albatts
Alliance for Batteries Technology, Training and Skills

ALBATTS - Recognition Action Plan

Alliance for **B**atteries **T**echnology, **T**raining and **S**kills
2019-2023

D6.3 - Report on emerging job roles and skills and EU recognition

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Document Title

Report Title:	**D6.3 - Report on emerging job roles and skills and EU recognition**		
Responsible Project Partner:	VSB-TUO	Contributing Project Partners:	ATEC, VAMIA, Skelleftea, UM-FERI, FEUP, ISCN
Document data:	**File name:**		
	Pages: 28	No. of annexes:	0
	Status: Final	Dissemination level:	PU
Project title:	Alliance for Batteries Technology, Training and Skills	GA No.:	2019-612675
WP title:	WP6 Training and Education	Project No.:	612675-EPP-1-2019-1-SE-EPPKA2-SSA-B
		Deliverable No:	D6.3
Date:	Due date: 31/05/2024	Submission date:	31/05/2024
Keywords:	recognition measures; job roles; skills; concepts; ESCO; frameworks; DRIVES Framework; Sectoral Skills Strategy;		
Reviewed by:		Review date:	
		Review date:	
Approved by:	Katarina Sandbacka (Vamia), Joao Alves (ATEC)	Approval date:	31/05/2024

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ALBATTS EU-wide Recognition of Results

- This document provides **key measures** taken to assure the **EU-wide recognition (Pillar 4)** of the ALBATTS results in terms of **training material** and **sectoral intelligence results** that are being applied and used

- Overall approach to the training and education is defined in the D6.2 deliverable, which is accessible here: , following pillars are described or to be defined in further specific documents:
  - **Pillar 1** - Curricula for all levels;
  - **Pillar 2** - Innovative and flexible learning;
  - **Pillar 3** – Competent trainers and tutors;
  - **Pillar 4** – EU-wide recognition;
  - **Pillar Q** – Quality assurance;

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Pillar 4 – EU-wide Recognition

- EU-wide recognition is crucial aspect of the ALBATTS education and training framework, it concerns following aspects that are further described in this document:
  1. **Framework Coherency** - Reference, use and linkage to other frameworks (ESCO, ASA Skills Hub);
  2. **Validation and Recognition of Competence** - On-the-Job Learning validation, validation of prior learning, validation of informal and non-formal learning, Key Competencies, transversal skills and other competence;
     1. **Micro-credentials** - Digital badge/s per training unit (the use of micro-credentials);
  3. **National and Regional Outreach** - Adaptation to the national and regional frameworks
     1. **Training Recognition** - of the developed training material based on the training type on EU level
     2. **Job Roles and Competences** - recognition of the used competence concepts and job roles on EU level
     3. **European Vocational Core Profiles** – recognition throughout Europe (work together with Pillar 1)
  4. **Sectoral Skills Strategy**

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1. Framework Coherency

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1. Framework and Tools Coherency

Selected frameworks were taken into account when working on the training and education in the ALBATTS project and following measures will be followed:

- **European Skills, Competences, Qualifications and Occupations (ESCO)** – developed training modules are mapped to the sectoral intelligence concepts which are mapped to the ESCO taxonomy, covered job roles are also mapped to the ESCO.
  - Further update and alignment with the ESCO is possible
- **ASA Skills Hub** – developed training material and concepts are plugged into the Hub which allows flexible update of the concepts as well as EU-wide recognition amongst the PfS Partnerships (e.g. Automotive Skills Alliance)
- **European Qualifications Framework (EQF) and ISCED** – all training and education modules will be referenced against EQF and ISCED levels
- **BLOOMs taxonomy** – used to identify maturity level of competence mappings

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1. Framework Coherency - Results

European Skills, Competences, Qualifications and Occupations (ESCO)

- every concept (skills, knowledge, job roles) of ALBATTS is mapped to ESCO
- update of the ESCO was assured (not yet released):
  - 4 new occupations in the ESCO
  - 8 new competences concepts
  - 15 new alternative labels

ASA Skills Hub

- all training modules are plugged to the ASA Skills Hub with mapped skills
  - Landing Page - Skills Hub (skills-framework.eu)
- ALBATTS concepts are plugged to the ASA Skills Hub
  - Skills Cards: Job Roles - Skills Hub (skills-framework.eu)
  - Competence: Skills and Competence - Skills Hub (skills-framework.eu)

