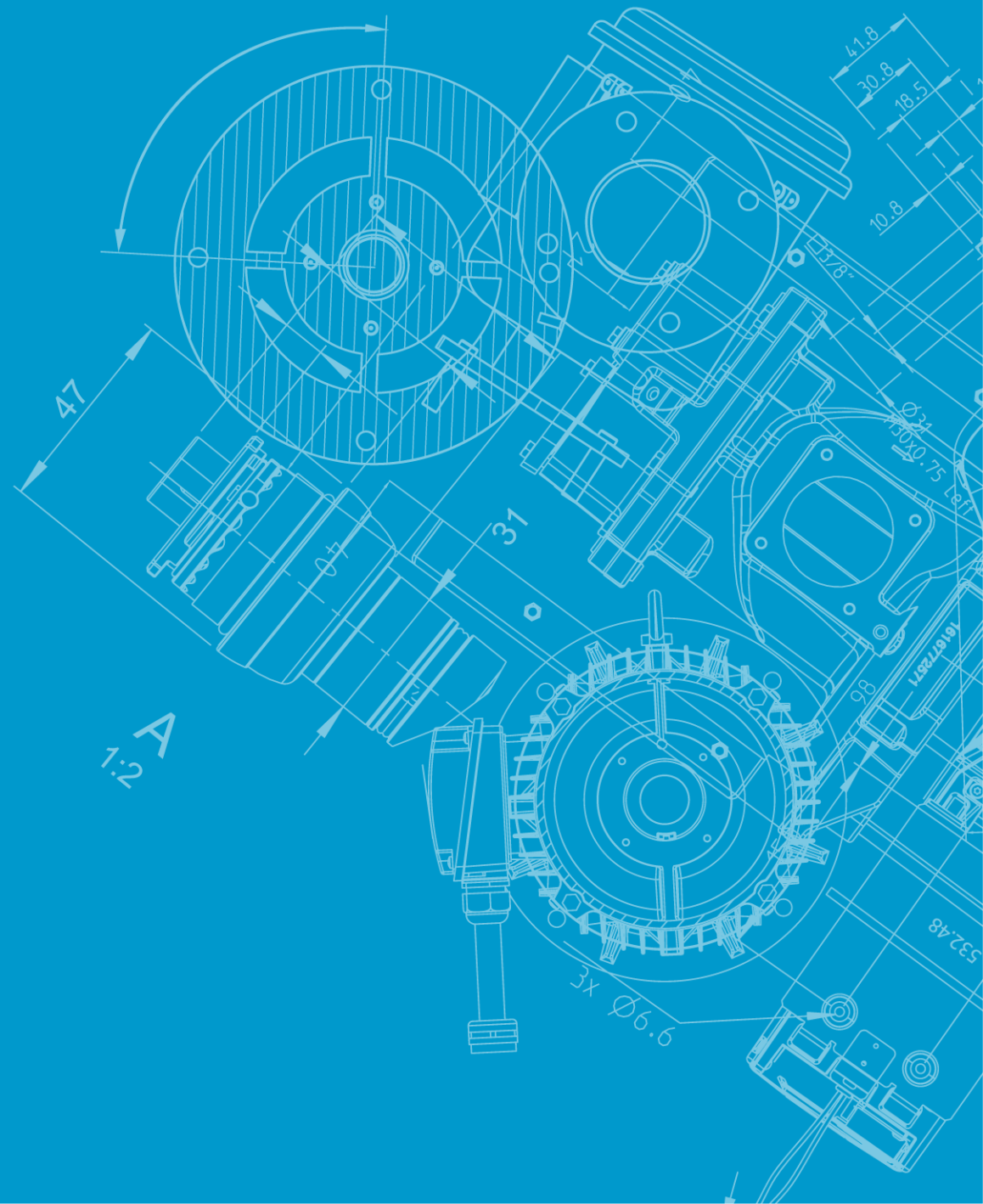
GENERAL MANUFACTURING

- Clear market leadership
- Wet to dry transition
- Liquid Ring Focus
- Mobile vacuum

OTHER

- Enabling advancements in space simulation and solar cell production, glass and optical coating

