

## 9 Teacher's notes – Volume 9 – Audits

The ninth volume of the UNIDO Cleaner Production Toolkit focuses on audits. It introduces the method of auditing a company to identify cleaner production options during a site visit and develop an action plan including the definition of priorities. The theory of auditing is also explained, and examples, exercises and worksheets are provided.

The background material can be used as described below.

| Use of the background material "Audits"                 |  |
|---|--|
| Material  | Comment  |
| <b>Textbook</b>   | The textbook provides basic information on auditing, the choice of auditors, the planning of an audit and the corresponding auditing report. The trainer should be familiar with these topics before starting the training course or workshop. The textbook itself can be distributed as training material to the participants.  |
| <b>Examples</b>   | The example of identifying water spillage from a hose illustrates that the audit should contribute actively to improving the environmental performance of a company by identifying weak points. Furthermore these observations should be translated into economic data by specifying costs and losses. Based on the example, a discussion of similar procedures could highlight the importance of good housekeeping measures during a company audit. |
| <b>Exercises</b>  | The exercise called "Chinese whispers" illustrates the difficulties involved in communicating ideas.   |
| <b>Slides</b>   | The slides can be used for the introductory presentation on cleaner production audits. They provide an overview of the elements of a cleaner production audit, the organization of an in-house audit and main considerations for a walk-through inspection of a company.   |
| <b>Worksheets</b>                                       | <i>Worksheet 9-1 Audit form</i> can be used to document the questions asked during an audit, to document the responses and the identified options. House keeping, health and safety aspects should be considered during the inspection. The form can also be used during preparation for the audit to systematically prepare the questions.  |
| <b>Checklists</b>                                       | These very helpful and practical checklists describe in detail what the cleaner production auditor should examine and focus on, including water consumption, compressed-air systems, steam consumption, boilers and lighting. The checklists can be used as a basis for discussion as well as for planning the actual audit.   |
| <b>CP Award for Consultants, Trainers and Companies</b> | The CP award scheme was conceived by UNIDO to acknowledge the achievements of UNIDO's CP consultants, CP trainers and of companies with outstanding results. It is based on specific training and the completion of an in-plant assessment report for a CP audit. The forms for UNIDO's IPA report are included in the CP Award.   |



### Training course/Workshop

Cleaner production auditing can be learned in a one-day training course consisting of a theoretical input in the morning and practical auditing in the afternoon. Alternatively the training can be extended to two days, comprising half a day of theoretical input, preparation for the audit during the first afternoon, and the actual audit and the wrap-up session on the next day. The schedule provided on the next page is designed for a one-day training course. The second table comprises the suggested materials, learning objectives and success indicators for the different teaching units. Ideally this course should include on-site training in a real company as an example and object of study for the participants. The participants of the workshop or training course on "Audits" are consultants or trainers.