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1. Framework Coherency - Results

European Qualifications Framework (EQF) and ISCED

- all training and education modules are referenced against EQF and ISCED levels
- job role skills cards contain mapping to ESCO
- maturity levels used within the skills cards are mappable to EQF
- covering EQF levels from 2-7

BLOOMs Taxonomy

- learning outcomes are described using BLOOMs taxonomy
- BLOOMs taxonomy is used for identification of maturity levels of training modules and job role skills cards – awareness, practitioner, expert

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2. Validation and Recognition of Competence

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2. Validation and Recognition of Competence

- ALBATTS developed a model for the validation of informal and non-formal learning, taking into consideration:
  - Curricula with clear learning outcomes for new and central areas of education and training in the sector is proposed
  - Clear learning outcomes will be used for assessment and validation of prior learning, turning the whole process easier and more transparent
  - Digital badges are integrated to assure the sector recognition
  - Competent and independent assessors

- **Europass** can be used for validation and recognition of
  - competence
  - Work Based Learning (WBL)
  - courses done abroad.

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2. Validation and Recognition of Competence

- **Adaptive Learning** was tested and piloted by the ALBATTS Project.
- Adaptive learning **involves assessing the learner's knowledge continuously**
- Allowing users to demonstrate and gain credit for their knowledge through testing, without having to read through material they already understand.
- This allows the learning platform to meet learners where they are, rather than assuming that all students start courses with the same level of knowledge. Depending on the learner's prior knowledge this can lead to substantial time savings, in contrast to traditional 'one size fits all' systems that force every learner to consume all of the content.
- Courses in the tested adaptive learning system start with an operation called Determine Knowledge – a generative assessment where students are tested on questions drawn from across a learning objective.
- If students do well, the system allows them to move ahead in their learning based on the knowledge they have demonstrated.

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2.1. Micro-credentials

Project ALBATTS issues micro-credentials for the training developed which boosts the recognition of the trainee achievement as well as the quality of the training:

- Selected training units and modules developed in the ALBATTS project are supplemented with **digital badges**, this is synergistic with the **ASA Skills Hub** where badges can be issued per learning outcome on different levels;

- Issued micro-credentials may be seen in this **DASHBOARD**.

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3. National and Regional Outreach

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3. National and Regional Outreach

It is important to create impact to various stakeholders on different levels. Project ALBATTS rolled-out the training and education framework in following ways:

- **International, National and Regional dissemination and implementation:** training and framework was piloted in selected regions and ways of integration into national systems were explored (Events), e.g.;

  - Czech Republic
  - Finland
  - Sweden
  - Portugal
  - Italy
  - France
  - Spain
  - Romania

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3. National and Regional Outreach

It is important to create impact to various stakeholders on different levels. Project ALBATTS rolled-out the training and education framework in following ways:

- Roll-out of the **training courses** and **skills cards and competences** including European Vocational Profiles: Batt Forum, Piloting, final ALBATTS conference, tour for skills – ALBATTS webinar series, through the ASA Learning Platform and Skills Hub, through InnoEnergy Skills Institute (Free Partner Courses (innoenergy.com)), various other presentations with stakeholders, new projects suchs as CaBatt, TRIREME, and Voltage

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3.1. Training Recognition

- Training is recognised within the sector and measures taken boosts the impact of the course enrollments – due to the selection of platform which boosts the recognition via training quality, dissemination/impact and sustainability

- Training recognition is assured by following measures:
  - **MOOC courses** are developed as an ideal way of inclusively delivering the material to wide audience, courses are configured in the ASA Learning Platform.
  - **Adaptive learning** by RealizeIT platform is integrated within the ASA Learning Platform
  - **InnoEnergy Skills Institute** recognised the training and co-offers the training modules via the ASA Learning Platform: Free Partner Courses (innoenergy.com)
  - Training of trainers was facilitated in ALBATTS project and is more deeply described in D6.7, this boosted the recognition and further outreach of the knowledge transfer
  - Use of the courses in various other projects – CaBATT, Voltage, TRIREME, etc.

