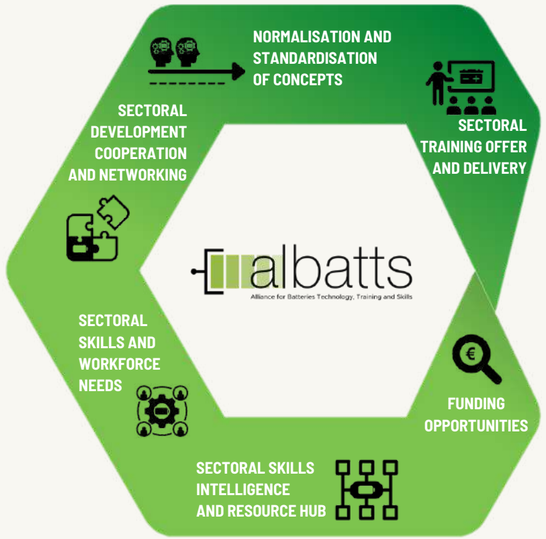
SECTORAL SKILLS INTELLIGENCE & STRATEGY FOR THE EUROPEAN BATTERY SECTOR

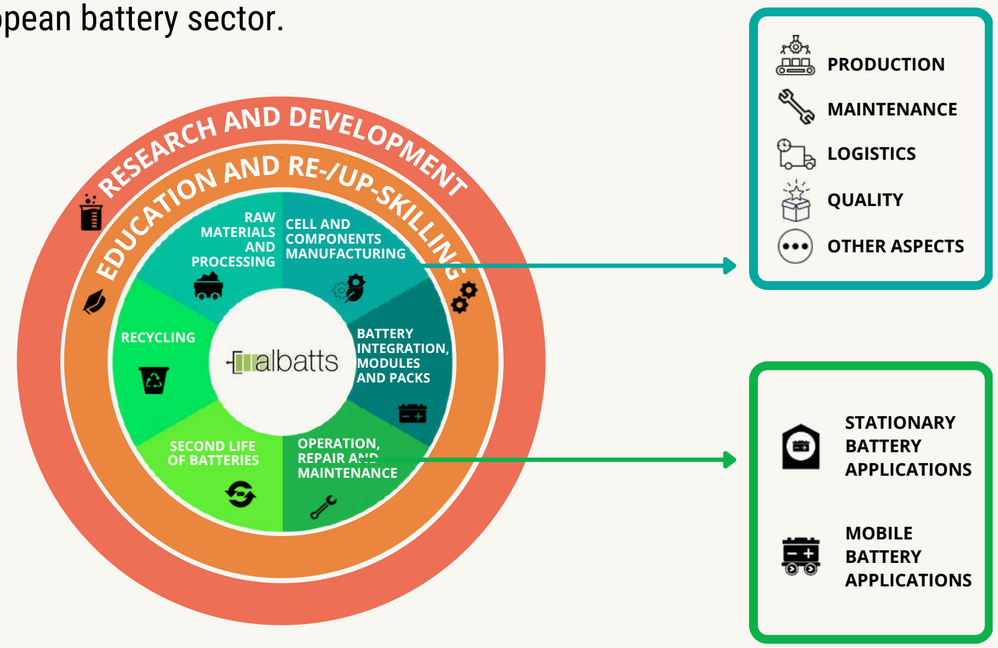
D3.10 – Sectoral Skills Intelligence and Strategy – Release 2

This is the **second** release of the sectoral skills intelligence and strategy **covering the whole European battery value chain from raw materials to recycling of batteries in terms of skills needs, job roles needs and recommendations**.



Readers will find designated actions needed in the sector to boost the overall re-/up-skilling activities as well as cooperation, information sharing and provision and many more.

The report also provides quantitative and qualitative overviews of the skills and the job roles needs per identified areas of interest consisting of the battery value chain steps, as well as specific aspects of production, quality or safety tailored to the battery production or other processes that are happening within the European battery sector.



This factsheet provides a summary of the report in what regards **PRODUCTION & MAINTENANCE of cell and components manufacturing**.

