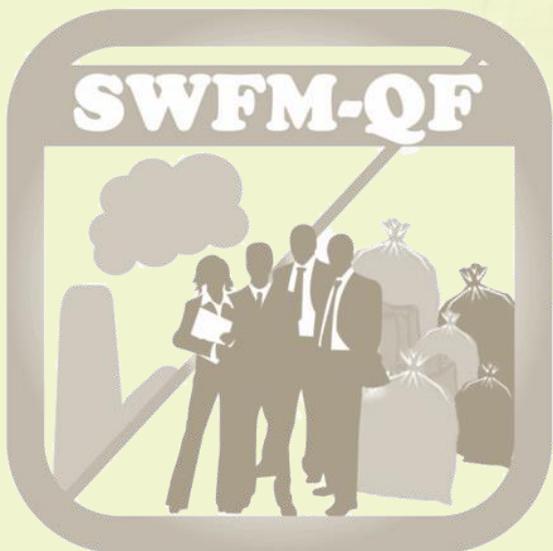




Towards a European qualification for

Solid Waste Facilities' Managers SWFM-QF



SWFM-QF PARTNERSHIP

SWFM-QF partnership incorporates 13 partners with different background and expertise in waste management and VET, originating from 8 different countries from Northern, Central and Southern Europe (Bulgaria, Greece, Germany, Italy, Hungary, Lithuania, Poland and England).

 SIGMA Consultants Ltd. (**Sigma**)
<http://www.sigmaconsultants.gr>

 Hellenic Federation of Environmental Protection Companies (**PASEPPE**)
<http://www.paseppe.gr/>

 Saxon Education Company for Environmental Protection and Chemical Occupations Dresden Ltd. (**SBG-DD**)
www.sbg-dresden.de

 Research Institute for Vocational Education & Training (**f-bb**)
www.f-bb.eu

 SINERGIE Società Consortile a responsabilità limitata (**SINERGIE**)
www.sinergie-italia.com

 Szent Istvan University (**SZIE**)
www.sziu.hu

 Association of Environmental Enterprises (**KSZGYSZ**)
www.kszgysz.hu

 International Centre for the Environment, Resource Management & Sustainability Ltd. (**ICERMS**)
<http://www.icerms.com>

 Institute of Environmental Protection - National Research Institute (**IEP-NRI**)
www.ios.edu.pl

 Polish Chamber of Commerce (**PCC**)
<http://en.kig.pl>

 Kaunas University of Technology - Institute of Environmental Engineering (**KTU- APINI**)
www.apini.lt

 Alytus Region Waste Management Center (**ARWMC**)
<http://www.aratc.lt>

 Bulgarian Industrial Association (**BIA**)
www.bia-bg.com

SWFM-QF PROJECT

Waste management is the largest sub-sector of the EU27 eco-industry. In 2008, the total turnover was of €92.2 billion and employment was estimated at about 1.467 thousand workers. Achieving full implementation of EU waste legislation, the turnover of waste management and recycling would increase by €5 billion per year (or €42 billion per year including externalities) and over 400,000 jobs would be created within the period 2008-2020. Waste management industry has changed a lot in recent years and continues to develop as new legislation, technologies, and techniques are advanced.

Introducing integrated waste management approach and replacing landfill with other more advanced waste management techniques have influenced decisively the evolution of the sector. As a result, the “new generation” waste management facilities are becoming highly technical worksites implementing innovative solutions and a number of processes on one site. This in turns affects the structure of qualifications of the professionals employed in the sector.

The latest Labour Market Investigation undertaken by EU Skills (2010 reports for the UK waste management industry, indicative for the whole European sector), refers that “additional need for a comparatively large number of technically skilled employees to maintain and operate advanced waste treatment facilities will be produced as more facilities are build”. It is also highlighted that “whilst the changing demand for different types of technical skills is acknowledged, it will also be necessary to continue to address the more general professional skills gaps identified, including Project Management, Human Resources, Planning, Financial Management, Environmental Legislation and generic sales skills”.