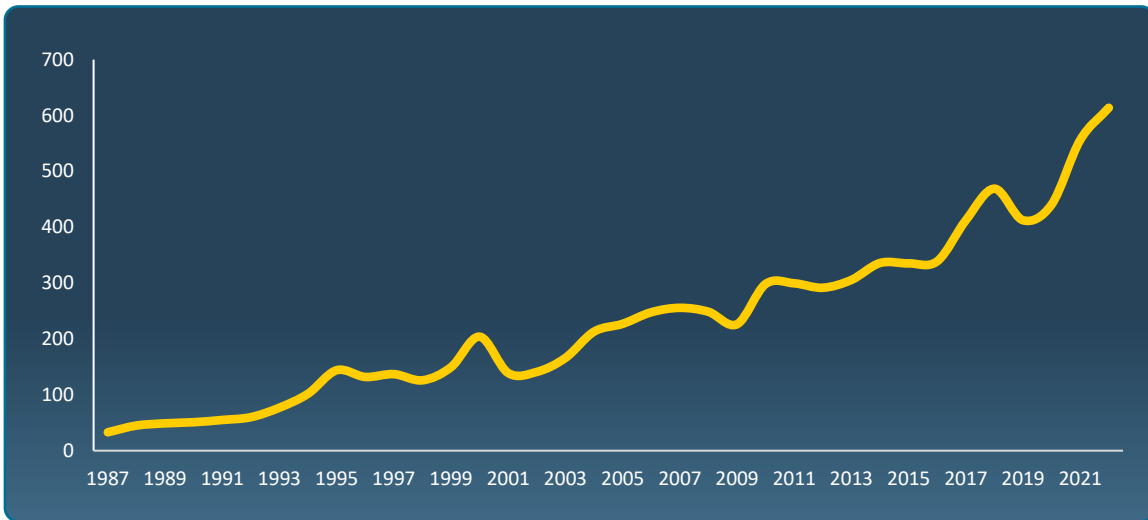
Market trends and business fundamentals



Semiconductor market size

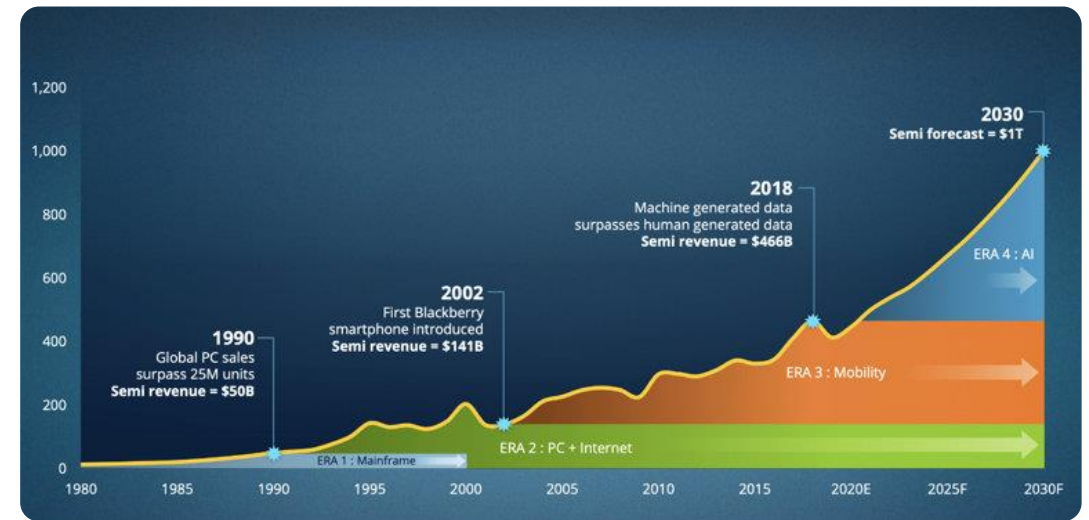
CAGR 10% over full 35 year term

SEMICONDUCTOR MARKET SIZE WORLDWIDE
From 1987 to 2022* (\$B)



*Source: Statista June 2022

SEMICONDUCTOR INDUSTRY REVENUE (\$B)