### Example schedule for a one-day training course in cleaner production auditing

| Topic   | Content  | Time         | Min.       | Method  |
|---|--|--------------|------------|---|
| <b>Welcome</b>  |  | <b>9.00</b>  | <b>15</b>  |   |
|   | Participants' welcome<br>Programme of the day, organizational matters  |              | 5<br>10    | Short presentation using a flipchart. The use of a flipchart has proven effective because it is more personal and gives the impression of a workshop rather than using PowerPoint and a beamer. |
| <b>Introduction to the concept of CP auditing</b>       |  | <b>9.15</b>  | <b>60</b>  |   |
|   | Elements of auditing.  |              | 60         | Presentation by an expert, using an overhead projector or beamer (textbook, slides).  |
| <b>Coffee break</b>                                     |  | <b>10.15</b> | <b>15</b>  |   |
| <b>Brief exercise</b>                                   |  | <b>10.30</b> | <b>45</b>  |   |
|   | Evaluation of the amount of water lost by a running hose. Interactive exercise with the participants. They are equipped with a bucket and a stopwatch and have to evaluate the volume of water lost through a running hose. (Example 9-1). |              | 30         |   |
|   | Evaluation   |              | 15         |   |
| <b>Additional aspects of auditing and communication</b> |  | <b>11.15</b> | <b>15</b>  |   |
|   | Presentation on the characteristics of an audit, question techniques, formal and informal types of information   |              | 15         | Presentation by an expert using slides (slides) and beamer.   |
| <b>Brief discussion</b>                                 |  | <b>11.30</b> | <b>15</b>  |   |
|   |  |              | 30         | Plenary discussion  |
| <b>Exercise communication</b>                           |  | <b>11.45</b> | <b>45</b>  |   |
|   | Presentation of the task, group work, Chinese whispers, analysis of the results (Exercise 9-1)   |              | 30         |   |
|   | Evaluation   |              | 15         |   |
| <b>Lunch</b>  |  | <b>12.30</b> | <b>60</b>  |   |
| <b>Group work: Preparation of the audit</b>             |  | <b>13.30</b> | <b>30</b>  |   |
|   |  |              | 30         |   |
| <b>Auditing the selected sector of the company</b>      |  | <b>14.00</b> | <b>120</b> |   |
|   |  |              | 120        | Walk-through inspection, use various checklists, examples (checklist)   |
| <b>Discussion and evaluation</b>                        |  | <b>16.00</b> | <b>60</b>  |   |
|   | Discussion of the results and conclusions, discussion of the topics of the day, summary of major aspects, continuation of the work, explanation of training materials and worksheets, homework, organizational matters                     |              | 60         |   |
| <b>End</b>  |  | <b>17.00</b> |            |   |

| Explanation of the topics of the training course |   |
|--|---|
| Topic  | Materials/teaching units/success indicators   |
| Introduction to CP auditing                      | <p><i>Materials:</i></p> <ul style="list-style-type: none"> <li>- Slides from the background material;</li> <li>- Textbook of this volume and also from the previous volumes.</li> </ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"> <li>- Make the participants familiar with the concept of CP auditing;</li> <li>- Provide an overview of the topics to be covered;</li> <li>- Provide an overview of the factors influencing the success of an audit as an instrument of continuous improvement.</li> </ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"> <li>- The participants have an overview of the concept of CP auditing and are able to plan a CP audit for any company using the worksheets and checklists.</li> </ul>   |
| Group work participants                          | <p><b>Example 1 (Example 9-1):</b></p> <p><i>Materials:</i></p> <ul style="list-style-type: none"> <li>- Bucket, stopwatch, hose.</li> </ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"> <li>- Indicate how key environmental data can be collected on site when no data are available, how they can be translated into monetary units (costs, savings) and presented in a way to trigger action in the form of preventive measures.</li> </ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"> <li>- The participants can use the method of identifying water losses on their own in a company.</li> </ul> <p><b>Exercise 1 (Exercise 9-1):</b></p> <p><i>Materials:</i></p> <ul style="list-style-type: none"> <li>- Description of the task.</li> </ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"> <li>- Collecting information by effective communication and understanding the necessity for feedback.</li> </ul> <p><i>Success indicator:</i></p> <ul style="list-style-type: none"> <li>- The participants can plan effective communication during an audit.</li> </ul> |
| In-house work                                    | <p><i>Materials:</i></p> <ul style="list-style-type: none"> <li>-</li> </ul> <p><i>Teaching unit:</i></p> <ul style="list-style-type: none"> <li>-</li> </ul> <p><i>Success indicators:</i></p> <ul style="list-style-type: none"> <li>- Number of options generated during a CP audit;</li> <li>- Immediately after the training the identification of options contained in the checklist can be considered a success indicator. In future more options should be identified as the trained auditors learn to use their knowledge of best practice and best available technology, and to transfer their knowledge from one company to another and from one sector to another.</li> <li>- The quality of the audit reports can also be considered a success indicator. They should include key figures, describe the company, production input and output as well as material and energy efficiencies and relate them to basic, sector-specific benchmarks or benchmarks from publications.</li> </ul>  |