

# MAPS:

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**VAT's technology and market lead creates new growth opportunities in the Digital Revolution.**

Megatrends like artificial intelligence, the Internet of Things and cloud computing continue to gain momentum, driving demand for semiconductors, digital displays and other devices. VAT's advanced vacuum valves are mission-critical in the manufacture of these products. The following pages show some of these technologies and how VAT is creating value today and what it plans for the future.

# TECHNOLOGY DRIVES GROWTH

Modern semiconductors contain billions of transistors, or nodes, and the number is growing as chip manufacturers put more processing power into smaller spaces. VAT's vacuum valves are essential for manufacturing at this tiny scale.

**Vacuum purity**  
Keeping particles out of the process chamber is essential in chip fabrication. The distance between particles\* is shown here:

Earth's atmosphere at sea level



68 nm

**High vacuum**  
Semiconductor, displays and solar photovoltaic manufacture



1 cm - 1 km

**Ultra-high vacuum**  
Research and high-speed particle accelerators

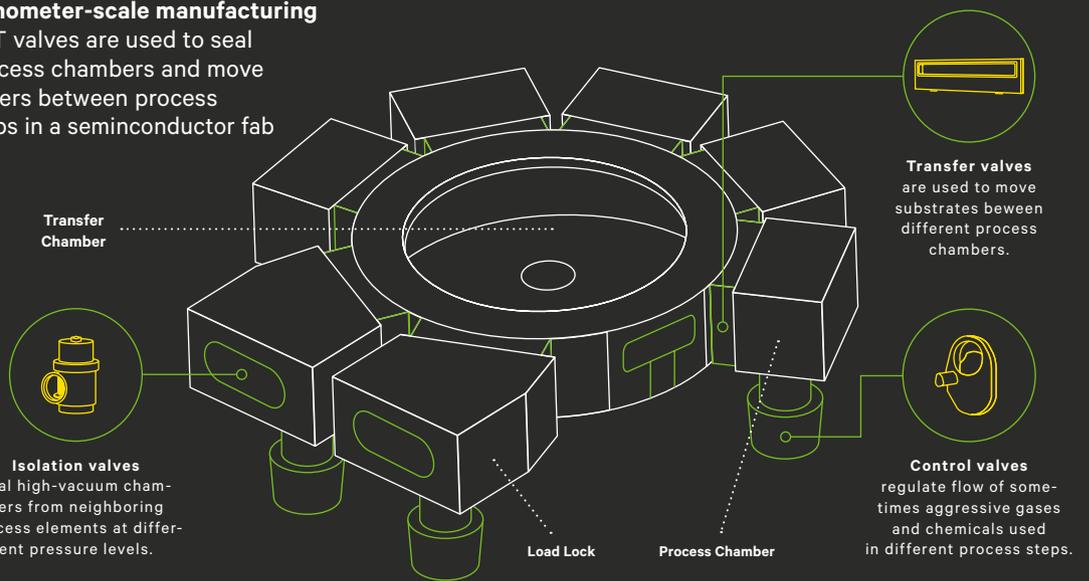


1 km - 100,000 km

\* Mean free path: the average distance travelled by a gas molecule or other particle between collisions with other particles

