Vacuum Technique

Capital Markets Day 2019
Geert Follens, Business Area President
Agenda

1. Facts in brief
2. The market and business fundamentals
3. Strategy for growth
4. Summary
Facts in brief
Vacuum Technique

Growth drivers

- Climate change (Drive for efficiency, batteries)
- Miniaturization (Moores law)
- New industrial production processes
- Digitalization (IOT, 5G, VR, AI...)
- Sophisticated healthcare
- Service 24/7 (Connectivity)
- Global to local investments

Orders, revenues and operating margin

Orders received, MSEK
Revenues, MSEK
Operating margin, %
Orders received – Local currency Q3 2019

SHARE OF ORDERS RECEIVED YEAR TO DATE:

- 25% = Q3 VS. Q2
- 16% = Q3 Year-on-Year
- 59% +17% +48%

= Q3 VS. Q2
= Q3 Year-on-Year

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The market and business fundamentals
The markets we operate in

- **General manufacturing**
  - Market leader in the global steel degassing industry.
  - Increasing applications due to new industrial processes.

- **Electronics**
  - Consumers demand ‘electronics as necessity’.
  - Presence in all semiconductor fabs.
  - Semiconductor technology advances and manufacturing capability are critical.

- **Process industry**
  - Taking market share across the process industry – food, chemical, metallurgy.

- **Other – Scientific**
  - Enabling progress in space simulation.

- **Service**
Vacuum – a growing market

Global/Technology trends

- Miniaturization
  - Moore’s law
  - Low power use
  - 3D structures

- Climate Change
  - Exhaust regulations
  - CO₂ footprint

- Data Economy
  - Connectivity
  - AI
  - Machine learning

- Healthcare
  - Personalised medicine
  - Life sciences

- Transportation
  - Autonomous driving
  - Electric cars
  - Hyperloop

- User interface
  - Foldable Oled
  - Electronics as necessity

Customer Applications

- Vacuum intensity
  - EUV
  - Minimal footprint systems

- Energy/Legal
  - LED & Solar
  - Efficiency
  - Abatement performance

- Processing power
  - Quantum computing
  - Memory
  - Edge Computing

- Data Analysis
  - MRI
  - Wearables
  - Mass spectrometers

- Electrical
  - Lithium-ion batteries
  - Electric vehicle applications

- Connectivity
  - Mobility
  - 5G
  - VR

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Data growth estimates and driving forces

**DATA GROWTH DRIVES COMPUTE, STORAGE, NETWORK DEMAND**

**PROCESS EVERYTHING**

**COMPUTE DEMAND**

- 2013
- 2018
- 2023

- 5x
- ~30% CAGR

**STORE MORE**

**STORAGE DEMAND**

- 2013
- 2018
- 2023

- ~30% CAGR

**MOVE FASTER**

**NETWORK DEMAND**

- 2013
- 2018
- 2023

- ~25% CAGR

### Extensive and innovative product offering across applications

<table>
<thead>
<tr>
<th>Atlas Copco GHS central vacuum system</th>
<th>Edwards Ezenith integrated vacuum &amp; abatement system</th>
<th>Leybold steel degassing vacuum system</th>
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<td><img src="image4" alt="Edwards nXRI multi stage roots" /></td>
<td><img src="image5" alt="EUV" /></td>
<td><img src="image6" alt="Edwards CTI &amp; Edwards Polycold cryo pumps and coldheads" /></td>
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Market trends and driving forces

- Battery production
- Hyperloop
- Automotive electronics
- Technology in healthcare
- Quantum computing
- Freeze drying
Sustainable profitable growth
Strategy for profitable growth - Summary

Miniaturization

Product innovation

Growth in general vacuum

Service

Opportunities in China

People

Cryogenics

Agility and resilience

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Product offering from rough to ultra high vacuum

- Extensive pump range
- Vacuum systems
- Accessories

- Product coverage 70%
- Multi brand strategy
- Modular design
- Customer applications
- Innovation centers
- Localized systems delivery
## Recent product launches

Continuous focus on innovation with more than 20 new products launched in past year

