



Pilot Programme for the Promotion of Environmental Management  
in the Private Sector of Developing Countries (P3U)



# Good Housekeeping Manual (GHK<sup>®</sup>)

September 2006

## Why did GTZ/P3U develop the 'Good Housekeeping Manual'?

1. The Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U), which was implemented (06/1996-09/2006) by the German Agency for Technical Co-operation (GTZ), has developed instruments for environmental management that are easy to apply, inexpensive, and suitable for use by micro, small- and medium-sized enterprises (SME) in developing and countries in transition. In discussions with experts, the importance of 'Good Housekeeping' has emerged as an excellent starting point for improving productivity and organisational efficiency, as well as environmental and economic performance of SME (and even big companies, supply chains or industrial clusters and areas). As to our knowledge there has no easy-to-use methodology for Good Housekeeping been available to SME, we developed in 1997 this Good Housekeeping Manual in co-operation with various experts (among others with Rachid Nafti, Joyce Miller, Christoph Vosseler, Christian Tebert, Petra Eimer-Kontny and the GTZ-P3U team, as well as the respective training courses (standard course: 3,5 days). Since June 2006, PREMAnet e.V. and the international network of PREMA trainers and consultants support GTZ in disseminating the GHK® methodology and the Profitable Environmental Management - PREMA® method all over the world.
2. Since 1997, the Manual has been used (to our knowledge( by entrepreneurs, consultants, trainers, business associations, economic and environmental promotion institutions, as well as universities and schools in Argentina, Bolivia, Brazil, Costa Rica, Cuba, Guatemala, El Salvador, Mexico, Nicaragua, Paraguay, Uruguay, Venezuela; China, Indonesia, Philippines, Sri Lanka, Thailand, Vietnam; Kenya, Uganda, South Africa, Zimbabwe; in the Near East (Jordan, Palestine, Syria); in Algeria, Morocco, Tunisia; as well as in Europe (Germany, Bulgaria, Croatia, Macedonia, Montenegro, Rumania and Turkey).
3. Based on the experience of industrialists and consultants as well as from training provided by GTZ-P3U and partners, the Manual has been revised several times, adding questions and a checklist that covers Work-place Safety and Occupational Health, as well as systematically integrating the "Non-Product Output" (NPO approach, the *triple win* (economic, environmental and organisational), and the PREMA® "cycle of change".
4. **ATTENTION: The GHK Guide used by SBA, Lausanne, e.g. in the DELTA programme, is one of the first, outdated versions which due to legal aspects cannot be denied to be used by SBA. However, the methodology used by SBA is not conform to GTZ-P3U quality standards and SBA acts in no way and nowhere with the support of GTZ, but on its own behalf.**
5. In addition to a general version of the Manual, several sector-specific Good Housekeeping manuals have been elaborated by GTZ-P3U, consultants, and local partners in Brazil, China, Croatia, India, the Philippines, Sri Lanka, Thailand, Mexico and Morocco for the following industries:
  - Bakeries / Cake Shops
  - Furniture Manufacturer
  - Car Garages
  - Hotels
  - Schools
  - Food Processing
  - Shoe Manufacturing
  - Construction Materials Manufacturing
  - Agricultural Companies
  - Rubber Industry
  - Tanneries
  - Print Offices
  - Laundries/Dry Cleaners
  - Offices

## For whom did GTZ-P3U develop the GHK® Manuals?

GTZ-P3U expects that also in future entrepreneurs, consultants and trainers will consider the Good Housekeeping Manuals a useful tool for integrating good housekeeping concepts into their business operations in order to enhance productivity and overall efficiency, reduce the negative environmental impact of production, and production costs and risks. Consultants, business associations, and institutions in the field of environment, quality, health and safety, SME promotion, ISO management systems (14000, 9000, SA 8000), management of supply chains, industrial clusters or parks or education and training may also find the Manuals a useful complement to existing tools, including "5 S", "Green Productivity", "Cleaner Production".

## Feedback and Training Courses

We would ask users to provide any type of feedback and case studies to GTZ-P3U / PREMAnet to further improve the Manuals (see case studies and format at the end of the Manuals you can also download ([www.premanet.net](http://www.premanet.net))). For training courses (standard training: 3,5 days, including application in the companies), please contact GTZ or PREMAnet.

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# PREFACE

The objective of this Manual is to enable micro, small and medium-sized enterprises (SME), and eventually also big companies, to identify strengths and optimisation potentials, its actual effects and causes, as well as inexpensive, easy-to-identify, common sense measures, These 'Good Housekeeping' type measures can be easily implemented to reduce production costs, enhance the company's overall productivity and organisational efficiency – by following the steps of the PREMA®-"Cycle of Change" of organisational development - and mitigate environmental impact and risk issues.

Good Housekeeping (GHK®) practices relate to a number of measures that deal with preventing the inefficient use and loss of raw materials, minimising off-specification products, trade returns, waste, conserving water, saving energy, preventing accidents, and improving the company's operational and organisational procedures. The implementation of these practices is relatively easy and fast, the cost is usually low, providing an attractive payback period. Thus, they are particularly suitable for SME or any type of company with a low level of resource efficiency .



This Manual is intended to be used by those individuals who are responsible for managing daily operations within SME, teams who steer improvement processes (e.g. ISO 14000), consultants who assist SME, big companies with low level of Good Housekeeping, or supply chains, as well as trainers who train staff from institutions, companies or consultants.



It is hoped that this Manual will enable managers to understand the main elements of Good Housekeeping, put in place the management procedures to integrate these practices into the daily operations of the business, and lay the ground for a more systematic approach to continuously improving the competitiveness and 'resource-efficiency' of their companies. We also hope that consultants will use this Manual to help managers to fulfil the above-mentioned tasks.



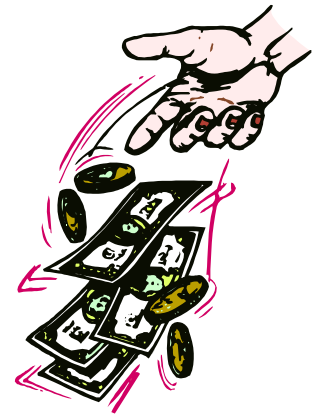
# 1 Introduction





## 1.1 Why and For Whom has This Manual been Developed ?

- specifically for small and medium-sized enterprises (SMEs)
- for use by Managing Directors, Operation Managers, Production Managers, and/or their Technical Staff, as well as Consultants who assist SMEs
- to be applied with very modest external support or consultancy (e.g. 1/2 to 1 day), if needed at all
- to be applied without major requirements of time and money; i. e. used by existing staff to go through a company's operations during 1/2 to 1 day
- to identify specific areas related to Good Housekeeping and the relevant actions that can be undertaken to achieve cost savings and reduce environmental impact
- to set priorities for further action
- to be used by companies as a modest management tool to track the actual results achieved
- to be built upon by more sophisticated tools of environmental management (such as environment-oriented cost management, quality and environmental or integrated management systems)
- to be introduced in companies and/or to consultants during a 1-3 day training, which includes a company visit and its evaluation and the planning of any follow-up steps.



