Analyst Conference
March 24, 2020

SINGULUS
## Agenda

<table>
<thead>
<tr>
<th></th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Financials</td>
</tr>
<tr>
<td>3</td>
<td>SINGULUS TECHNOLOGIES Segments</td>
</tr>
<tr>
<td></td>
<td>Solar</td>
</tr>
<tr>
<td></td>
<td>Semiconductor</td>
</tr>
<tr>
<td></td>
<td>Life Science</td>
</tr>
<tr>
<td>4</td>
<td>SINGULUS TECHNOLOGIES Strategy/Forecast</td>
</tr>
</tbody>
</table>
**Introduction**

SINGULUS TECHNOLOGIES AG - Innovations for New Technologies

State-of-the-Art Equipment Supplier in Combination with Market Orientated Technology Know-How

**THIN FILM DEPOSITION**

For an wide range of coating applications for the enhancement of surfaces with specific functionalities

- Sputter (PVD) deposition
- Evaporation (thermal evaporation)
- PECVD (ICP, µ-Wave)
- AACVD (aerosol assisted CVD)

**SURFACE ENGINEERING**

Can be used to archive a wide range of functional and optical properties on different substrates and materials.

- Embossing
- Injection molding
- Plasma cleaning & etching
- Lacquering & bonding

**WET CHEMICAL**

Is used in an wide range of applications, for the cleaning, etching, structuring and surface treatment of substrates.

- Cleaning/washing
- Etching/polishing
- Texturing
- Coating and Developing

**THERMAL PROCESSING**

Is used at photovoltaic and semiconductor applications, core focus on high temperature and diffusion processes.

- Rapid thermal processing
- Conditioning
- Annealing
Agenda

1. Overview
2. Financials
3. SINGULUS TECHNOLOGIES Segments
   - Solar
   - Semiconductor
   - Life Science
4. SINGULUS TECHNOLOGIES Strategy/Forecast
## Financial Key Figures

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>127.5</td>
<td>79.4</td>
</tr>
<tr>
<td>Order Intake</td>
<td>86.8</td>
<td>39.7</td>
</tr>
<tr>
<td>Order Backlog (31.12.)</td>
<td>66.0</td>
<td>26.3</td>
</tr>
<tr>
<td>EBIT</td>
<td>6.8</td>
<td>-8.2</td>
</tr>
<tr>
<td>EBIT adjusted</td>
<td></td>
<td>-4.9</td>
</tr>
<tr>
<td>EBITDA</td>
<td>9.1</td>
<td>-4.1</td>
</tr>
<tr>
<td>Result before Tax</td>
<td>4.8</td>
<td>-10.3</td>
</tr>
<tr>
<td>Result for the Period</td>
<td>0.8</td>
<td>-11.3</td>
</tr>
<tr>
<td>Operating Cash Flow</td>
<td>2.5</td>
<td>-3.2</td>
</tr>
<tr>
<td>Shareholders’ Equity</td>
<td>19.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Total Assets</td>
<td>104.1</td>
<td>83.7</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>2019</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Gross Revenues</strong></td>
<td>127.5</td>
<td>79.4</td>
</tr>
<tr>
<td><strong>Net Revenue</strong></td>
<td>125.9</td>
<td>77.9</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td>35.4</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>R &amp; D</strong></td>
<td>-8.2</td>
<td>-6.5</td>
</tr>
<tr>
<td><strong>Sales &amp; Customer Service</strong></td>
<td>-14.2</td>
<td>-11.0</td>
</tr>
<tr>
<td><strong>GM &amp; A</strong></td>
<td>-8.5</td>
<td>-10.2</td>
</tr>
<tr>
<td><strong>Other Income/Expenses</strong></td>
<td>2.3</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Impairment Expenses</strong></td>
<td>0.0</td>
<td>-3.3</td>
</tr>
<tr>
<td><strong>OPEX</strong></td>
<td>-28.6</td>
<td>-30.6</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>6.8</td>
<td>-8.2</td>
</tr>
<tr>
<td>(in % of Net Revenues)</td>
<td>5.4</td>
<td>-10.5</td>
</tr>
<tr>
<td><strong>Net Result</strong></td>
<td>0.8</td>
<td>-11.3</td>
</tr>
<tr>
<td><strong>EPS (basic; €)</strong></td>
<td>0.09</td>
<td>-1.27</td>
</tr>
</tbody>
</table>
## Balance Sheet

