

Evaluation work package 4

Work package 4 essentially had two objectives within the overall project: Firstly, it was intended to serve as an ‘interim step’ in forming transnational working groups (see also “evaluation overlapping): The partners were to see themselves represented with their training programmes within the overarching field of activity of ‘building service engineering’ and recognize that there are competence-based ‘overlaps’ between different training occupations in different countries. Secondly, it was intended to highlight the comparability between the various vocational training occupations in order to determine the possible content and level of the learning modules that were created.

This worked well in the work process - a total of 11 vocational training occupations were mapped:

- 1. Germany – Electronics Technician (EQF 4)**
- 2. Germany – Roofer (EQF 4)**
- 3. Germany – Plant Mechanic for Sanitary, Heating & Air Conditioning Systems (EQF 4)**
- 4. Germany – State-Recognized Technician in Building Service Engineering (EQF 6)**
- 5. Italy – Industrial Expert Chief Technician IT Specialist (EQF 4)**
- 6. Spain – Senior Technician in Maintenance of Thermal and Fluid Installations (EQF 5)**
- 7. Spain – Technician in Refrigeration and Air Conditioning Installation (EQF 4)**
- 8. Spain – Basic Professional in Housing Maintenance (EQF 3)**
- 9. Netherlands – First Mechanic Electrotechnical Installations (EQF 3)**
- 10. Netherlands – First Mechanic Mechanical Installations (EQF 3–4)**
- 11. Finland – Electronics Technician (EQF 4)**

The mapping provides a detailed picture of the individual apprenticeship occupations and their respective areas of expertise. Each competence profile covers a different but overlapping set of areas from the competence matrix. There are some areas of competence that are strongly represented and have a high degree of overlap (1 and 2) and others that are less strongly represented (especially 9). Overall, there is a high level of basic coverage of the matrix.

Conclusions:

- All mapped training programmes follow a competence-based modular structure with a strong focus on work processes (assembly, maintenance, commissioning, optimization).
- Each competence profile comprises technical, organisational, digital and communication skills and competences that are aligned with the EQF learning outcome descriptions (knowledge, skills and competences).
- All competence profiles are based on real work processes and include safety, sustainability and teamwork as cross-cutting competences.
- Vertical mobility is possible in all systems from initial training (EQF 3–4) to advanced technician (EQF 5–6)
- The overall range extends from EQF 3 (Spain, Netherlands) to EQF 6 (Germany – Technician in BSE).

German and Spanish occupations focus heavily on the installation and maintenance of building systems; Italian occupations focus on IT, automation and IoT integration; Dutch and Finnish occupations focus on practical implementation in the built environment. Compliance with legal regulations and safety are central to the German and Spanish training profiles, whereas they are less explicitly structured in the Dutch and Finnish classifications.

The overlap analysis combines the mapping results of individual national occupations to identify common areas of competence – i.e. areas where knowledge, skills and competences overlap across countries and occupations. This allows areas of competence to be identified that are relevant to all or most BSE occupations.

The overlaps were mapped across **10 competence areas** (CA1–CA10).

The table below summarizes the **extent of overlap** and **number of participating occupations** per area:

Competence Area	Focus	Involved programmes	Level of overlap	Comments
1		1–11 (almost all)	Very High	Universal trade competence: basic installation, safety, legal compliance
2		1–11 (especially 1,2,3,4,5,6,9,10,11)	Very High	Core operational skills and competences: inspection, repair, optimization

3		1–11 (broad but variable depth)	High	Shared procedural competence; important for integration & testing
4		1,3,4,5,7,9,10,11	High	Automation & data-driven operation; digital and sustainability links
5		1,4,5,6,7,9,10,11	Medium/High	Mainly higher-level planning roles; shows link between EQF 4–6
6		1,2,3,4,7,9,10,11	Medium/High	Health, safety, and regulatory awareness; strong in Germany & Spain
7		1,3,4,7,9,10,11	Medium/Low	Shared by managerial or advanced technician roles (EQF ≥ 5)
8		1,2,3,4,5,6,9,10,11	High	Interdisciplinary teamwork; international work context
9		4 only	Low	Specific to managerial/technician EQF 6 roles
10		1,2,3,4,5,7	High (but uneven)	Strong overlap in digital tool use, documentation, and data protection

- Competence areas 1, 2, 3, 4 and 8 occur in almost all occupations and represent the core competences of occupations in the field of building service engineering. They form the focus for interdisciplinary approaches.
- High degree of overlap – Most areas of competence are common to the 11 occupations covered, which demonstrates a strong European convergence in vocational education and training in the field of BSE. Digitalization and Sustainability acts as a connecting, overarching theme – this was implemented as a key cross-cutting skill in the learning modules.
- Advanced skills and competences (human resources, cost calculation, conceptual design) – currently limited to higher qualification levels; inclusion at lower levels could improve career development and the coherence of the system.
- Impact at EU level – The overlaps underpin the potential for mutual recognition frameworks, modular learning pathways and recognition of interdisciplinarity in the field of building service engineering.