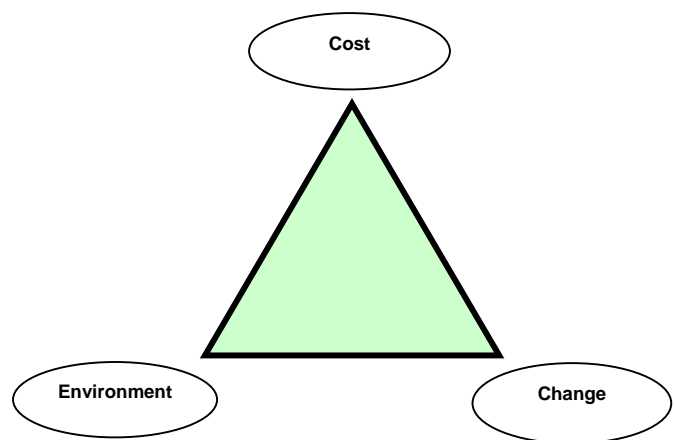
## 1.2 What is Good Housekeeping ?

Good Housekeeping refers to a number of practical measures based on common sense that enterprises can undertake immediately and on their own to improve their productivity, obtain cost savings, reduce the environmental impact of their operations, and improve organisational procedures and workplace safety. Thus it is a management tool for cost management, environmental management, and organisational change. When these areas are adequately taken into consideration, a “**triple win**” (economic, environment, organisation) can be achieved and a successful process of continuous improvement in the company can be established.

The three benefits of Good Housekeeping:

- **cost savings**
- **better environmental performance**
- **organisational improvements**

can be seen as a **triangle** with synergistic effects, allowing companies to tap into “triple win” options, which can lead to a process of continuous improvement .



Putting the concept of Good Housekeeping into practice means undertaking voluntary action aimed at:

- Rationalising the use of raw materials, water, and energy inputs, reducing the loss of valuable material inputs and therefore reducing operational costs
- Reducing the volume and/or toxicity of waste, waste water, and emissions related to production
- Reusing and/or recycling the maximum of primary inputs and packaging materials
- Improving working conditions and occupational safety in a company
- Making organisational improvements.

Hence, Good Housekeeping practices can provide a real economic asset and advantage for companies. For instance, minimising the use of raw materials, energy, and water, as well as waste and waste water, leads to cost reduction.

Furthermore, by adopting Good Housekeeping practices, enterprises can reduce the level of environmental impact created by the company. Thus, a company can improve its image – and that of its products – vis-à-vis customers, suppliers, neighbours, and regulatory authorities. In this respect, much can be accomplished at a low cost, or even through cost savings, and in ways that are easy for SMEs to implement.

The implementation of Good Housekeeping measures requires internal communication, motivating employees, and setting clear responsibilities. These aspects must be addressed as part of the implementation process, which can lead to organisational benefits that help a company to improve its performance in the longer run.

### **1.3 What is Needed to Implement Good Housekeeping ?**

#### *a) Common Sense and Willingness to Take Action*

Many measures suggested within the Manual are quite simple and based on common sense. As such, they do not require specific technical skills but rather, the motivation and willingness to change.

#### *b) Simple Actions*

The adoption of Good Housekeeping practices does not require major investments in cleaner technologies, which may be very costly, especially for a SME. Rather, the aim is to continuously improve production at a technical and organisational level through easy-to-implement and cost-effective measures, through a more rational use of resources, and by optimising production processes.

#### *c) Problem Awareness*

Companies need to take steps to draw the attention of their employees to problem areas and identify opportunities for them to take action.

#### *d) Information Gathering and Dissemination*

The effectiveness of Good Housekeeping actions can be enhanced by gathering information internally and by ensuring that there is good information dissemination within the company. In this respect, relevant and effective Good Housekeeping-procedures can be developed, followed, and integrated into the daily operations of the company.

#### *e) Organisational Culture*

Good Housekeeping is also related to changing behaviour and creating a culture of productivity. Involvement and motivation of personnel at all levels of the company can significantly enhance the implementation process.

## 1.4 Contents of the Checklists

This Manual is set up in the form of **Checklists** covering 6 areas. Each Checklist contains a series of questions that can be used to identify possible problems, their causes, and corrective measures that can be taken within an enterprise in the 6 areas related to Good Housekeeping, which include: Materials, Waste, Storage and Handling, Water and Waste Water, Energy, and Workplace Safety and Health Protection.

The 6 Checklists contain suggested measures related to:

### 1. Materials



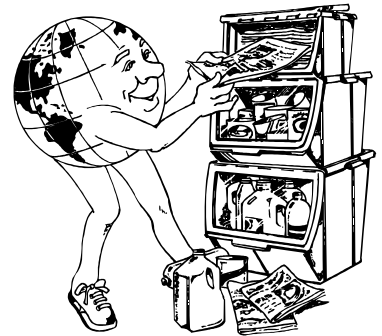
#### **Efficient Use of Materials and Assessment of Environmental Impact**

- Monitoring material consumption
- Performing regular loss assessments through all manufacturing and processing steps
- Avoiding losses due to spillage and leakage
- Establishing preventive maintenance programmes
- Substituting and/or reducing the use of materials harmful to the environment (e.g. cleaning agents, disinfectants, leaded fuel)

## 2. Waste

### Reduction, Reuse, Environmentally-Sound Recycling, and Treatment of Waste

- Monitoring waste quantities and qualities
- Segregating and collecting waste according to different categories
- Avoiding / reducing wastes (including packaging waste)
- Reusing waste materials and by-products back in a company's own production process
- Recycling / selling certain wastes (e.g. paper, glass, plastic, aluminium, steel, etc.)
- Properly disposing of waste that can not be reused or recycled





### 3. Storage and Handling of Materials

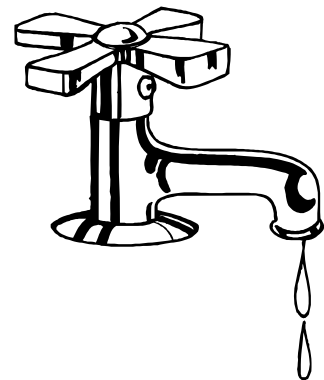
#### Appropriate Storage, Handling, and Transport of Materials

- Monitoring the quality of purchased raw materials
- Ensuring proper handling and storage of purchased raw materials and manufactured products
- Applying the first-in-first-out principle
- Establishing adequate, secure, and controlled storage for hazardous materials
- Handling dangerous substances with care
- Properly cleaning and disposing of packaging materials

### 4. Water and Waste Water

#### Reduction of Water Consumption, Waste Water, and Pollution

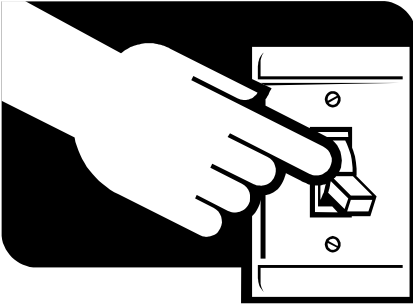
- Monitoring water consumption and quality
- Reducing water consumption in manufacturing processes and other areas
- Avoiding spillage and leakage
- Reusing and/or recycling suitable water sources
- Reducing waste water pollution
- Treating waste water in an environmentally-sound way



## 5. Energy

### Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy

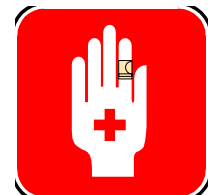
- Monitoring energy consumption
- Reducing energy consumption and costs
- Avoiding energy losses and optimising electrical installations
- Recuperating and reusing energy
- Operating electrical equipment (for lighting, heating, cooling, freezing, air-conditioning) in an energy-efficient way
- Implementing a preventive maintenance programme for equipment
- Purchasing energy-efficient equipment
- Dealing adequately with black-outs



## 6. Workplace Safety and Health Protection

### Protection against Accident, Hazardous Substances, Odours, Noise, and Injury

- Minimising the risk of accident and fire
- Providing sufficient provisions in case of accident and fire
- Creating a safe work environment for employees
- Supplying and properly maintaining personal protection equipment
- Using harmful substances with care
- Reducing health risks to workers
- Controlling air emissions
- Minimising odours
- Lowering noise levels



## 1.5 Using the Checklists

The Manual's **6 Checklists** are set up in the same format for each Good Housekeeping area. There are:

- **Key questions** that can help you to identify Good Housekeeping opportunities in your enterprise.
- A list of **sub-questions** that help draw your attention to different possibilities for action in each area.
- A column entitled **Observations** where you can make note of additional information concerning specific aspects of your enterprise, which may help you to answer the key questions.

