## CANATU

Deep technology platform for advanced carbon nanotubes



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## Rapidly growing deep technology company

### Canatu in brief



#### Founded in 2004 as a University spin-off

Listed on Sep 17th, 2024 on Nasdag Helsinki First North Growth Market, MCAP ~440MEUR



#### Versatile technology platform for advanced carbon nanotubes

CNT products and reactors for the semiconductor, automotive, and medical diagnostics industries



### Differentiated technology supporting a strong competitive position

Canatu's Dry Deposition process provides significant material advantages over wet dispersion



#### In mass production

Since 2015



#### 213 patents and patent applications in 39 families<sup>2)</sup>

Complemented with trade secrets



#### 136 employees across 35 nationalities<sup>2)</sup>

20% holding doctorates or being doctorate candidates

### Strong revenue growth and attractive margins



### **High-growth focus markets**

Semiconductor



**Automotive** 



**Medical diagnostic** 





# Canatu's current high-growth focus markets are estimated to grow to EUR 2-4 billion by 2030

These industries require high-quality CNTs and offer Canatu strong growth and profitability potential.



Semiconductor is experiencing growing demand for advanced chips due to advancements in Al and computing, with sub-7 nm chips made by EUV technology growing the fastest.



**Automotive** is seeking to shift into assisted and autonomous driving and FVs.



Medical diagnostics aims to increasingly transition to point-of-care from laboratory-based testing in some parts of the care chain.

### Scalable, asset-light business model

### **CNT** product sales



- Automotive products in mass production since 2015,
   ~1,1 M sensors delivered, 0 field returns
- **Semiconductor products** in mass production since 2021
- Medical diagnostics under development

### **CNT** reactor sales



- Fixed revenue from reactor sales and technology licensing
- Recurring revenue from consumables and royalty payments from each product sold
- First reactor shipments to customers in 2024, used for CNT pellicle membrane production

### Long-term financial targets

### FY 2027 targets

- Forecasted revenue: >100M€
- EBIT margin: >30%
- Relative contribution:
  - Semiconductor: Large
  - Automotive: Medium
  - Medical diagnostics: Limited
- CAPEX: 5-6M€/year
- Hiring: 25-35 FTEs/year



# Long-term financial targets are grounded on the most conservative assumptions from the market analysis

# Canatu's long-term financial targets are grounded on:

- Existing customer relationships
- Current or currently developed offering within the selected three focus industries
- Assessment of gross margin potential within those focus industries

# Reaching the targets may require:

- Growing the headcount by 25-35 FTEs annually
- Annual CAPEX expenditures of 5-6M€

# Long-term financial targets are not predicated on upside scenarios e.g.

- Broader adoption of CNT pellicle membranes to under 500W EUVL scanners,
- Broader adoption of inspection membranes beyond patterned mask inspection
- Potential additional investments enabled by the over 100M€ capital from Lifeline SPAC I

# Carbon nanotubes are a revolutionary new material with incredible properties



### Record length-to-diameter ratio

One gram of CNTs aligned side by side can stretch to the moon & back



### High specific surface area

One gram of CNT equals the area of a soccer field



### Strongest materials known to man

Exceptional mechanical strength - 100 times stronger than steel



### Ultra stable up to 1500°C in vacuum

Can withstand ultra-high temperatures



### More precious by weight than diamonds

Canatu's advanced CNT is valued



### 'Advanced' CNTs

- Primed for high-value applications like EUV
- Primarily a "quality game", produced in small quantities (hundreds of grams)
- Challenging to produce and customize on an industrial scale
   high barriers to entry
- Versatile can be extensively tailored to achieve specific electrical, optical, mechanical, or thermal properties
- Canatu is a leader in advanced CNT



### 'Bulk' CNTs

- Low-end CNTs
- Produced in tonnes
- Used in e.g., composite materials, structural reinforcements, and EV batteries