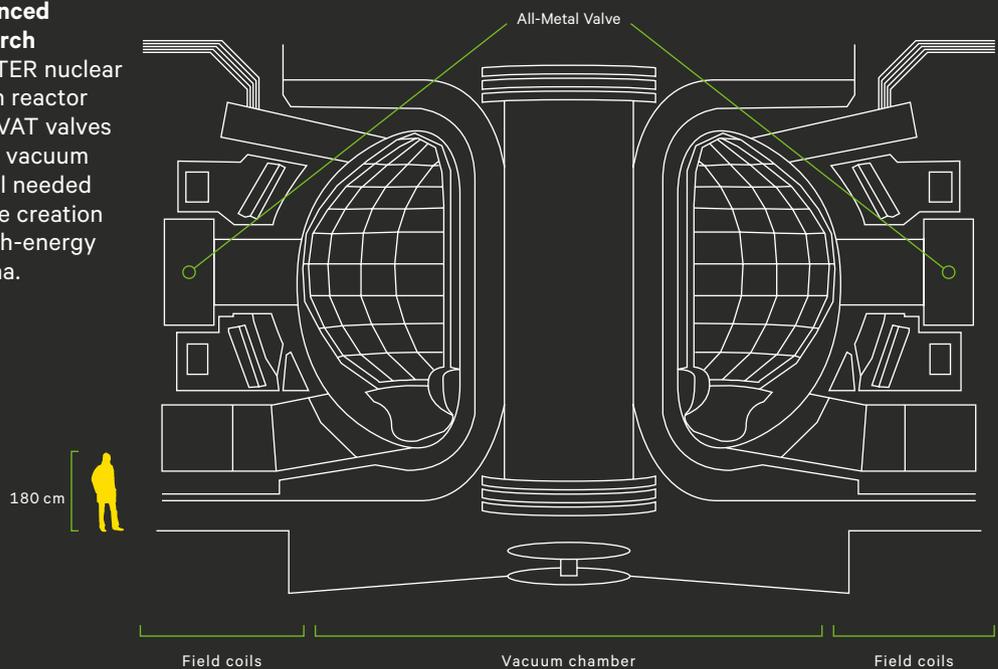
## Nanometer-scale manufacturing

VAT valves are used to seal process chambers and move wafers between process steps in a semiconductor fab



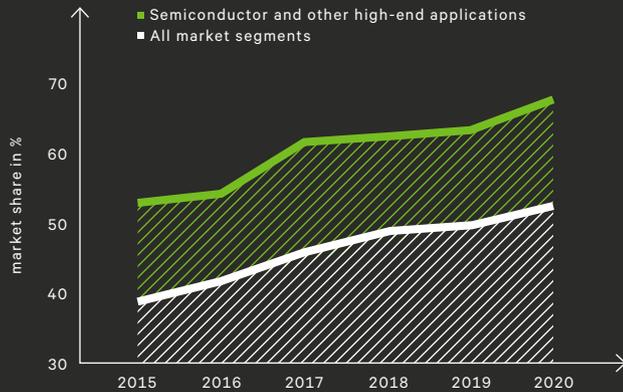
## Advanced research

The ITER nuclear fusion reactor uses VAT valves in the vacuum vessel needed for the creation of high-energy plasma.



### High-end market share

VAT has steadily grown market share across all of the markets it serves. But VAT is strongest in semiconductors, the most technologically demanding segment.



As semiconductors become smaller and more powerful, VAT's technology advantage grows.

### High-end market growing faster

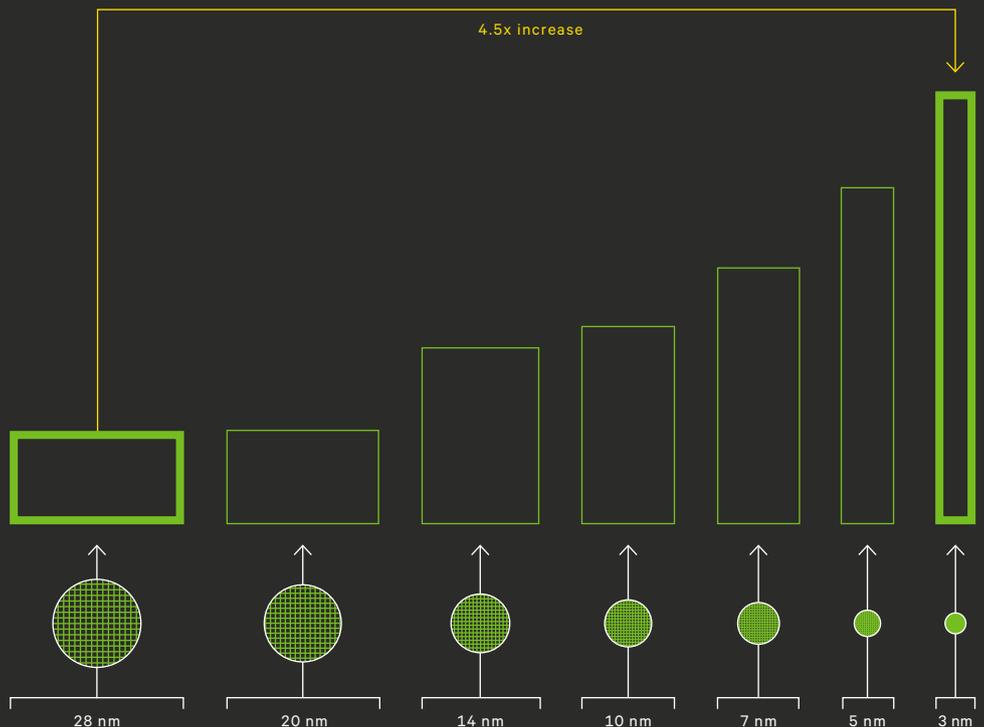
Spending on wafers with nodes of 7 nanometers (nm) and smaller is expected to grow 3x faster than the overall market. And as node size decreases, the number of process steps increases, further driving demand for high-end vacuum solutions.

