MicroElectronics, Training Industry and Skills

Agenda

I) Presentation of METIS

II) METIS achievements in 2020

III) Next steps in 2021-2022
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Brief overview of the METIS project:

- **METIS = MicroElectronics Training Industry and Skills**
- A Sector Skills Alliance, co-funded by Erasmus+
- Implementing a strategic approach to sectoral cooperation on skills
- Aiming to bridge the microelectronics skills gap
- 4-year project: November 2019 - October 2023
- Budget: EUR 4,000,000

- 19 partners from 13 countries, coordinated by SEMI Europe
The METIS Consortium

Coordinated by

Training & Education

Industry

Skills Demand

Societal Supply

Market Intelligence, Career Guidance, Diversity & Regulatory Bodies
METIS associated Partners
The EU microelectronics sector needs to overcome severe skills shortages

Fast-changing technological landscape

The METIS project

- The EU microelectronics sector needs to overcome severe skills shortages
- Fast-changing technological landscape

Source: DECISION Etudes & Conseil

Study « Emerging technologies in electronic components and systems (ECS) - opportunities ahead », DG CONNECT 2020
Most of the European leaders across the microelectronics value chain have participated to METIS WP2...

...as well as the main Research and Technology Organizations (RTO)...

...and many global leaders, often with large activities in Europe.
**Global overview of METIS - 2019 to 2023**

**First steps of METIS**
- **2020**: Skills strategy, Identifying the trends & needs

**Design training modules**
- **2021**: Establish EU Microelectronics Observatory & Skills Council (150 stakeholders)
- **2023**: Evaluation
- **2022**: Implementation

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Duration (hours)</th>
<th># of Modules</th>
<th>EQF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component Design</td>
<td>300</td>
<td>10</td>
<td>4 to 6</td>
</tr>
<tr>
<td>System Design</td>
<td>400</td>
<td>13</td>
<td>4 to 6</td>
</tr>
<tr>
<td>Basic of manufacturing</td>
<td>300</td>
<td>10</td>
<td>4 to 6</td>
</tr>
<tr>
<td>Key competencies &amp; innovative thinking</td>
<td>100</td>
<td>10</td>
<td>5 to 7</td>
</tr>
</tbody>
</table>

- From 2022... yearly monitoring
Identifying the trends & needs (2020): Methodology

10 Focus Groups

50 Structured Interviews

Online survey (>150 answers)

Identification of trends affecting skills

Analysis of skills demand

Assessment of skills supply

Best practices/lessons learnt

Definition of occupational profiles
- Using the European Skills, Competences, Qualifications and Occupations classification (ESCO)
- Refining of already existing occupational profiles
- Definition of new profiles: 4 new profiles

Foresight scenarios for skills development
- Horizon: 2030

Action Plan
- Actionable measures
- Timeline
- Expected impact
Agenda

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Organisations participating in the METIS project

So far in total, we have engaged 237 stakeholders of 150 organisations.

That is more than the average of the sector in Europe.

The entire electronics value chain involved:

