

REPORT 1

External Evaluation Report Template (Evaluator: Dr.-Ing. Christoph Wünsch)

1. Executive summary

This external evaluation report to the course material for solid waste facility managers was done at the end of July 2014 by Dr.-Ing. Christoph Wünsch. The developed course has the demand to fulfil the requirements of the level 6 of the European Qualification Framework.

The course consists of 13 units, 6 units to technical qualifications, 7 units to common qualifications. For each unit a document to describe the unit learning outcomes (ULO) and a document to the info training toolkit (ITT) was developed. The ULO's contains the learning outcomes and how the knowledge, skills and competences of the participating solid waste facility managers will be positively affected. The ITT's give an general overview about the course concept, the structure and the contents of the training course and the requirements for trainers to give the courses, the participants to take the courses and the requirements for the training facilities and the their infrastructure.

The 13 developed units contain all the important aspects solid waste facility managers have to deal with. In the evaluators opinion the anaerobic digestion needs an own unit because this technology will get more and more important in the near future to treat separate collected bio-wastes and low calorific fractions of mechanical biological treatment plans to generate energy. Also the different kinds of mechanical biological/physical treatment plants have good opportunities for development in the future and therefore an own unit with a more extensive description of these technologies would be desirable.

The qualities of the generated courses/documents are in good quality but not always consistent. Sometimes the sub-units in the ITT's have the same title like the learning outcomes of the respective ULO, sometimes at least the content is the same, but sometimes even the content between ULO and ITT of the same unit is nonexistent.

The requirements for trainers, participants and for the training facility are formulated for each unit. Especially here the description of those requirements differs uncommonly between the units. It seems that each developer of a unit created the requirements for one unit and simply copied it in another unit. Finally the project or work package leader seems not to have reviewed the documents to have consistent information.

All in all can be stated, that the structure of the training course for thermal treatment and the new projects management is missing, some obvious copy and paste mistakes are recognisable and the formatting of the different ITT's is not consistent. This leads to a conclusion that the materials are not finally developed and internal revised at the actual stage of processing.

2. Introduction

- a. Brief overview of the report –**see executive summary**
- b. General information about evaluation method:

- methods of conducting the internal evaluation process (e.g. criteria used for comparison, mapping to EQF/NQF, national & EU relevance, etc.)

The prepared course material were evaluated with regard to the fulfilment of level 6 of the European Qualification Framework (EQF 6) and compared to the levels of bachelor and master courses in Waste Management and Circular Economy in German Universities.

c. Information about author/evaluator

Dr.-Ing. Christoph Wunsch studied Waste Management and Contaminated Site Treatment at the TU Dresden. After finishing the studies he started working at the chair of Waste Management at TU Dresden and finished his PhD with the topic "Avoidance of greenhouse gas emissions by improvement in energy efficiency of German Waste to Energy plants". Since 2012 he is responsible for the teaching of the bachelor and master course "Waste Management and Contaminated Site Treatment" at TU Dresden. He is member of the study commission and took part in the creation of the new bachelor and master courses of the department of hydro sciences. Since this year he gives courses in the master craftsmen training at the "Sächsische Bildungsgesellschaft für Umweltschutz und Chemieberufe Dresden mbH". He is evaluating scientific paper such as e.g. for the Waste Management Journal of Integrated Waste Management.

3. Description of the evaluation process

a. Overview of internal evaluation process

i. Evaluation context

The context of the evaluation was the structural content of the Solid Waste Facilities Managers concept, the structure of the different developed units/subunits and the comparison of the content of the prepared Unit Learning Outcomes (ULO) and their respective Info Training Toolkits (ITT).

ii. Evaluation scope

The developed Course Material for Solid Waste Facility Managers (EQF 6) consists of 13 units divided into six units for the technical understanding of the different kind of waste treatment facilities and seven units for the general understanding of environmental, financial, human resources, health and safety, new projects and operational management. To each of the units "Unit Learning Outcomes" (ULO) and "Info Training Toolkits" (ITT) were developed.

iii. Evaluation process

The provided ULO's and ITT's were read and commented, the overall structure of the course and the structure and content of the developed units were evaluated with regards to the needs of a manager of a solid waste facility. Finally the single ITT and each respective ULO were compared, inaccuracies identified and suggestions made.

iv. Problems or other relevant information

A Problem was that the ITT's for Thermal Treatment and New Projects Management was not finished at the evaluation stage.