To date and despite the similarities in the regulatory framework, the recognition and support of Solid Waste Facilities Managers (SWFMs) are very diverse in the European countries. Designation of qualifications and VET are within the domain of state regulations and are strongly based on national traditions and priorities. Although there are considerable variations regarding the governance, scope and structure, a clear pattern of qualifications does not emerge at the European level. In addition training within the industry is delivered in a wide range of forms. In conclusion, the existing frameworks are inadequate to provide or support the creation of the SWFM professional profile with the multidisciplinary background and the new required qualifications.

SWFM-QF project aimed at the development of a European harmonized qualifications and training framework to address the needs of facilities managers in the waste management industry.

SWFM-QF PROJECT RESULTS

SWFM-QF project succeeded to:

- identify the structure and contents of the professional activities and qualifications for the SWFM occupation in the European market and the specificities linked to the waste management sector
- explore and compare the Vocational Educational Training (VET) processes whereby these qualifications are acquired
- detail the proposed qualifications with regard to the respective required learning outcomes, and for every learning outcome depicting knowledge, skills, competences descriptors in alignment with level 6 of the European Qualifications Framework (EQF), implementing an extensively interactive collaborative approach incorporating also stakeholders involvement
- create a harmonized training frame – the Info-Training Toolkit – for the different developed SWFM qualifications modules
- establish multi-national network – the SWFM-QF Network – with the engagement and active involvement of key stakeholders from all project's short and long term target groups. SWFM-QF members along with the experts from the waste management and VET sectors evaluated and validated all the developed qualifications modules and the contents of the Info-Training Toolkit

THE SWFM-QF COMPARISON REPORT

The SWFM-QF Comparison report analyses and compares the qualifications, national vocational education and training (VET) systems and the labour markets in the field of waste management in the eight EU SWFM-QF project partners' countries.

The report focuses on the qualification levels technicians (EQF 4) and managers (EQF 6). The relevant data were acquired by two parallel surveys conducted in each partner's country: one concerning required SWFM qualifications and another – existing VET systems. Waste management facilities, associations, training providers and institutes were contacted and interviewed to provide first-hand information and current insights into the state of the importance of knowledge, skills and competences for SWFM as well as the labour market conditions and VET offers in the solid waste management sector.

STRUCTURE OF THE COMPARISON REPORT

Six key questions structure the report. That makes it easier to navigate through the report and helps to compare the SWFM-QF focus countries with the European and each national legal, political, economic and educational background. Through analysis of current needs, future developments in VET and in the waste management industry can be predicted.

The key questions used were the following:

- Q-1. Implementing the waste hierarchy in national law: Do legal changes result in economic and structural changes or vice versa?
- Q-2. Branch associations: Are they the result or the main driver for a more resource saving waste management industry?
- Q-3. Players of the national waste management industry: Driver or driven?
- Q-4. Which qualifications do matter?
- Q-5. Labour market: Demanding and rewarding?
- Q-6. Education and training: Demand based and affordable?

RESULTS OF THE COMPARISON REPORT

The main conclusions resulting from both surveys answering question “Which qualifications do matter” are presented below.

1. Importance of knowledge

The survey gives the current insights into the aspects of knowledge required in the national waste management industries.

The survey provides data with regard to:

1. Legal aspects: national legal requirements, EU legal requirements, waste management policy principles and national requirements for waste management procedures.
2. Environmental aspects: environmental impact assessment, principles of environmental management systems and principles of environmental management accounting, IPPC principles and waste/pollution prevention principles.
3. Technical aspects: principles of waste classification, technical requirements for equipment and technology, state-of-the-art technologies and monitoring requirements.
4. Social aspects: principles of emergency preparedness and planning of preventive corrective actions, health and safety.
5. Economic aspects: sustainable development, product life cycle principles, corporate social responsibility and principles of corporate organization and management.

Figure 1 presents a comparison of the importance of knowledge in the abovementioned 5 aspects among the project's countries. The numbers are the arithmetic averages of each single and scored element within these 5 aspects.