Wafer fab spend  
2020-2025  
by node size  
US Dollars bn



\* Compound annual growth rate

Number of process steps under vacuum, by node size

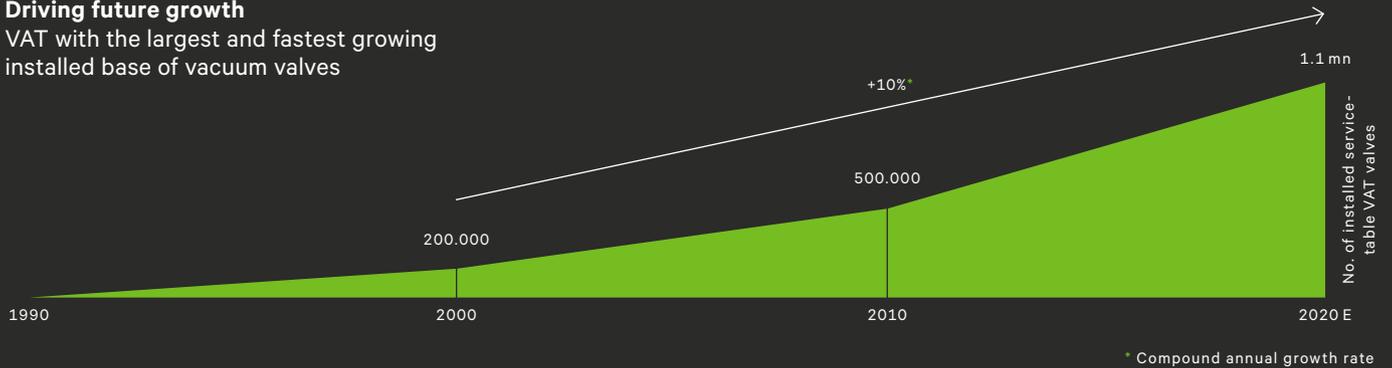


# EXPANDING GLOBAL SERVICE

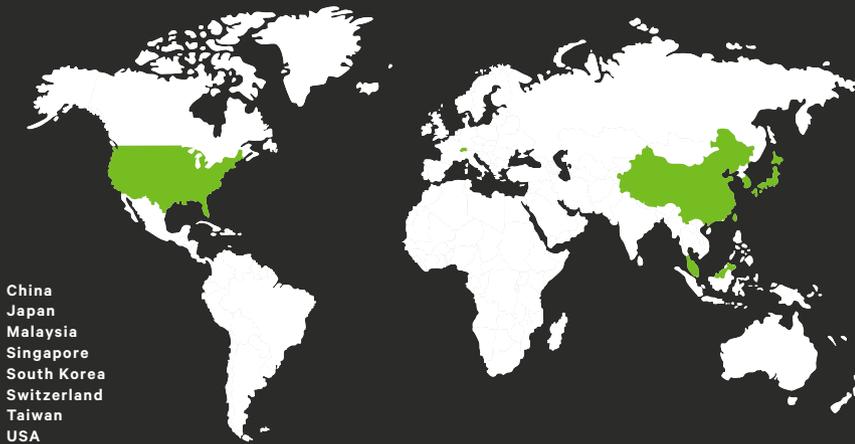
Servicing VAT's more-than one million vacuum valves installed worldwide provides a steady revenue stream through the cycle.