# Our strong competitive position is supported by the differentiated IPR-protected technology

- Advanced CNTs are challenging to manufacture and customize on an industrial scale creating high barriers to entry
- Canatu has invested 20 years / 80MEUR to reach this stage of technology
- Canatu Dry Deposition™ process brings significant material advantages over wet dispersion
- **Simpler, faster process** yields high-purity, strong CNTs that enable better performance in end applications
- Platform technology that is easy to expand into new applications/products at a reasonable additional cost, enabling scalable asset-light growth





137 patents76 applications39 families

# Our proprietary Dry Deposition™ process offers significant material advantages over wet dispersion

Canatu Dry Deposition™





### Canatu Dry Deposition<sup>™</sup> process<sup>1)</sup>

- Simplied production with fewer steps
- Shorter cycle time
- Stronger, longer and more pristine CNTs<sup>2)</sup>
- Differentiated, IPR-protected technology

137 patents76 applications39 families

Competitors' wet dispersion



CNT powder collection

Wet dispersion, ultrasonication Adding surfactants

Purification

Centrifugation

Filtration

Water transfer printing

*W*ashing

### Semiconductor market drivers

### **EUV** market drivers

- Growing demand for advanced sub-7nm chips, driven by AI and cloud computing
  - EUV is the only technology capable of producing these high-end chips; the fastest growing segment in the industry
    - Top three chip manufacturers have announced USD >300bn investments in new production capacity to match demand<sup>1)</sup>
      - Majority of investments will be allocated to manufacturing equipment, creating opportunities for Canatu.
        higher volume of inspection membranes, a critical quality control component in EUV Lithography (EUVL)
        - Canatu's growth in the semiconductor industry is driven by the adoption of the latest, high-power 500W EUV lithography machines CNT pellicle membranes support productivity increase potential in EUVL by up to 8-15%

EUV is the only tech capable of producing high-end sub-7nm chips

Enables higher transistor density, resulting in smaller and more powerful chips

These chips power everything from Apple's smartphones to NVIDIA's Al accelerators.

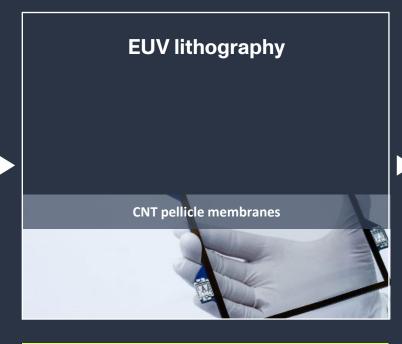
Canatu is a critical technology supplier for EUV.