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

The main criterion was the educational background a solid waste facility manager needs to fulfil his tasks and if the provided course gives him/her this background. Also the impartment of knowledge the manager needs to think about specific problems that can occur and to solve these problems should be successful performed by the course. Another criterion was the fulfilment of the course content with level 6 of the European Qualification Network (EQF) because this level of qualification that fits to managers of solid waste facilities.

c. Preparation works

- I. Was each part of the qualification/training material fairly evaluated, and how did you make sure it was

If materials were finally completed a fair evaluation can be guaranteed.

- II. How did you ensure that the evaluation process would be:

- Valid
- Authentic
- Reliable
- Consistent
- Sufficient

See 3b / Evaluator did not know what to write here, as it seems similar to 3b.

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

4. Results

a. Evaluation of Technical qualifications

- i. Qualification framework – What was the outcome of the evaluation – any comments suggestions?

The course materials fulfill the requirements for the level 6 of the EQF. But there is no duration of the courses, units and subunits mentioned. The hours of teaching/preparation/time of presence should be mentioned.

- ii. Knowledge, skills and competencies – What was the outcome of the evaluation – any comments suggestions?

The information given in the knowledge, skills and competence are enough to assess the units and subunits to the EQF-level 6. But the amounts of information are very different for various ULO's. For example in ULO COM the reachable

knowledge, skills and competences are described in very detail in contrast to the other ULO's. A more detailed description for the other ULO's would be desirable.

- iii. Learning outcomes – What was the outcome of the evaluation – any comments suggestions?

The Learning Outcomes (LO 1, LO 2, ...) often does not fit to the respective description in the area knowledge, skills and competences. Examples are the ULO REC and AD/MTB. I suggest naming the headings in the area knowledge, skills and competences like in the Learning outcomes as done in the ULO COM.

Some course units like ULO AD/MTB-3 and AD/MTB-9 fits also to other units like Thermal Treatment and Composting. In the unit Waste Sorting Facilities the course units 1, 2, 3, 4 and 5 also fits to all the other technical units. The structure of the units should be revised.

In Composting some objectives are repeated in the different course units like the characterization of the waste input and finally products in the course units 1, 2 and 4. Look for repetitions.

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

The course structure for Thermal Treatment is missing. In other ITT's the course structure does often not fit to the structure in the respective ULO's (AD/MTB). Structure the ITT's closer to the ULO's and use the same formatting for all course units.

There are ITT's to mechanical biological treatment and to anaerobic digestion but only one ULO for both. The suggestion is to have an own ULO about anaerobic digestion and the respective ITT, especially because the information in the ULO AD/MTB describes an anaerobic digestion of separate collected bio-waste and not of a low calorific fraction of an MBT-plant. Another reason is to have an own ITT to composting, so why not also to anaerobic digestion?

In the ITT of landfill the course unit 6 "Implement systems and procedures to prevent delivery of unauthorized waste" is missing but described in ULO LF-6. There is only one source for the course material in the landfill course unit. The content of a unit should be based on more "literature".

The requirements for trainers and trainees in the units landfill and health and safety were described much more into detail than in other units. But why? Try to explain these requirements more uniform for the course units.

In the different ITT's many different synonyms e.g. for trainees are used (Trainees, students, learners, candidates). More uniform!

In composting an evaluation process also or the trainers is recommended. Why not for other units? I suggest having it for all trainers.

Only in the ITT of Composting it is mentioned if a subunit is done by a lecture or by practical training. This should be done by all ITT's.

b. Common qualifications

- i. Qualification framework – What was the outcome of the evaluation – any comments suggestions?

The course materials fulfill the requirements for the level 6 of the EQF. But there is no duration of the courses, units and subunits mentioned. The hours of teaching/preparation/time of presence should be mentioned.