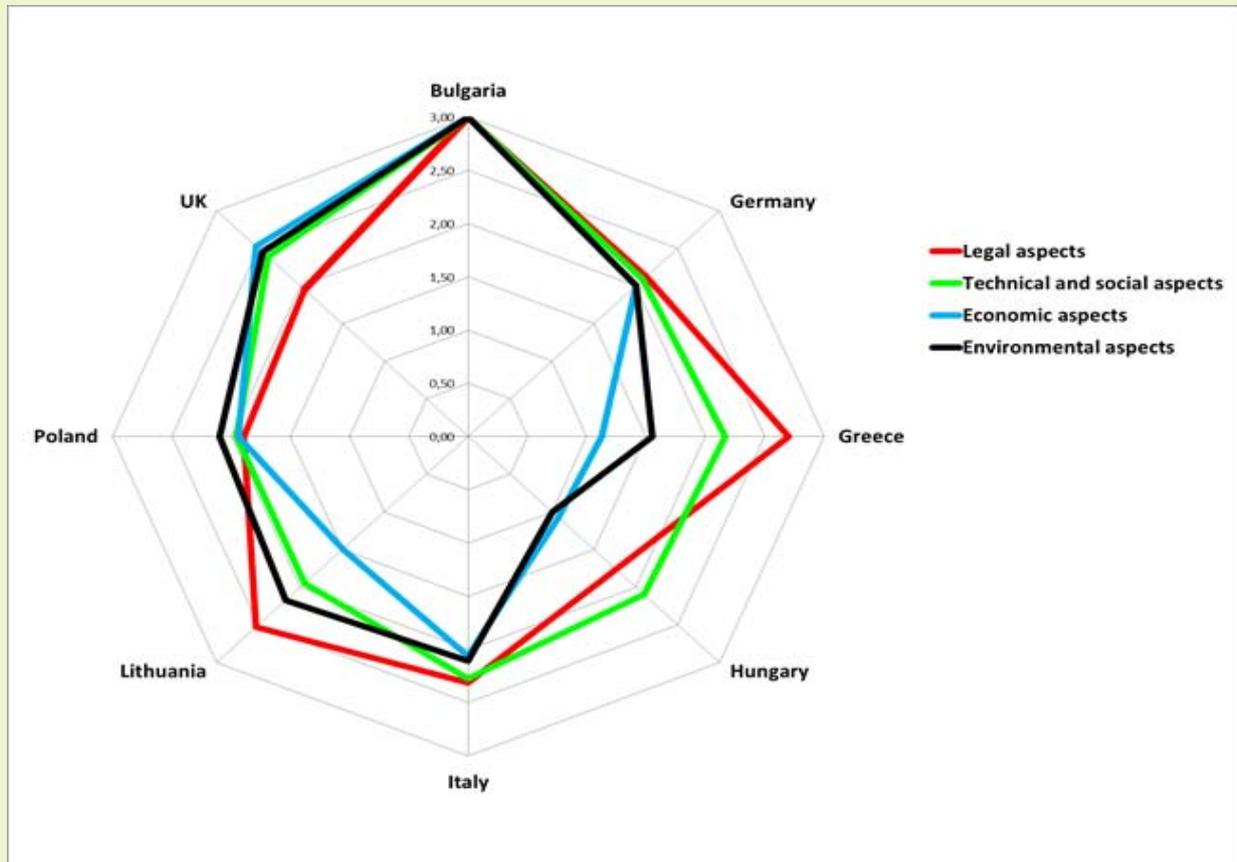


Figure 1: Overview of the scored importance of knowledge in the eight EU member states according to legal, technical and social, economic and environmental aspects.

II. Importance of skills

A skill is a learned ability to achieve a predetermined result. In the survey a closer look was taken at the following practical skills:

1. Waste management procedures.
2. Environmental management procedures.
3. Health and safety procedures.
4. Waste minimization technology.
5. Life cycle assessment methodology.
6. Environmental impact assessment methodology.
7. Development of IPPC permits applications.

Figure 2 shows the high importance of health and safety aspects in almost all countries. Of rather low to medium interest are skills with regard to life cycle assessments.