INFORMATION
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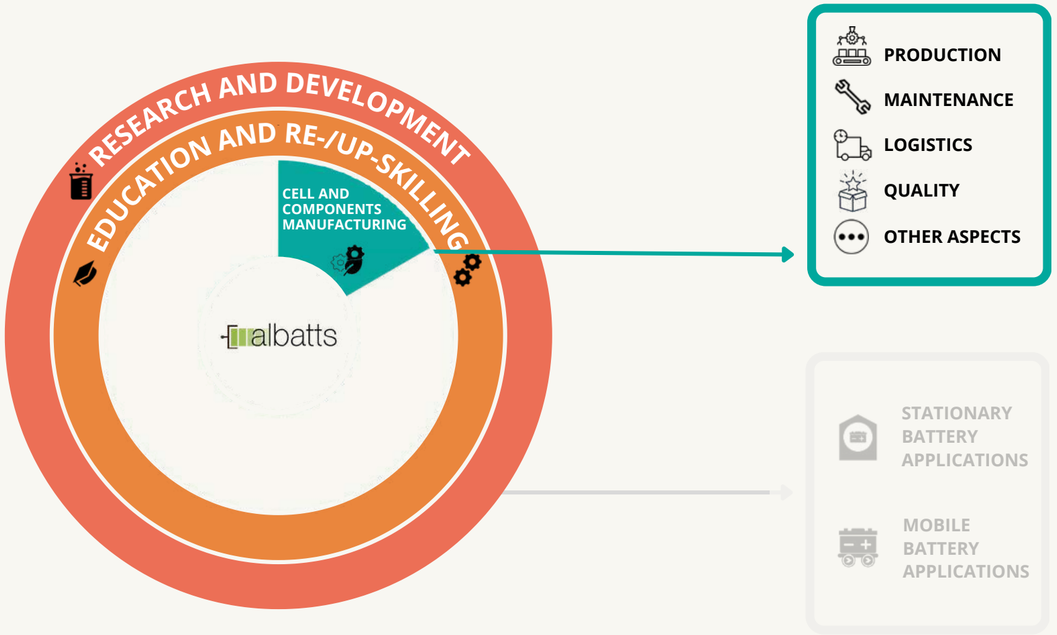
CELL AND COMPONENTS MANUFACTURING



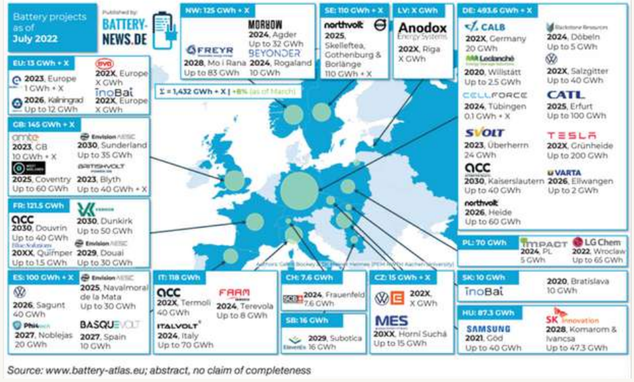
COMPONENTS & CELL MANUFACTURING step follows the raw materials and processing value chain step and concerns the manufacturing and development of different components for battery cells and the production of cells.

This factsheet describes the Gigafactory perspective. Different departments and their roles are described further below. Areas of interest covered are as follows:

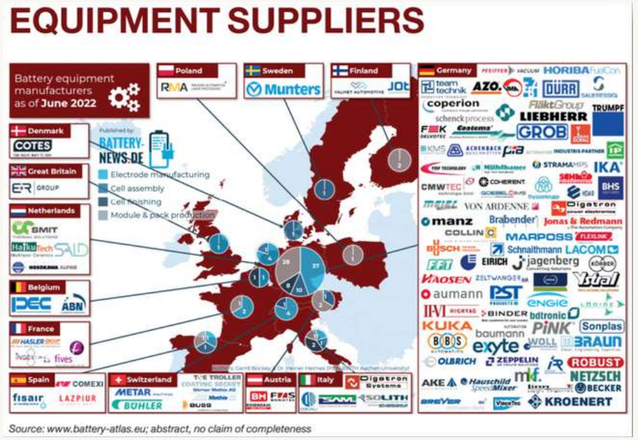
- Production and Maintenance
- Logistics
- Quality
- Other departments and Aspects, specifically: purchasing, HR, finance, sales and digitalisation