<table>
<thead>
<tr>
<th>in million €</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Cash</td>
<td>13.5</td>
<td>14.8</td>
</tr>
<tr>
<td>Restricted Cash</td>
<td>14.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Total Current Receivables and Other Assets</td>
<td>35.5</td>
<td>16.8</td>
</tr>
<tr>
<td>Total Inventories</td>
<td>17.1</td>
<td>15.5</td>
</tr>
<tr>
<td>Non Current Assets</td>
<td>23.7</td>
<td>32.2</td>
</tr>
<tr>
<td>Total Assets</td>
<td>104.1</td>
<td>83.7</td>
</tr>
<tr>
<td>Total Current Liabilities</td>
<td>50.2</td>
<td>38.2</td>
</tr>
<tr>
<td>Total Non-Current Liabilities</td>
<td>34.2</td>
<td>38.5</td>
</tr>
<tr>
<td>Total Equity</td>
<td>19.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Equity and Liabilities</td>
<td>104.1</td>
<td>83.7</td>
</tr>
</tbody>
</table>
## Cash Flow Development

<table>
<thead>
<tr>
<th>in million €</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Flow from Operating Activities</td>
<td>2.5</td>
<td>-3.2</td>
</tr>
<tr>
<td>Cash Flow from Investing Activities</td>
<td>-4.4</td>
<td>-5.6</td>
</tr>
<tr>
<td>Cash Flow from Financing Activities</td>
<td>-11.3</td>
<td>10.0</td>
</tr>
<tr>
<td>Total Cash Flow</td>
<td>-13.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Liquid Funds at the Beginning of the Fiscal Year</td>
<td>27.2</td>
<td>13.5</td>
</tr>
<tr>
<td>Effect of Exchange Rate Changes</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Changes in the Scope of Consolidation</td>
<td>-0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Liquid Funds at the End of the Fiscal Year</td>
<td>13.5</td>
<td>14.8</td>
</tr>
</tbody>
</table>
## Employees

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGULUS Group</td>
<td>+8</td>
<td>343</td>
<td>351</td>
</tr>
<tr>
<td>Domestic</td>
<td>+3</td>
<td>293</td>
<td>296</td>
</tr>
<tr>
<td>Abroad</td>
<td>+5</td>
<td>50</td>
<td>55</td>
</tr>
</tbody>
</table>
Sales Split by Segments 2019

2018
- Life Science: 22.4%
- Solar: 70.4%
- Semiconductor: 7.2%

2019
- Life Science: 35.6%
- Solar: 56.7%
- Semiconductor: 7.7%
Sales Split by Region 2019

2019
- Europe: 27.1%
- Asia: 55.5%
- Americas: 17.0%
- Africa & Australia: 0.4%

2018
- Europe: 20.4%
- Asia: 67.5%
- Americas: 11.5%
- Africa & Australia: 0.6%
Shareholder Structure
Status: March 23, 2020

Janus Henderson Group plc
(TR European Growth Trust plc)
3.54%

Universal-Investment-Gesellschaft
mit beschränkter Haftung
7.96%

Clemens Jakopitsch
6.21%

Triumph Science and
Technology Group Co., Ltd.
(100 % subsidiary of CNBM)
16.75%

Free float
65.54 %

Total
100 %
Agenda

1. Overview
2. Financials
3. SINGULUS TECHNOLOGIES Segments
4. SINGULUS TECHNOLOGIES Strategy/Forecast
PV Heading in the Terrawatt Range

- Rapid introduction of PV globally is fueled by availability of cost-competitive, distributed energy
- By 2018, about 500 GW have been installed

We are just at the beginning of the global growth curve!
PV Solar Drives Strong rebound in Renewable Capacity Expansion

The IEA expects renewable electricity generation capacities to increase by 50 percent or 1,200 GW between 2019 and 2024.

Expansion for PV by 720 GW.

