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# DEFMA

## VET Integration Guidelines

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## 1.0 Introduction

The purpose of this report is to define the guidelines for VET providers to facilitate the integration of developed DEFMA learning units in training curriculum for facilities management. The guidelines provide instructions on how to a) implement training making use of the DEFMA learning units, b) attribute the most appropriate reference levels to learning units according to the partnership countries' National Qualification Frameworks (NQFs), and c) develop additional units fitted to their current training programmes. Finally, the report presents a practical example on how an existing VET programme could be modified to include the DEFMA learning outcomes and units.

## 2.0 Learning units integration methodology

Separating the integration methodology into four phases, VET providers need to go through a sequence of processes in each phase in order to ensure that their organization will get the best results from the use of the DEFMA learning units.

### 2.1 Phase 1: Prepare

- Identify an individual or team that will be responsible for undertaking the integration process. Working in collaboration with peers/experts will ensure the adoption of the widest possible perspective, and will avoid the risk of adopting only a trainer's viewpoint.
- Understand the factors that encourage change in the existing curriculum. Study DEFMA outputs elaborating on the necessity of improving facilities management skills in digital and green needs that are based on desk and field research across Europe, in order to get a better overview of the situation in the industry. All outputs of the project are available online, on the official DEFMA website at <http://defma-project.eu/>. The contact details of DEFMA partners are also available there, and can be used for establishing contact and discussing/clarifying terms and opportunities for using and promoting DEFMA results.



- Select the curriculum that is most suitable for integrating one or more DEFMA learning units. Go through existing curriculum offered by the organization (VET provider) targeting facilities management , taking into consideration
  - a) the skills needs ranked by DEFMA partnership (available on the DEFMA website to download);
  - b) the relevance of content and objectives between existing and DEFMA learning units; and
  - c) Demand for existing curricula, selecting the curriculum that could best integrate DEFMA learning units and offer added value to the organization and the market.
- Get feedback from industry stakeholders. Contact local constructors, present DEFMA learning outcomes and consult on which of them would improve local facilities management skills.
- Define the revised learning objectives of the curriculum, based on the DEFMA learning units to be integrated. Following feedback from local industry stakeholders, the change-team consults on how DEFMA and existing learning units could be combined, and decides on the main learning objectives of the new curriculum, which will be the axes for the design phase.

## 2.2 Phase 2: Design

- Define the main constraints for the design of the course. Consult with the VET provider's management/programme director and identify constraints related to:
  - a) Time available in the programme of the organization (e.g. will the curriculum be extended or will one or more existing learning units be replaced?);



- b) Human resources available to design, implement and run the new curriculum (e.g. is the teaching staff qualified and able to teach the material or is there a need to train or hire new people?);
  - c) time available until the release of the new curriculum;
  - d) availability of teaching equipment (smart meters) for hands-on lessons (e.g. is there a need to acquire related equipment?); and
  - e) Any other conditions that should be taken into consideration.
- Decide on potential existing learning units to be replaced by DEFMA ones. If, based on constraints above, the course duration cannot be extended and one or more learning units from the existing curriculum have to be replaced by new ones, break down the existing curriculum into its learning units and, after examining potential overlaps among them, decide on which of the existing learning units will be replaced.
  - Check prerequisites' consistency of the selected DEFMA learning unit(s) to be integrated. Examine whether knowledge and experience required for a student to attend the course are covered by the prerequisites of the existing curriculum. If so, DEFMA learning units can be used independently with the existing learning units. If not, DEFMA learning units should follow existing learning units that provide knowledge required. Ensure that the prerequisites of the DEFMA learning units to be integrated are added to the overall prerequisites of the curriculum.
  - Define the sequence of learning units based on the prerequisites described above, as well as on a teaching flow that suits the objectives of the course.
  - Adapt ECVET credits of the DEFMA learning units into the existing allocation system. As credit points are a numerical representation of the relative weight of units in relation to the qualification, the change-team consults on the weight of the new learning units compared to the existing ones and allocates credits accordingly.



