Alliance for Batteries Technology, Training and Skills
2019-2023

Presentation at the NVL Conference in Skellefteå
11/04/2024

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THE PROJECT

THE BLUEPRINT FOR SECTORAL COLLABORATION ON SKILLS IN THE BATTERY SECTOR

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What is an ERASMUS+ “Blueprint” project?

• Based in an action in the *European Skills Agenda* 2016; ”Sector Skills Alliances”

• **One project** for each sector, 4 years, min 12 partners in 10 countries

• To examine relevant trends, changes, new job roles, new skills demands, education needs, solutions

• To strengthen *European competitiveness* - addressing skills mismatches by training and education

• To develop a **sectoral skills strategy**

• A part of EU *soft policy* - all countries have their own education systems

• From 2020, ”alliances” are becoming ”partnerships” in the ”**Pact for Skills**” initiative
Examples of ERASMUS+ Blueprints

Wave 1 (2018-2022)
- Automotive: project-drives.eu
- Maritime technology: projectmates.eu
- Space (Geo information): eo4geo.eu
- Textile, clothing, leather & footwear: s4tclfblueprint.eu
- Tourism: nexttourismgeneration.eu

Wave 2 (2019-2023)
- Additive manufacturing
- Construction
- Maritime shipping
- Steel industry

Wave 3 (2020-2024)
- Batteries for electro-mobility
- Bio-economy: new technologies & innovation in agriculture
- Defence technologies
- Digitalisation of the energy value chain
- Energy-intensive industries/industrial symbiosis
- Microelectronic manufacturing & design
ALBATTS CONSORTIUM

21 partners in 11 countries
ALBATTS STEERING COMMITTEE

THE ALBATTS STEERING BOARD PROVIDED SUPPORT, GUIDANCE AND OVERSIGHT OF WORK PROGRESS
ALBATTTS Tackles Two Main Questions

1. WHAT IS ONGOING IN THE BATTERY SECTOR AND HOW DOES IT AFFECT JOB ROLES & SKILLS?

   - Gathering **skills needs**
   - Detailed description of **skills and job roles**
   - Covering the **whole value-chain**
   - Covering both **higher education and VET**

2. HOW CAN WE ADDRESS CURRENT CHALLENGES?

   - **FOCUSING ON** Vocational Education and Training (VET) & Higher Education (HE) **AIMED AT** initial training and re-skilling and up-skilling of workforce
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MORE THAN 30 REPORTS RELEASED!
MORE THAN 30 WEBINARS & WORKSHOPS

- Vessels of the future: Maritime Batteries - Job Roles and Skills
  January 19, 2023 - 13:00-14:30 CET

- Battery Cells Manufacturing - Job Roles and Skills
  January 20, 2023 - 10:00-11:30 CET

- Stationary Energy Storage in Grids and Teleco Applications: Safety & Future Job Roles and Skills
  January 26, 2023 - 10:00-11:30 CET

- Electric vehicle manufacturing & battery integration - future qualifications needed
  January 27, 2023 - 14:00-15:30 CET

- Autonomous Operations and Virtual Reality in Maritime: Job roles & skills
  September 28, 2023 - 10:00-11:30 CET

- Recycling Electric Vehicles’ Batteries: Skills & Qualifications needed in Auto Workshops
  September 28, 2023 - 10:00-11:30 CET

- Battery Management Systems and Control: Job roles, skills & competencies
  November 30, 2023 - 10:30-12:00 CET

- Future-proofing electric vehicles to meet the changing needs of the battery value chain
  Future-proofing scholarship: January 26, 2023 - 13:00-14:30 CET

- Safe Recycling and Second use of EV Batteries: Skills & competencies needed
  January 27, 2023 - 09:00-10:30 CET

- Skills Transition in the battery industry: Training people from other industries
  February 6, 2023 - 10:00-11:30 CET

- Safety issues of Batteries: recycling, remanufacturing, repair & disposal
  May 2, 2023 - 12:30-14:00 CET

- Servicing of electric vehicles: Future qualifications needed
  Official Partner
More than 80 speakers helped ALBATTs research over the project’s duration.
Glance on Needed Skills

