

REPORT 1

External Evaluation Report Template

1. Executive summary

The report contains the analysis of the project "European Qualifications Framework for Waste Facilities Managers" (SWFM-QF). Both the training programme (information and training tool) and the Qualifications Framework describing teaching results were analysed. Particular attention was drawn to ambiguity of the Polish term "Zarządzający" (Manager). The programme of trainings concerning technical issues related to the waste management and trainings concerning widely understood management was reviewed for its substantive contents.

In the technical part, the compliance of the training programme with the legal requirements (waste incineration and storing) was assessed, and it was proposed to make changes and additions in the programme. The training programme should be prepared in such a way so as to prepare the listener to acquire necessary knowledge and learn proper skills.

The assessment of the Qualification Framework included the analysis of the compliance with Information and Training tools, because the requirements for the knowledge and competence expected from the listener cannot be different from the scope of knowledge received during training. It was underlined that the competence of the manager presented in the technical part corresponds, in general, to the sum of the technician/expert and the manager in its classical meaning. It was also noted that the two of the plants mentioned have "Qualification Frameworks" (for technical and technological issues) defined in Polish legal regulations, which relates to the incineration plant and landfill site manager.

2. Introduction

a. Introduction Brief overview of the report

The report reviewed general rules for preparing opinions on European Qualifications Framework Design, indicated assessment and comparison methods to compare with the existing Qualifications Framework. A detailed assessment is included in the Annex "Opinion on the project..."

b. General information about evaluation method:

Both the Information and Training Tool and the Qualifications Framework were assessed based on the experience of the author acquired during many years of the scientific and educational work in the Cracow University of Technology. He

is also a co-author of the profile of the environmental engineering graduate (today Framework) and teaching programmes (today Tools). During assessment, the European Credit Transfer System initially used in Polish Universities was employed, as well as the currently implemented National Qualifications Framework.

c. Information about author/evaluator

Zbigniew Grabowski, Ph.D. Environmental Engineering. Experience in design, consulting and environmental assessments. Author of approx. 180 publications and papers, approx. 120 designs for industry and over 700 environmental assessments and expertise. Expert of the Ministry of Environmental in following subjects: atmosphere pollution protection, solid, hazardous and medical waste treatment. Lecturer at the Krakow University of Technology graduated and postgraduate studies. Member of National Bodies for Environmental Impact Assessment, Member of Malopolskie Voivodship Bodies for Environmental Impact Assessment, Member of Environmental Board at Malopolskie Voivodship, Member of Advisory Board for Waste Management supporting the Mayor of Cracow, Member of Examination Board of Malopolskie Voivodship for the landfill and incineration managers, Expert for the Waste Treatment Industries Technical Working Group European IPPC Bureau

3. Description of the evaluation process

a. Overview of internal evaluation process

1 Evaluation context

The aim of the Project analysis was to assess the substantive contents of the Information and Training Tools and the Qualifications Framework and their consistency. A properly designed programme and consistent qualification indications, as well as a proper method of verification will allow to educate professional personnel able to adequately manage plants for waste management.

2 Evaluation scope

The assessment was employed for training materials (Information and Training Tools) related both to the technical part, and to plant management, and to the Qualifications Framework, that is for the training results for each module.

3 Evaluation process

In the first place, the assessment was conducted on the Qualifications Framework to determine the scope of requirements for employees who manage plants for waste management, and then the substantive scope of the training programme was analysed. You cannot disregard expected qualifications in relation

to the scope of information learned during the training. The compliance of the Framework with applicable regulations was also assessed.

4 Problems or other relevant information

a. What criteria did you choose to use in the evaluation process and why

Both the training part (Information and Training Tools), and the Qualifications Framework were referred to the National Qualifications Framework and ECTS. Moreover, the training programme and the qualifications framework were referred to the requirements for students of the first and second cycle degree technical studies covering waste management and teaching programmes from the same subject area, as well as of exam preparation courses for incineration plant and landfill site managers. Legal requirements for waste landfill site and incineration plant operation were an additional criterion.

b. Preparation works

- I. Was each part of the qualification/training material fairly evaluated, and how did you make sure it was
- II. How did you ensure that the evaluation process would be:
 - Valid
 - Authentic
 - Reliable
 - Consistent
 - Sufficient

d. Outcome/findings of the evaluation process (comments, suggestions by evaluators)

Answers to the above issues are in the annex

4. Results

a. Evaluation of Technical qualifications

- i. Qualification framework – What was the outcome of the evaluation – any comments suggestions?
- ii. Knowledge, skills and competencies – What was the outcome of the evaluation – any comments suggestions?
- iii. Learning outcomes – What was the outcome of the evaluation – any comments suggestions?