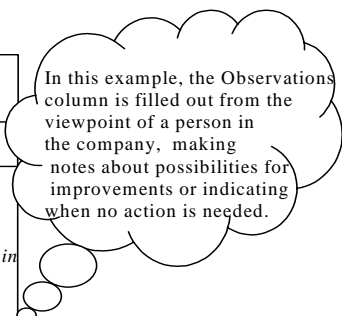
In going through a company's operations – following the flow of materials from the storage department through production steps to the final product – opportunities for the implementation of Good Housekeeping measures can be identified.

Each of the Manual's Checklists is summarised in a "mindmap" that points out the relevant topics that should be considered while doing this initial walk-through of the company. The "mindmaps" provide a structured approach for this overall assessment step by guiding you through the relevant topics in the different areas of a company. Notes can also be recorded along the way.

After doing this initial walk-through, the Checklists can be analysed in greater detail vis-à-vis the company's operations. First, analyse the sub-questions using the Observations column in the Checklists to note down any relevant comments that can help you to determine whether there is an opportunity to take action with respect to the key question. Then answer the key question on an overall basis by checking the appropriate box.

Example from Checklist 3: Storage and Handling of Materials

Objective: <b>Appropriate Storage, Handling, and Transport of Materials</b>	
Actions to consider	Observations
<p><b>Can you avoid losses of raw materials during storage?</b>  <input type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you ensure that the packaging of materials is not damaged during storage?</li> <li>• Do you avoid keeping unnecessarily large quantities of stock on hand?</li> <li>• Have you verified the expiration dates for all raw materials to avoid having inputs that are no longer useable?</li> <li>• Do you carry out regular checks and keep written records?</li> <li>• Have you instructed employees to use raw materials on a first-in first-out basis?</li> </ul>	<p><b>First, analyse the sub-questions then, answer the key question</b></p> <ul style="list-style-type: none"> <li>- I will check materials packaged in paper and plastic to see if there are losses</li> <li>- for some materials, we order large quantities; we could ask for smaller orders in future</li> <li>- we use perishable inputs very quickly so expiry dates are not an issue for our operation</li> <li>- we started making an inventory record system last month and it's working well</li> <li>- good idea; I must emphasize this point to our employees</li> </ul>



In this example, the Observations column is filled out from the viewpoint of a person in the company, making notes about possibilities for improvements or indicating when no action is needed.



By assessing the operations of a company vis-à-vis the **Checklists** in this manner, a rapid analysis of the enterprise's strengths and weaknesses can be made with respect to Good Housekeeping.

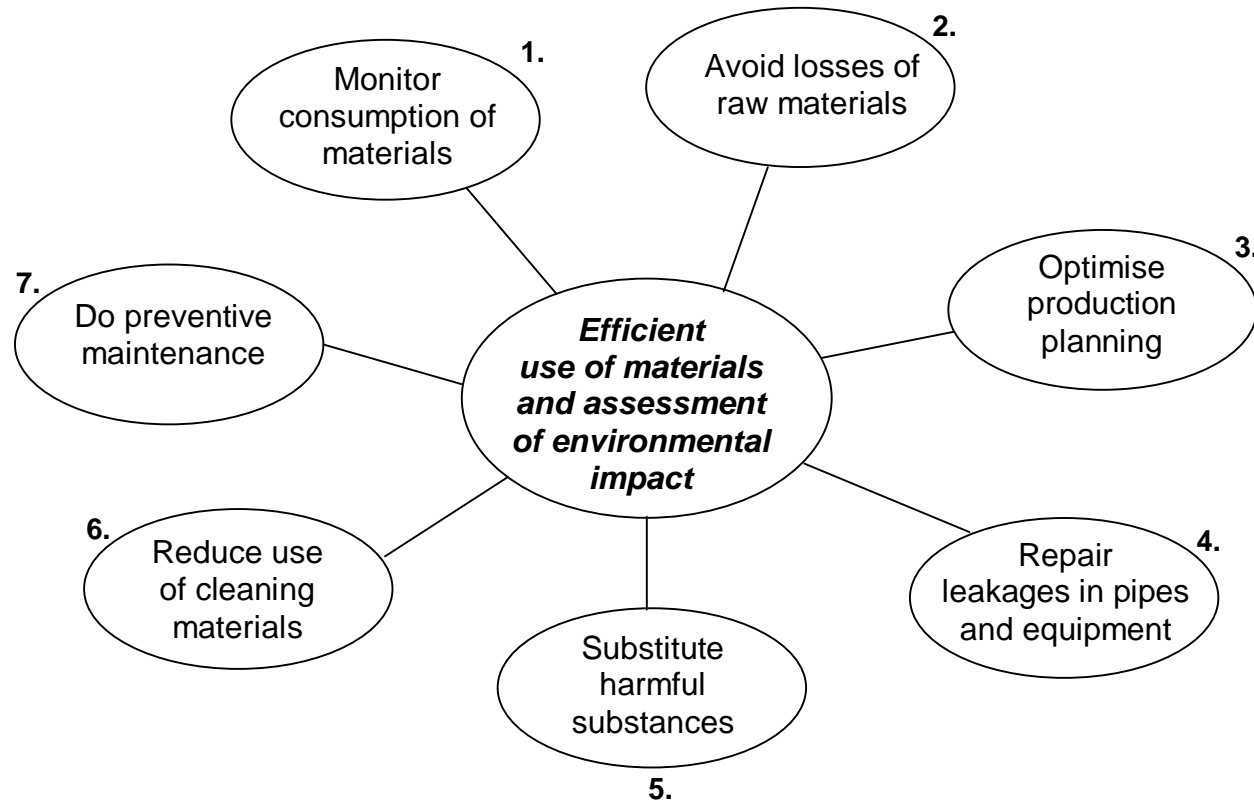
Based on this analysis, the weaknesses can be addressed in a more structured way by establishing and implementing an **Action Plan** (see *Chapter 3.2*).