## Driving future growth

VAT with the largest and fastest growing installed base of vacuum valves



## Global service and after-sales support



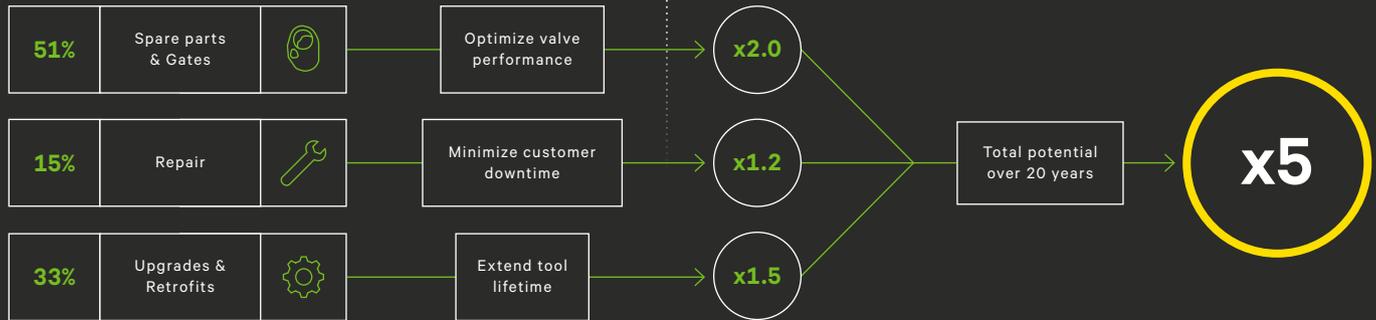
## VAT Global Service goals to 2025



## 2020 Service highlights



**VAT service businesses**  
Share of total service revenues

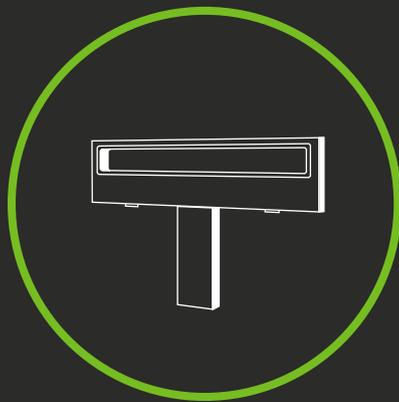


**Gaining market share through service**

Retrofits allow us to replace competitor equipment and increase market share.

**New transfer valves**

Launched in 2020 for all primary OEM platforms



Transfer valves used in semiconductor and display fabrication to increase yield and lower maintenance costs.

**New pendulum control valves**

For launch in 2021–2022



VAT pendulum valves to control pressure with an algorithm that continuously adjusts valve operation to current gas type and flow conditions.

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More than 20 new upgrade & retrofit products launched in past two years

**Optimized cost of ownership**

Upgrades and retrofits allow customers to:

-  adapt existing tools to new technologies
-  reduce manufacturing footprint
-  lift output from existing assets
-  lower service time and cost
-  minimize equipment downtime