STAKEHOLDERS/COMPANIES

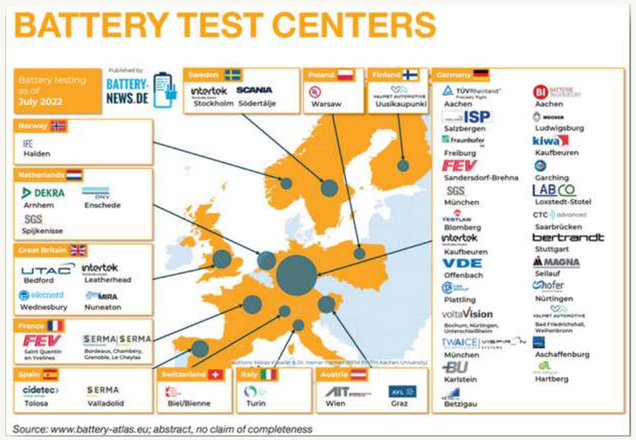
BATTERY CELL MANUFACTURERS



EQUIPMENT SUPPLIERS



BATTERY TEST CENTERS



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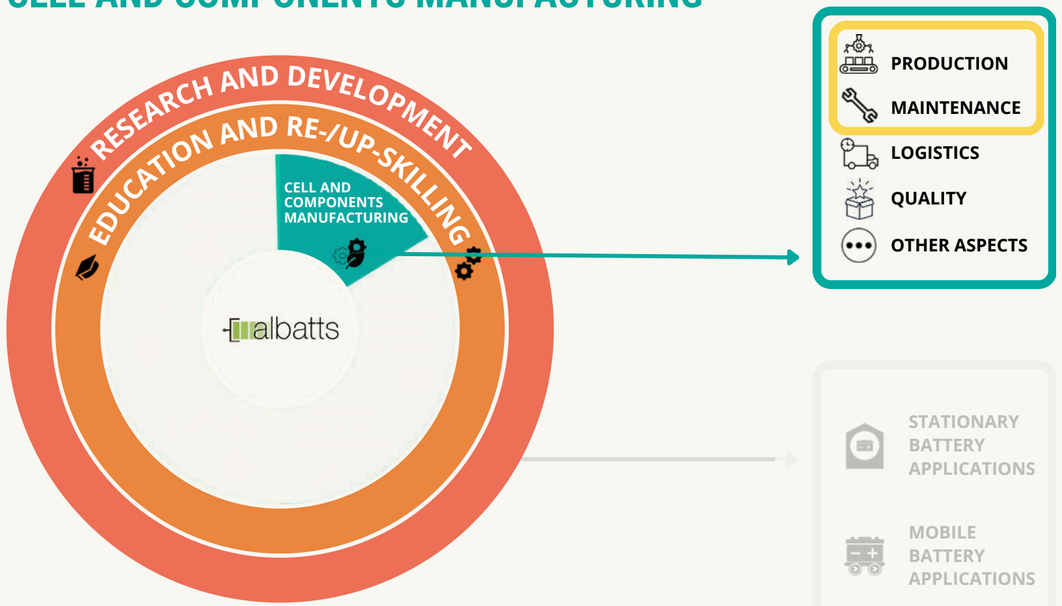
CELL AND COMPONENTS MANUFACTURING



- PRODUCTION
- MAINTENANCE
- LOGISTICS
- QUALITY
- OTHER ASPECTS

STATIONARY BATTERY APPLICATIONS

MOBILE BATTERY APPLICATIONS

Production and Maintenance

A **production** department performs one of the key activities of a Li-ion battery manufacturing company. It can be considered a volume department due to having a relatively high number of employees when compared to the other departments.

