



## **Curriculum for the seminar**

### **“Waste and Wastewater Management and Energy Production”**

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# **1. Summary of the most important features**

## **1.1. Goal**

The goal of this seminar is to give summary to employees and decision makers in SMEs as well as in the field of waste and wastewater management of technology for waste and wastewater management and of possibilities of energy production from waste and wastewater. The seminar provides information and facts related to various possibilities as well as well implemented examples in order to enable the participants to evaluate the implementation of possible measures at the enterprises which are specific in the industry and also in the new market areas for SMEs.

## **1.2 Target groups**

Entrepreneurs, management personnel at the enterprises and also in the field of waste and wastewater management.

## **1.3 Duration and timing**

The seminar can be implemented as a full-time or part-time course, it is separated into 7 modules and contains at least 9 and not more than 13 teaching units in total, each with the duration of 45 minutes. At first general economic and international issues are discussed. After that technologies, Best Practice and also possibilities of energy production, at first waste management and after that wastewater management are communicated. In conclusion on the basis of case studies the participants develop possibilities for the purpose of discovering new market areas in small and medium-sized enterprises. Wherever possible the seminar should include an excursion to waste and wastewater management facilities.

## **1.4 Qualification of lecturer(s)**

The seminar should be preferably held by lecturers which possess not only in-depth knowledge in the field of waste and wastewater technologies but also country-specific knowledge, especially the financial framework conditions for the implementation of measures. It is recommended to utilize the services of at least 3 lecturers at the seminar. The lecturers should not only be competent in this field but also in the didactic field to possess presentation and discussion experience. Thereby it is of course advantageous to organize group work and to hold presentations of partial results by working groups.

## **1.5 Required technical equipment**

- Flip chart
- Blackboard
- PC with projector
- Internet access for the lecturer's laptop
- Screen

## 1.6 Methodological and didactic remarks

Depending on the knowledge of seminar participants the fundamental correlations are discussed to the necessary extent but anytime when it is desired they can be deepened. Each module should be concluded with a detailed discussion and debate as well as contribution of experiences and examples by the participants. For both big modules "Waste Management" and "Wastewater Management" work in small groups is recommended. Within the framework of the last module "Discovering market areas" the participants should elaborate their own strategies and solutions.

## 2. Seminar concept

### 2.1 General concept

#### 2.1.1 Overview of the modules, key issues and contents (oriented at the contents of the master slide set for the lecturer)

##### **Module 1: Questions of general economic and international development – 1 TU**

- Topic 1.1: Growth areas in the field of energy and environment
- Topic 1.2: Tendencies of international development
- Topic 1.3: Requirements for the cooperation

##### **Module 2: Recycling Management and Cradle to Cradle – 1-2 TU**

- Topic 2.1: Requirements related to the reduction of consumption of raw materials
- Topic 2.2: Recycling
- Topic 2.3: The Cradle to Cradle Principle
- Topic 2.4: Ecological Cycle
- Topic 2.5: Technical Cycle
- Topic 2.6: Examples for Best Practice and Products

##### **Module 3: Technologies and Developments in Waste Management on the Example of City Cleaning – 2 TU**

- Topic 3.1: Overview of Tasks, Solutions and Developments
- Topic 3.2: Best Practice Examples
- Topic 3.3: Energy Production from Wastes

##### **Module 4: Use of Wastes for Biogas and Electricity Generation – 1-2 TU**

- Topic 4.1: Best Practice Example of a Company
- Topic 4.2: Biogas Installations
- Topic 4.3: Substrata and Energy Yield

##### **Module 5: Technologies and Developments of Wastewater Engineering – 2 TU**

- Topic 5.1: Volume Developments and also Treating Procedures and Results
- Topic 5.2: Separation of Wastewater
- Topic 5.3: Best Practice: Green Energy from Black Water

## **Module 6: Decentralized Wastewater Treatment – 1-2 TU**

- Topic 6.1: Subterranean Treatment Procedure  
Topic 6.2: Best Practice Examples

## **Module 7: Discovering New Market Areas for SMEs – 1-2 TU**

- Topic 7.1: Presentation and Discussion of Case Studies  
Topic 7.2: Development of Strategies

## **2.2 Learning Objectives and Methodological and Didactic Remarks related to Key Issues of the Concept**

With the help of this seminar technologies and developments of waste and wastewater management should be communicated and at the same time new fields of activity should be shown to enterprises which offer rewarding market chances on the one hand, and make crucial contributions to the overcoming of energy and environmental problems on the other. The main learning objective is thus to provide an overview related to new waste and wastewater technologies and to recognize decentralized solutions for the own enterprise and also especially for the purpose of discovering new market areas.

Specific learning objectives of the seminar contain the following topics:

- Evaluations related to the general economic and international development
- Sensitization for the requirement of recycling management and energy production from waste and wastewater
- Learning technical and organizational solutions
- Sensitization for economic growth fields

The learning objectives for each module are described below:

### **2.2.1 Module 1: Questions of general economic and international development**

The participants...

- ... recognize bottlenecks of economic development and new market chances for SMEs.
- ... get the idea related to international developments and market chances.
- ... learn the need for cooperation.

### **2.2.2 Module 2: Recycling Management and Cradle to Cradle**

The participants...

- ... recognize the importance of reduction of raw materials consumption.
- ... learn the principles of recycling and recycling management.
- ... learn a new economic approach according to the Cradle to Cradle principle.
- ... obtain information related to Cradle to Cradle products.
- ... can evaluate possibilities and fields of application for the own enterprise.
- ... get an idea of the saving potential of raw materials and economic future-oriented approaches.

### **2.2.3 Module 3: Technologies and Developments in Waste Management on the Example of City Cleaning**

The participants...

- ... get an overview about tasks and developments on the example of city cleaning.
- ... learning Best Practice examples of waste management.
- ... recognize the possibilities of energy production from waste.

### **2.2.4 Module 4: Use of Wastes for Biogas and Electricity Generation**

The participants...

- ... recognize the possibilities of energy production from wastes.
- ... on the basis of specific examples can evaluate the suitability of wastes for the production of energy.
- ... learn market chances through the example of the enterprise.

### **2.2.5 Module 5: Technologies and Developments of Wastewater Engineering**

The participants...

- ... get an overview about technologies and results of wastewater treatment.
- ... recognize the importance of wastewater separation.
- ... can evaluate the importance and the possibilities of energy production from wastewater using the Best Practice example.

### **2.2.6 Module 6: Decentralized Wastewater Treatment**

The participants...

- ... learn technologies of decentralized wastewater treatment.
- ... are familiarized with the construction and the principle of operation of subterranean treatment systems.
- ... learn Best Practice examples.
- ... have the ability to find solutions for the own enterprise as well as especially for the new fields of activity of the enterprise.

### **2.2.7 Module 7: Discovering New Market Areas for SMEs**

The participants...

- ... get an impression related to market developments and chances.
- ... elaborate strategies for the development of new market areas of the own enterprise.

## **3. Certificate**

After the conclusion of the seminar the participants obtain a certificate in which training contents (key issues) are listed and which is signed by training centers (e.g. a Chamber) and the Hanseatic Parliament.