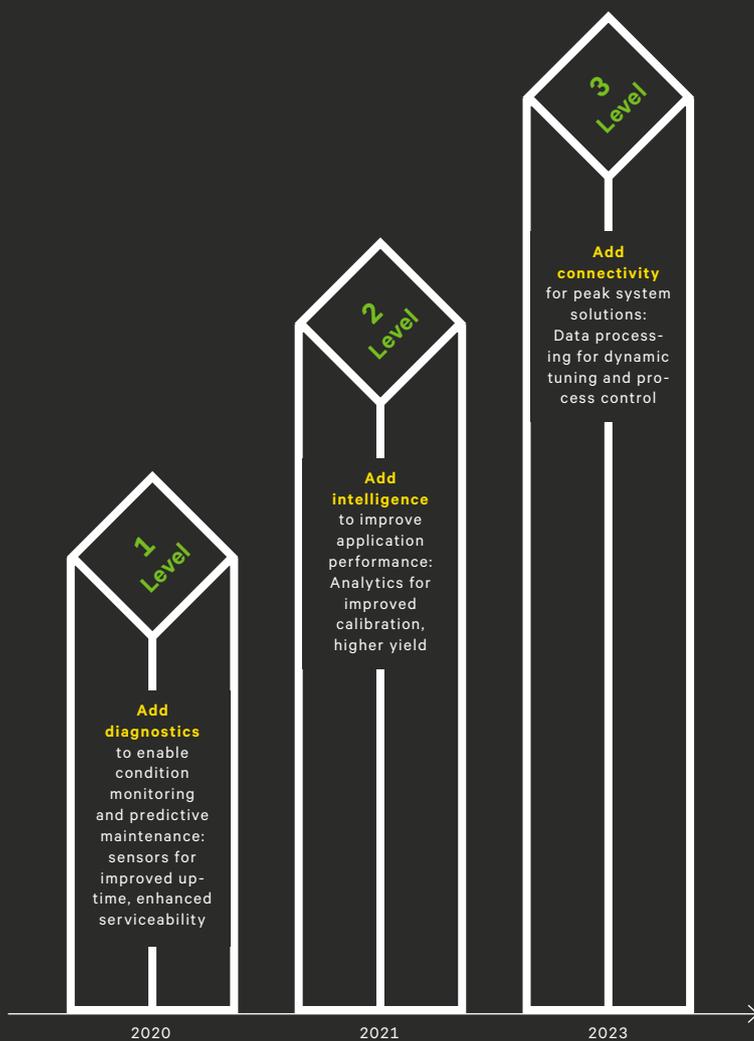
CHF >500

mn  
market potential in upgrades & retrofit

# CONNECTED VAT FOR A DIGITAL FUTURE

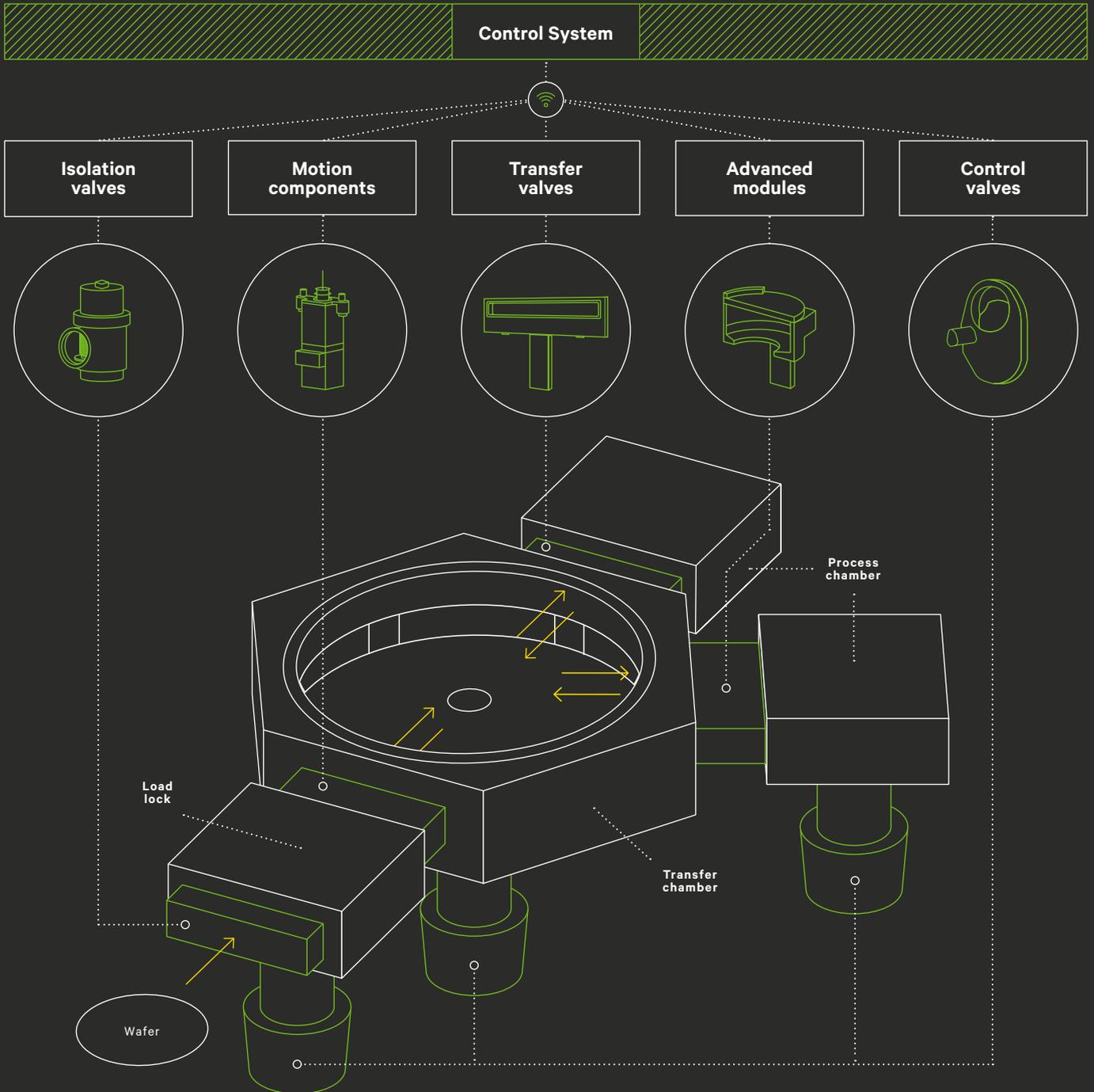
Moving from single vacuum valves to digitally-connected systems, providing customers with more precise process control for higher output, lower downtime and greater competitiveness.