- iv. Info-training toolkit – What was the outcome of the evaluation – any comments suggestions?

b. Common qualifications

- i. Qualification framework – What was the outcome of the evaluation – any comments suggestions?
- ii. Knowledge, skills and competencies – What was the outcome of the evaluation – any comments suggestions?
- iii. Learning outcomes – What was the outcome of the evaluation – any comments suggestions?
- iv. Info-training toolkit – What was the outcome of the evaluation – any comments suggestions?

Answers to the above issues are in the annex

5. Conclusions

- v. Discussion of main comments & suggestions
- vi. Summary and rationale for suggested changes

Answers to the above issues are in the annex

6. Annexes

Z. Grabowski. Review of the project "European Qualifications Framework for Waste Facilities Managers" (SWFM-QF)

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Review of the project

"European Qualifications Framework for Waste Facilities Managers" (SWFM-QF)

General remarks

Training aims and rules remark

As it was written in the SWFM-QF materials, *"the aim if the project is to create a mechanism that would allow to make qualifications of managers of various waste facilities comparable in the entire European Union"*. The rule itself is right, and it can be compared to the rules implemented in the National Qualifications Framework Universities, however some questions arise: who will organise trainings, will these trainings be controlled in any way, who and how will check the qualifications. Unless the project is developed to create a good and coherent training programme to be used by anyone, who will be willing to organise the trainings.

Universities base their educational system on the teaching process (teaching programme), here called Information and Training Tools and on the National Qualifications Framework (here Qualifications Framework) that describes consistent teaching results. The teaching process ends with verification of assumed teaching results and reception of an appropriate diploma.

However, the assessment of the Project in question involves the issue of "Qualifications Framework" and its "enforcement". In Poland, at the end of many waste management trainings participants receive "certificates" that confirm not that they gained some knowledge or took part in the given training, but that they paid for it. And, it appears that the certificates are not of a big value for participants, apart from the collector value. In general, employers do not take them into account when assessing their employees.

In Polish waste management law, managing only three types of waste facilities requires to confirm qualifications (incineration and co-incineration plants cover the same scope of qualifications, and in case of other plants there are no such requirements). In accordance with the Act on Waste, *Article 164. The position of a manager of a waste incineration plant, waste co-incineration plant, landfill site or exploratory waste treatment facility may only be held by a person with a qualification certificate that is appropriate for conducted waste treatment processes.*

Article 165. 1. The qualification certificate for waste management is issued by the province marshal, after an interested party has successfully submitted the waste management exam.

This means that checking qualifications and issuing documents to certify this is related only to the method of thermal waste treatment (incineration and co-incineration plants) and waste storing, since only acquired qualifications give the right to commission and run the plant.

For other facilities there are no legal requirements to certify knowledge and operational skills for waste management facilities. However, it is invaluable to have appropriate knowledge, even without any certification. It appears that, although there are no legal regulations for qualifications requirements (a national exam), it is worth not only to provide such trainings, but also to create a substantial programme pattern and try to implement proper exams and tests that will check the knowledge acquired during the training. Thus, I can see a lot of sense in implementing "Qualifications Framework", ending individual trainings with control tests that will be a basis to issue a unified "certificate" or a "training completion certificate".

Moreover, the term "Zarządzający" used in the Project requires codification and further clarification. In the Qualifications Framework competence of the manager was confused with competence of the technical expert. By analysing the Qualifications Framework, it is hard to assess whether it is about the qualifications of the technician/expert or the manager. The knowledge and skill resource of these specialists is markedly different. The requirements should be different as well. It is hard and rather not so necessary to connect the scope of requirements for two specialities for the Qualifications Framework. The position of the manager can be held by a person without a particular technical knowledge, and the manager (technician/expert) must unquestionably have such knowledge, and he can acquire the knowledge and skills of the classic manager easier. This is not going to work the other way round!

Remark concerning the presented materials for the section the Information and Training Tool

It is visible that the section was prepared by a few persons, and the editing method had not been agreed earlier. This is the reason why some big difference are visible between particular modules, both in the contents, and in the editing method. It appears that it is necessary to develop a training programme matrix, so that separate modules, when put together, could create an integral entirety.