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3.2. Job Roles and Competence

- Project ALBATTS gathered data on the job profiles and other sectoral intelligence, it is important to provide formal definition of the job roles and deliver the most up-to-date concepts for the sectoral stakeholders
- Project ALBATTS provided job role skills cards based on the sectoral intelligence competence matrix and kept them updated during the project duration;

- Feedback and recognition received from **companies** in the sector;
- **National level recognition** via adaptation of the national curricula or usage of the concepts - Germany – Kombih project and Stuttgart region; Portugal; Finland; Dunkirk Region - France, Catalunya Region – Spain, Czech Republic and more – see later slides;
- **EU Level** - Synchronisation with InnoEnergy; ESCO (section 1); ASA Skills Hub; and
- **EU Projects** - GREEN, CaBATT, Voltage, TRIREME, and other.

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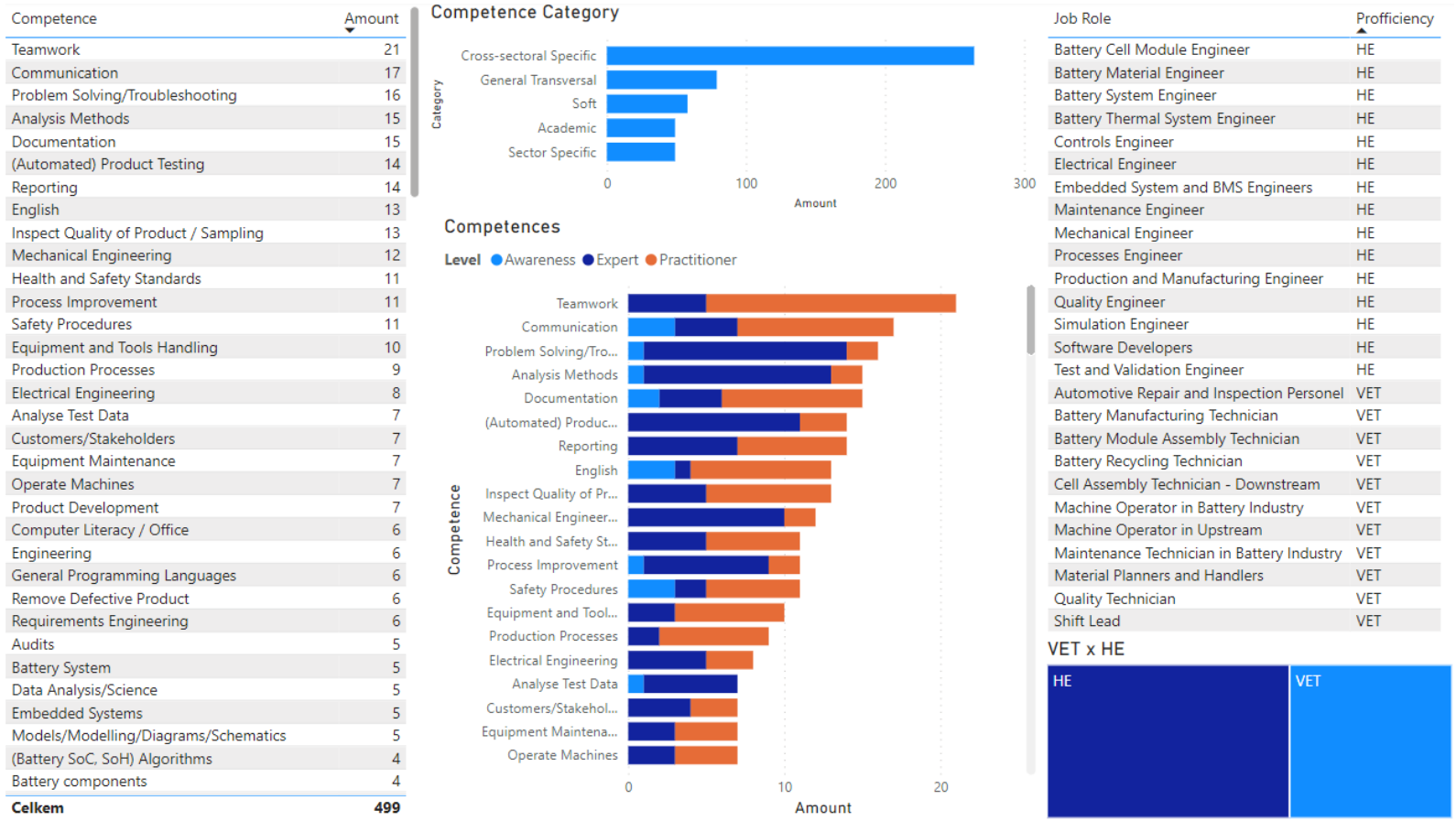
3.3. European Vocational Core Profiles