Adding sensors & analytics to  
unlock growth opportunities



“Smart features, such as self-monitoring for predictive maintenance, or improved algorithms will help customers increase yield and reduce downtime.”

Mike Allison, CEO



»»» 50%

of our new products will have digital features by 2025

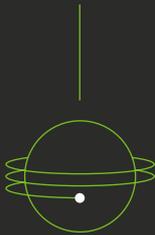
# GLOBAL VALUE CREATION

Our strong global footprint provides a competitive cost structure, speeds time to market, and helps us stay close to our customers, so we can maintain our lead in service, quality and reliability.



### Global value chain

We continue to invest nearly half of our capital expenditures in our global supply, manufacturing and service footprint – a competitive advantage in cost, flexibility and customer responsiveness.



### Integrated footprint

We seamlessly integrate and automate our business systems globally, so we can deliver exactly what our customers need, when they need it.



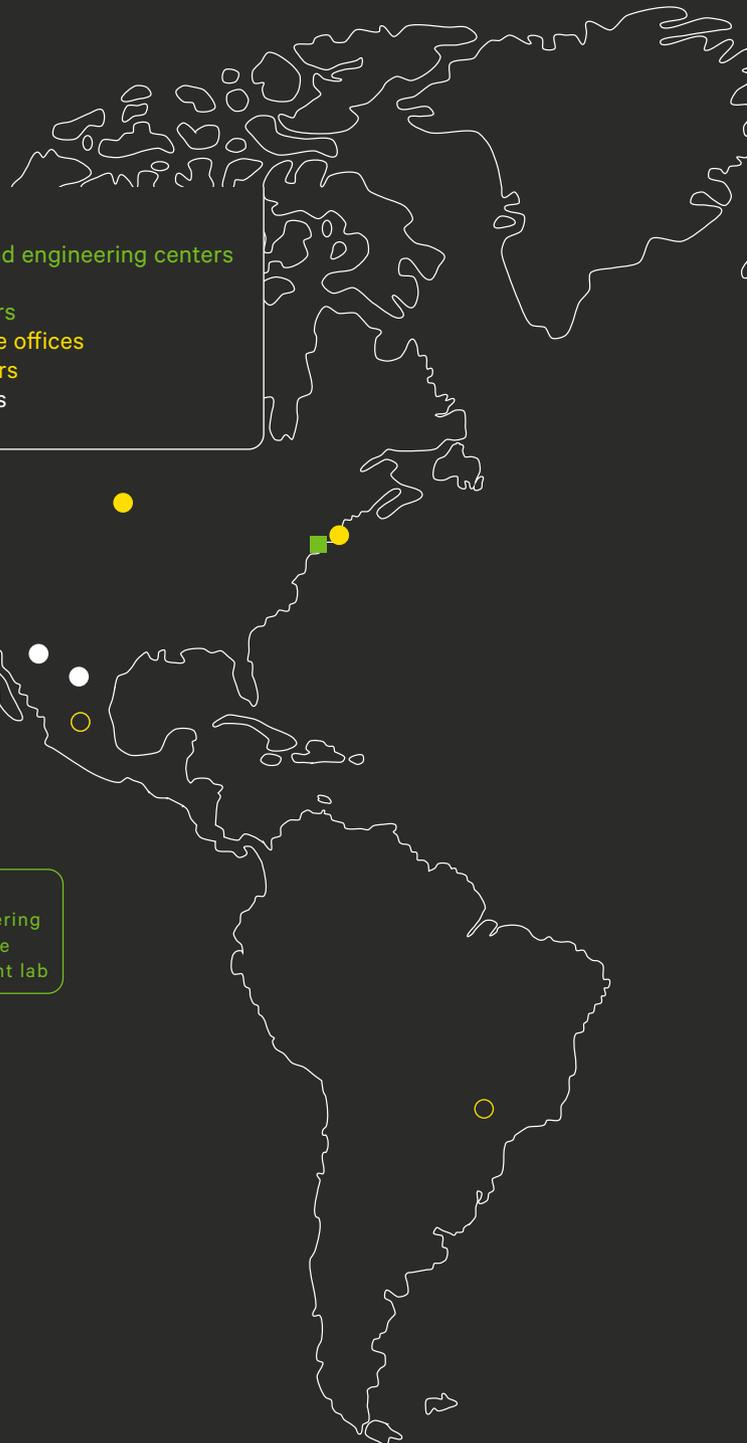
### Future VAT

Our goal remains to build a high-performance global organization offering faster innovation, a more resilient cost base, more efficient manufacturing, and people who feel empowered to create and deliver value to all our stakeholders.