- and the only listed company in the Nordics in EUV tech

## Semiconductor applications

### Simplified illustration of EUV-chip manufacturing process





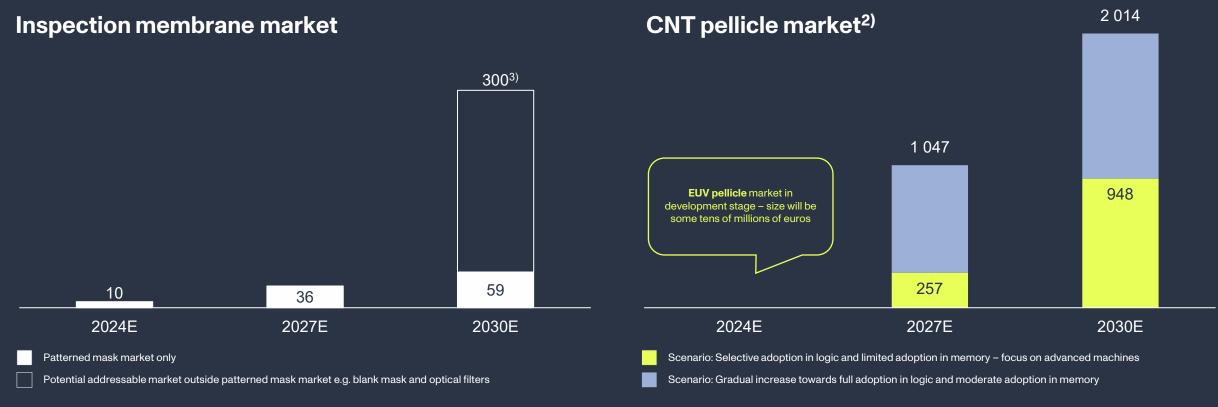
**Current Business Area** 

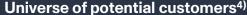


Potential Future Business Area

## Semiconductor market size and growth

Estimated annual development of addressable market (EURm)<sup>1)</sup>



























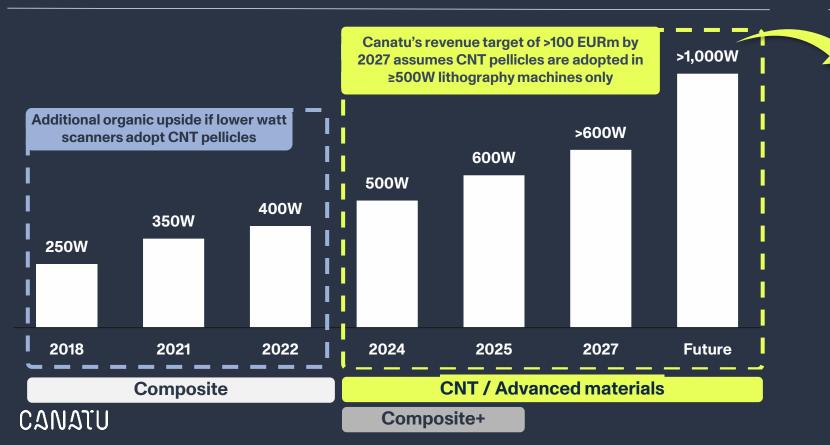




# Technology development is expected to further increase demand for high quality pellicles



What higher watts mean for Canatu



Higher watt levels cause higher heat loads for pellicles

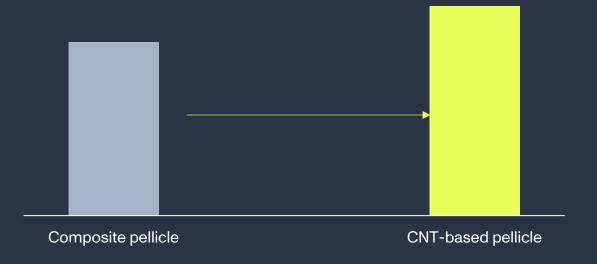


Canatu's CNT pellicle membranes have higher thermal stability compared to the old technology

# CNT is a superior material for pellicles and economically more viable option

Significant step change in transmittance and performance

Up to 8-15% estimated performance increase due to higher EUV transmittance<sup>1)</sup>



Why CNT has the potential to surpass composite in pellicles?

- High EUV light transmission correlates with higher productivity
- High thermal stability is advantageous in EUV lithography machine applications' increasing heat load
- CNT withstands mechanical stress that comes with advanced EUV lithography machines



## Semiconductor products

### **CNT** pellicle membranes



- Protect photomasks from particle contamination in high-power (>500W) EUV lithography machines.
- Outperform composite pellicles with high EUV transmission, thermal stability of up to 1500°C in a vacuum, and exceptional strength.
- Supports productivity increase potential in the EUVL by up to 8-15%.