CELLS PRODUCTION & CELLS MAINTENANCE

- Production
- Maintenance
- Logistics
- Quality
- Other Aspects

- Stationary Battery Applications
- Mobile Battery Applications

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Cell Production

- Understanding in fields electrochemistry, electronics, mechanical engineering, process engineering, manufacturing technology, automation and digitalization in manufacturing (data analytics, maintenance and product process optimisation)
- In general, to speak and understand foreign languages, mainly English in working environment
Cell Production and Maintenance – Specific Needs

What Industry Demands

**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**, SS 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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Production and Maintenance

→ What Industry Demands

BLUE-COLLAR

TECHNICAL ASSEMBLY WORKER
ELECTROMECHANICAL EQUIPMENT ASSEMBLER
CMM LAB TECHNICIAN
BATTERY TECHNICIAN OPERATOR
MAINTENANCE TECHNICIAN SHIFT LEAD
LITHIUM MAINTENANCE TECHNICIAN
CALIBRATION TECHNICIAN
CELL ASSEMBLY TECHNICIAN
AUTOMATION/PROCESS OPERATOR
TEAM ASSEMBLER
INSTRUMENT TECHNICIAN
BATTERY PRODUCTION TECHNICIAN
COMPUTER-CONTROLLED MACHINE TOOL OPERATOR
MATERIAL PLANNER
GENERAL-MACHINIST

WHITE-COLLAR

DEVELOPMENT ENGINEER HIGH-VOLTAGE STORAGE COMPONENTS
BATTERY CELL SIMULATION ENGINEER
CELL SIMULATION ENGINEER SR. BATTERY CELL ENGINEER MAINTENANCE ENGINEER
ELECTROCHEMISTRY LEAD-BATTERY MATERIALS SR. ELECTRONICS ENGINEER TECHNICIAN
FORMATION MAINTENANCE MANAGER CONTROLS ENGINEER CELL TEST ENGINEER
MECHANICAL CELL DESIGN ENGINEER ELECTRICAL ENGINEER
BATTERY MECHANICAL ENGINEER SENIOR CELL DESIGN ENGINEER
LITHIUM ION CELL BATTERY SYSTEM ENGINEER
CELL ASSEMBLY PROCESS ENGINEER MANUFACTURING ENGINEER
EQUIPMENT ENGINEER MECHANICAL ENGINEER
PRODUCTION ENGINEER MECHANICAL BATTERY DESIGN ENGINEER
MANUFACTURING ENGINEER, LI-ION ENGINEER
CELL MECHANICAL ENGINEER DESIGN ENGINEER-BATTERY TECHNOLOGY
MECHANICAL DESIGN ENGINEER MANUFACTURING ENGINEER, LI-ION ENGINEER
PRODUCT MANAGER CELL ASSEMBLY
PRODUCTION MANAGER CELL ASSEMBLY
AUTOMATION ENGINEER
SUCH A MANUFACTURING CELL ASSEMBLY
SUCH A MANUFACTURING CELL ASSEMBLY
ELECTRICAL DESIGN ENGINEER SENIOR BATTERY MECHANICAL ENGINEER

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Production and Maintenance – Skills and Competence

What Industry Demands

CROSS-SECTORAL SPECIFIC KNOWLEDGE

CROSS-SECTORAL SPECIFIC SKILLS

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The Skills Cards are a practical and helpful tool for...
The overall assessment is supported by a strategy

The whole value-chain and all levels of education need to be addressed

Competencies can be sector specific and cross-sectoral
ALBATTTS Tackles Two Main Questions

FOCUSING ON Vocational Education and Training (VET) & Higher Education (HE) AIMED AT initial training and re-skilling and up-skilling of workforce
Education & Training Framework

Pillar 1: Curricula for all levels
- EGF levels 3 to 8
- Learning outcomes approach
- Modular approach based on micro-learning
- Reference of transversal, cross-sectoral, sector-specific and occupation-specific skills