The production department can be divided into two main sections (note: the "upstream production" part can be done in-house or outsourced):

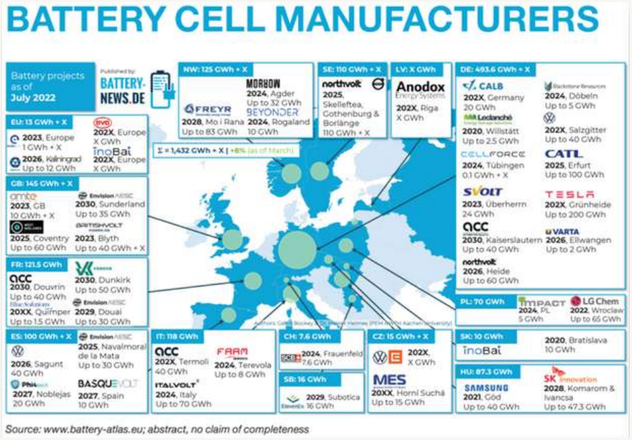
- "An upstream" production that prepares the input electrode materials. This production phase, where chemical processes take place, requires a lower number of employees than the following downstream production phase.
- "A downstream" production section that involves the other production steps such as electrode manufacturing, cell assembly (depending on battery design - prismatic, pouch, cylindrical) that is the most labor-intensive part, and cell finishing.

Maintenance: The battery production line is a very complex system, and the manufacturing needs special conditions - the dry and clean rooms, for example, need periodic maintenance. Software maintenance needs to be carried out as well. Companies are trying to introduce preventive maintenance concepts aiming to prevent failures during production and outages. Within predictive maintenance, parts of the line should monitor themselves and predict when interventions will be needed.

TARGET GROUPS: Educational institutions, battery producers, recruitment companies, head-hunters, consultants.