Growth in GW

Source: IEA, 2019

Renewables expand by 50% through 2024, with distributed PV alone growing as much as onshore wind. The IEA forecast is 14% higher than last year due to improved policies and increasing competitiveness.
Unsubsidized levelized cost of alternative electricity compared to conventional energy sources

Source: Lazard’s Levelized Cost of Energy, 2019
General Informations about Crystalline and Thin Film Solar

Comparison Crystalline vs. Thin Film

Silicon Wafer Material
- High cell & Module efficiency
- Largest Market Share
- Advanced technology potential
- Production split on different locations

Thin Film Solar - Glass or Flexible Material
- Excellent stability
- Good low light (incl. shade) performance
- Reduced sensitivity to overheating
- Full values chain in production
- Lower energy consumption in production (per WP) than with c-Si
CNBM Announced Steps of Investment

Each 300 MW Fab comprises the following Machines:

- 10 CISARIS
- 2 VISTARIS
- 2 SELENIUS

City of Bengbu, Province Anhui
1.5 GW

City of Meishan, Province Sichuan
1.5 GW

City Xuzhou, Province Jiangsu
1.5 GW

City Weihai, Province Shandong
1.5 GW

2nd step
LOI for 300 MW

1st step
Order for 300 MW

Order for 150 MW signed January 15, 2020

Existing LOI for 300 MW

Existing LOI for 5 CISARIS
CIGS Factory City of Bengbu, Province Anhui

Example: VISTARIS Sputtering system

---

**Status City of Bengbu**

**1st Step**
- 5 CISARIS, 2 VISTARIS, 2 SELENIUS
- 150 MW CIGS Production running
- Additional 5 CISARIS for ramp up to 300 MW already delivered and in acceptance testing

**2nd Step**
- LOI for the next 300 MW signed
CIGS Factory City of Meishan, Province Sichuan

Example: CISARIS Selenization furnace

Status City of Meishan
1st Step
• 5 CISARIS, 2 VISTARIS, 2 SELENIUS delivered
• Start of installation for 150 MW CIGS Production summer 2020
• LOI for 5 CISARIS for ramp up to 300 MW
CIGS Factory of City Xuzhou, Province Jiangsu

Example: SELENIUS Evaporation Equipment

Status City of Xuzhou
1st Step
• Order received for 5 CISARIS, 2 VISTARIS, 2 SELENIUS
• First down payments received
• Delivery planned for end 2020
Example: VISTARIS Sputtering system

Status City of Weihai

1st Step

• In discussion
Production Lines for Crystalline Solar Cells

Processflow PERC (Passivated Emitter and Rear Contact) Solar Cell

PERC Solar Cell production lines, with an average efficiency range up to 22% (mono)
Production Lines for Crystalline Solar Cells

Processflow HJT (Heterojunction) Solar Cell

- Test incoming Wafer (mono)
- Cleaning and Texturing (Wet Chemical)
- A-Si:H Frontside Deposition (PECVD)
- A-Si:H Backside Deposition (PECVD)
- TCO Front & Backside Deposition (PVD)

TCO Front & Backside Deposition

Metallization (Screen Printing & Annealing)

Testing and Sorting
Key Production Steps for Heterojunction Solar Cell Manufacturing

SILEX II

GENERIS PVD
TOPCon – Chemical Treatment and Plasma Coating

Tunnel Oxide Passivated Contact Solar Cells

LINEX
a) inline alkaline texturing
b) advanced cleaning
c) wet chemical tunnel oxide using ozone
d) single side processes (polishing, layer or mask removal, oxidation)

GENERIS PECVD
a) plasma tunnel oxide
b) (i,n,p) poly-Si layer
c) SiNx:H and AlOx / SiNx:H passivation and ARC layers

GENERIS PVD (process in development)
a) plasma tunnel oxide
b) (n,p) poly-Si layer
LINEX – Wet Chemical Inline Processes

Features
• High throughput performance up to 8.200 wph
• Integration of ozone
  • alkaline texturing
  • single side and immersion etching
  • tunnel oxide formation
• High uptime up to 98
• High throughput and best performance
• Low cost of ownership
• 5 Lane R&D tool in pilot production
• 10 Lane production tool in design
• Low breakage rate down to 0.05 %
• Best footprint
GENERIS PVD Inline Sputtering System for Heterojunction and TOPCon Solar Cells

Features
- For transparent conductive oxide layers
- Parallel processing of several substrates (Si wafers)
- Low cost of ownership and high uptime
- Top down and bottom up sputtering configurable
- Sputter sequence configurable
- Rotatable cylindrical magnetrons
- highest utilization of target material
- Single end and double end version selectable
Agenda

