



Cleaner Production Toolkit

HOW TO USE THE TOOLKIT

The “Train the Trainer” Toolkit is designed for trainers in the field of cleaner production. It consists of the following information and 12 volumes (to open the documents just click).

UNIDO’s holistic and sectoral CP strategy



- 1. Introduction to cleaner production – CP Basics**
Eco-design/Life cycle analysis



- 2. Team, Policy and Motivation**



- 3. Material Flow Analysis**



- 4. Energy Flow Analysis**



- 5. Innovation, Creativity and Option Generation**



- 6. Green Procurement and Hazardous Materials**



- 7. Indicators and Environmental Controlling**



- 8. Waste Management and Recycling**



- 9. Audits**



- 10. Regional and National Networking**



- 11. From Cleaner Production to an Environmental Management System**



- 12. Hazard Analysis and Critical Control Points (HACCP)**

Links



Cleaner Production Toolkit

Each volume has the following structure:

- Teacher's notes – recommendations from experienced CP experts to teachers;
- Background material:

Textbook	Textbook with important background information;
Examples	Several examples with photos, diagrams and/or specific information;
Exercises	Several exercises or interactive training units with solutions and instructions;
Slides	Selected slides for presentation;
Worksheets	Worksheets for work in companies and/or workshops;
Checklist	Checklist for workshop and company work;
Questions	Questions with solutions to check that the participants have understood the subject.

The background material and teacher's notes are helpful tools for the trainer during training sessions or technical assistance at company level. The authors have used these materials in workshops with consultants or companies and achieved excellent results.

The teacher's notes and background material are based on the long-term experience that CP experts have acquired during many projects in different industrial sectors.

The authors believe that successful CP projects are based on a unique combination of training, interactive exercises, motivation of trainers, extensive experience as consultants, practical implementation of options, mutual learning and last but not the least on the fun factor of group work.



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Using the Toolkit for the design of CP projects and training courses

The Toolkit is a support to develop CP projects and carry out trainings.

- **CP project combined with training course**

The following table contains a proposal for a CP project combined with training courses, which has proven to be a successful and economic strategy, as several companies participate in the project and at the same time the concept of “training on the job” is applied. For more details on the training courses and company work, please refer to the respective chapters of the twelve volumes (teacher’s notes, textbooks, worksheets, checklists, etc.)

<p>CP project with the participation of consultants/CP experts and companies Several companies (5 to 15) from different or the same sector Duration: 9 to 12 months Important: Companies start the CP project together, the CP projects are implemented in parallel and joint training sessions are held.</p>	
<p style="text-align: center;">Training courses/workshops</p> <ul style="list-style-type: none"> ▪ 10 to 12 training sessions/workshops, e.g. a monthly meeting with all participants covering a half or full day; ▪ Alternative: 3 training blocks every 2 to 3 months for 2 to 3 days. ▪ Introduction to CP; ▪ Team, policy, motivation; ▪ Material flow analysis; ▪ Energy analysis; ▪ Waste management; ▪ Option finding, feasibility; ▪ Sustainable chemicals management; ▪ Eco-procurement; ▪ Indicators, environmental controlling; ▪ Environmental management systems, health and safety; ▪ Final report, presentation of results. 	<p style="text-align: center;">CP project, in-company work</p> <ul style="list-style-type: none"> ▪ Number of company visits and expert support depending on the skills of the expert and the involvement of the company; ▪ Minimum: 4 to 6 visits during the project. ▪ Company visits with staff and CP experts; ▪ Data assessment; ▪ Option finding/generation (company-specific); ▪ Evaluation; ▪ Implementation; ▪ Definition of a CP programme/environmental programme; ▪ ...
<p>T I M E</p>	
<p>Optional: Final presentation event Refer to the Guidelines for the UNIDO endorsed Cleaner Production Awards for Consultants, Trainers and Companies Public relations such as designing a brochure, media reports, etc.</p>	



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- **Training courses**

In the teacher's notes, one-day training workshops are described. The material in the Toolkit (examples, slides, exercises) can also be used for training units only. This training course can be designed as:

- Complete CP training course including all the volumes of the Toolkit (from three days up to three weeks);
- CP training course on specifically selected topics;
- Single training workshops on a specific topic (from one hour to two days).



Cleaner Production Toolkit

List of abbreviations

AD	Anaerobic digestion
BOD	Biological oxygen demand
BS	British Standard
CE	Communauté Européenne (a European safety standard)
CFC	Chlorofluorocarbon
CHC	Chlorinated hydrocarbon
CIP	Cleaning in place
CL	Chemical Leasing
COD	Chemical oxygen demand
CP	Cleaner production
ED	Eco-design
ELV	Emission limit value
EMAS	Eco-Management and Audit Scheme
EMS	Environmental management system
EST	Environmentally sound technology
HACCP	Hazard analysis critical control point
H&S	Health and safety
IMS	Integrated management system
IPPC	Integrated pollution prevention and control
IRR	Internal rate of return
ISO 14 000 (ff)	International standard for environmental management systems
ISO 9 000 (ff)	International standard for quality management systems
LCA	Life cycle analysis, life cycle assessment
LCT	Life cycle thinking
MCW	Maximum concentration at workplace
MEA	Multilateral environmental agreements
MFA	Material flow analysis
MLE	Medium-sized and large enterprise
MSDS - SDS	Material safety data sheet – safety data sheet
NCPC	National Cleaner Production Center
NGO	Nongovernmental organization
P2	Pollution prevention
PC	Personal computer
SCM	Sustainable chemicals management
SME	Small and medium sized enterprise
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization
WGK	Water danger/protection class



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List of major unit abbreviations

a	Year	
bar	Bar (pressure unit)	
°C	Centigrade	
c_p	Specific heat capacity in kJ/kg K	
d	Day	
g	Gramme	
h	Hour	
hl	Hectolitre = 100 litres	
Δh_v	Specific heat of evaporation (difference of enthalpy)	
J	Joule (energy unit)	
K	Kelvin	
kg	Kilogram	
kJ	Kilojoule (energy unit)	
kW	Kilowatt (power unit)	
kWh	Kilowatt hour (energy unit)	
l	Litre	
m	Mass unit, mostly in kg	
m^3	Cubic metre = 1 000 litres	
mg	Milligramme	
min	Minute	
MWh	Megawatt hour (energy unit)	
Nm^3	Norm cubic meter (volume at 0°C and 1.013 bar)	
pcs	Pieces	
s	Second	
t	Tonne	
ΔT	Temperature difference	
W	Watt (power unit)	
m	milli	times 1/1,000
k	kilo	times 1,000
M	Mega	times 1,000,000
G	Giga	times 1,000,000,000
MM	Million	times 1,000,000