STAKEHOLDERS/COMPANIES

BATTERY CELL MANUFACTURERS



Source: www.battery-atlas.eu; abstract, no claim of completeness

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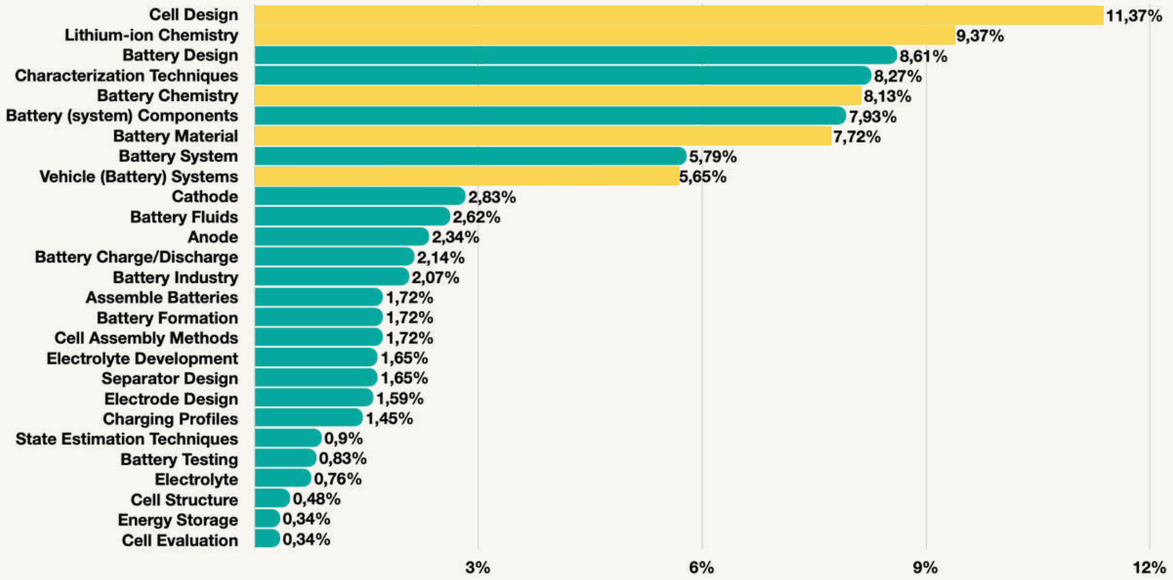
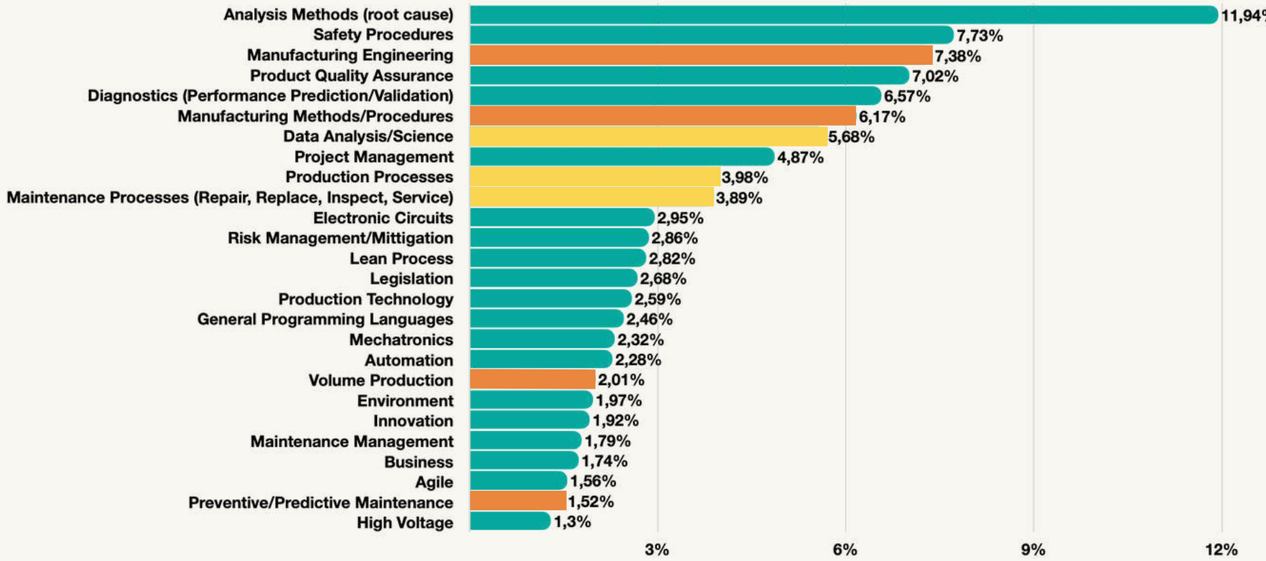
SKILLS, COMPETENCES & KNOWLEDGE NEEDS