*Source: Applied Materials

Market drivers



**Artificial
Intelligence**



5G Network



**Cloud
Computing**



Gaming



Medical



**Work
from home**



**Super
Computing**



IoT

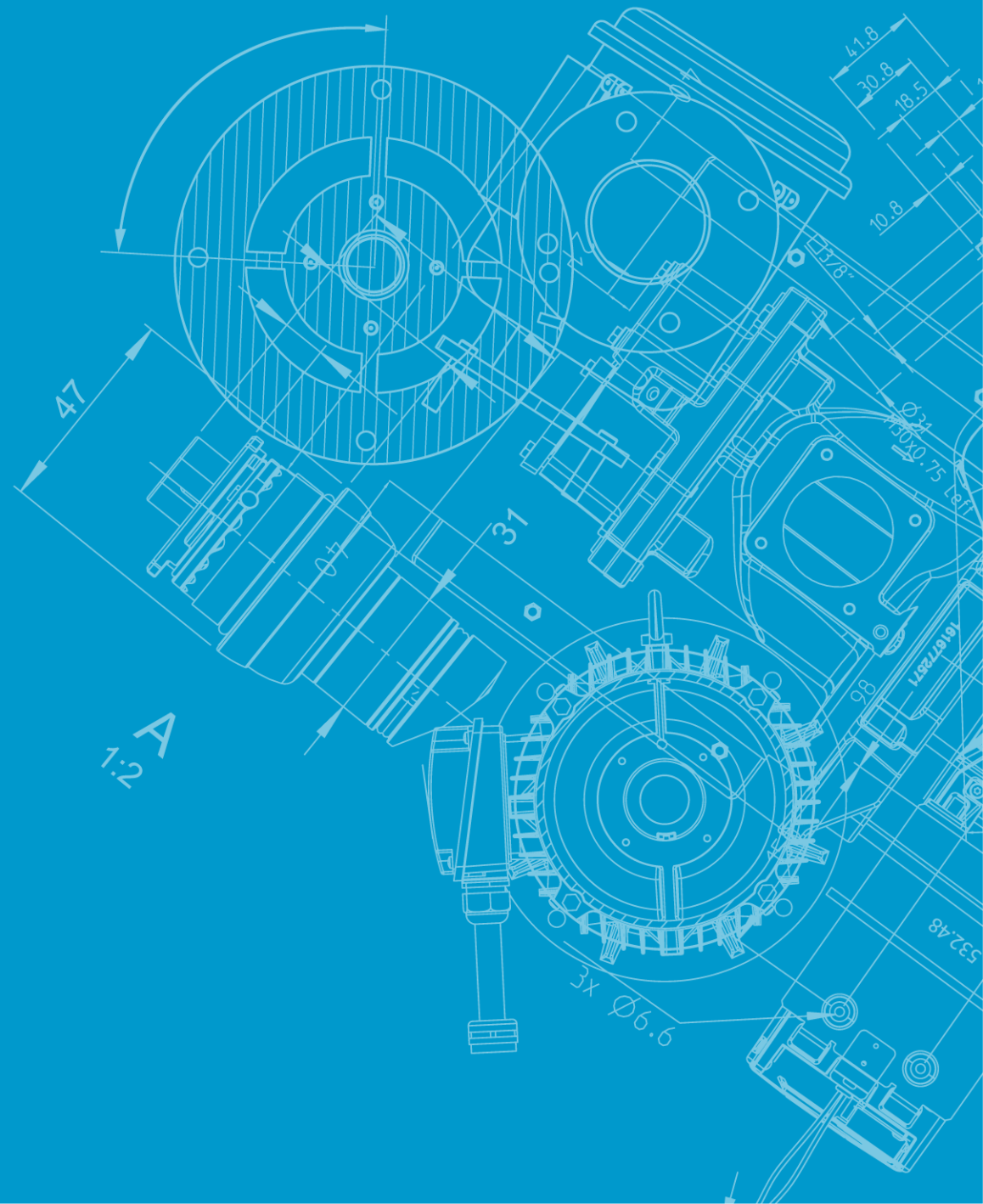


Automotive



Industrial

Strategy for growth



Strategy for profitable growth – Summary

Agility/Capacity



Innovation



**Opportunities
in the US**



Acquisitions



**Growth in
General Vacuum**



Local for Local



Service/Connectivity



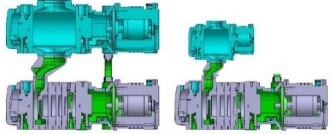
People & Culture

Agility and Capacity



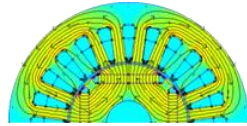
Why we innovate

PERFORMANCE DENSITY



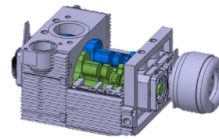
- Footprint, NVH, 3D Printing
- EMS Emissions, PFC, NOx

MOTORS & DRIVES



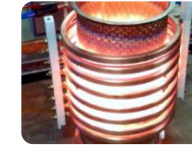
- Variable Speed / Universal
- 1f, 3f, 80W – 11kW

PRODUCT ENERGY & EFFICIENCY



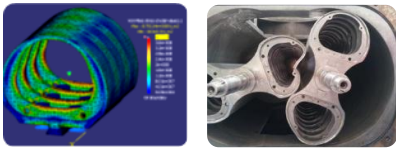
- Optimized mechanisms
- Utilities Consumption

CIRCULAR ECONOMY & RENEWABLE



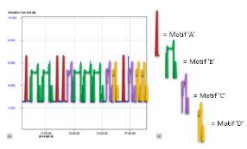
- Reduce, Reuse, Recycle
- Abatement Electrification

PRODUCT INTEGRITY



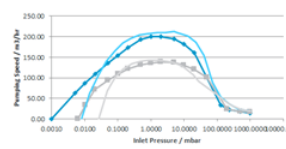
- Safe Operation
- Reliability & Robustness

MONITORING ALGORITHMS



- Diagnostics & Prognostics
- Operation optimization

SIMULATION & ANALYTICAL TOOLS



- Pumping Mechanisms
- Network Modelling

DIGITAL TWINS



- IoT, Sensors, Ecosystems
- ML/AI Analytics, HMI

HARSH APPLICATION SOLUTIONS



- Powder Management
- Corrosion Resistance

PRODUCT CLEANLINESS



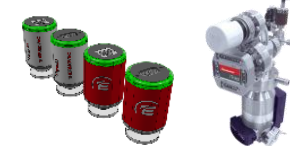
- Particle Management
- Contamination Reduction