<table>
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<th>Industrial &amp; Scientific</th>
<th>Semiconductor</th>
<th>Cryogenics</th>
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<td>Leybold – Novadry</td>
<td>iXH XCEDE</td>
<td>MaxCool 2000</td>
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<tr>
<td>Edwards – EDO, dry scroll</td>
<td>iXM XCEDE</td>
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<tr>
<td>Atlas Copco – DSS dry scroll</td>
<td>New Atlas high flow environmental technology</td>
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</tr>
<tr>
<td>Leybold – TURBOVAC MAGiNTegra MAG2207iS</td>
<td>Edwards – nXR50/80i Multi Stage Roots</td>
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<tr>
<td>Edwards – EXDM</td>
<td>iForest EVO</td>
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Cryogenics

- PVD coating and Ion implant processes
- Oled evaporation and encapsulation
- Industrial coating
- Space simulation

- Industrial coating
- Sample cooling
- Wafer chuck cooling
- Cryogenics refrigerators: MRI scanners
- Dilution refrigerators: quantum computing
Miniaturization – Support technology investments

• **Pumps working in extreme harsh conditions**
  – Temperature: cooling + heating
  – Corrosive gasses used: XCEDE coating
  – Deep etch and deposition

• **Enhanced lithography**
  – EUV: H2 pumping and recycling

• **Footprint reduction**
  – Matching envelope of the tool
  – Integrated systems

• **Foreline temperature management**
  – Controlled TMS

• **Meeting all legislative requirements**
  – Abatement with exhaust control
  – NOx management
Growth in general vacuum

• **New products**

• **New processes**
  – Lithium-ion batteries
  – Steel degassing
  – Food processing
  – Centralised installations
  – Point of use mass spectrometry

• **New territories**
China

• Sales capability
  – Highly technical application knowledge
  – Global Semiconductor understanding
  – Customer proximity

• Service Capability
  – Investments in hub capacity
  – Training centres

• Investments
  – Qingdao factory
  – Shanghai Innovation Centre

• Product Capability
  – Integrated systems
  – Environmental solutions
Talent framework aligned to career levels

VT business area

Early Careers

VT business area

Programs

progresses participants towards business leadership roles

Atlas Copco

Programs from GM-1

- **Individual Contributor**
  Responsible for one's own work as well as supporting and guiding others.

- **Team Leader**
  Directly responsible for managing at least one employee, leading project teams, or applying expertise that directly impacts the work of others.

- **Business Leader**
  Directly responsible for the results of a business unit or a major segment thereof, responsible for a specific functional area of the business unit, or applies expertise on a national basis.

- **Global Leader**
  Directly responsible for the P&L of a global business, or a major segment thereof, responsible for a specific function of the global business or applies expertise on a global basis.
Strategy for profitable growth – Service

**Vacuum Technique Service**

- Leading edge technology & advanced service solutions to maximize customers' uptime providing low total cost of ownership in general vacuum applications.
- Convenience, quality & customer value.
- Mission to be present in every customer’s service experience.
- Supporting efficiency in processes and enterprise systems.

**Semiconductor Service**

- Supports the process vacuum and environmental needs our customers depend on in the semiconductor, display, LED and PV solar industries.
- Provide and support customer-based data-driven outcomes, with the clear aim of maximising customer throughput and uptime.
- Field Service, Service Product Management and Service Technology Centres.
Vacuum Technique – Service

CAGR
Service 24%
Equipment 21%
The evolution of our offer

- VEasy Quoter
- Connectivity
- Tailored service products
- Competitor service
- OEM contracts
- Increased sales presence
- Multi-branded service hubs

CUSTOMER FOCUS

OPERATIONAL EFFICIENCY

- Parts and Oil
- AD HOC
- Preventative Maintenance
- Exchange Certified
- Service Contracts
- Advanced Services
Strategy for profitable growth – Agility & resilience

Cost of sales management
• Product cost reduction
• Insourcing of subcontracted manufacturing
• Flexible workforce

Growth initiatives
• Service development
• Continuous investment in R&D
• Investment in growth markets

Optimize efficiencies
• Mergers of multi-branded factories, service centers, financial support services
• Sales & administration cost management
• Discontinued old, low-margin products
Summary
Summary – Vacuum Technique

• Accelerated technology development and product innovation
• Integration of new acquisitions
• Expand coverage in general industry – products and service
• Semi presence in focused markets – customer proximity
• People – talent development and gender diversity
• Continue to build agile structures and processes
• Further focus on resilient business models
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, the actual outcome could be materially and adversely affected by other factors such as the effect of economic conditions, exchange-rate and interest-rate movements, political risks, the impact of competing products and their pricing, product development, commercialization and technological difficulties, supply disturbances, and major customer credit losses.”