- Calculate total duration of the curriculum, by aggregating contact, hands-on, self-study and assessment hours of new and existing learning units.
- Assign the National Qualification Level of the curriculum, based on the methodology described in section 3.
- Train (if needed) the teaching staff. Assuming that the teaching staff have adequate teaching experience/qualifications, a study of the DEFMA trainer handbook, which facilitates the integration of the DEFMA training and assessment material with the existing curriculum should be sufficient. Additional assistance could be offered by DEFMA project partners if requested and availability permits it.
- Integrate learning materials. In collaboration with the teaching staff, integrate the existing learning material with DEFMA's Open Educational Resources, also available through a Massive Open Online Course (MOOC), in order to support the new learning unit(s). The choice of approach and format for the existing curriculum depends on the overall strategy and common practices of the VET provider. Adopting those parts of the MOOC that are relevant to the learning units being integrated should be a choice for VET providers that are already experienced in using online tools for training. (No facilitator can be made available from the DEFMA partners, unless otherwise agreed with them.)
- Integrate assessment material. Modify the existing assessment procedures, either by using the assessment material suggested by the DEFMA partnership, or by developing new assessment materials, or both, in order to create a unified methodology that assesses the learning outcomes overall.

### **2.3 Phase 3: Run Pilot & Evaluate**

- Run a pilot course. A VET provider forms a group of students (at least 5) that meet the prerequisites. (Alternatively trainers can assume the role of students, and the teaching staff delivers a mini course with the new learning unit(s) combined with the learning and assessment material.



- Evaluate the pilot course. Evaluate the learning process, based on feedback from teaching staff and learners. The evaluation tools will include personal interviews and group discussions, focusing on the achievement of learning objectives and potential improvement.

#### **2.4 Phase 4: Optimize & Run**

- Optimize the curriculum. Based on the evaluation process, make any necessary amendments to the structure, content and materials of the curriculum in order to best meet learning objectives.
- Run the new curriculum. Proceed with any necessary promotional activities and run the course.

#### **2.5 Development methodology of additional units**

In case a VET provider needs to develop new, additional, units for facilities management skills on digital and green technology, all methodology followed by the DEFMA partnership for the development of DEFMA learning units is available through the deliverables of the DEFMA project on the official project website (<http://defma-project.eu/>). The methodology comprises the following reports, which outline the steps followed by DEFMA partners, and could similarly be applied in extending the work of DEFMA to fit the needs of different / specialised target groups:

- Definition of research tools for data collection
- Data analysis and reporting on learning outcomes
- Grouping of learning outcomes into learning units
- Learning units' specifications



## 3.0 Referencing National Qualifications Levels to the EQF

### 3.1 What is referencing to the EQF

Referencing is the process that results in the establishment of a relationship between the levels of national qualifications - usually defined in terms of a national qualifications framework - and the levels of the EQF. Through this process, national authorities responsible for qualifications systems, in cooperation with stakeholders responsible for developing and using qualifications, define the correspondence between the national qualifications system and the eight levels of the EQF.

### 3.2 How referencing is applied in DEFMA

Based on the European Qualification Framework descriptors and DEFMA learning outcomes in terms of skills, competence and knowledge, all DEFMA learning units have been attributed with the highest level that a VET qualification can obtain, which is Level 5. More specifically, level 5 EQF descriptors for skills, competence and knowledge define the following:

- Knowledge: Learner should have a comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge.
- Skills: Learner should have a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems.
- Competence: Learner should be able to exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others.



DEFMA partners researched and consulted on how level 5 of the EQF can be translated to each partnership country's NQF, so that VET providers in each country (Greece, Lithuania, Bulgaria, Italy and the United Kingdom) can attribute the most appropriate level to the new curriculum.