## **2 Checklists to Identify Good Housekeeping Measures**



## Checklist 1: Materials





## Checklist 1      Materials

Objective: <b>Efficient Use of Materials and Assessment of Environmental Impact</b>	
Actions to consider	Observations
<p><b>Do you <u>monitor</u> the <u>consumption</u> of materials in your enterprise?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you have written accounts specifying the type, quality, quantity, and costs of primary products, ingredients, and additives used each month in production operations?</li> <li>• Have you looked at ways to reduce the consumption of these materials in order to reduce production costs?</li> <li>• Do you avoid excessive buying of raw materials?</li> <li>• Do you keep stocks and inventories at levels based on your actual production needs?</li> </ul>	
<p><b>Have you taken measures to avoid unnecessary <u>losses</u> of raw materials <u>during production</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you keep only the quantity of inputs in or at the workplace that are required for daily or batch use?</li> <li>• Do you place all raw materials packaged in paper on wooden or plastic pallets in production areas to protect the materials from any floor water and ground level humidity?</li> </ul>	
<p><b>Have you investigated opportunities to optimise <u>production planning</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you thought about dedicating certain equipment to producing only one product?</li> <li>• Do you maximise the number of same products produced (e.g. by working one day or one week on one process or one production line, and then switching)?</li> </ul>	

## Checklist 1      Materials

<b>Objective:      Efficient Use of Materials and Assessment of Environmental Impact</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you repaired all <u>leakages</u> in pipes and equipment?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you make a regular (e.g. monthly) visual assessment of all pipes, ducts, and equipment to identify leakages?</li> <li>• Have poor seals been replaced?</li> <li>• Have you undertaken all necessary repairs using appropriate materials?</li> <li>• Have you monitored the repairs to ensure that the leakages have been eliminated?</li> </ul>	
<p><b>Have you established a <u>preventive maintenance plan</u> for your equipment to avoid material losses?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you have a list or map of all equipment, noting their location, characteristics, and maintenance schedules?</li> <li>• Have you established maintenance schedules for all equipment that needs to be serviced?</li> <li>• Do the maintenance schedules include responsibilities, intervals, and procedures to be followed when repairs are required (e.g. leakage check of all closed systems like pipes for liquids or air, regular cleaning of ventilation equipment and change of filters in air conditioning / cooling systems to prevent unpleasant odours and discharge of bacteria)?</li> <li>• Are the maintenance s provided by equipment suppliers kept in a convenient place?</li> <li>• Do you provide employees with regular training to ensure that manufacturer recommendations are followed?</li> <li>• Do you regularly check compliance with the maintenance schedules?</li> </ul>	

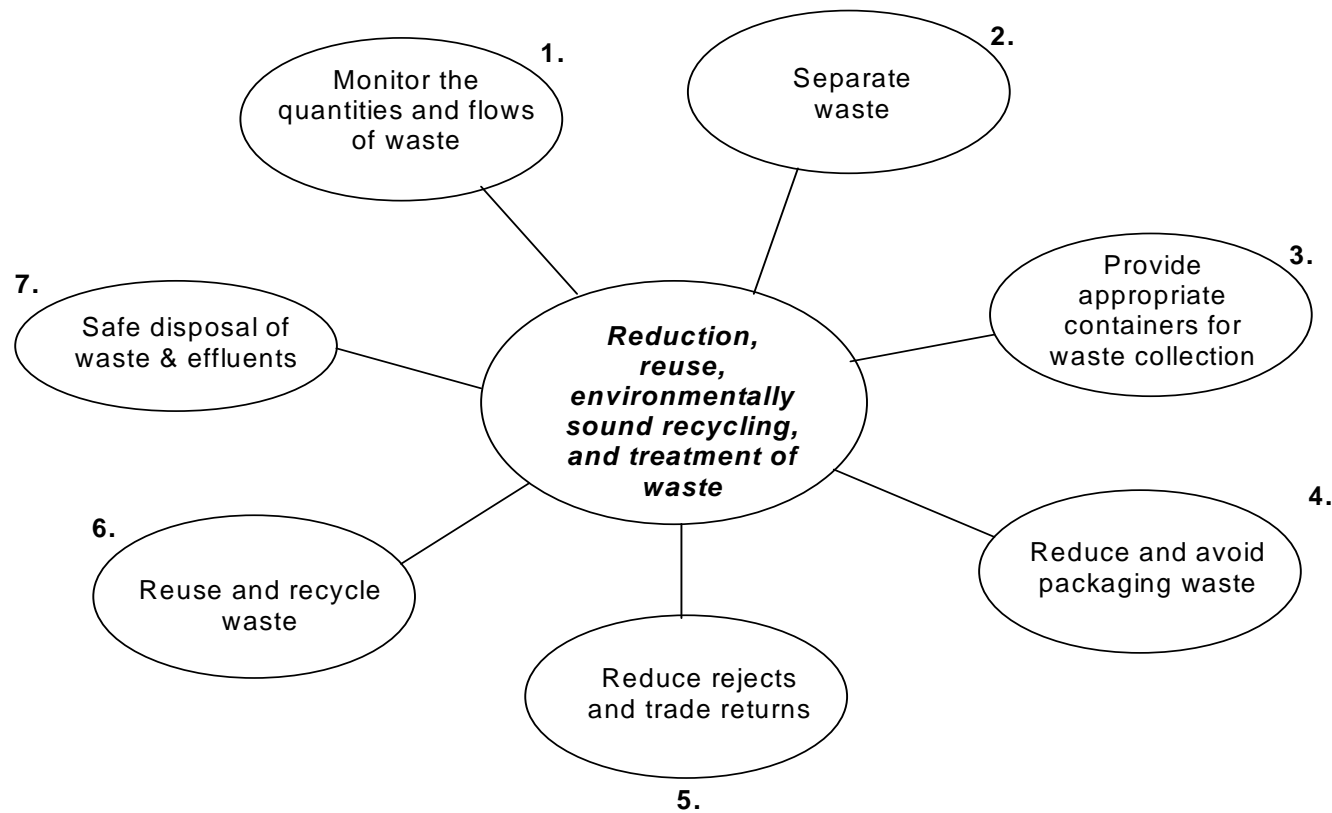


## Checklist 1      Materials

Objective: <b>Efficient Use of Materials and Assessment of Environmental Impact</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Can you <u>substitute harmful substances</u> with less harmful products or methods?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you completely avoid the use of banned substances, replacing these with more environmentally-friendly alternatives?</li> <li>• In choosing detergents and cleaners, do you try to select products that are biodegradable (i.e. those that do not contain phosphates, chlorine, and /or chlorine oxide)?</li> <li>• Do you use lead-free petrol in your delivery and transport vehicles (e.g. forklifts, small trucks, etc.)?</li> <li>• Do you encourage employees to make suggestions for improvements that could lead to a reduction in the consumption of materials as well as a reduction in environmental and health risks?</li> </ul>	
<p><b>Do you try to reduce the use of <u>cleaning materials</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you checked into the option to purchase concentrates instead of ready-made solutions?</li> <li>• Have you verified whether satisfactory cleaning results can be obtained when using less cleaning agents than the dosage recommended by the manufacturer?</li> <li>• Have you posted dosage instructions on cleaning products at locations where they are routinely used?</li> <li>• Do you use effective but environmentally-sound disinfectants?</li> <li>• If you use detergents and disinfectants, do you use these as sparingly as possible?</li> <li>• Do you avoid using chemicals for the cleaning of discharge pipes, using suction bells and/or pipe coils instead?</li> </ul>	



## Checklist 2: Waste





## Checklist 2      Waste

<b>Objective:</b> <b>Reduction, Reuse, Environmentally Sound Recycling, and Treatment of Waste</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you <u>monitor</u> the <u>quantities</u> of waste produced within your enterprise?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you examined the major sources of waste and where these sources occur throughout the production process?</li> <li>• Do you know the overall quantity and composition of waste generated by your enterprise each month?</li> <li>• Do you know your monthly costs for waste disposal?</li> </ul>	
<p><b>Have you established a <u>waste separation</u> system?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you avoid mixing together different flows of waste, which may be more difficult to treat as a whole?</li> <li>• Have you taken measures to ensure that organic wastes are collected separately from other wastes (e.g. packaging) to allow a separate treatment?</li> <li>• Do you keep hazardous waste separated from other waste to avoid contamination and the creation of an even larger amount of dangerous waste?</li> <li>• Do you separate liquid waste from solid waste?</li> <li>• Do you collect and remove waste as often as possible from production areas and temporarily store this waste in a specially-designated place until final removal and disposal?</li> </ul>	