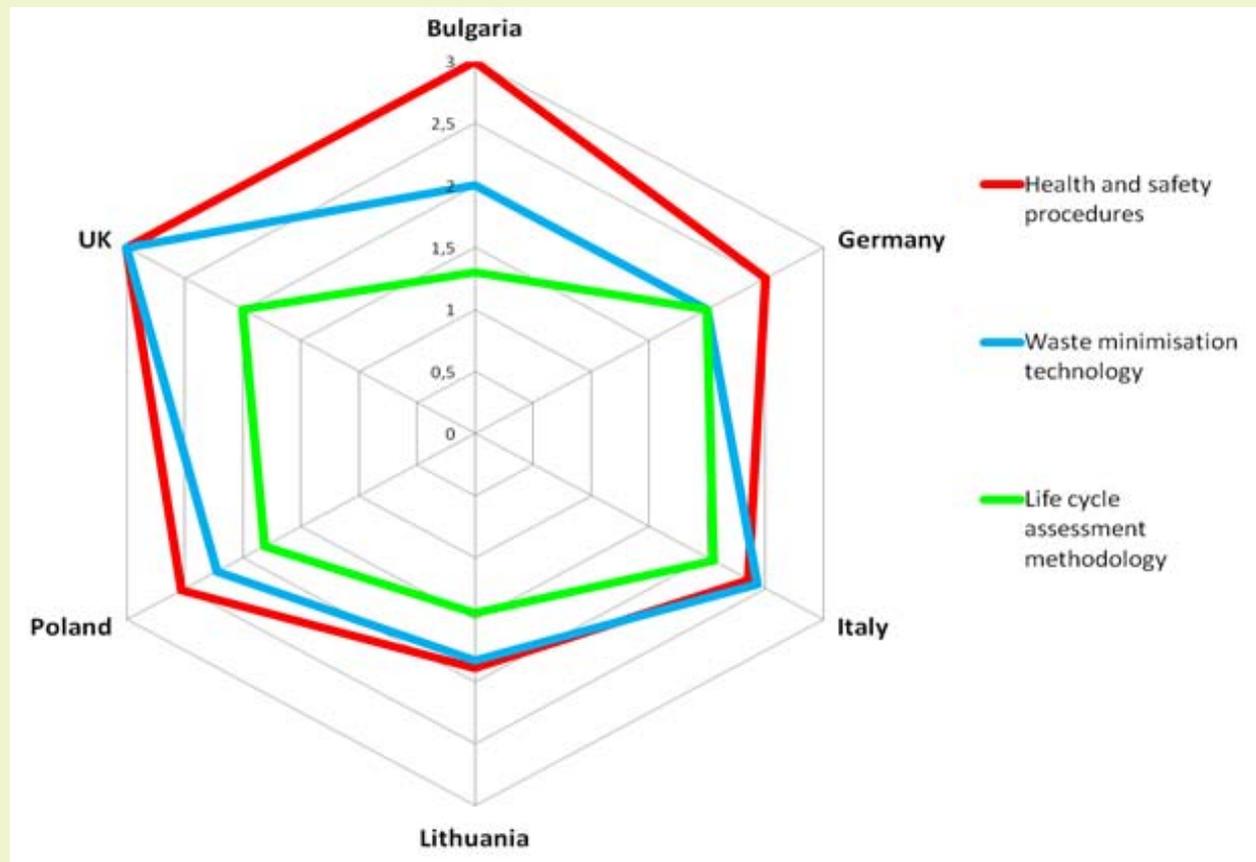


Figure 2: Importance of skills.

The discovery of lacking knowledge and skills needs provides opportunities for further trainings. At the same time the state of development of each national waste management industry, in comparison to the other SWFM+QF countries of that report, is clearly visible.

Of high importance, in the term of knowledge, are legal issues, the managing of waste and the meeting of health and safety requirements as well as emergency actions and environmental impact assessments. The differences among the countries are mainly in the field of legal aspects, and for some countries also with regard to economic and environmental aspects.

Proper waste management, meeting the EU requirements will require significant efforts in most of the focus countries of this report. Close cooperation of all stakeholders, that are local governments, the public and businesses with proper experience and know-how is necessary. This structural change offers business opportunities in fields such as logistics, waste treatment and material recovery; whereas the public attitude focuses primarily on the reduction of waste generated and the increase of recycling levels.

Success in waste management requires up-to-date and qualified personnel, on the technician and management level, for public waste management and in private owned firms.

THE HARMONIZED QUALIFICATIONS FRAMEWORK

A harmonized qualifications and training frame for managers employed in different types of solid waste management facilities, was developed, in alignment with EQF and ECVET tools, aiming and supporting to the recognition and adoption of the necessary qualifications of solid waste management occupation, across the European Union countries.

The methodology used to compile the SWFM Harmonized Qualifications Framework (SWFM-HQF) was based on the methodology implemented for the development of a Professional Profile. Therefore, the main Professional Functions, Activities and Tasks, that a Solid Waste Facilities' Manager should exercise, were identified.

