Sustainable! How robots enable a green future
Schedule

- Welcoming and presentation of the participants of the Executive Round Table
  Dr. Susanne Bieller, IFR General Secretary

- Preview on World Robotics Industrial Robots 2022
  Milton Guerry, IFR President

- Discussion on “Sustainable! How robots enable a green future”

- Get together and personal interviews with the participants
International Federation of Robotics

- **Non-profit organization** since 1987
- IFR represent **more than 2,000 organizations** from **25 countries**
- Robot manufacturers, national robotics associations, universities, start-ups worldwide
- Annual global **robotics turnover $50 billion** (robot systems including software & peripherals)
Your panelists today

Marc Segura
Robotics Division President
ABB

Dr. Stephen Travers
Director Digitalization & Production System MERCEDES BENZ

Christophe Coulonget
Executive President STÄUBLI ROBOTICS

Dr. Joachim Döhner
Chairman VDMA Battery Production (KUKA SYSTEMS)

Gwenole Cozigou
Director for Construction and Machinery EUROPEAN COMMISSION

Your host: Ken Fouhy
Editor in Chief VDI NACHRICHTEN
IFR statistics 2021: preliminary results

Milton Guerry
IFR President
(Schunk)

Dr. Christopher Müller
Director IFR Statistical Department
IFR statistics and World Robotics

- Numbers presented here are preliminary

- Final results will be published in World Robotics 2022
  - Available October 2022
Global installations 2021: 486,785 units (+27%)

Annual installations of industrial robots - World

1,000 units

Source: International Federation of Robotics - preliminary results 2021
Electronics largest customer

Annual installations of industrial robots by customer industry - World
1,000 units

- Electrical/electronics: 132, 109, 89
- Automotive: 109, 80, 102
- Metal and machinery: 57, 41, 46
- Plastic and chemical products: 22, 19, 18
- Food: 15, 12, 11
- All others: 53, 30, 36
- Unspecified: 98, 86, 86

Source: International Federation of Robotics preliminary results
Strong recovery in all main regions

Annual installations of industrial robots
(‘000 of units)

- 2020:
  - Asia/Australia: 266
  - Europe: 68
  - The Americas: 39

- 2021:
  - Asia/Australia: 355
  - Europe: 78
  - The Americas: 49

Source: International Federation of Robotics - preliminary results 2021
North America exceeding pre-pandemic level

Annual installations of industrial robots - North America

1,000 units

Source: International Federation of Robotics - preliminary results 2021
## General Industry in the US robotizes

### Annual installations of industrial robots by customer industry - United States

<table>
<thead>
<tr>
<th>Industry</th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>9,782</td>
<td>10,494</td>
<td>12,960</td>
</tr>
<tr>
<td>Metal and machinery</td>
<td>2,294</td>
<td>3,807</td>
<td>3,785</td>
</tr>
<tr>
<td>Plastic and chemical products</td>
<td>2,661</td>
<td>2,491</td>
<td>3,462</td>
</tr>
<tr>
<td>Food</td>
<td>2,715</td>
<td>3,399</td>
<td>-</td>
</tr>
<tr>
<td>Electrical/electronics</td>
<td>2,843</td>
<td>3,710</td>
<td>3,460</td>
</tr>
<tr>
<td>All others</td>
<td>2,618</td>
<td>3,461</td>
<td>4,461</td>
</tr>
<tr>
<td>Unspecified</td>
<td>4,971</td>
<td>6,295</td>
<td></td>
</tr>
</tbody>
</table>

Source: International Federation of Robotics - preliminary results
Early recovery in Asia; new record

Annual installations of industrial robots - Asia/Australia

1,000 units

Source: International Federation of Robotics - preliminary results
Strong growth across all customer industries

Annual installations of industrial robots by customer industry - Asia/Australia
1,000 units

<table>
<thead>
<tr>
<th>Customer Industry</th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical/electronics</td>
<td>124</td>
<td>102</td>
<td>82</td>
</tr>
<tr>
<td>Automotive</td>
<td>73</td>
<td>46</td>
<td>58</td>
</tr>
<tr>
<td>Metal and machinery</td>
<td>36</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Plastic and chemical products</td>
<td>9</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Food</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>All others</td>
<td>36</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>Unspecified</td>
<td>70</td>
<td>51</td>
<td>51</td>
</tr>
</tbody>
</table>

Source: International Federation of Robotics - preliminary results
Europe exceeding pre-pandemic level

Annual installations of industrial robots - Europe
1,000 units

44 41 43 46 50 56 67 76 74 68 78

Source: International Federation of Robotics - preliminary results
Automotive major customer

Annual installations of industrial robots by customer industry - Europe

1,000 units

- Automotive: 19 (2021), 19 (2020)
- Metal and machinery: 15 (2019)
- Unspecified: 16 (2021), 17 (2020), 17 (2019)

Source: International Federation of Robotics - preliminary results
Annual installations of industrial robots - Germany

1,000 units

Source: International Federation of Robotics - preliminary data
Italy recovering well

Annual installations of industrial robots - Italy

Source: International Federation of Robotics - preliminary data
Outlook

• Orders are growing strongly
  • But supply chain issues are a burden to production and shipping

• Headwinds
  • Russian invasion in Ukraine and its consequences for Europe
  • Investments burdened by inflation and rising interest rates

• Diversification of customers continues
  • Robotics beyond automotive

• Achieving the United Nations' Sustainable Development Goals requires robotics
  • Smart automation reduces productions costs, making alternative energy and transportation affordable
  • Smart automation makes production more resource-efficient
  • Smart agricultural robots eliminate the use of chemical agents