## Checklist 2      Waste

Objective: <b>Reduction, Reuse, Environmentally Sound Recycling, and Treatment of Waste</b>	
Actions to consider	Observations
<p><b>Have you provided appropriate <u>containers</u> for the collection of waste?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you provided designated containers in sufficient numbers and the appropriate sizes for the different types of waste that could be collected separately (e.g. paper, glass, tins, plastic, etc.)?</li> <li>• Are all waste containers uniformly marked according to their targeted use (by using colour coding, labels, and obvious symbols)?</li> <li>• Can employees easily access the needed containers?</li> <li>• Have you informed employees about the need to separate waste, as well as the objectives and results achieved?</li> <li>• Do you encourage personnel to make suggestions for improvements in the waste separation system?</li> </ul>	
<p><b>Have you examined possibilities to avoid or reduce <u>packaging waste</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you asked suppliers whether raw materials could be purchased with less packaging?</li> <li>• Have you checked possibilities to reduce the packaging of your own products?</li> <li>• Have you checked all containers to see whether 1-way containers could be replaced by the use of returnable containers?</li> <li>• Have you examined the possibilities to buy certain products in larger containers (e.g. cleaning agents)?</li> <li>• Have you investigated options to reuse packaging material for other purposes within your own operations?</li> <li>• Do you repair and re-use transport pallets for storing and/or protecting your own raw materials from floor water?</li> </ul>	

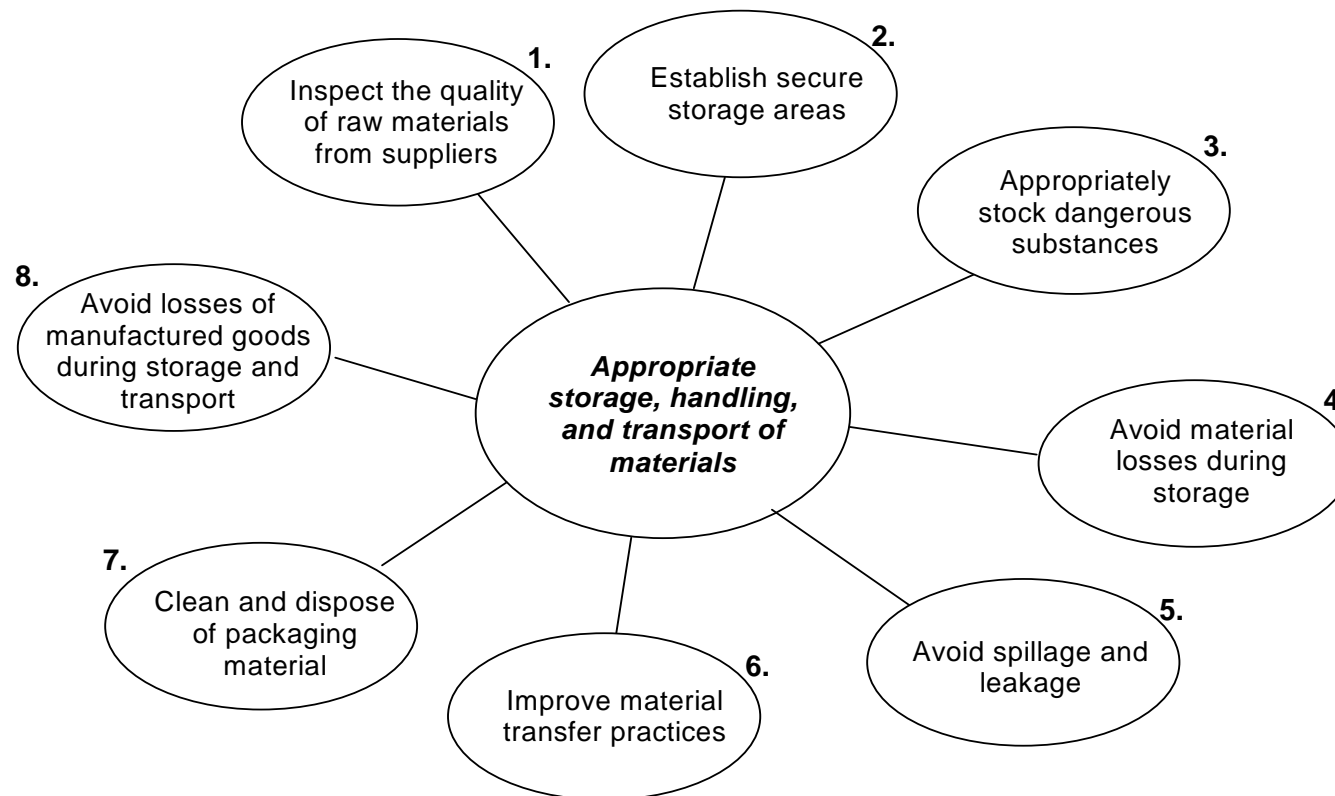
## Checklist 2      Waste

Objective: <b>Reduction, Reuse, Environmentally Sound Recycling, and Treatment of Waste</b>	
Actions to consider	Observations
<p><b>Have you examined possibilities to <u>reduce rejects and returns</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you carry out quality checks after each processing step to correct errors and reduce rejects and material losses?</li> <li>• Do you know the level of product returns, and have you made efforts to reduce this level, while also improving customer satisfaction?</li> </ul>	
<p><b>Have you looked at ways to <u>reuse and/or recycle</u> wastes from your enterprise?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you investigated options to reuse waste materials or by-products in different phases of your production process?</li> <li>• Have you studied the possibility to regenerate any solvents used in the production process in order to recover valuable material?</li> <li>• Have you tried to sell your non-product output (waste) to other enterprises for use in their production processes?</li> <li>• Have you checked the possibility to sell your organic wastes for use as compost or fodder?</li> <li>• Have you checked the possibility to sell certain wastes (e.g. paper, cardboard, plastics, aluminium, glass, textiles, steel, etc.) to recyclers?</li> </ul>	
<p><b>If waste cannot be recycled or reused, is it <u>disposed of</u> without causing risk?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you have any information regarding the safety and environmental soundness of the landfill(s) in which your wastes are disposed?</li> <li>• Have you checked options to submit non-reusable and non-recyclable waste to a landfill site that is covered and particularly protected from seepage into groundwater?</li> </ul>	





## Checklist 3: Storage and Handling of Materials





### Checklist 3      Storage and Handling of Materials

<b>Objective:      Appropriate Storage, Handling, and Transport of Materials</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you inspect the <u>quality</u> of raw materials and primary products upon <u>receipt</u> from suppliers?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Is the packaging of raw materials checked for damage upon arrival to ensure that the contents are secure?</li> <li>• Do you return poorly packaged or deteriorated materials to suppliers?</li> </ul>	
<p><b>Have you created a <u>secure storage</u> area for <u>dangerous substances</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you store all chemicals in one central place so that you can closely monitor their use, and limit and control access to this area?</li> <li>• Do you stock hazardous substances in a designated area that is physically separated from production areas and/or workshops that contain potential sources of ignition (e.g. generators, transformers, equipment)?</li> <li>• Is the floor of areas where hazardous chemicals are stored made of non-permeable material (e.g. cement, concrete) to prevent the contamination of soil and groundwater in case of a spill?</li> <li>• Is the floor of the chemical store flat to allow easy handling of chemical containers to prevent spills?</li> <li>• Is sufficient ventilation provided to keep humidity, temperature, and the concentration of fumes and vapours at a low level?</li> <li>• Have warning signs describing precautionary and preventive measures been posted in areas where hazardous chemicals are stored?</li> <li>• Are there at least 2 clearly marked exits (e.g. doors, windows) that are always accessible (i.e. not blocked by materials or locked)?</li> </ul>	