While developing the SWFM professional profile the learning outcomes associated with each professional task were designated, too. Learning outcomes are considered the criteria for the certification and performance-value reflected in the European Qualifications Framework, the common frame of reference levels of qualifications in EU. Then learning outcomes were described in units of knowledge, skills and competences which constitute a part of a qualification.

Since SWFM-QF project is addressed to manager's level qualifications framework, the respective identified qualifications are presented in the form of a matrix according to EQF level 6 knowledge, skills and competences descriptors.

While developing the different qualifications modules, consideration were given to all modern main trends affecting the solid waste management sector and their influence on the functions and the activities a SWFM is involved in, and the tasks that have to accomplish while managing a solid waste management facility. Such trends are the:

- increased internationalization of the market and growing subcontracting of activities
- demand for sustainable operation and continuously improved environmental performance of the facilities
- introduction of new technologies and application of automated and advanced processes
- occupational health and safety concerns and improvements
- new provisions of national and European regulatory framework.

Solid waste management incorporates the implementation of different technologies for different and similar types of solid waste. There is also significant diversification among EU countries in the adapted solid waste management technologies.

From the SWFM-QF comparison report it is clearly concluded that solid waste facilities managers must not only possess technical but also strong administrative and financial management qualifications. Based on these facts, it was concluded that two suites of qualification modules should be developed. One for these qualifications which are necessary in every solid waste management facility (so called "common" qualifications), since they are required for all solid waste managers, no matter what solid waste management technology is implemented within the facility. And second for these qualifications which vary between different solid waste management facilities (so called "technical" qualifications), since these ones differ a lot.

COMMON QUALIFICATIONS

The common qualifications include the following SWFM professional functions:

- **Operational Management**
- **Financial and Contractual management**
- **Human Resources**
- **New Projects' Management**
- **Environmental Management**
- **Health and Safety**

An example of the developed qualification for the professional function “Environmental Management”, for one of the professional activities “Environmental management aspects for the sustainable business practices” is presented in Table 1.

TECHNICAL QUALIFICATIONS

The different technical qualification modules were developed for the technical operations of the following solid waste management facilities:

- **Municipal Solid Waste Sorting**
- **Recycling**
- **Composting**
- **Anaerobic Digestion and Mechanical Biological Treatment**
- **Thermal Treatment**
- **Sanitary Landfill**

An example of the developed qualification for the professional function “Environmental Management”, for one of the professional activities “Environmental management aspects for the sustainable business practices” is presented in Table 1.

All the developed qualifications modules are uploaded and can be accessed via SWFM-QF webpage at http://www.swfm-qf.eu/main/?page_id=7304&lang=en.

Table 1: Example of the common qualification for the professional function „Environmental management”, for the activity “Environmental management aspects for the sustainable business practices”