- A dashboard with analysed ALBATTS skills cards was developed in order to identify core competence for the battery sector (the most important competences are seen in the picture)



Competence	Amount
Teamwork	21
Communication	17
Problem Solving/Troubleshooting	16
Analysis Methods	15
Documentation	15
(Automated) Product Testing	14
Reporting	14
English	13
Inspect Quality of Product / Sampling	13
Mechanical Engineering	12
Health and Safety Standards	11
Process Improvement	11
Safety Procedures	11
Equipment and Tools Handling	10
Production Processes	9
Electrical Engineering	8
Analyse Test Data	7
Customers/Stakeholders	7
Equipment Maintenance	7
Operate Machines	7
Product Development	7
Computer Literacy / Office	6
Engineering	6
General Programming Languages	6
Remove Defective Product	6
Requirements Engineering	6
Audits	5
Battery System	5
Data Analysis/Science	5
Embedded Systems	5
Models/Modelling/Diagrams/Schematics	5
(Battery SoC, SoH) Algorithms	4
Battery components	4
Celkem	**499**

Job Role	Profficiency
Battery Cell Module Engineer	HE
Battery Material Engineer	HE
Battery System Engineer	HE
Battery Thermal System Engineer	HE
Controls Engineer	HE
Electrical Engineer	HE
Embedded System and BMS Engineers	HE
Maintenance Engineer	HE
Mechanical Engineer	HE
Processes Engineer	HE
Production and Manufacturing Engineer	HE
Quality Engineer	HE
Simulation Engineer	HE
Software Developers	HE
Test and Validation Engineer	HE
Automotive Repair and Inspection Personel	VET
Battery Manufacturing Technician	VET
Battery Module Assembly Technician	VET
Battery Recycling Technician	VET
Cell Assembly Technician - Downstream	VET
Machine Operator in Battery Industry	VET
Machine Operator in Upstream	VET
Maintenance Technician in Battery Industry	VET
Material Planners and Handlers	VET
Quality Technician	VET
Shift Lead	VET

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Adoption of core skills in Albatts to the Finnish National VET curricula

- A basic module for working in the battery industry has been developed for the Finnish Vocational Education system based on the "core" competences identified in the Albatts project
- The module can be found in the national education database e-requirements (e-perusteet: Prosessiteollisuuden perustutkinto - ePerusteet (opintopolku.fi)) and will come into force 1.8.2024
- The module is called "Working in the battery industry" 15 cp (competence points)" and suits the whole battery value chain and can be applied to any battery related company context.

The vocational education modules in Finland are competence based and the skills should be showed in working life or a workplace authentic environment. The skills are examined by a qualified teachers and a workplace instructor against national competence requirements (learning outcomes).

The module is placed in the IVET qualification exam of Process worker but can be chosen by any other qualifications.

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Working in the battery industry 15cp – competence requirements

Code

107377

Vocational competence requirements

Preparing for the job

The Student

- observe working hours
- familiarizes him/her self with the tasks and plans his/hers own work
- understand written and oral instructions in English
- knows how to function as a member of the work community
- knows how to work in a multicultural and international work environment

Knowledge of the operating environment and materials of the battery industry

The Student

- understand the importance of the battery industry and its value chain
- knows the most commonly used raw materials, materials and chemicals in his/her own work area and the battery industry, as well as their production methods
- knows the most common components of battery cells and their chemical properties
- understand the importance of traceability of raw materials in the battery industry
- understand the electrical and chemical risks associated with ready-made battery cells and packs
- understand the factors affecting product quality requirements
- understand the importance of recyclability of batteries

