



## 8 Teacher's notes – Volume 8 Waste management and recycling

In its first section, Volume 8 provides information about the necessity of an appropriate waste management system and well functioning waste logistics. **Since this is a very country-specific subject, the trainer has to adapt the background material and exercises to the country-specific waste situation!**

The different chapters on recycling are more general and provide insight into modern recycling technologies available on the international market. Please decide which of the technologies you want to present in more detail depending on the situation in the country.

The teacher's notes provide comments on the **training activities (workshops)**.

The background material can be used as described below.

| Use of the background material "Waste management and recycling" |  |
|---|--|
| Material  | Comment  |
| <b>Textbook</b>   | The textbook provides background information on the topic. The trainer should be well informed on the waste disposal situation and legal requirements of the country as well as the cost of disposal of different types of waste. For particular recycling technologies, he can also invite representatives of companies which distribute or use a specific technology. The textbook itself can be distributed as training material to the participants.   |
| <b>Examples</b>   | The examples illustrate how well functioning waste logistics contribute to cost savings. They provide tips and tricks on how to motivate employees to segregate waste and include information on the following topics: <ul style="list-style-type: none"> <li>- <b>Introducing new waste logistics;</b></li> <li>- <b>Significant reduction of hazardous waste;</b></li> <li>- <b>Training on the reduction of residual waste.</b></li> </ul>  |
| <b>Exercises</b>  | Two exercises support the practical application of the topic "waste management and recycling". <ul style="list-style-type: none"> <li>- <b>Correct waste segregation:</b> This is an exercise designed for two or three groups (depending on the number of participants). Each group should comprise a maximum of five persons. Each group has to segregate mixed waste from a big plastic bag and correctly designate it to the different types of waste commonly used in the country.</li> <li>- <b>Waste management in view of legal compliance:</b> This exercise teaches about waste-relevant regulations, the assignment of correct waste key codes, and also illustrates which type of waste requires special attention (hazardous waste). In addition, it helps to identify potential for waste management.</li> </ul> |



| Use of the background material "Waste management and recycling technologies" |   |
|--|---|
| Material   | Comment   |
| <b>Slides</b>  | The slides provide general information on waste management based on the principles of CP and waste avoidance, and illustrate the introduction of a functional waste logistics system into a company. The slides are designed for a more general application but they <b>should be complemented by special and country-specific information on waste segregation, waste disposal and waste costs!</b>  |
| <b>Worksheets</b>  | <p>The worksheets on waste management concentrate on important information, e.g. which type of waste arises in a specific department of a company, how can the hazardous and non-hazardous waste be correctly documented. On the third worksheet disposal companies that collect different types of waste are highlighted. The fourth worksheet provides a list of possible recycling technologies which could be introduced into a company. It is important that these worksheets are adapted to the country-specific situation.</p> <p>The worksheets include:</p> <ul style="list-style-type: none"> <li>- <i>Overview of the waste management system (Worksheet 8-1);</i></li> <li>- <i>Waste description (Worksheet 8-2);</i></li> <li>- <i>List of disposal companies (Worksheet 8-3);</i></li> <li>- <i>Possible waste recycling technologies (Worksheet 8-4).</i></li> </ul> <p>The worksheets can also be opened as <a href="#">doc.files</a>.</p> |
| <b>Checklists</b>  | The checklists include tips for the introduction and optimization of waste management in a company.   |
| <b>Questions</b>   | <p>The questions check the participants' understanding of the information covered during the training course or workshop. Most of the information is included in the textbook, therefore links to the textbook are provided. The trainer can decide whether and how he checks the participants' knowledge and if he wishes to use these questions.</p> <p>The questions can also be used as a quick self-check for the trainer.</p>   |

### Training course/Workshop

The participants of a workshop or training course on "Waste management and recycling" are consultants or trainers.

The following table shows an example of a schedule for a one-day workshop, which is designed as part of a series of workshops. This schedule has proved to be efficient with different target groups.

The second table comprises the suggested materials, learning objectives and success indicators for the different teaching units.