- Associated services: 1%
- Electronic systems manufacturers: 9%
- Passive components: 1%
- PCBs: 1%
- SC design & manufacturing: 20%
- SC design: 4%
- SC manufacturing equipment: 6%
- Materials for SC: 5%
- R&D: 12%
- Education & training: 26%
- Microelectronics: 31%
- Others: 15%
<table>
<thead>
<tr>
<th>N°</th>
<th>Focus Groups Themes</th>
<th>Participants</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Materials for semiconductors</td>
<td>JSR Micro / SEMI / Semilab / Okmetic / Graphenea...</td>
<td>Microelectronics skills issues from the point of view of materials companies</td>
</tr>
<tr>
<td>2</td>
<td>Semiconductor manufacturing equipment</td>
<td>Tokyo Electron / Edwards / EMD / SEMI / Dresden Chip Academy...</td>
<td>Microelectronics skills issues from the point of view of semiconductor manufacturing equipment companies</td>
</tr>
<tr>
<td>3</td>
<td>Semiconductor manufacturing</td>
<td>Bosch / X-Fab / Infineon / STMicroelectronics...</td>
<td>Microelectronics skills issues from the point of view of semiconductor manufacturing companies</td>
</tr>
<tr>
<td>4</td>
<td>Semiconductor design</td>
<td>Infineon / NXP / Bosch / IMEC / TU Graz...</td>
<td>Microelectronics skills issues from the point of view of semiconductor design companies</td>
</tr>
<tr>
<td>5</td>
<td>Edge AI</td>
<td>IMEC / Fraunhofer / SEMI...</td>
<td>How and when will/is Edge AI lead to new skills requirements in Microelectronics?</td>
</tr>
<tr>
<td>6</td>
<td>Microelectronics &amp; automotive</td>
<td>Infineon / Automotive Lightning / MetaSystem / IAL FVG...</td>
<td>Impact of automotive innovations on microelectronics skills needs (ADAS, electrification of powertrains, etc.)</td>
</tr>
<tr>
<td>7</td>
<td>Industry 4.0</td>
<td>BME / Institute of Electron Technology / Vienna University of Technology...</td>
<td>New skills needs in electronics manufacturing in view of industry 4.0</td>
</tr>
<tr>
<td>8</td>
<td>Validation of education</td>
<td>CIMEA / TU Sofia / TU Graz / IMEC / SBH Sudost...</td>
<td>Good practices developed within Erasmus+ projects / Assessing differences among national education &amp; training systems</td>
</tr>
<tr>
<td>9</td>
<td>EU Policy perspective</td>
<td>DG GROW / DG EMPL / DG CONNECT / DG RTD...</td>
<td>EU policy and microelectronics</td>
</tr>
<tr>
<td>10</td>
<td>Diversity in Electronics</td>
<td>WiTEC / Lund University / CNRS...</td>
<td>The place of women and other under-represented groups in Electronics</td>
</tr>
</tbody>
</table>

We have carried out 10 Focus Groups to address specific issues linked to microelectronics skills needs.
We have proposed 4 new ESCO profiles linked to microelectronics
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Publication of the METIS Skills Strategy (January 2021)

A) Identify trends, challenges and opportunities
   - Identification of the main employment trends over the past decade
   - Mismatches between offer and demand on the European microelectronics job market
   - Initiatives to be benchmarked (HR, policy, etc.)
   - Country analyses: European specificities, regional specificities

B) Anticipate skills and occupational profiles
   - Identification of the most needed microelectronics job profiles and skills
   - Identification of the main emerging microelectronics job profiles and skills
   - Identification of the main shortages regarding microelectronics job profiles and skills
   - Identification of the emerging technologies and markets impacting job profiles and skills (I4.0, Automotive innovations, etc.)
   - Description of the key job profiles: Associated main skills, emerging skills, EQF levels, duration to fill positions, etc.
   - Microelectronics ESCO profiles
     - Assessment of existing ESCO profiles in microelectronics
     - Identification of possible new ESCO profiles and proposal of 4 new ESCO profiles
   - Diversity in electronics

C) Skills strategy
   - Policy recommendations
Next steps 2020-2022: Overview

- **December 2020**: Consolidation of results
  - Preliminary results based on interviews, focus groups and questionnaire

- **January 2021**: Foresight exercise
  - Online Workshop, to present the results and collect feedbacks
  - Any stakeholder invited to join

- **January 2021**: Publication of METIS Skills Strategy
  - Based on interviews, focus groups, questionnaire and foresight exercise
  - The Strategy will be reviewed and updated yearly

- **2021**: Preparation of METIS Curriculum & Training
  - Topics: component design / system design / manufacturing / transversal skills
  - “Test rounds” in all industry and educational partners

- **2021-2022**: Launch of the METIS Observatory
  - Permanent governance structure, updating the skills strategy
  - Any stakeholder invited to join
Observatory and Skills Council (2021-2022)

- Permanent governance structures
- Anticipation of industry and skills development trends
- Improving METIS Training and Curriculum
- Thematic groups (e.g. circular economy, gender)
- Any stakeholder welcome to join
Thank you for your attention!

For more information,
visit [http://www.metis4skills.eu](http://www.metis4skills.eu)
or contact Yanying Li, Senior Manager Collaborative Projects, SEMI ([yli@semi.org](mailto:yli@semi.org))
or contact Léo Saint-Martin, Associate Consultant, DECISION Etudes & Conseil ([saint-martin@decision.eu](mailto:saint-martin@decision.eu)).

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