1. Overview
2. Financials
3. SINGULUS TECHNOLOGIES Segments
   - Solar
   - Semi-conductor
   - Life Science
4. SINGULUS TECHNOLOGIES Strategy/Forecast
Cluster Tools for Semiconductor Industry
Reliable, repeatable and precise control down to atomic layers

Vacuum deposition technology
• 200 mm and 300 mm wafer
• All common SEMI-Standards
• Up to 12 PVD cathodes
• Co-sputtering & DC/RF-sputtering
• Ultra-high vacuum (<10^-8 Torr)
• Competitive cost-of-ownership and target lifetime

From Spintronics to a wider range of applications
• Technological leadership in magnetic heterostructures, such as MRAM, Thin-Film-Heads, magnetic Sensors and integrated Inductors
• Growth potential in applying Singulus cluster tools in MEMS, Packaging, RF-Filter, LED, Power Electronics
Wet Processing System for Electronics & Semiconductor

Specialist for Cleaning, Etching & Drying
- Manual and Semi-Automated Wet Process Stations for 6", 8" / 200 mm wafer size
- Fully-Automated Wet Process Stations
- Total Metal Free Working
- Growth potential in a wide range of applications
Agenda

1. Overview

2. Financials

3. SINGULUS TECHNOLOGIES Segments
   - Solar
   - Semiconductor
   - Life Science

4. SINGULUS TECHNOLOGIES Strategy/Forecast
MEDLINE
Production System for Medical Technology

Applications for Medical Technology

- Washing and pre-cleaning
- Cleaning & Etching
- Ultra- or megasonic cleaning
- Surface conditioning & modification
- Vacuum Coating & Electrochemical etching
DECOLINE II
Production System for 3-Dimensional Coating

Advanced Surface Coating
• Brilliant layers on 3-dimensional parts & individual design variety
• UV-curing for protection lacquer
• Inline spray coating & metallization
• Fully automated processing & high productivity and flexibility
• Low cost of ownership & environment-friendly
Decorative Coating with POLYCOATER
Inline Sputtering System

Advanced Surface Coating
- Brilliant layers on 3-dimensional parts & individual design Inline metallization
- Fully automated processing & high productivity and flexibility
- Low cost of ownership & environment-friendly
Agenda

1. Overview
2. Financials
3. SINGULUS TECHNOLOGIES Segments
   - Solar
   - Semiconductor
   - Life Science
4. SINGULUS TECHNOLOGIES Strategy/Forecast
Objectives in 2020

Recovery of order intake and increase in sales and earnings

**Solar**
- Extend leadership in CIGS
- Establishment of further production systems for Heterojunction solar cells

**Semiconductor**
- Maintain leading position in magnetic films, e.g. Magnetic Sensors, MRAM
- Expand presence in production environment
- Grow into additional applications such as Inductors, MEMS, RF-Filters, LED, Power Electronics
- Grow market share for wet cleaning, etching and drying in semiconductor and electronics industry

**Life Science**
- Medical Technology
  - Addressing of new applications/costumers for production system for medical technology
- Decorative Coatings
  - Intensive marketing of the existing machine platform for cosmetics, consumer goods & automotive
- New Applications
  - Introduction of sputtering & wet processing equipment for new applications/markets
COVID-19 pandemic reduces visibility - achieving the financial forecasts requires a course of business activities in this financial year as planned. A significant delay in ongoing projects due to the COVID-19 pandemic could have an impact on the 2020 results. The management monitors the situation so that the necessary countermeasures can be implemented promptly.

For the current business year SINGULUS TECHNOLOGIES forecasts a substantial increase in sales and earnings pursuant to IFRS compared with the business year 2019 due to the current forecasts.

- In this context, sales in the business year 2020 should be in a range from € 120 million to € 140 million.

- The operating earnings before interest and taxes (EBIT) should also develop favorably and come in at a mid-single-digit million range.
Forward-Looking Statements

This presentation contains forward-looking statements based on current expectations, assumptions and forecasts of the executive board and on currently available information. Various known and unknown risks, unpredictable developments, changes in the economic and political environment and other presently not yet identifiable effects could result in the fact that the actual future results, financial situation or the outlook for the company differ from the estimates given here. We are not obligated to update the forward-looking statements made in this presentation unless there is a legal obligation.