- ii. Knowledge, skills and competencies – What was the outcome of the evaluation – any comments suggestions?

The information given in the knowledge, skills and competence are enough to assess the units and subunits to the EQF-level 6.

- iii. Learning outcomes – What was the outcome of the evaluation – any comments suggestions?

All learning outcomes in the ULO NP-1 have the same title, also the learning outcomes 5 and 6 in NP3. Please revise!

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

Could the introduction in eco-balances and Life-Cycle-Assessment to describe the environmental input of waste management a course unit in the unit Environmental Management? I suggest!

Title and also content in ULO's not always consistent with ITT's. For example in the unit financial and contractual management. Revise it.

The Course Concept of financial and contractual management is wrong. The requirements for trainers and trainees in financial and contractual management are done twice. Delete the first and revise the requirements for trainers. They does not match to financial and contractual management.

In the course unit 3 in financial and contractual management the sub-unit Combined heat and power systems... does not fit to the topic.

ULO FCM-PP to public procurement exists but no ITT. In the Course Unit 5 of the ITT of financial and contractual management the public procurement is listed. Why there is an own ULO for public procurement?

The ULO and ITT of the unit human and resources management are not consistent. Please revise.

There are no course materials listed in the ITT of the unit Health and safety. There is also only small course descriptions in the ITT compared to the information in the ULO. Course units 4, 5, 6, 7 and 8 of the ITT health and safety are not further described in the respective ULO. Please revise!

The structure and contents in the ITT of the unit new projects management is missing. Please add!

The order of the course units in the ITT of operational management is different from the respective ULO. Please change.

Only in the ITT of Composting it is mentioned if a subunit is done by a lecture or by practical training. This should be done by all ITT's.

Out of the structure and the formatting of the ULO's and the ITT's the author/the institution that developed the document can be seen. Make the structure and the formatting more uniform.

5. Conclusions

i. Discussion of main comments & suggestions

The course for solid waste facility managers is well structured by the development of different units. No important area of waste management a waste facility manager should know about is missing. The anaerobic treatment of separate collected bio-waste or of the low calorific fraction out of MBT-plants to recover energy will get more and more important in the future. I suggest to develop an own unit about anaerobic digestion and to extend the content of the mechanical biological treatment. In the description (ULO and ITT) I cannot see that the different MBT-concepts will be explained. A course unit about the general MBT concepts (mechanical treatment with composting, mechanical treatment with anaerobic digestion, biological-mechanical treatment and mechanical-physical treatment) should be developed.

There is an own ULO to public procurement developed but no ITT. In the ITT to financial and contractual management a course unit to public procurement exists. The suggestion is to put the ULO of public procurement as a part in the ULO of financial and contractual management.

It is conspicuous, that the different ULO's and ITT's were made by different persons/institutions. The content related scope (especially to knowledge, skills and competences) of the ULO to composting is for example much more extensive than the other ULO's. The formatting of the ITT's differs. Firstly by the description of the sub-units, but especially by the requirements for the trainers and the participants. As an example, these descriptions in the ITT's of mechanical biological treatment and anaerobic digestion are very short and unspecific, for landfill and health and safety very comprehensive and specific. The project/work package leader should revise all ULO's and ITT's and transfer them in a consistent form.

In some units the content and even the used words of the ITT are uniform to the title and the learning outcomes in the respective ULO. In some units the content between ITT and ULO is more or less the same, but the used word differ a lot. This could be done more consistent for all units.

ii. Summary and rationale for suggested changes

The overall content of the developed vocational education and training is complete but not in every case precise. An extra course unit to anaerobic digestion and an extension of the course unit to mechanical biological treatment is suggested because these techniques will have good opportunities for development in near future.

The developed learning outcomes for knowledge, skills and competences reach the level 6 status in the European qualification network. But in cases like the ULO of composting these qualities are described in very detail and in other ULO's much shorter. A more comprehensive picture between the ULO's should be achieved to show the quality of the developed sub-units.

The requirements for trainers and trainees to give and to take the developed courses are very different formulated. A more consistent presentation makes it easier for potential trainers and trainees.

6. Annexes

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