### **Inspection membranes**



- Used in pre-and post-lithography processes to enhance quality control
- Filter debris from EUV light source, preventing contamination of sensitive and costly optics or photomasks
- Currently used for patterned mask inspection
- Upside potential in EUV mask blank inspection and optical filtration

### **Optical filters**

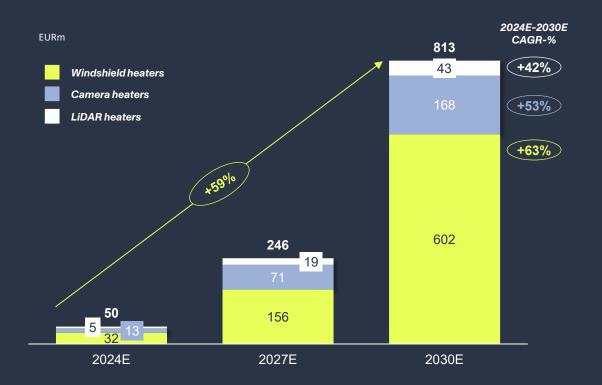


- Coated CNT membranes provide selective wavelength filtering, blocking unwanted photons (e.g., DUV, VIS, IR), while ensuring high EUV/X-ray transmission
- Can be reinforced with metallic or all-carbon mesh structures

### Automotive market size and growth

### Market size and growth

Expected double-digit growth in the medium term<sup>1),2)</sup>



### Key market drivers<sup>2)</sup>



Advanced driver assistance



Electric vehicles

### Universe of potential customers<sup>4)</sup>



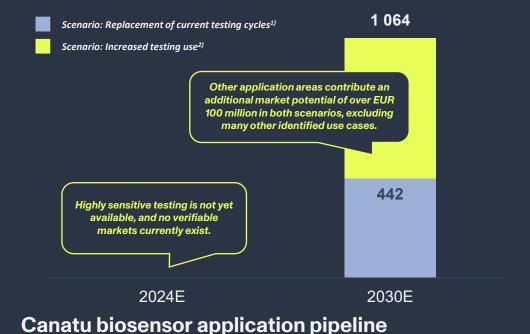


### Medical diagnostics market size & growth

**OTHERS** 

### Market size and growth

Market size expected to reach ~400 – 1,000M by 2030<sup>3)</sup>



**BREAST CANCER** 

### **Key market drivers**



Shift from centralized to POC testing



Increased need for higher sensitivity

### Universe of potential customers<sup>4)</sup>



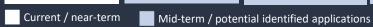












**LUNG CANCER** 



**PARACETAMOL** 

Note: 1) Assumes Canatu's CNT-based solution replaces current testing cycles in tests for breast cancer, lung cancer, and paracetamol overdose; 2) Assumes Canatu's CNT-based solution replaces current testing cycles as indicated previously, but in addition, it is used by a larger group of people screened and used more frequently in treatment monitoring with both breast cancer and lung cancer. Furthermore, for lung cancer patients, the participation rate is expected to be higher; 3) Canatu's management's view based on the Market Study; 4) Every logo presented is not Canatu's current customer

### Automotive products

### **Camera heaters**



- Camera heaters provide even heating across the field of view, allowing ADAS cameras to accurately detect surrounding objects in different weather conditions
- Due to the camera heater's low-haze, lowdistortion and colour neutrality it supports ADAS system's accuracy requirements

### **LiDAR** heaters



- Reliable LiDAR performance in different weather through efficient de-icing and de-fogging of the LiDAR lens
- The solution is compatible with 905-1550 nanometre LiDAR systems

### Medical diagnostic

### **Biosensors**



- Canatu's electrochemical biosensors can detect a wide range of substances at ultra-low concentrations, offering more than a tenfold increase in sensitivity in in vitro matrices compared to traditional materials
- High sensitivity diagnostic tests for faster, more affordable, and more convenient testing that can be performed at the point of care

## Canatu's key strengths

- Rapidly growing deep technology company with attractive margins
  - Current, high-growth focus markets are estimated to grow to EUR 2–4 billion by 2030
    - Customer relationships with leading global companies
      - Differentiated IPR-protected technology supporting a strong competitive position
        - Proven and efficient mass manufacturing capability
          - Business model enabling scalable, asset-light growth with high-margin potential
            - 7 Technological expertise with experienced management attracting global talent
              - Financial targets of annual revenue of over EUR 100 million and adjusted EBIT margin<sup>1)</sup> of over 30% in 2027

# CANATU

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