ULO EM-2	TITLE: Manage environmental aspects of sustainable business practices		EQF Level 6
Work tasks:	Ensure the evaluation of the impact of environmental management in daily operations and in training programmes for staff		
Weighting:	2		
Learning outcomes:	<p>LO 1: Assessment of Environmental Operation of the solid waste management site</p> <p>LO 2: Manage and control the solid waste management facility environmental aspects and impacts</p> <p>LO 3: Plan and certify Human and Financial Resources on the management of Environmental aspects and impacts</p> <p>LO 4: Implement environmental training arrangements</p> <p>LO 5: Implement improvements to the environment</p> <p>LO 6: Identify, assess and respond to environmental emergency incidents</p>		
<i>Knowledge</i> (assimilation of knowledge throughout learning)	<i>Skills</i> (Ability to apply knowledge)	<i>Competences</i> (Measure of responsibility and autonomy; ability to use knowledge, skills, social abilities)	
1) Identify and describe the environmental impact of Solid Waste Facility (SWF) work activities			
<ul style="list-style-type: none"> - Demonstrate advanced knowledge to identify the parameters designated for the efficient environmental operation of the solid waste management site - Demonstrate advanced knowledge on applicable environmental site assessment processes 	<ul style="list-style-type: none"> - Evaluate environmental operation of the solid waste management site - Designate environmental site assessment processes 	<ul style="list-style-type: none"> - Monitor the implementation of environmental assessment techniques and processes 	
2) Monitor and Control the environmental impact of SWF work activities			
<ul style="list-style-type: none"> • Explain in detail the environmental aspects and impacts associated with solid waste management operations • Demonstrate advanced knowledge to describe the main types of environmental impacts – emissions to air, waste/outputs disposal • Explain in detail the planning consents and environmental conditions applicable to the site • Demonstrate advanced knowledge to describe the benefits of improved environmental performance • Explain in detail the environmental incident and emergency arrangements at the solid waste management facility 	<ul style="list-style-type: none"> • Demonstrate advanced skills on the identification of environmental aspects in the workplace and their existing controls • Conduct an environmental assessment of the workplace, including the assessment of opportunities for environmental improvement • Seeking advice from managers or specialists in environmental aspect evaluation when appropriate • Demonstrate advanced skills by providing accurate information about environmental matters relating to the workplace to personnel and other appropriate people (e.g. contractors, visitors, management, environmental regulators) 	<ul style="list-style-type: none"> • Implement appropriate action in respect to environmental aspects which constitute a high risk • Manage environmental aspects which constitute a low risk in accordance with organisational and operational procedures • Ensure the aspect identification and the impact assessment associated with solid waste management operations • Ensure environmental emergency arrangements, which are reviewed and communicated to those involved • Ensure the completion of records/reports according to legislative requirements and/or organisational procedures 	

THE INFO-TRAINING TOOLKIT

For each developed qualification module the requirements for a training course that will ensure acquiring the designated learning outcomes for each identified SWFM professional activity and task were determined. All the training courses information were organised in order to have the format of an e-toolkit, the SWFM-QF Info-Training Toolkit, that will ease the organization and holding of training courses for each different SWFM qualification module developed.

The SWFM-QF Info-Training Toolkit incorporates:

- The curriculum of the vocational training courses addressed to Solid Waste Facilities' Managers based on the identified required qualifications. Within the curriculum the training course's:
 - ✓ Concept
 - ✓ Structure and Content
 - ✓ Trainers' and Trainees' requirements
 - ✓ Training Facilities and Infrastructure requirements.
- Proposals for training and other informative material.
- A multinational glossary of the relative solid waste management technical terms used in different solid waste management technologies and facilities.

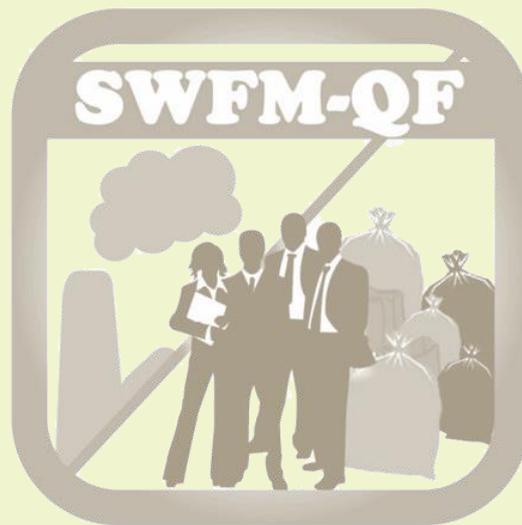
Info-Training toolkit contents are uploaded and can be accessed via SWFM-QF webpage at http://www.swfm-qf.eu/main/?page_id=7391&lang=en.

CONCLUSIONS

The sector of waste management is rapidly changing and developing, mainly due to the initiatives and policies adopted in EU and the new technologies and techniques introduced, thus rising a huge need of highly qualified engineers, operational managers and processing technicians all over Europe which now and in the future can only be met through workforce mobility, transparency and mutual recognition of professional qualifications and training.

The development of the new professional qualifications for SWFMs and the promotion of the new VET courses for the employees of waste management facilities were fully related to the general innovative perspective. The final results of the SWFM-QF project aims at creation of new job positions, the strengthening of solid waste management facilities' environmental performance and sustainable development.

The SWFM-QF project outcomes will be beneficial in raising transparency for required competences and mobility of professionals in the environmental protection business sector introducing an innovative clearly defined methodology for the creation of the Solid Waste Facility Manager job profile for EQF Level 6, based on the actual needs of the labour market, across different countries in Europe.



CONTACTS

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