### **3.3 Greek Qualification Framework Reference**

Level 5 of EQF corresponds to Level 5 of the Greek Qualification Framework, more precisely consisting of:

- Vocational Upper Secondary School Degree (Certificate with apprenticeship class)
- Vocational Training Diploma (Initial Vocational Training / post-secondary level)
- Post-Secondary and not Higher Education Diploma / Degree.

### **3.4 Lithuanian Qualification Framework Reference**

Level 5 of EQF corresponds to Level 5 of the Lithuanian Qualification Framework, which is not precisely described as programmes with this VET level are not registered in Lithuania, but can be described as:

- Qualifications intended for activities distinguished by integrated coordination of activity tasks in different activity areas. The activities include the evaluation of the competences of lower-qualification employees and training thereof and require coordination of comprehensive knowledge of the activity area with general knowledge in dealing with various specialised activity tasks in several different activity areas. The employee performs the activities independently and is supervised only by the evaluation of results. The activity tasks are set by an employee of a higher qualification, who frequently grants the employee performing the activities the discretion as to the choice of methods and measures to complete the tasks. The employee supervises the activities of lower-qualification staff, plans and assigns



activity tasks, oversees the performance of the activities, provides consulting and verifies the performance quality.

In order to have an evidence-based estimation of Level 5 of the Lithuanian Qualification Framework (LTQF), a brief description of levels 4 and 6 are given below:

- Level 4 LTQF: Vocational training diploma, Matura attestation (school leaving certificate)
- Level 6 LTQF: Professional bachelor's diploma, Bachelor's diploma.

### **3.5 Bulgarian Qualification Framework Reference**

The Bulgarian NQFs relate their qualification levels to the levels set out in the EQF. This helps to improve the transparency and recognition of qualifications in Europe; supports the mobility of learners and workers; encourages the achievement of unified training quality criteria; and facilitates the validation and transfer of non-formal and informal learning outcomes.

The NQF of Bulgaria encompasses the whole education system and all its qualifications. It includes nine levels, including level zero (preparatory level). Levels 1 to 4 correspond to the stages of education and qualification acquisition within the systems of general and vocational education and training. Level 5 includes training at a vocational college for acquisition of the fourth level of vocational qualification after the completion of secondary education. Levels 6 to 8 relate to qualifications acquired in the higher education system: 'bachelors', 'master's' and 'doctorate'. The separate levels are defined on the basis of a learning outcomes-oriented approach. They are described in terms of knowledge (theoretical and/or practical) and competences (personal and professional).

Level 5 of NQF of Bulgaria corresponds to level 5 of the EQF and covers only vocational training – the fourth level of vocational qualification.



Based on the comparison between the two frameworks, qualifications of the fourth level of vocational qualification of NQF can be successfully correlated to level 5 of the NQF and level 5 of the EQF.

### 3.6 Italian Qualification Framework Reference

Level 5 of EQF corresponds to the level 5 of the Italian Qualification Framework, more precisely consisting of higher technical education diploma (*Diploma di tecnico superiore*), the relevant education/training pathways are:

- Higher Technical Education pathways (ITS)
- Higher education and research apprenticeship programmes

### 3.7 British Qualification Framework Reference

Level 5 of EQF extends across both Level 5 and Level 4 of the British Qualification Framework, more precisely consisting of:

- Level 5 Vocational Qualifications
- Higher National Diplomas
- Level 4 Vocational Qualifications
- Higher National Certificates



## 4.0 Example of integrating learning units

The following example is based on a real curriculum that has been properly modified for demonstration purposes, in order to provide exemplary guidelines on how existing programmes could integrate DEFMA learning outcomes and units.

The curriculum below is being delivered by a VET provider in the United Kingdom, targeting site managers:

### EXISTING CURRICULUM DESCRIPTION

<b>Title</b>	<b>Network Construction Operations</b>
Description	The curriculum covers all aspects of electricity, gas, water and heat networks construction in buildings and helps to develop the learner’s technical skills in areas such as excavating, welding, operating tools, machinery and installation.
NQF level	4
Contact hours	155
Credits	29
Prerequisites	All learners entering the curriculum must have at least 5 years of experience in the construction industry.