INTELLIGENT CONTROLS



- Intelligent operating modes
- Interfaces/Protocols

NEW TECHNOLOGIES/APPLICATIONS



- Cryogenics, Chillers, Traps
- Gauges, Detectors, Quantum

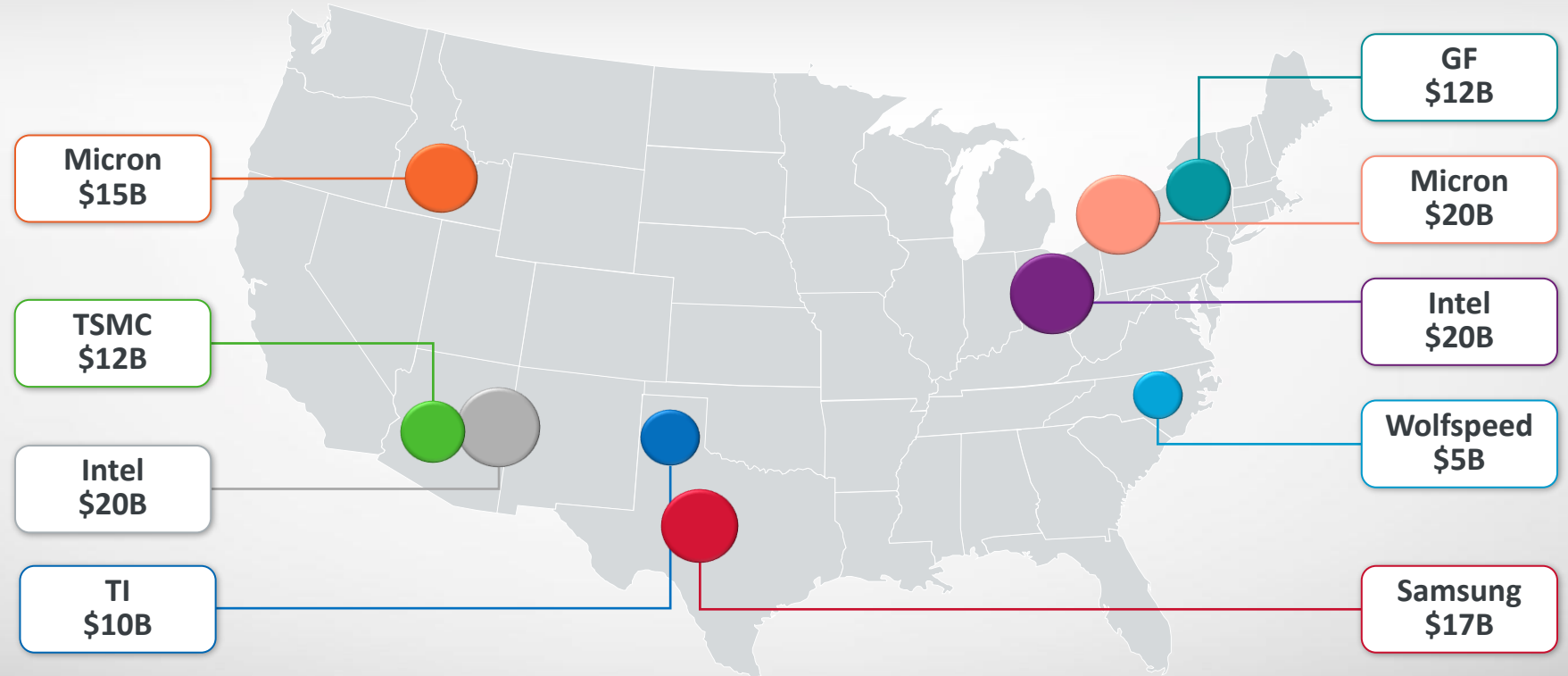
BASELINE CORE TECHNOLOGY THEMES

INCREASED FOCUS, SKILLS, PROJECTS

Local for Local – US Chips Act

Recently announced customer investment plans 2023-2025

- Semiconductor manufacturing in USA is now a matter of national security
- Only 10% of the worlds chips are now made in the USA
- In July 2022, US Congress passed the CHIPS Act
- Geopolitics will be the top factor in influencing where investments are made
- The construction of new semicon manufacturing facilities has increased 116% over the last year



VT Strategic approach to acquisitions (Semicon and Industrial / Scientific Vacuum)

Cryogenics – Vacuum and Low Temperature Physics

CTI Polycold



Semicon Cryo pumps and
Cryo chillers

2019

Montana Instruments



Quantum
Physics Cryostats

2022

Semicon – Solutions to reduce Carbon Intensity

Ceres Inc



Semicon molecule
delivery & recycling

2022

Qolibri



Semicon foreline
abatement

2022

Semicon – Process Efficiency

iTrap (Zeiss)



In-chamber
chemistry analysis

2019

Liquid ring pump Roll-up Initiative

Dekker



USA: Liquid
ring pumps

2020

Arpuma



Europe: LRP
Chemical industry
vacuum systems

2021

Chinco



China: Liquid
ring pumps

2022

Process Industry – Application Solutions

Ehrler & Beck



Industrial vacuum
systems

2021

Eugen Theis



Meat packaging
application
knowhow

2021

HHV Pumps



India industrial and
pharmaceutical vacuum
pumps & systems

2022

Mobile Vacuum Market Entry

National Vacuum Equipment



Mobile
vacuum

2022

Industrial Vacuum acquisition strategy

Distribution and System Builders



Presence



Application knowledge



Products and operations

OEM – Pump manufacturing

Hundreds of small sized distributors and system companies that possess unique and in-depth vital application knowledge



Realize full potential and growth acceleration

Less than 50 industrial vacuum OEMs with IP, factory and pump production operations

Market leader in Industrial and Scientific Vacuum

EHRLER & BECK 

Explore the side channel blowers market, test the waters through strategic partnerships.

NVE
National Vacuum Equipment, Inc.

Penetrate in the mobile vacuum market, establish global capability (organic and through acquisitions).

 **SHANDONG BOZHONG**
VACUUM EQUIPMENT CO.,LTD

 **CHINCO** 鲁阳精工

ARPUMA

 **DEKKER**
VACUUM TECHNOLOGIES

Accelerate fast in Liquid Ring Pump markets. Integrate acquisitions, establish a global intercompany network capability, innovate.