Literature — all reference links lead to either EPA (American solutions and regulations are hardly applicable to the EU law and standards) or to EU or other European Countries websites. Although the command of English is ever-increasing, it can still be a barrier in using knowledge. In Poland, there are many materials published in the Ministry for Environment sites or issued by training companies, such as PZITS Poznań, and it is not so rare to create own materials for the training needs. The experience tells that participants of trainings in most cases prefer to use materials in Polish.

It seems to be necessary to start each module with an overview of the waste management rules (in some modules the requirement is met), even taking as an example the framework directive with a detailed description applicable for each module. It relates to so apparently remote from techniques and technology modules as operation or financial management. Knowledge of the rules of waste management and regulations, as well as their change trends makes company management easier (all constructed incineration plants were calculated for the morphological composition of waste for the time of constructing. Calculations have not included information about the planned changes in the Directive, which make that in 2020 the composition of waste and their heating value will change significantly).

Linguistic remark — it is worth to fill the language of the training programme and the framework (the broadly understood management part) with "waste", so that to reflect the connection with waste processing. In the present form the programme could refer to any type of company, even the one that has nothing to do with waste management.

The proposed qualification for waste management plant managers consists of a few modules:

I. Common modules for all facilities:

- occupational health and safety
- human resources management
- project management
- operational management
- environmental management
- financial management and public procurement

II. Technical modules, individual for each facility

- landfill site management

- composting plant management
- recycling facility management
- mechanical and biological treatment and anaerobic fermentation plant management
- thermal transformation plant management
- transfer station management

Detailed remarks

Information and Training Tools (Training Programme)

The Information and Training Tools (Training Programme) does not comply with the Qualifications Framework — the programme includes anaerobic fermentation, composting and mechanical and biological waste treatment, and the Framework includes composting and mechanical and biological treatment. Anaerobic fermentation and composting are biological processes, and mechanical treatment of the charge and the final product is an auxiliary process. The processes of anaerobic fermentation and composting differ slightly, but the difference is important — the presence of oxygen.

1. Anaerobic fermentation

I think that all biological processes, apart from composting (in the composting process you get a product called compost, and in others—"it depends") should be treated collectively. And thus they should be included in the mechanical and biological treatment, and you will have methane fermentation — wet and dry, as well as biostabilisation, biodrying, etc.

When speaking about law, one should mention the reference BAT Waste Treatments Industries document for EU (August, 2006), which defines the requirements for technical solutions for fermentation and mechanical and biological waste treatment.

The programme contains too detailed description of fermentation chambers, while the most important issue is the fermentation technology — wet or dry.

What about post-treatment residues? How to handle with them? Fermentation does not end with the production of the gas and stabilised compost

— certainly not! The aerobic stabilisation phase must follow. Fermentation residues still contain too much carbon and they must undergo the aerobic stabilisation process to be able to stored.

Since fermentation is treated as an independent module, there are no mechanical processes to be used for preparation of the charge for the process.

The process of deodorisation of the entire processing line should be treated seriously. And OHS (methane!)

2. Composting

Very developed legal framework — I suggest to apply the same for the mechanical and biological treatment together with fermentation.

Literature materials also include American items. European ones are more helpful, since they refer to our regulations and criteria. If this is to be used by training participants, Polish materials, even those published in the Ministry for Environment websites (by R. Szpadt and A. Jędrzak), would be more adequate.

It is important for the programme to define and teach what is the compost and what requirements it must meet. Because whether it is the compost and composting or aerobic stabilisation and the stabilised compost it depends both on the quality of the charge and the quality of the product.

The technical part of the mechanical process — that is preparation of the appropriate charge (composition, size reduction, heating compost treatment) — is poorly underlined.

3. Mechanical and biological processing

The subject contains only mechanical processing — to be completed. The programme is has little substantial content. I suggest to include methanation here, treat the legal regulations similarly as in case of composting, and it will be much better. These processes can be treated as MBP and as BMP. And then, in the latter circumstance we deal with biological drying. The module is big enough to further develop the mechanical part.

MBP or BMP is not only production of the gas and stabilised composed, but also production of fuel for the waste incineration plant. So, from the technological point of view, the topic is interested and broad.