Pillar 2: Innovative and flexible learning
- Inclusive training methods
- Training methods adapted to initial and up/re-skilling
- Work-based learning
- ICT based on open educational resources
- Adaptive learning solutions
- Joint educational programs, including transnational learning

Pillar 3: Competent trainers and tutors
- Continuous train the trainer programs for sectoral skills update
- Digital skills development programs
- Language skills (VET)
- Companies' tutors development programs (Dual system)
- Mobility programs for teachers/trainers in companies
- Expert and discussion international forums

Pillar 4: EU wide recognition
- Reference to other frameworks
- Micro-credentials / Digital badge
- Adapted to national and regional frameworks
- Validate and recognition of Competence
- Training recognition
- Sectoral Skills Strategy Alignment
- European Vocational Core Profiles

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Courses

Available through the Automotive Skills Alliance (ASA), an association created through the bridging of the projects ALBATTs and DRIVES activities and to sustain project results.

Examples of available courses:

- Manufacturing Processes
- Introduction to the Battery Sector
- Future Trends
- EU Policies and Regulations
- Types of Batteries
- Battery Fundamentals

11 Courses already available
The BaTT Forum is an initiative that was launched by ALBATTS with the purpose of gathering current and future teachers and trainers to share ideas and good practices, work together and deepen their knowledge about the battery sector.

The BaTT Forum is now funded and further developed through the CaBatt - Capacity Building for Battery Teachers in VET, an Erasmus funded project developing a sustainable model for offering Erasmus+ courses for VET teachers.
Published in March 2024

Available through the ALBATTS website

Target group: education providers, teachers, companies, education authorities
Some other outcomes of the ALBATTs project
Dunkerque, Capital of the new European Battery Valley

8.5 billion € will be invested over the next few years in the industrial port zone to produce and recycle electric batteries (total production of around 64 GWh by 2030).
Gains and opportunities with the Albatts project

- Raising local awareness about skills and competencies for all the battery value chain
- Identifying European cities with common challenges
- Saving time!
- Further twinning and cooperation (cities, training centres)
A battery school to further grow those talents

L'École de la batterie

1,600 people trained every year from 2026

100 initial & continuous trainings

From vocational training to Doctorate

At anytime of life

Battery School

Born in France in 2022 with recognised universities and schools
Leading by Verkor
Supported by French Government

Training for trainers
- Electric vehicle - Level 1 with Verkor, TOLV, WattAlps & PowerUp (2 days)
- Design of test benches courses with Verkor and Critt M2A (8 days)

Operator trainings
AFPA x Verkor "Battery Operator" training course - 1st class (March-June 23) and 2nd class (Oct-Jan 24)
Creation of a dedicated "Bac+1" by Cnam

Source: Company information
Further information on the battery expertise trios

- Development of battery expertise in Saarland (ABAKOS)
- Battery Education Network Bavaria (B³)
- Bildungsverbund Batterie Mitteldeutschland (BatteryMD)
- Developing expertise for battery cell production in the capital region (KOMBiH)
- Qualification measures in the Baden-Württemberg battery ecosystem (QualiBattBW)
- Qualification and further training of specialists along the entire value chain of sustainable lithium-ion batteries (QuW-LIB)
KOMBiH activities with ALBATTs

Own further training through the webinars

Good basis for shaping the KOMBiH project

Input at the 1st Battery Forum in Berlin-Brandenburg, March 2023

Integration into all German qualification projects (battery trios)

Participation in the ALBATTs teachers' forum

We translate all materials into German

Make these and your own results available via the ALBATTs platform

We discuss the integration of the courses developed by KOMBiH on ALBATTs
Case: New optional unit for battery industry

- EDUFI renew two vocational qualifications in 8/2022-5/2023
  - Vocational Qualification in Mechanical Engineering and Production Technology, 180 cp
  - Vocational Qualification in the Process Industry, 180 cp
- Our vision was to develop these vocational qualifications at the same time and find the similar optional units for these vocational qualifications
- There were lot of talk about battery industry and how we can recognize the needs of battery industry and different kind of job descriptions
- There were not lot of information about job descriptions until we found out about ALBATTs-project and we contacted with Katarina Sandbacka from VAMIA
Examensdel i den finländska läroplanen – Arbete inom batteribranschen 15kp