 **HHV PUMPS**
Vacuum Technology Solutions and Services

 **SCHROEDER EQUIPMENT**
equipment and systems for the process industries

 **ETV**
Eugen Thels Vakuum

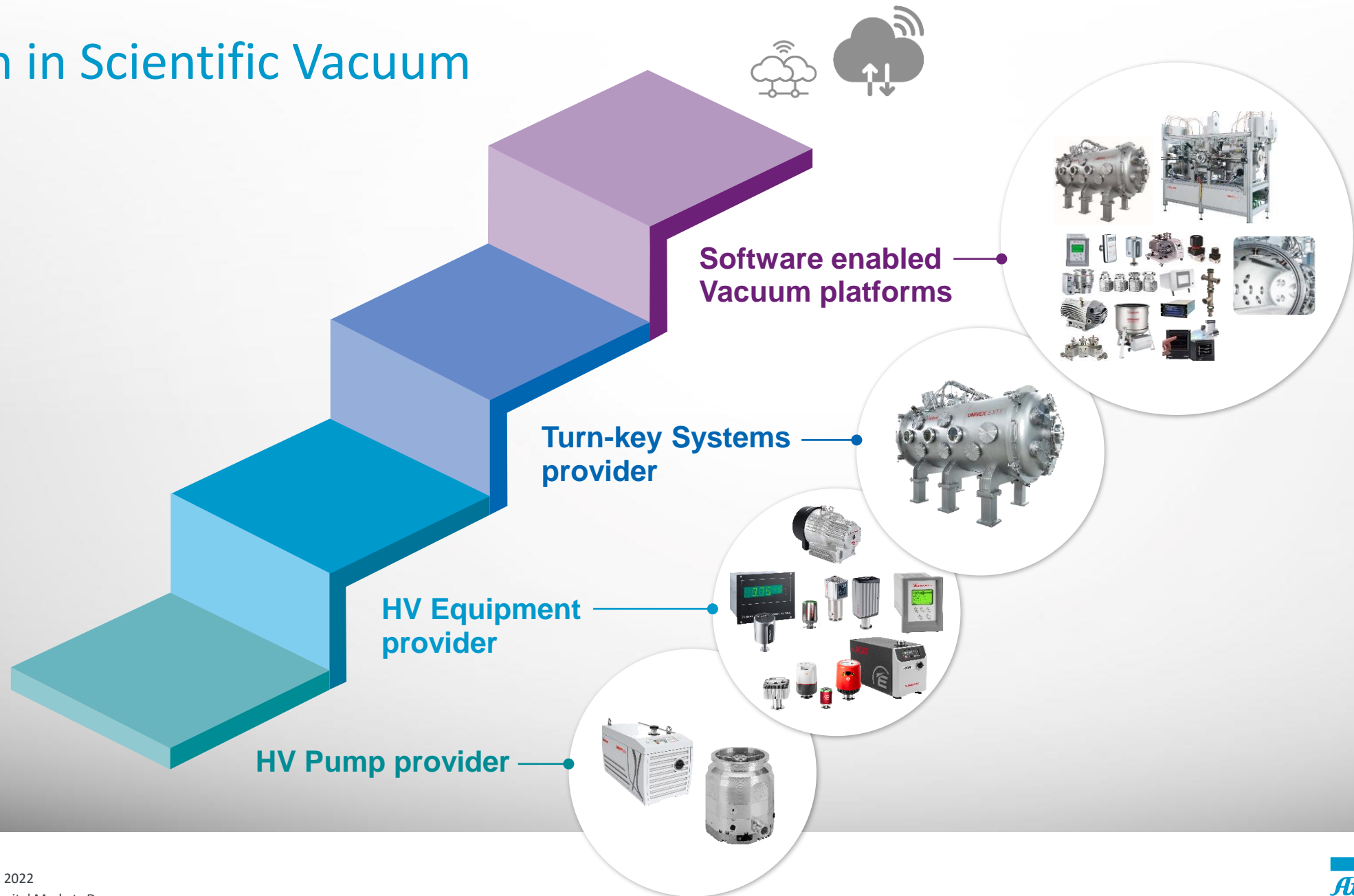
Market leader in dry and oil flood vacuum pumps technologies.
More from core. Innovation and selective acquisitions.