### Checklist 3      Storage and Handling of Materials

Objective: <b>Appropriate Storage, Handling, and Transport of Materials</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you established an <u>appropriate stocking</u> system for dangerous substances?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you respect the stocking conditions recommended on the Material Safety Data Sheet (MSDS) available from suppliers for each chemical that you have on hand?</li> <li>• Do you stock chemicals in compatible groups to avoid the possibility that their vapour/gas could react together and form hazardous mixtures that could lead to ignition, fire, or explosion?</li> <li>• Do you ensure that flammable substances (e.g. organic solvents) are not exposed to direct sunlight in order to avoid self-inflammation?</li> <li>• Do you regularly inspect and keep the storage area clean to avoid any contamination of raw materials?</li> <li>• Do you ensure that all substances are properly labelled to prevent any mistakes on the part of workers?</li> <li>• Have containers holding toxic substances been marked with the appropriate symbols (e.g. flame symbol for flammable substances, St. Andrew's Cross for toxic substances)? <i>Refer to Annex I</i></li> <li>• For any unlabelled or unknown substances, have you sent a sample to a local laboratory for identification, and then used or disposed of the material properly?</li> </ul>	
<p><b>Can you <u>avoid losses</u> of raw materials during <u>storage</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you ensure that the packaging of materials is not damaged during storage?</li> <li>• Have you verified the expiration dates for all raw materials to avoid having inputs that are no longer usable?</li> <li>• Do you carry out regular checks and keep written records?</li> <li>• Do you avoid keeping unnecessarily large quantities of stock on hand?</li> <li>• Have you instructed employees to use raw materials on a first-in-first-out basis?</li> </ul>	

**Checklist 3****Storage and Handling of Materials**

<b>Objective:           Appropriate Storage, Handling, and Transport of Materials</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you taken measures to <u>avoid spillage</u> and <u>leakage</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"><li>• Have you instructed workers to avoid using the same tools (e.g. scoops, cups, buckets) for measuring and removing chemicals in order to avoid contaminating stored materials?</li><li>• Are the lids and taps of containers tightly closed after removing materials from within to avoid leakage?</li><li>• Have you ensured that containers filled with hazardous substances cannot fall over?</li><li>• Have you stored drums containing hazardous chemicals on catchpits of the same or double volume to contain any accidental spillage and avoid contamination?</li><li>• If your enterprise is using organic solvents, have you stored these materials on metal catchpits to prevent contamination in case of accidental spillage?</li><li>• Have you instructed workers to immediately clean-up any chemical spills and report the incident to a supervisor?</li><li>• Have you thought about assigning only designated workers to handle chemicals so that these workers can be specially trained on the proper and safe handling of hazardous substances?</li><li>• Have you established responsibilities, maintenance routines, and intervals to ensure that tanks and containers are regularly checked for leakage?</li></ul>	

### Checklist 3      Storage and Handling of Materials

Objective: <b>Appropriate Storage, Handling, and Transport of Materials</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Can you <b>improve transfer practices to avoid losses</b>?</p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you considered placing chemical drums on an elevated rack and inserting a metal or plastic spout to safely transfer materials to smaller containers?</li> <li>• Do you ensure that smaller containers used to transfer chemicals are clearly labelled?</li> <li>• Do you avoid the carrying of chemicals in open containers?</li> <li>• Have you considered using pumps to dose chemicals in a closed system to avoid the loss of valuable materials?</li> <li>• Is a hand piston pump, siphon, or other low-cost device used to transfer liquid chemicals (e.g. acids) for dosing to avoid the distribution of vapours, spillage, and accident?</li> <li>• Are carts, trolleys, and other simple transport devices available to move materials to avoid accident &amp; spillage that could otherwise occur during manual handling?</li> <li>• Have you repaired uneven or damaged floor areas to ensure easy and fast transfer of materials and chemicals throughout production operations?</li> <li>• Have you thought about rinsing chemical containers with a small amount of water and adding this to the process in order to retrieve any remaining materials?</li> </ul>	

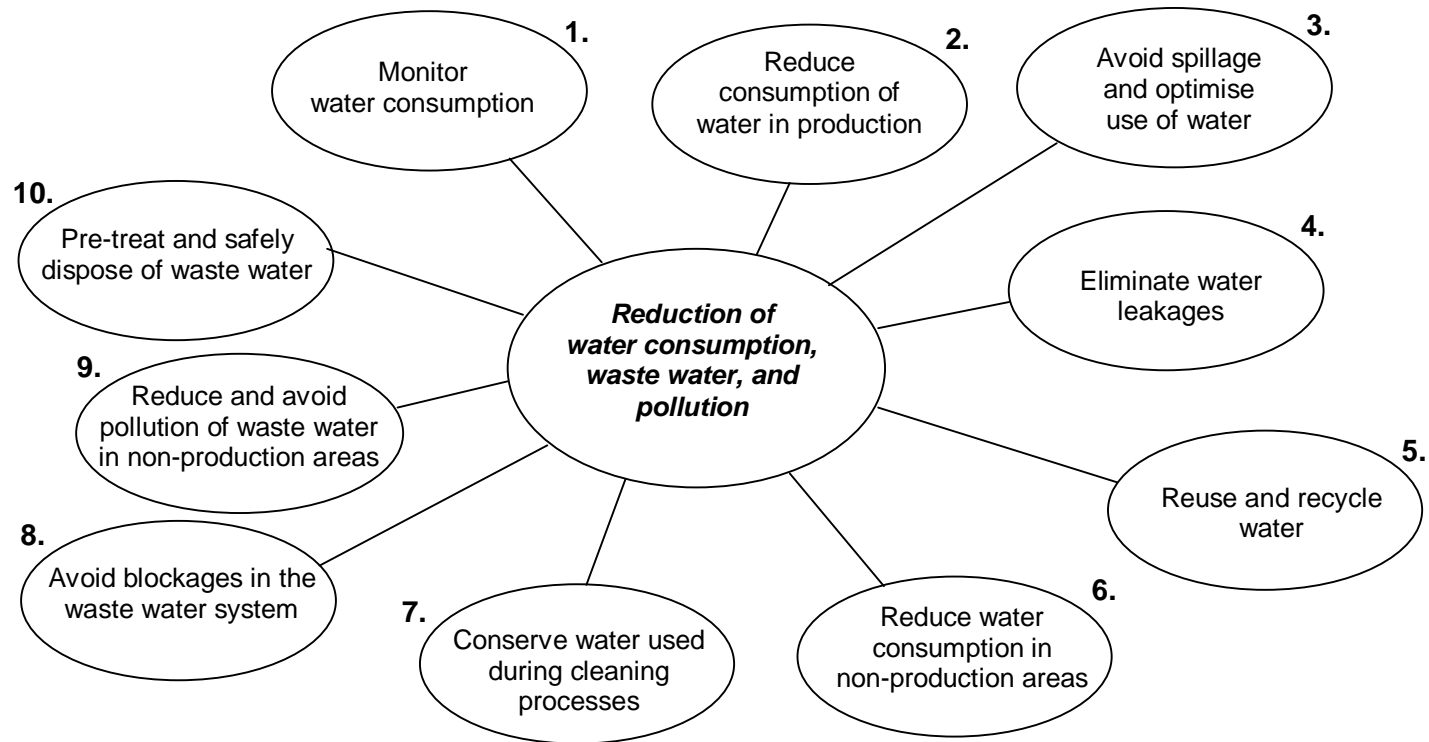
### Checklist 3      Storage and Handling of Materials