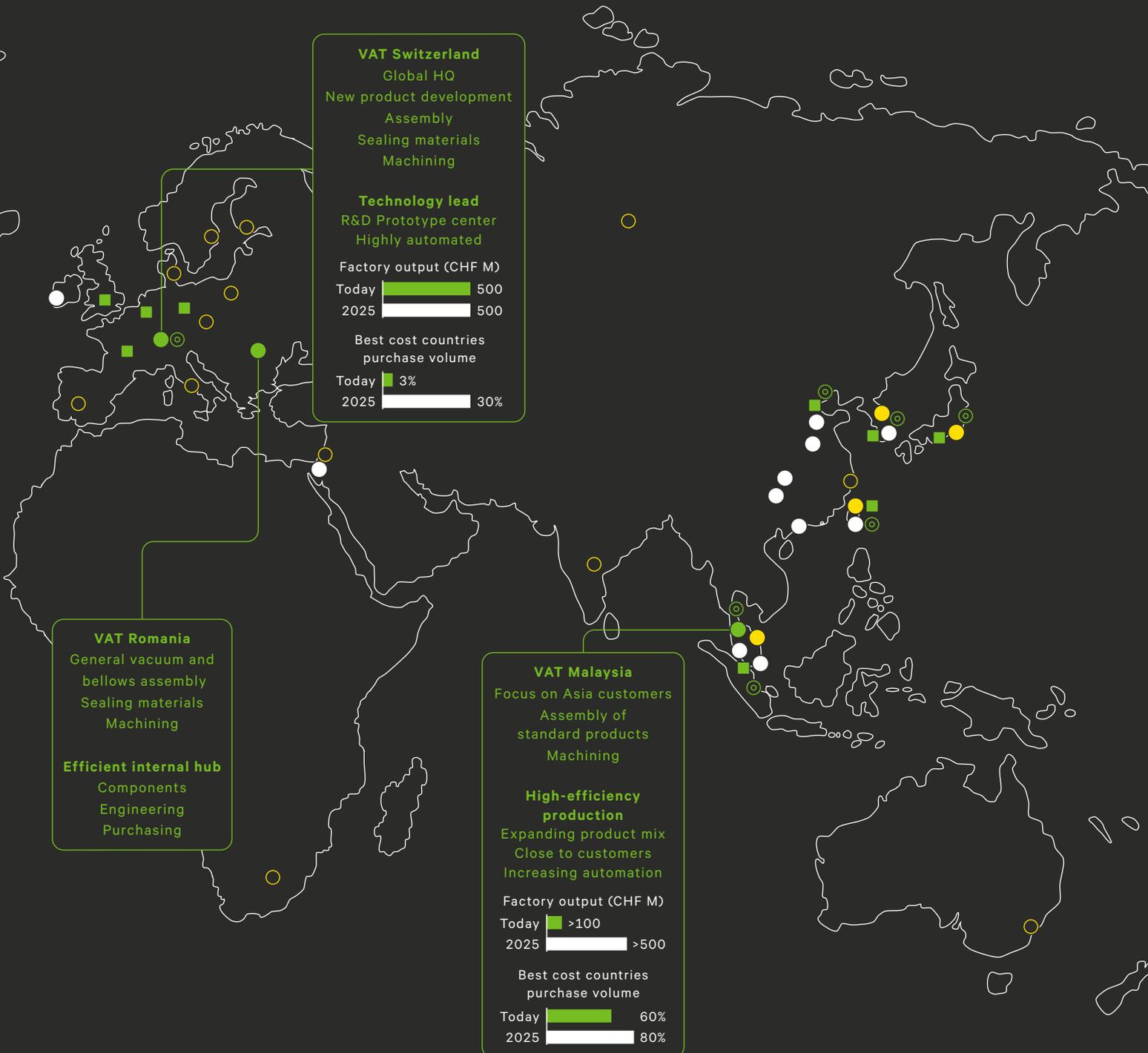
### Close to customers

- VAT production and engineering centers
- VAT locations
- ⊙ VAT service centers
- VAT representative offices
- Top OEM customers
- Top end customers

**VAT USA**  
Application engineering  
Customer service  
Particle measurement lab

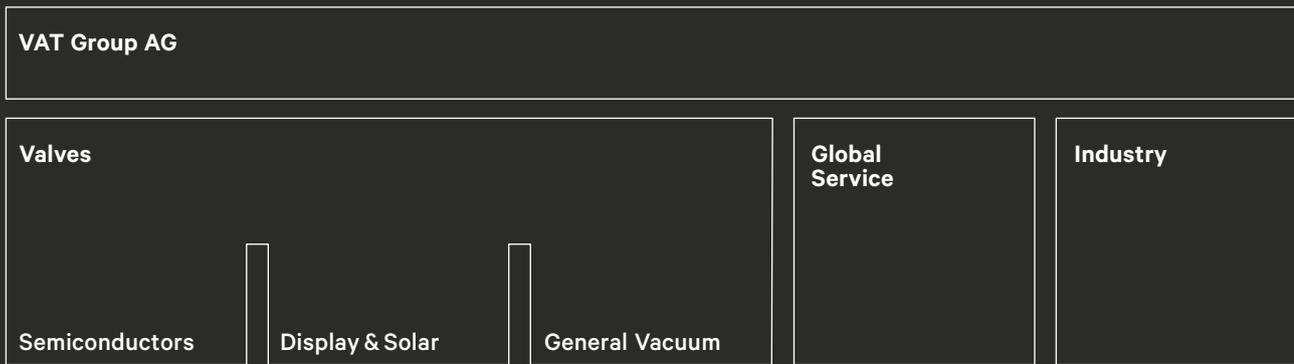


# Our differentiated footprint makes us more competitive and supports sustainable growth.



# ORGANIZATION

VAT Group is organized and managed in three segments: Valves, Global Service, and Industry. The Valves segment comprises the three business units Semiconductors, Display & Solar, and General Vacuum.



The VAT Group is led by the Group Executive Committee (GEC) consisting of the CEO, CFO, and COO. The GEC is supported by the Group Management Board and Group Functions.