## LEARNING UNITS OF EXISTING CURRICULUM

<b>ID</b>	<b>Description</b>	<b>Duration</b>	<b>Credits</b>
1	Create an efficient and effective environment in utilities network construction.	10	4
2	Establish and maintain effective working relationships in utilities network construction.	5	3
3	Locate and avoid supply apparatus for utilities network construction.	25	4
4	Excavate and maintain holes and trenches for utilities network construction.	35	5
5	Operate powered tools and equipment for routine and predictable requirements on utilities network construction.	25	5
6	Install equipment for safe working on sites for utilities network construction.	20	3
7	Reinstate excavation and pavement surfaces after utility network construction operations.	35	5

### 4.1 Integration Phase 1: Prepare

Based on the results of the VET providers research of DEFMA project (publicly available on the project's website), there is a need for facilities management operators to improve not only their technical but also their management skills regarding digital skills and green technologies. As the existing curriculum mainly focuses on technical skills' improvement of facilities managers regarding technology, integrating a DEFMA learning unit focusing on managerial skills and smart metering would provide learners with a well-rounded skill-set.

To this end, the design of the new curriculum should be structured around the following main learning objective: Improvement of technical and managerial skills of site managers on networks construction, including smart metering technologies. Guided by this objective, there are two DEFMA learning outcomes



that could be integrated with the existing curriculum and form the new one. These are:

- a) DEFMA learning unit 1: Sustainability and Environmental Issues and their Impact on FM.
- b) DEFMA learning unit 2: Energy efficiency and energy management in buildings.

## 4.2 Integration Phase 2: Design

Assuming that there is no constraint in duration of the new curriculum and none of the existing learning units need to be removed or replaced, there is no need to check interconnections of existing learning units because of prerequisites.

Additionally, no other change in the new curriculum prerequisites is needed, as the minimum required experience of the existing curriculum is 5 years, which is more than the 3 years required by DEFMA learning units. However, DEFMA learning unit 2 should follow unit 1, based on the learning outcomes required to attend it. A logical sequence of existing and new learning units in the curriculum would be the following:

### LEARNING UNITS OF NEW CURRICULUM

ID	Description	Duration	Credits
1	Create an efficient and effective environment in utilities network construction.	10	4
2	Establish and maintain effective working relationships in utilities network construction.	5	3
3	Locate and avoid supply apparatus for utilities network construction.	25	4



4	Excavate and maintain holes and trenches for utilities network construction.	35	5
5	Operate powered tools and equipment for routine and predictable requirements on utilities network construction.	25	5
>	Sustainability and Environmental Issues and their Impact on FM.	5	2
>	Energy efficiency and energy management in buildings.	5	2
6	Install equipment for safe working on sites for utilities network construction.	20	3
7	Reinstate excavation and pavement surfaces after utility network construction operations.	35	5

Credits for the new learning units have been adapted based on their relative weight, compared to the weight of the existing learning units towards the overall qualification, and taking into consideration their importance for achieving the learning objectives.

Aligned with the European Qualification Framework (EQF), DEFMA learning units have been attributed to level 5, while the existing curriculum has been attributed with level 4 according to the British Qualification Framework. However, based on section 3.4 about referencing EQF to the British Qualification Framework, the two levels of both frameworks correspond to each other. As a result, no change in the overall NQF level of the curriculum is required.

Summing up all changes described indicatively above, the new curriculum could be described as follows:

### **NEW CURRICULUM DESCRIPTION**

<b>Title</b>	<b>Network Construction Operations</b>
Description	The curriculum covers all aspects of electricity, gas, water



and heat networks construction in buildings and helps to develop the learner's technical and managerial skills in areas such as excavating, welding, operating tools, machinery and installation, including smart metering technologies.

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NQF level	4
Contact hours	165
Credits	33
Prerequisites	All learners entering the curriculum must have at least 5 years of experience in the construction industry.

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