<b>Objective:      Appropriate Storage, Handling, and Transport of Materials</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you ensure proper <u>cleaning</u> and <u>disposal of packaging material</u> from dangerous substances?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you instructed workers to use only a small amount of detergent and water to clean containers (i.e. 2-4 litres of water for drums ranging up to 200 litres)?</li> <li>• Do you rinse chemical containers 3-4 times to ensure safe reuse or disposal?</li> <li>• If not further used in production, do you make sure that this rinse water is discharged to the effluent treatment system?</li> <li>• Do you absolutely avoid that empty chemical containers are used for the storage of drinking water or food?</li> <li>• Have you investigated the possibility to return empty chemical drums to the supplier for refill and reuse?</li> </ul>	
<p><b>Have you taken measures to <u>avoid losses</u> of your own <u>manufactured goods</u> during <u>storage and transportation</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are your raw materials and processed products stored in separate areas?</li> <li>• Have you established a maintenance schedule for regular cleaning (and disinfection, if required) of storage facilities?</li> <li>• Does your staff check manufactured products and their packaging for defects/problems prior to storage?</li> <li>• Have you taken measures to ensure that the packaging of your products cannot be damaged during storage and transportation?</li> </ul>	





## Checklist 4: Water and Waste Water





## Checklist 4      Water and Waste Water

<b>Objective:                      Reduction of Water Consumption, Waste Water, and Pollution</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you <u>monitor</u> water <u>consumption</u> in your enterprise?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you know the quantity of water consumed per month?</li> <li>• Do you know the quantity and composition of waste water generated by your enterprise each month?</li> <li>• Have you got this data for specific production areas or steps that are high consumers of water or responsible for a major portion of waste water generation?</li> <li>• Do you know the costs charged to you for water and waste water each month?</li> </ul>	
<p><b>Have you examined possibilities to <u>reduce</u> water consumption in your <u>production processes</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you eliminated all excessive washing and rinsing between process steps?</li> <li>• Could you use closed systems and/or batch washing to reduce water consumption?</li> <li>• Can you avoid continuous rinsing with water by using still baths?</li> <li>• Have you informed your personnel about what is or what could be achieved by reducing water consumption?</li> <li>• Do you encourage employees to make suggestions for conserving water?</li> </ul>	

## Checklist 4      Water and Waste Water

<b>Objective:                      Reduction of Water Consumption, Waste Water, and Pollution</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you actively taken measures to <u>avoid spillage</u> and optimise water use?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are water tanks used in the production process visually monitored on a regular basis to avoid spillage?</li> <li>• Have you considered using inexpensive automatic flow controllers in containers that need to be filled with water to ensure there is no overflow?</li> <li>• Do you regulate water pumps and pipes so that the water flow is matched to your specific production needs?</li> <li>• Have you installed water measurement instruments in operations that have high water consumption to verify an efficient utilisation of water?</li> </ul>	
<p><b>Have you <u>eliminated</u> all sources of water <u>leakage</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you examined all water pipes for holes and made the necessary repairs?</li> <li>• Have you replaced poor seals on pipes?</li> <li>• Have you established maintenance routines including responsibilities and intervals for regular checks on leakage, as well as procedures to be followed when cleaning or repairs are required?</li> </ul>	

## Checklist 4      Water and Waste Water

<b>Objective:                      Reduction of Water Consumption, Waste Water, and Pollution</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Can you <u>reuse</u> and/or <u>recycle</u> water in your operations?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you determined the quantities, qualities, and locations of reusable water sources?</li> <li>• Have you verified that the reuse of such water will not harm the quality of your end product?</li> <li>• Have you checked possibilities to recycle at least part of the washing water (e.g. by using the waste water of a previous washing step again in the first step)?</li> <li>• Have you checked other possibilities to reduce or recycle water in other processing steps (e.g. by re-circulating cooling water)?</li> <li>• Have you thought about collecting and using rain water for toilet flushes or watering of garden areas?</li> </ul>	
<p><b>Have you examined possibilities to <u>reduce</u> water consumption in <u>non-production related areas</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you closed all running taps?</li> <li>• Have you sealed or removed any water taps that are not absolutely needed?</li> <li>• Have you installed inexpensive water-saving devices, where appropriate (e.g. aerators, flow constrictors)?</li> <li>• Have you posted signs near taps reminding workers to conserve water?</li> <li>• Have toilets been equipped with smaller water containers or water stop buttons including instructions?</li> </ul>	

## Checklist 4      Water and Waste Water

<b>Objective:                      Reduction of Water Consumption, Waste Water, and Pollution</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you taken steps to <u>conserve</u> water used during <u>cleaning</u> processes?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Rather than using running hoses to clean floors, have you instructed workers to use brushes and brooms as a first step for removing wastes and debris?</li> <li>• Have you considered installing small sinks so that workers do not use running hoses to do personal hygiene?</li> <li>• Have you instructed workers to use only a small amount of water to clean containers (i.e. 2-4 litres for containers ranging up to 200 litres)?</li> </ul>	
<p><b>Have you taken measures to avoid <u>blockages</u> of the <u>waste water</u> system?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you use screens to prevent solid wastes from entering waste water channels?</li> <li>• Do you regularly clean these screens to minimise clogging problems?</li> <li>• Have you installed a fat separator in drainage channels?</li> <li>• Have you instructed employees not to dispose of any fats or solid waste through the sewage system?</li> <li>• Have you established maintenance routines including intervals and responsibilities for regular checks of the fat separator, as well as procedures to be followed for cleaning drainage channels?</li> </ul>	