Working at the workstation

The Student

- works at the workstation in accordance with the workplace operating system
- works in accordance with the cleanliness and hygiene requirements of the job
- identify the variables to be monitored in production processes and their measurement categories
- uses and monitors workstation machines and equipment and processes
- identifies problem situations and acts in production problem situations according to the instructions
- performs the daily maintenance and condition monitoring tasks required for the work station's machines and equipment in accordance with the instructions
- takes into account the previous and next work phase in his work
- use information systems and reports in their work
- takes care of data transfer and reporting as required by the job
- performs the quality control required for the work

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Working in the battery industry 15cp – competence requirements

Safe operation

The Student

- acts in his/her work in accordance with the regulations and instructions related to occupational safety
- evaluates and observes safety risks related to his work
- report safety deviations, faults and damages to machines and equipment
- works ergonomically
- use personal and other protective equipment in accordance with the instructions at work
- use tools and work methods in accordance with instructions
- knows how to act in an emergency and in the event of an accident

Responsibility

The Student

- ensures the cleanliness and functionality of work area tools, machinery, and equipment
- minimizes loss and the generation of waste in his/her work and takes care of waste sorting
- looks for information on the safety data sheets of the chemicals he/she uses
- handles and disposes of chemicals used at work in accordance with instructions.

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The process in Finland

DEVELOPING A BATTERY MODULE FOR THE NATIONAL CURRICULA

1. First contact with the national agency (NA) about the ALBATTS project and the needs for the Battery industry.

CONTACT

2. Presentation of the job skill cards and the idea of the core competences to the NA.

MEETING

3. Analyse by the NA and feedback loops for a first draft of a module based on the core competences found in ALBATTS.

ANALYSIS

4. Feedback from stakeholders, including all VET schools and the working life advisory boards for different programs

STAKEHOLDERS

5. Approval and incorporation as an optional course to the curricula for the process industry and mechanical engineering VET programs

ANALYSIS

WORKING IN THE BATTERY INDUSTRY

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The process in Portugal

DEVELOPING BATTERY TRAINING FOR THE NATIONAL CURRICULA

1. Participation in an Expert Group that is revising the National Catalogue of Qualifications, to pin-point the need for adding Batteries competencies.

CONTACT

2. Adding skills needs to the National Recovery and Resilience Plan Battery Agenda, with activities related to VET and up-skilling and re-skilling.

NATIONAL AGENDA

3. ALBATTS skill cards were used as a basis to inquire national companies about job roles and skills needs.

SKILLS CARDS

4. Focus groups with experts from companies were organized to fine-tune the needs.

FOCUS GROUPS

5. Curricula development and approval by the National Agency of Qualifications are the next steps to close the process within the national

NEXT STEPS

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The process in Czech Republic

DEVELOPING A NATIONAL BATTERY TECHNICIAN QUALIFICATION

1. Participation in an Expert Group within the project that is developing new curricula under The Ministry of Labour and Social Affairs (MoLSA) of Czech Republic

CONTACT

2. Based on the needs, ALBATTS inputs were used in the development of occupational profiles on the National level.

ELLABORATION

3. Battery Manufacturing Technician profile was developed to be inserted into the National Curiculla

PROFILE DEVELOPMENT

4. Profile was review by regional development institutions across Czechia as well as various stakeholders and employment pacts

REVIEW

5. Finalised profile is to be inserted into the national catalogue Národní soustava povolání (nsp.cz)

NEXT STEPS

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4. Sectoral Skills Strategy

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4. Sectoral Skills Strategy

- Guaranteeing a wide European formal recognition of competencies acquired in different learning environments and countries is a key challenge for the battery industry.

- ALBATTS defined key measures to be taken to assure the EU-wide recognition, categorized and structured within the areas following the structure of this deliverable.

- Mapping of the key measures and recommendations to the Sectoral Skills Strategy is presented in the ALBATTS deliverable 6.8 (Project ALBATTS (project-albatts.eu)).

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5. Conclusions

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5. Conclusions

- This report emphasizes the importance of EU-wide recognition in the context of the ALBATTS outputs. Key aspects include integrating with frameworks like ESCO and ASA Skills Hub, validating various forms of learning and competencies, utilizing digital badges for micro-credentials, adapting to national and regional frameworks, recognizing training materials and job roles at the EU level, ensuring recognition of European Vocational Core Profiles, and implementing a sectoral skills strategy.

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