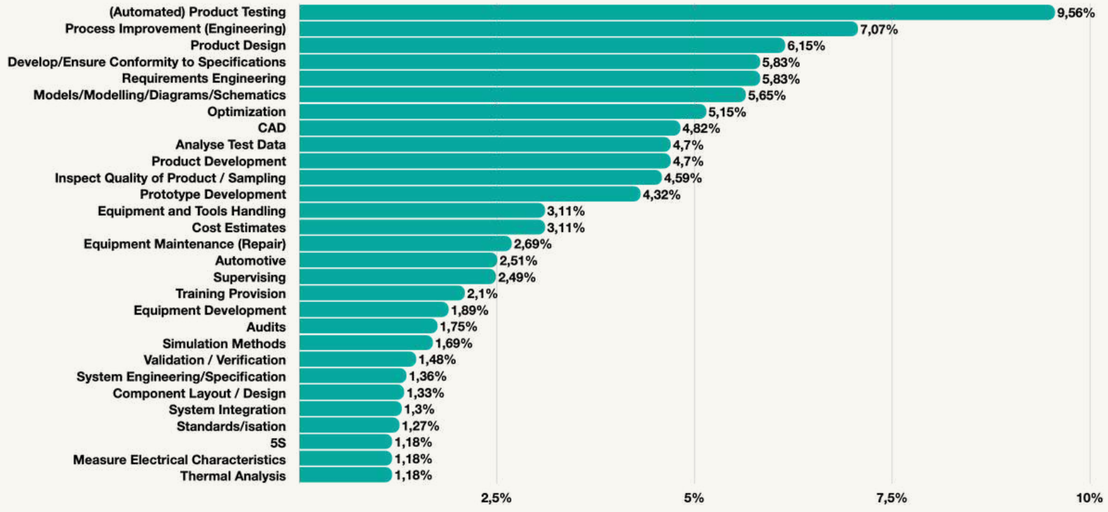
SECTOR SPECIFIC COMPETENCE



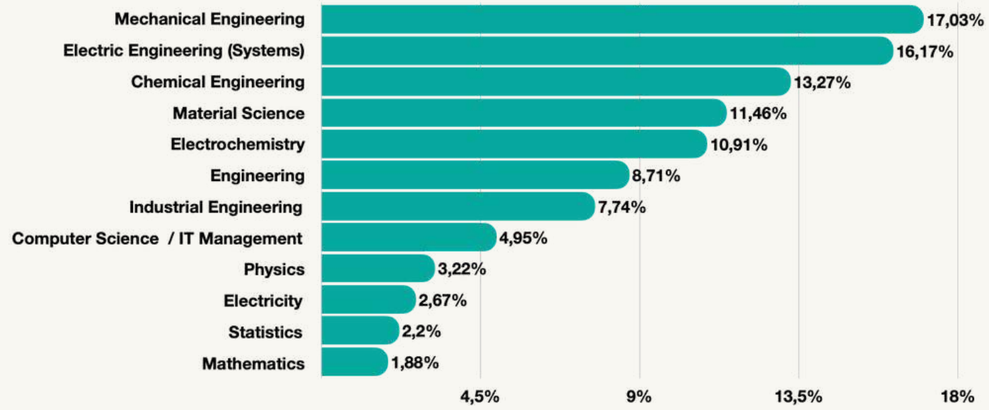
CROSS-SECTORAL SPECIFIC KNOWLEDGE



CROSS-SECTORAL SPECIFIC SKILLS



ACADEMIC COMPETENCE



YELLOW-HIGHLIGHTED ROWS – CONCEPT WAS ENDORSED/MENTIONED DURING THE WORKSHOP/INTERVIEW BY THE PARTICIPANTS

ORANGE-HIGHLIGHTED ROWS – CONCEPT WAS ENDORSED/MENTIONED DURING THE WORKSHOP/INTERVIEW BY THE PARTICIPANTS MORE THAN ONCE