- Baserat på innehåll från ALBATTS-projektet har det gjorts en examensdel för den nationella läroplanen i Finland.
- Examensdelen träder i kraft 1.8.2024 för Grundexamen inom Processindustrin och Grundexamen i maskin- och produktionsteknik.
- Examensdelen kommer även att erbjudas till andra grundexamen då de förnyas
- Examensdelarna i Finland kan användas både för grundexamen men även för up-skilling and re-skilling
- Det finns planer på att göra nya examensdelar så fort behov uppstår.

- Grundexamen i maskin- och produktionsteknik - eGrunder (opintopolku.fi)
Welcome to the Pact for Skills

The Pact for Skills aims to get public and private organisations together and encourage them to make concrete commitments to upskilling and reskilling adults.

Join the Pact
Automotive Skills Alliance

- Europe & Stakeholder-wide Partnership for collaboration on Skills Agenda in the Automotive-Mobility Ecosystem
- The ASA was announced and officially launched in November 2020
- The ASA became a legal entity (non-profit organization) in January 2022

The Automotive Skills Alliance (ASA) is focused on the re-skilling and up-skilling of workers in the automotive sector, developing intelligence and fostering dialogue among all relevant partners and stakeholders in the sector, and supporting the elaboration of specific plans for re-skilling, up-skilling and training of workers in the EU automotive sector.
What is happening after the ALBATTs project duration?
Large-scale Pact for Skills Partnership in the Mobility-Transport-Automotive Ecosystem to strengthen collective actions on skills

- Announced and officially launched in November 2020
- ASA became legal entity (non-profit organization) in January 2022

- More than 110 members up to now
ASA STRUCTURE – MEMBERS PARTICIPATION & COLLABORATION

ASA Partnership participate in Topic Committees, Working Groups & Task Forces

ASA builds upon the work carried out by strategic projects in the skills agenda for the ecosystem & promotes and facilitates initiation of new projects/initiatives or support mainstreaming the existing ones.
Skills Hub
(Catalogue, Micro-credentials,
Reference definitions of Job Roles)

(LMS, hosting free MOOCs)

(hosted by individual providers/universities/VETs on their own costs)

Learning Platform

Other already existing courses/Modules
Training Module 1 (Online)
Training Module 2 (Online)

Other already existing courses/Modules across the EU (irrespective of funding – private/public) - Paid or free

Training Course 1 (on site, MOOC, VR, Lab Course)
Training Course 2 (on site, MOOC, VR, Lab Course)

- Microlearning modules
- Learning Path - Combination of Modules
- Etc.

- Learning Path – Combination of Modules/Training Courses from different Providers to reach desired Job Role/level of Skill (combination of MOOC courses, onsite, etc.)
- Issue micro-credentials – digital certificates

www.automotive-skills-alliances.eu
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**EU-level:**
- Encourage flexible modular approach
- Encourage cross-disciplinary content
- Promote cooperation between VET & HE
- Funding for labs, on- and offline

**Regional/National level:**
- Green skills in curriculum
- Flexible modular approach – easy to update and adapt, cross-disciplinary content
- Training in English and soft skills
- Funding for labs, on- and offline, teacher training
- Funding encouraging education providers to cooperate

**VET provider level:**
- Cooperate – universities - industry, - other VET providers, municipality, authorities
- Be proactive! Don’t wait!

**Industry /Working life:**
- Communicate with VET providers!
- Help with training material and content
- Offer on-site experience for teachers and trainers!
Recommendations /University Education!

Challenge:

• *Universities teach only what they research*...but few universities have eg. battery research

• *Incentives* for European universities to cooperate not only in research, but also in education offerings, also on Bachelor level

Recommendations:

• *Subcontract* a research-specialised university for the needed course!

• *Wrap* a MOOC course from a good university!

• *Introduce optional green-skills courses!* In all relevant programmes, now!...while program development speeds up...
THANK YOU!

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