Also include and discuss regulations concerning MBA — Regulation of 2012, item no. 1052.

4. Thermal conversion

Similarly, as in case of composting, start with legal regulations and discussing the Waste Incineration Directive.^P Then, proceed to discussing the thermal technologies, that is incineration, gasification and pyrolysis. Also you can add plasma processes, which are connected with incineration, gasification and pyrolysis anyway. So, we start with the technology (part 5), not with reception of waste (part 1).

Discuss the Regulation of the Minister for Economy on the conditions of conducting the thermal process in detail (and of the Minister for Health on medical waste) (it is the basic scope for the exam for incineration plant managers). If you have knowledge of thermal technologies, it is easier to learn the regulation, incineration process technical and technological conditions and aim of monitoring the incineration plant (not exhaust gas emission). What is more, you should discuss the regulation on plant emission standards. Also, think whether the training could be a preparation to the exam for managers. Then, the regulations being discussed should be expanded with the environment protection law. The Waste Act lists the incineration plant manager requirements (technician/expert), including rules for accepting waste, as well as all decisions that need to be acquired.

5. Recycling facility

I have not found, nor in the programme, neither in the Qualifications Framework, what authors understand as the recycling facility. The definition from the Act says that recycling *is.....recovery, involving reprocessing waste for products, materials or substances used in compliance with their initial purpose or for other purposes; this also means reuse of the organic material (organic recycling), but does not cover reuse of energy or reprocessing for materials to be used as fuels or to fill excavation pits*. Thus, there is no information whether we deal the paper recycling facility (paper-mill), plastic recycling facility (eg. the waste bag production plant), or the scrap processing steelworks.

I assume that the authors were referring to the waste sorting plant, and I think that this is the way the plant should have been called. Then, the general information will become easier to understand. And if not, if the programme

concerns in general a recycling facility, With such a big level of generality, nobody will be interested in the training.

Please note the substantive error — there is no such a term as temporary storing — if a place where you temporary store waste will be called in this way, in accordance with the Waste Act and the environment protection law, such a place will have to meet all conditions imposed by the regulations on waste landfill sites. It is just the waste storing site.

6. Waste landfill site

It is the second plant for which it is required to get the qualification certificate for waste management and, similarly as for the incineration plant, it should be decided whether the training could be a preparation to the qualification exam.

As in case of thermal conversion, the module should start with regulations on waste management, especially those which determine the quality and amount of remediated waste. And of course, you should also discuss the Regulation of the Minister for Environment on the Waste Landfill Site in detail.

In the programme attached (again, we come across a discretion for the training programme construction) it is more appropriate to gain knowledge of the localisation and landfill site construction rules, and not, as it was mentioned "to plan the landfill site infrastructure" — it is the preserve of the designer, not the manager (even not the technician/expert on the landfill site). And of course, you should start by discussing the definition of waste storing and clarification of threats resulting from operation of the landfill site (limited use area, as near the composting plant, impact of the landfill site on the environment, landfill site emission).

It would be also good to discuss a catalogue of waste, waste classification method, waste categories and recovery and remediation processes in each module.

Why only this module contains the participants selection criteria, contrary to the rest of them? Is there a specific reason for this?

7. Transfer station

The transfer station — there is no a single word in the programme about what the transfer station is, what functions does it perform, where should it be located and how should it be equipped or what threats for environment are involved.

I am not sure how the section (page 3) connected to waste treatment mechanical processes management and improving the separation processes (LO1) relates to the transfer station — does the transfer station is developed for this purpose? How to reduce the amount of waste in the transfer station (LO2)? I thing that only the amount of waste produced by own activity, and this is the obligation of every company. In this case, a similar task should be included for all plants. How I should understand effective waste management (what waste? own?, brought?) on site!!! What about the permit to conduct such an activity?

8. Financial management

If this is an independent financial management training, it does not discuss the rules of waste management, especially if it comes to the applicability of time horizons for certain conditions (increasing waste production rate, lower amount of waste passed to landfill sites, changeable heating value of waste, increasing waste flow for recovery), which excellently affect development plans for the plants and their bottom lines.

9. Operational management

Remarks similar to financial management. The presented programme is very general. Since it is about waste management, and the module relates to so distinct plants as the incineration plant and the transfer station, you should rely on selected examples. I have a sensation that the programme was elaborated based on a management course book, not on the real-life experience.