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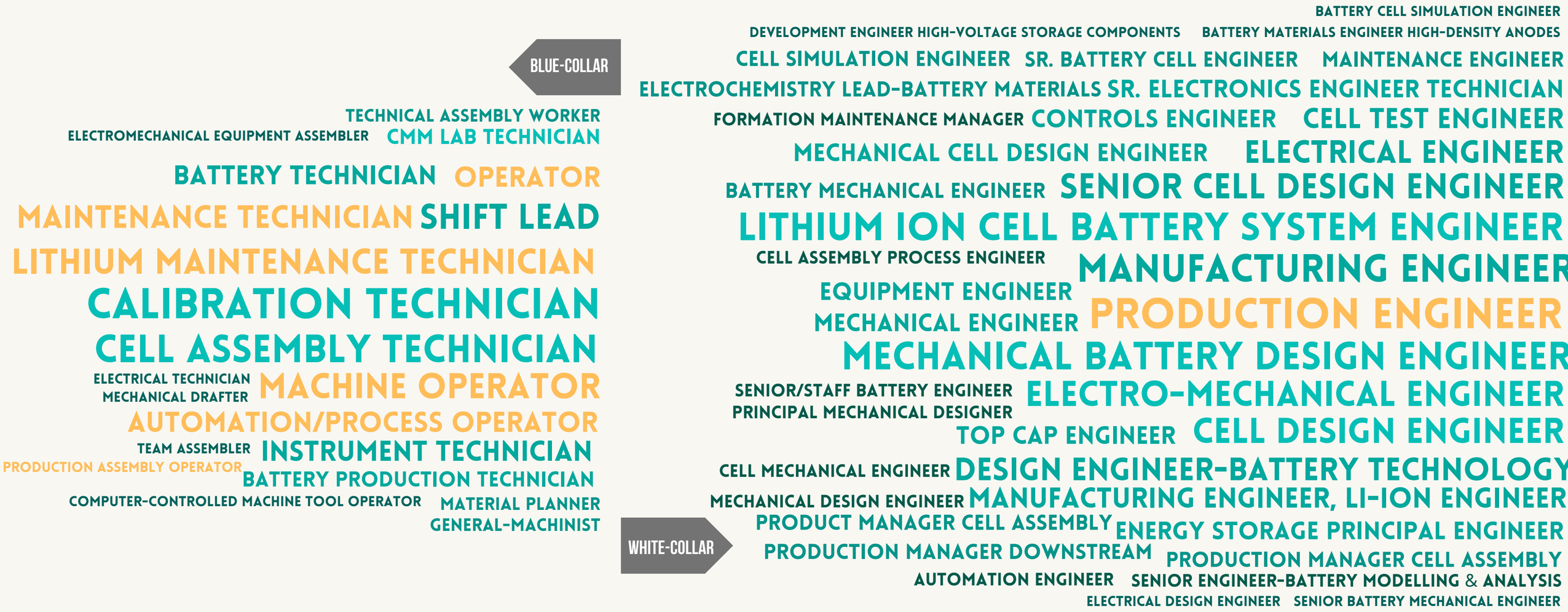
JOB ROLES



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CONSIDERATIONS / RECOMMENDATIONS

PRODUCTION

- **Apart from the general battery-related education, strengthening the skills and competencies to ensure understanding of setting up the production, preparing the related structures, commissioning the machines, chemical, and mechanical assembly, automation experience, and mechanical understanding of the automated systems combined with understanding the related software and calibration.**
- **Strengthening general IT and data analysis skills to cover future needs.**
- **Battery skills (also mentioned in the context of Production)**
- **"Dry and clean room" maintenance (including room contamination measurement)**
- **Predictive and preventive maintenance**
- **Diagnostics**

WHITE-COLLAR SPECIFIC NEEDS

- Increasing competencies in **production and material engineering, production planning, production management, shift management, process engineering, cell design, machine learning and optimisation, modelling and simulation;**
- Strengthening the focus on **large-scale manufacturing,** understanding of **chemical processes** and **quality, risk and safety management;**
- **Battery industry-related knowledge skills:** battery material, battery chemistry, battery fluids, battery components, battery testing, defective products removal

BLUE-COLLAR SPECIFIC NEEDS

- "Upstream" production - increasing knowledge to understand the **risks, envision the safety issues**, and how **chemicals** behave;
- "Downstream" production - increase **machine understanding, 5S skills**, and the ability to **troubleshoot**;
- Overall production system understanding;
- Knowledge/skills: **material handling, Clean/Dry Room Procedure/Validation, Inspect Quality of Product / Sampling, material pressing, electrode process, fine mechanics, HMI (Human Machine Interface)**

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CONSIDERATIONS / RECOMMENDATIONS

MAINTENANCE

Apart from the general battery-related education, strengthening the skills and competencies to ensure understanding of setting up the production, preparing the related structures, commissioning the machines, chemical, and mechanical assembly, automation experience, and mechanical understanding of the automated systems combined with understanding the related software and calibration.

- **Strengthening general IT and data analysis skills to cover future needs**
- **Battery skills (also mentioned in the context of Production)**
- **Diagnostics**
- **"Dry and clean room" maintenance (including room contamination measurement)**
- **Predictive and preventive maintenance**

LINKS & RESOURCES

albatts Alliance for Batteries Technology, Training and Skills
Co-funded by the Erasmus+ Programme of the European Union

- Sectoral Skills Intelligence and Strategy - Production and Maintenance
- See the list of the ALBATTS **SKILLS CARDS**

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