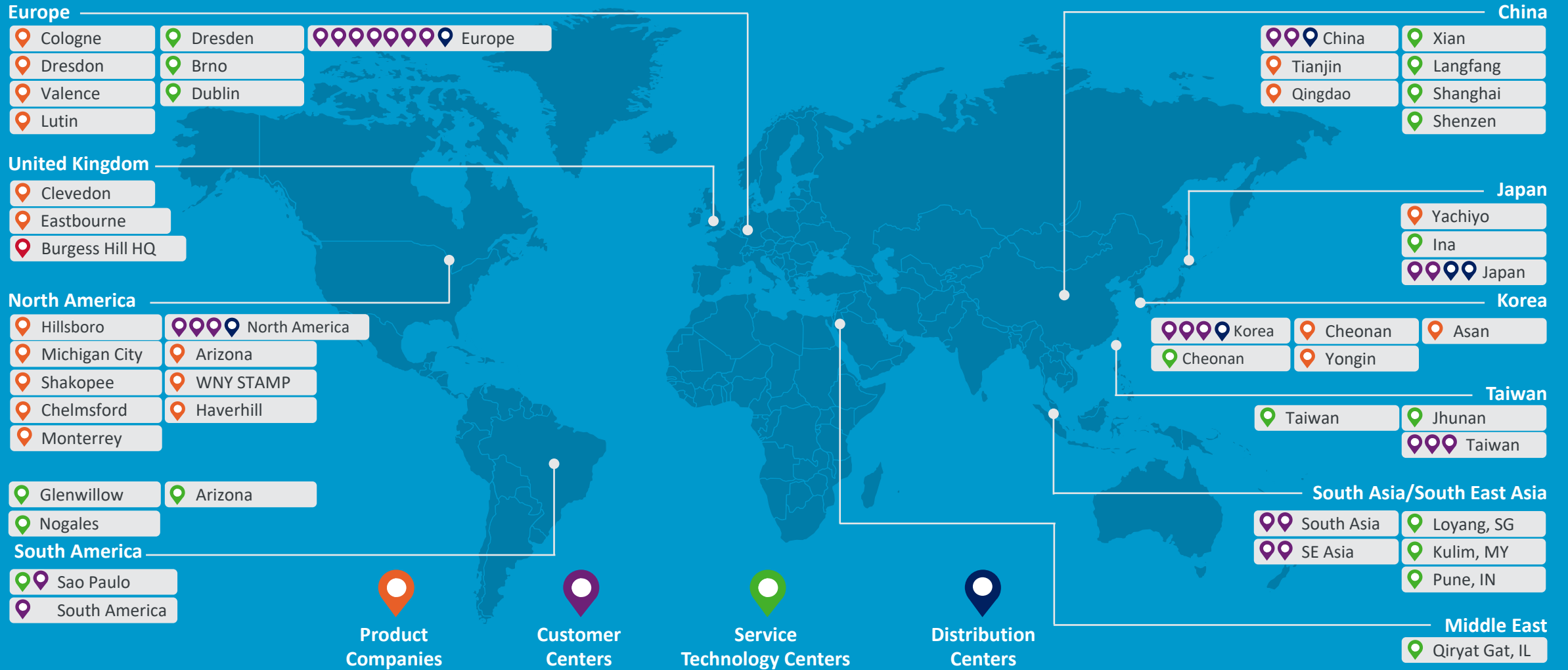
 **Leybold**



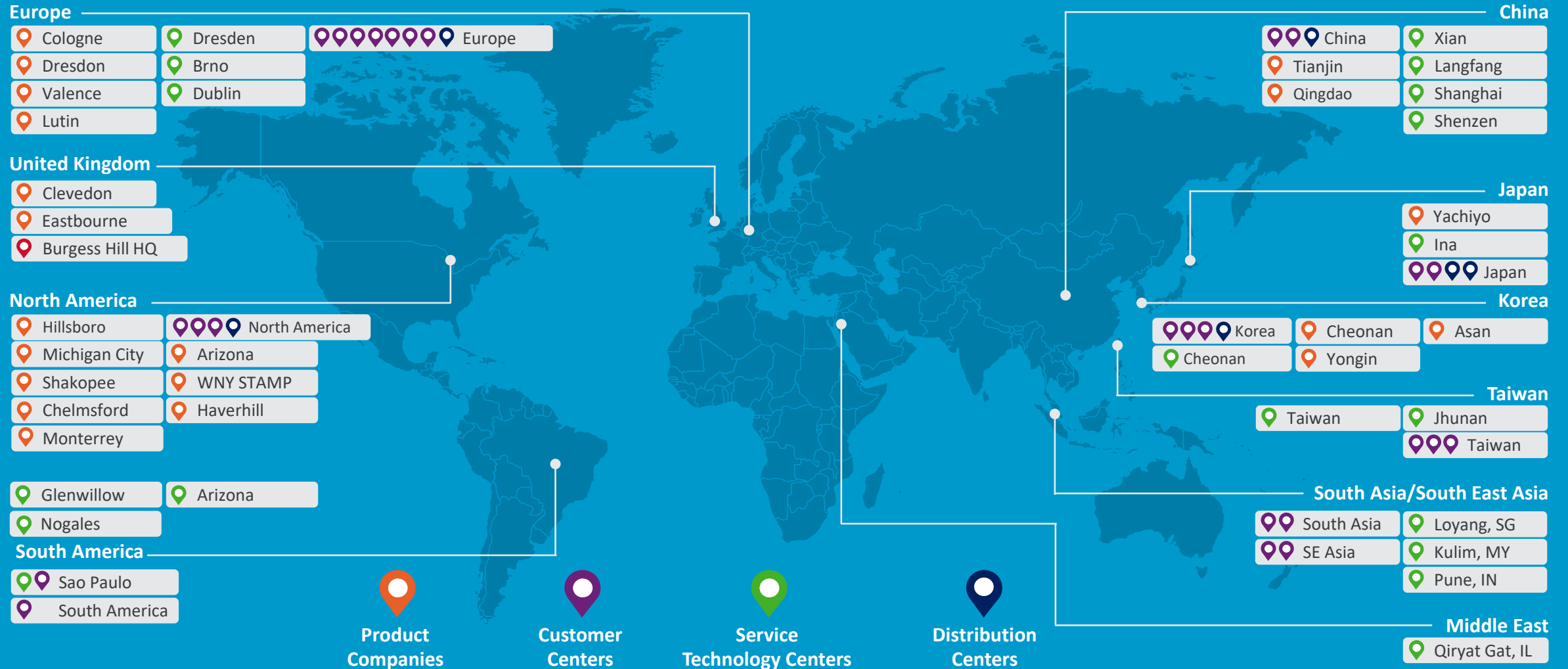
Growth in Scientific Vacuum



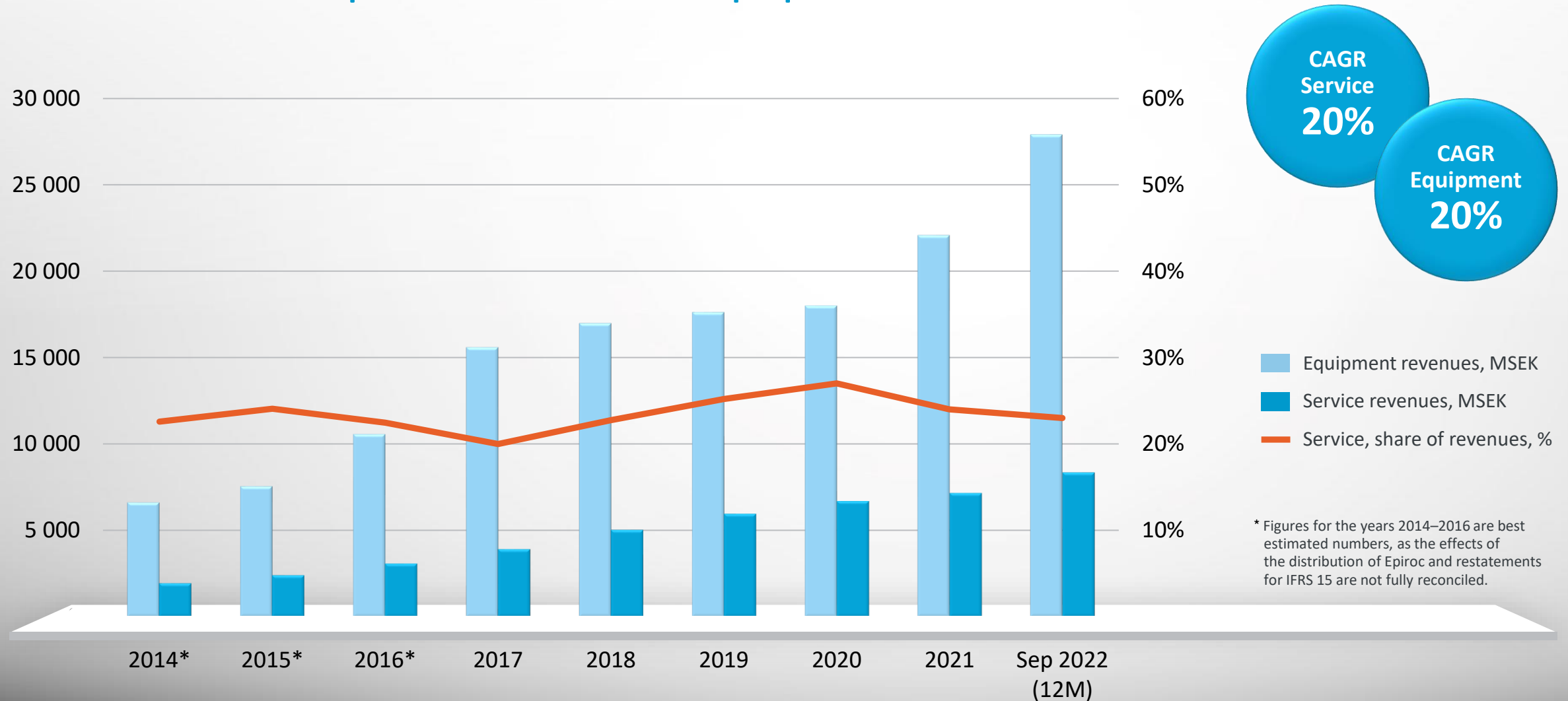
Vacuum Technique Global Footprint



Vacuum Technique Global Footprint



Vacuum Technique – Growth in equipment and service



Vacuum Technique Service strategy

Convenience, Quality and Customer Value



GENIUS Portal

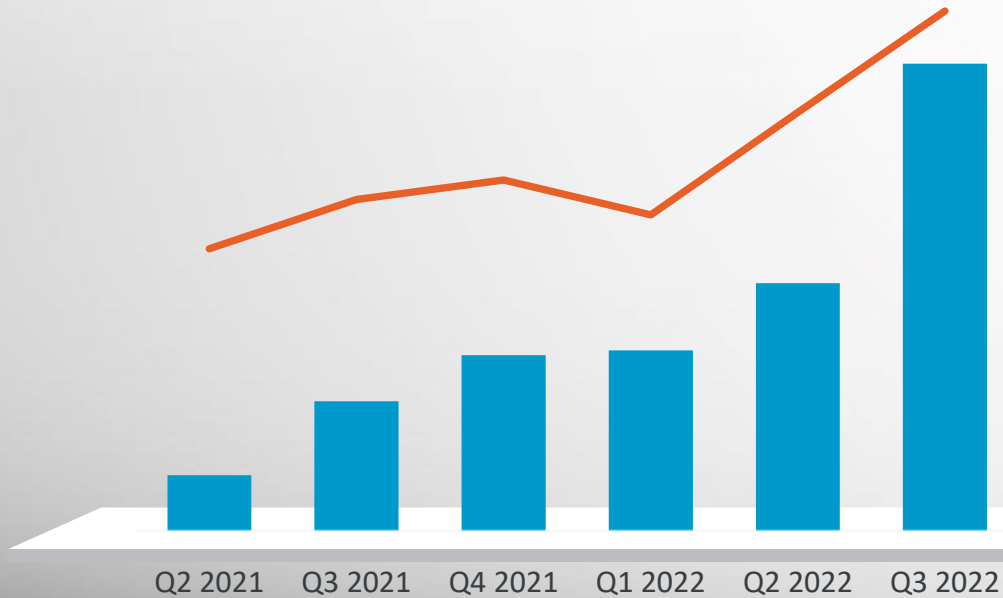


Semiconductor Service

Uptime based contracts

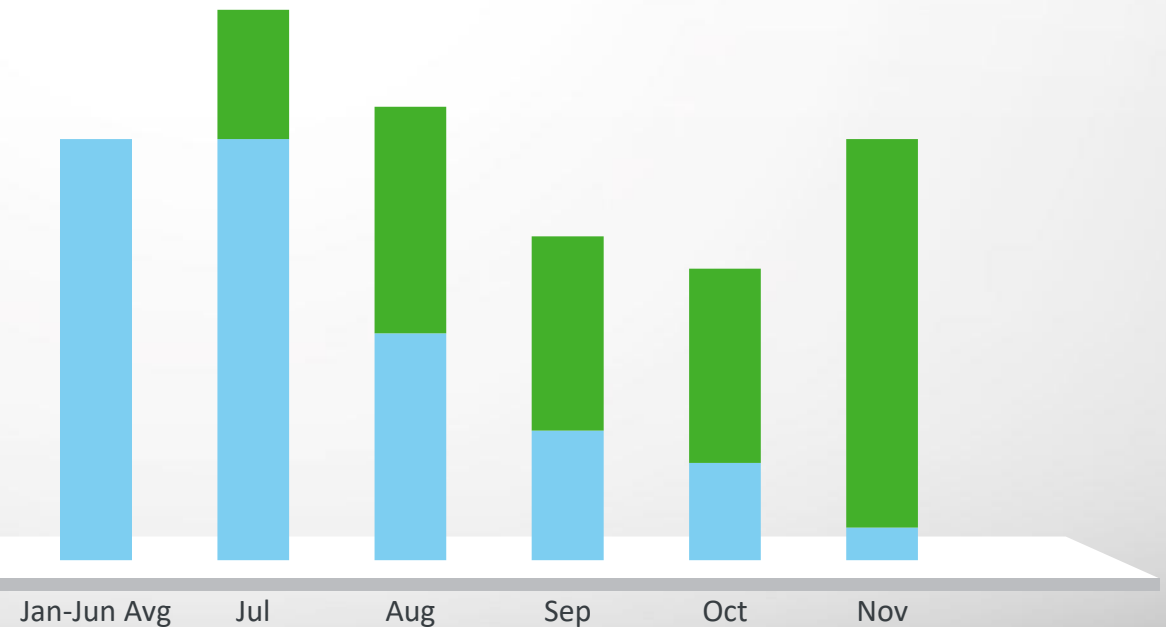
TRANSFORMATION REVENUE AND UGP TREND

Revenue USDk UGP%



CORRECTIVE MAINTENANCE VS PREDICTIVE MAINTENANCE Events 2021

CM Events PdM Events



Vacuum Technique People & Culture Strategy



Attract & develop best talent

- Continue to provide different entry opportunities to attract and develop a diverse, innovative and agile talent and skills-based pipeline.
- Invest in early careers to meet our demographic and growth goals. Target 5% of workforce joining via one of our early careers programs.