10. Project management

Plant management is based on the waste management regulations, and these regulations still evolve, but their development can be envisaged by trends — as an example, the need to recover paper material, glass, plastic and metal. In

case of an independent project management training, these regulations should be discussed. Designing an incineration plant was carried out under different conditions, and starting from 2020, the waste energy properties will differ significantly from the old ones. So, again, we come back to the waste management basic programme. Many of chief accountants and economists employed in plants have quite poor knowledge of waste management.

11. Environmental management

It seems that this training programme should cover all technical plants being discussed. Each operational plant for waste management has environmental decisions, which determines its operation for environmental protection. It is hard to speak about environmental protection without mentioning a specific plant type.

12. Human resource management

No comments or remarks — it includes all elements for the management of a team of employees.

13. OHS (Health and Safety)

Remarks concerning the qualifications of the coach. He should be an OHS expert at least and complete post-graduate OHS-related studies.

Why requirements for training participants? Singles are discriminated!!

Qualifications Framework

1. Composting

For each of the analysed plants, requirements entered in the Framework and those required from the listener after the training has been finished, are very high. I am wondering, whether we want to train managers or plant operators. The passage — *"develops the composting system and procedures, taking into account legal and organisational requirements"* — means that the manager also develops the composting technology. In my opinion, a person responsible for such tasks

should be the engineer (technician/expert) and not the manager. To not to create a false impression, I suggest to change nomenclature.

The term "rubbish" is used in the colloquial language and in journalism; for professional context, the term "waste" should be used.

2. Mechanical and biological processing

Change the name of the Framework from the mechanical processing to the mechanical and biological processing. I suggest to clearly divide the Framework — 1. aerobic stabilisation, 2 anaerobic fermentation.

Page 17 — *"places the mixing unit in a place easily accessible for inspection"* — the location results from the process and construction design and is not so dependent on the manager. Unless the design was faulty.

3. Thermal treatment

If a manager of an incineration plant had all skills described in the Framework, he would be a remarkable and enviable omniscient person. He is experienced in incineration technology, as well as in other treatment processes (page 7), plans OHS for a plant, determines efficient technologies to use process residues (page 17). *Understands technology, ensures engineers and operators are informed and implement proper procedures for heat production process* — so should the manager teach engineers how to perform processes in the incineration plant? I think that what worked here was automatic translation of the plan from English.

It seems that emphases in the incineration plant management Framework were arranged quite randomly. incineration is above all a process used to treat waste, and its secondary function is to recover energy. Technology first, the rest next. Too much of heat and current, and not enough of the technology, which main aim is to provide proper conditions for the **WASTE** treatment thermal process — because this determines emission to the environment. Heat and current are important, but they are side products!

4. Recycling

Repeated question — is the recycling facility a sorting plant? The text on page 4/5 suggests that it can be an unspecified treatment facility — *Manages the equipment for treatment of recyclable materials*. But this is not a method to learn how to manage a recycling facility! Supposedly, managing a store is everywhere the same, but there are different conditions in a grocery store and a shoe store. Technical conditions! Because the flow of documents, financial matters or human resources can be similar.

What does the term "separacja odpadów" (waste separation) mean (page 8)?

5. Storing

In case of MBP remarks are similar to the ones for composting — page 1 "*provides suitable planning and effective construction of sealing for the landfill site bottom*" — no, because the manager is not the site architect neither the site manager. The manager manages the existing plant, but must have the knowledge about its construction and operation. Such a note may mislead listeners who may think that the training will teach them how to design and that they will acquire the construction license. The word to be changed.

No remarks for the rest of the Qualifications Framework.

6. Transfer station

Mechanical waste treatment process management (page 12) — does the transfer station have a decision for waste treatment and what is its role? Such practise is not employed in the Polish conditions, at least I have not heard about such solutions. Nothing should be done in the transfer station, apart from possible removal of problematic waste and transportation to the **PROCESSING OR TREATMENT FACILITY**.

7. OHS

Generally, the programme is coherent. The only drawback is that there is no reference to specific plants. Working conditions and related safety in the incineration plant differ from conditions in the transfer station.

8. Public procurement

No remarks or comments

9. Financial management

No remarks or comments

10. Operational management

Utterances too general. Please refer to specific plants to make the understanding of the management process easier.

11. Project management

No remarks or comments.

12. Environmental management

Remarks the same as for the training programme

13. Human resource management

No remarks or comments

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