| Example of a schedule for a training course/workshop   |  |              |           |  |
|--|--|--------------|-----------|--|
| Topic  | Content  | Time         | Min.      | Method   |
| <b>Welcome</b>   |  | <b>9.00</b>  | <b>15</b> |  |
|  | Participants welcome   |              | 5         | All  |
|  | Programme of the day, organizational matters   |              | 10        | All, flipchart   |
| <b>Feedback</b>  |  | <b>9.15</b>  | <b>45</b> |  |
|  | Progress in the companies since the last workshop  |              |           | All  |
| <b>Introduction to waste management</b>                |  | <b>10.00</b> | <b>30</b> |  |
|  | General information on waste logistics   |              | 30        | Trainer: presentation with slides (projector)  |
| <b>Coffee break</b>                                    |  | <b>10.30</b> | <b>30</b> |  |
| <b>Group work participants</b>                         |  | <b>11.00</b> | <b>30</b> |  |
|  | Correct waste segregation <a href="#">(Exercise 1)</a>   |              | 30        | Group work: preparation and presentation   |
| <b>Waste logistics in practice</b>                     |  | <b>11.30</b> | <b>45</b> |  |
|  | Waste analysis – optimization potential  |              | 45        | Presentation by the trainer. Ask participants if they already have a functional waste logistics systems, where they see problems, etc. |
|  | Motivation and information on waste segregation: Waste guidelines  |              |           |  |
|  | Structure/implementation/design of waste logistics   |              |           |  |
| <b>Lunch</b>   |  | <b>12.15</b> | <b>75</b> |  |
| <b>Wake-up game</b>                                    |  | <b>13.30</b> | <b>10</b> |  |
|  | Standing in a circle, chairs are tipped and the participants have to "hand over" the chair to the next participant in the circle without letting it fall.                  |              |           | All, standing up and forming a circle.   |
| <b>Waste management legislation</b>                    |  | <b>13.40</b> | <b>20</b> |  |
|  | Information on waste-relevant requirements under national laws   |              |           | Presentation by trainer  |
| <b>Group work participants</b>                         |  | <b>14.00</b> | <b>60</b> |  |
|  | Waste management in view of legal compliance <a href="#">(Exercise 2)</a>  |              | 60        | Group work; presentation and evaluation using the flipchart  |
| <b>Break</b>   |  | <b>15.00</b> | <b>20</b> |  |
| <b>Recycling technologies</b>                          |  | <b>15.20</b> | <b>30</b> |  |
|  | General information on the state of the art of recycling technologies. Which types of waste can be recycled, what are the environmental advantages?                        |              | 30        | Presentation by the trainer – slides   |
|  | Waste segregation: which types of waste can be recycled by a nearby company?   |              |           |  |
| <b>Invited speaker: presentation on a biogas plant</b> |  | <b>15.50</b> | <b>50</b> |  |
|  | Presentation on a biogas plant: Operation and environmental advantages. The companies are invited to collect organic waste and deliver it to the biogas plant. Networking! |              |           | Lecture and presentation with slides   |
| <b>Discussion, continuation</b>                        |  | <b>16.30</b> | <b>30</b> |  |
|  | Discussion of the topics of the day, summary of major aspects, continuation of the work, explanation of training material and worksheets, homework                         |              | 30        | Plenary discussion   |
| <b>End</b>   |  | <b>17.00</b> |           |  |



| Explanation of the topics of the training course       |   |
|--|---|
| Topic  | Materials/teaching units/success indicators   |
| Introduction to waste management                       | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- <a href="#">Slides</a> stressing the advantages of correct waste segregation;</li><li>- <a href="#">Textbook</a> of the background material.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- General reference to cleaner production: waste is an undesirable output;</li><li>- Principle: Avoidance before recycling or before disposal!</li><li>- Reasons for waste management: Present the advantages of waste management, such as a clean company, calling card of the company and cost saving potential.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants can bring forward convincing arguments and benefits of waste management and recognize appropriate waste management as a first visualization of CP in their company.</li></ul> |
| Group work participants                                | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- <a href="#">Exercise 1</a>: Correct waste segregation.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Learning by doing (waste segregation);</li><li>- The participants receive waste guidelines, which they can use as basis for a company-specific waste guide;</li><li>- They can discuss with their colleagues how waste is correctly segregated.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants have acquired a good knowledge of the different types of waste.</li></ul>  |
| Waste logistics  | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- <a href="#">Textbook</a>, <a href="#">slides</a> and <a href="#">examples</a> of this volume;</li><li>- Own examples.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Introduction to the steps required for the implementation of waste logistics: Analysis – information and motivation – choosing suitable containers.</li></ul> <p><i>Success indicators:</i></p> <ul style="list-style-type: none"><li>- The participants know what to consider in a company's waste logistics;</li><li>- The participants want to improve the waste logistics in companies.</li></ul>   |
| Waste management legislation                           | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- <a href="#">Worksheets</a> and <a href="#">textbook</a> of the background material.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Introduce waste-relevant legislation.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants know the most important aspects regarding legal compliance.</li></ul>   |
| Exercise: Waste management in view of legal compliance | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- Background material <a href="#">Exercise 2</a> and <a href="#">worksheets</a> and <a href="#">textbook</a>.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Learn to work with the waste management catalogue containing the waste key codes;</li><li>- Learn to segregate non-hazardous and hazardous waste;</li><li>- Determine potential for optimization.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants know how to comply with the most important waste-relevant regulations.</li></ul>  |



| Explanation of the topics of the training course |   |
|--|---|
| Topic  | Materials/teaching units/success indicators   |
| Recycling technologies                           | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- <a href="#">Textbook and slides</a> of the background material.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Provide an overview of the manifold recycling technologies.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants get an overview of state-of-the-art recycling technologies.</li></ul>   |
| Invited speaker: biogas plant                    | <p><i>Materials:</i></p> <ul style="list-style-type: none"><li>- The speaker's <a href="#">Slides</a>, background material from the <a href="#">textbook</a>.</li></ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"><li>- Information on a special recycling technology;</li><li>- Possible cooperation with the biogas plant.</li></ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"><li>- The participants initiate networking with recycling companies.</li></ul> |