Future proof leaders

- Develop future proof leaders who role model key behaviors & coach for high performance.
- Develop inclusive leadership behaviors that explicitly drive our D&I agenda, our Sustainability agenda and our focus on Growth mindset.



Culture First

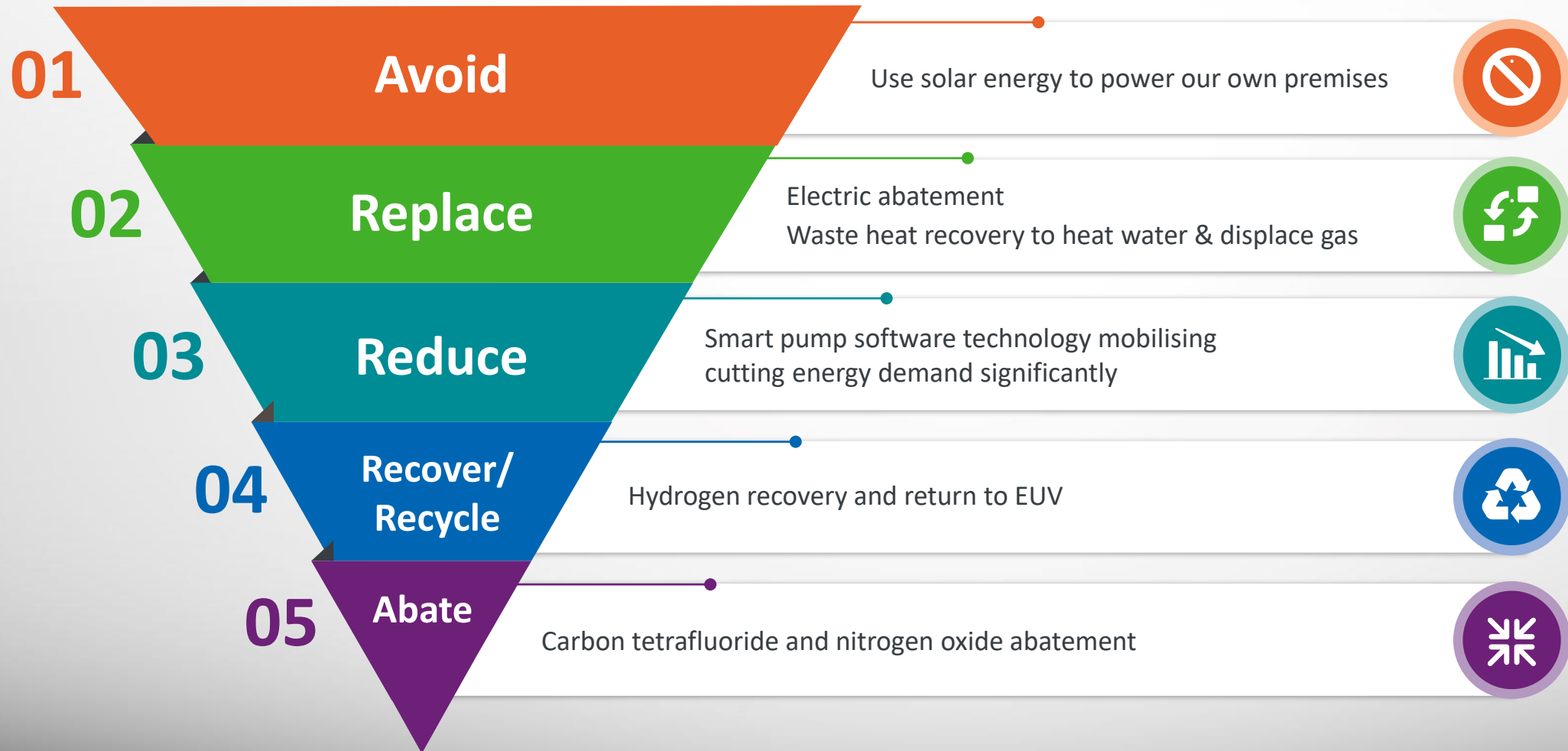
- An inclusive, diverse culture that inspires wellbeing, creativity and passion, self driven learning and where people have a sense of belonging and purpose.
- Investment in wellbeing activities to help our people better manage their own wellbeing to achieve their full potential.

KEY ENABLERS: Digitalization and data analytics to support speed, efficiency and informed decision making

**An enabler of the transition to
a low carbon society**



Towards a low carbon society – CO₂ reduction hierarchy



Summary – Vacuum Technique

- Develop channels organic + inorganic
- Expand core business
- Continuous innovation
- Capacity to take share
- Local for local
- Connectivity and uptime
- Data delivering growth
- Looking after our people
- Contributing to a low carbon society



Forward-looking statements

“Some statements herein are forward-looking, and the actual outcome could be materially different. In addition to the factors explicitly commented upon other factors could have a material effect on the actual outcome. Such factors include, but are not limited to, general business conditions, fluctuations in exchange rates and interest rates, political developments, the impact of competing products and their pricing, product development, commercialization and technological difficulties, interruptions in supply, and major customer credit losses.”