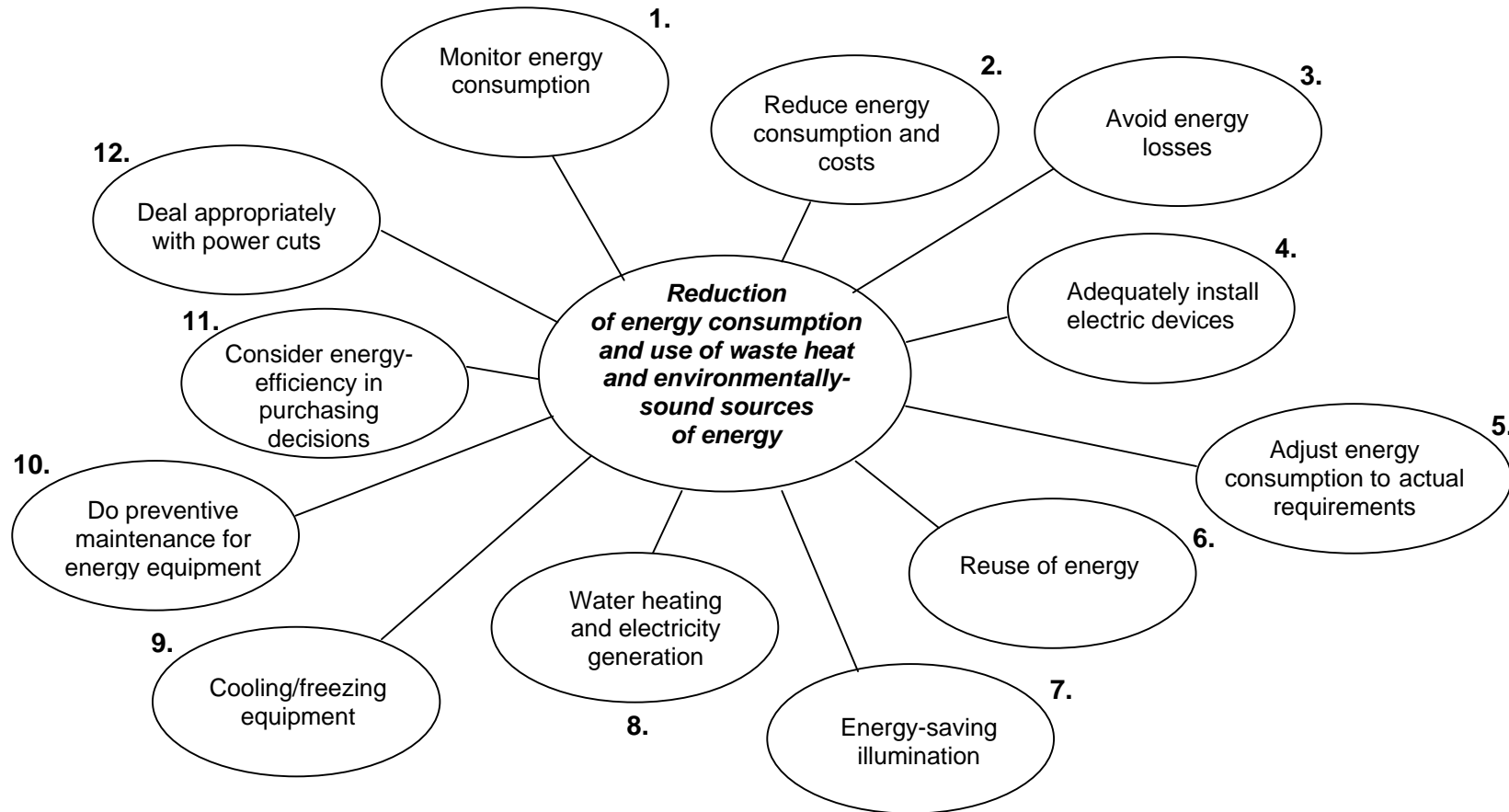
## Checklist 4      Water and Waste Water

<b>Objective:                      Reduction of Water Consumption, Waste Water, and Pollution</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you taken measures to avoid unnecessary <u>pollution</u> of waste water in <u>non-production related areas</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you posted instructions (in the local language or by using symbols) asking people not to throw waste into the toilets?</li> <li>• Have you placed waste containers near the toilets?</li> <li>• Are sanitary bags available in all toilets, and have ashtrays been installed in the urinals?</li> <li>• Do you avoid using deodorisers in toilets and urinals?</li> </ul>	
<p><b>Is waste water <u>treated</u> in an environmentally-sound way?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Is your enterprise connected to an appropriate public sewage system?</li> <li>• Is this public sewage system connected to an appropriate sewage treatment plant?</li> <li>• If you are not connected to a public sewage system, are you in compliance with the current legal standards for effluents?</li> <li>• If you are not connected to an appropriate public sewage system, have you checked possibilities to pre-treat waste water on your own premises (e.g. by using a biological cleaning process)?</li> <li>• If you have your own treatment plant, have you determined maintenance routines including responsibilities and intervals for regular checks of the treatment plant, as well as procedures to be followed when cleaning, sludge disposal, or repairs are required?</li> </ul>	





# Checklist 5: Energy





## Checklist 5      Energy

<b>Objective:                      Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you <u>monitor</u> energy <u>consumption</u> in your enterprise?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you know how much energy (e.g. electricity, gas, heating oil, petrol, etc.) is consumed overall each month, and how much is consumed in specific production areas and/or single manufacturing steps?</li> <li>• Do you know how much you pay on a monthly basis for each energy source?</li> </ul>	
<p><b>Have you examined opportunities to <u>reduce</u> energy <u>consumption</u> and costs?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you avoid running equipment when the machines are not in actual use for production?</li> <li>• Have you looked into the possibility to shift high energy-consuming production steps to off-peak tariff rates?</li> <li>• Can you use plastering or whitewashing to improve the light reflection of inside walls and (for warm climates) to improve heat reflection of outside walls and roofs?</li> <li>• Have you considered using radiant heat from machines and processes to warm the workplace in a cold climate?</li> <li>• Do you use shades for the wall openings to deflect heat from direct sunlight?</li> <li>• Have you considered planting trees and shrubs around the premises to provide natural shade and filter outside dust?</li> </ul>	

**Checklist 5      Energy**

<b>Objective:                      Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you taken steps to <u>avoid</u> energy <u>losses</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you verified that hot water pipes are sufficiently insulated to avoid energy losses?</li> <li>• Have you maintained good insulation of cold water pipes to ensure that cooling and air conditioning systems do not heat-up unnecessarily?</li> <li>• Do you maintain compressed air pressure pipes to avoid the loss of pressure?</li> <li>• Have you established maintenance routines including intervals and responsibilities for regular checks on leakage, as well as procedures to be followed when repairs are required?</li> </ul>	
<p><b>Are your <u>electric devices</u> adequately installed?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you installed adequate electrical cabling and wiring (especially in wet operation areas) to avoid any waste of electricity and damage to machines?</li> <li>• Have poorly-protected electric circuits been properly insulated to avoid losses?</li> <li>• Have all joints of electric circuits been properly connected in order to avoid losses?</li> <li>• Do the electric fittings correspond to the actual power requirements?</li> </ul>	
<p><b>Is your energy <u>consumption</u> adjusted to your <u>actual requirements</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Is the maximum temperature for your hot water supply limited to 60°C ?</li> <li>• Have you verified that your hot water storage container is not oversized?</li> </ul>	

## Checklist 5      Energy

<b>Objective:                      Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you looked at options for <u>reusing</u> energy generated within your operations?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you examined possibilities to reuse waste heat (e.g. for heating water)?</li> </ul>	
<p><b>Do you have adequate and energy-saving <u>illumination</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you buy energy-saving bulbs or fluorescent tubes and avoid the purchase of conventional electric light bulbs?</li> <li>• Do you provide sufficient lighting to reduce worker fatigue, eye strain, and headaches?</li> <li>• Do you keep windows clean at all times to reduce the need for artificial lighting?</li> <li>• Have you considered painting walls and ceilings in light colours to improve the distribution of natural light?</li> <li>• Have you asked employees to switch off the lights in areas that are not in use and at night?</li> <li>• Have you made an appropriate division of circuits so that it is possible to light only certain areas in rooms and halls instead of entire areas?</li> <li>• Have you considered installing an automatic movement detector for illumination (e.g. for corridors, rarely used rooms like storerooms, etc.)?</li> </ul>	

## Checklist 5      Energy

<b>Objective:                      Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Are your <u>water-heating</u> and <u>electricity generating systems</u> efficient and environmentally-sound?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you taken steps to maximise the combustion of your boiler unit?</li> <li>• Have you checked whether the source of energy used for heating water is the most cost-efficient and the lowest in emissions?</li> <li>• Have you examined the possibility to install a solar water heating system?</li> <li>• Have you investigated the option of using a small scale combined heat and power unit?</li> <li>• Have you instructed employees to reduce any preheating periods for machinery as much as possible?</li> <li>• Have you instructed personnel to switch off burners, heaters, lights, and stand-by equipment when not in use and at night?</li> <li>• Do you inform employees of cost savings that have been achieved and/or that could be achieved through energy conservation?</li> </ul>	

## Checklist 5      Energy

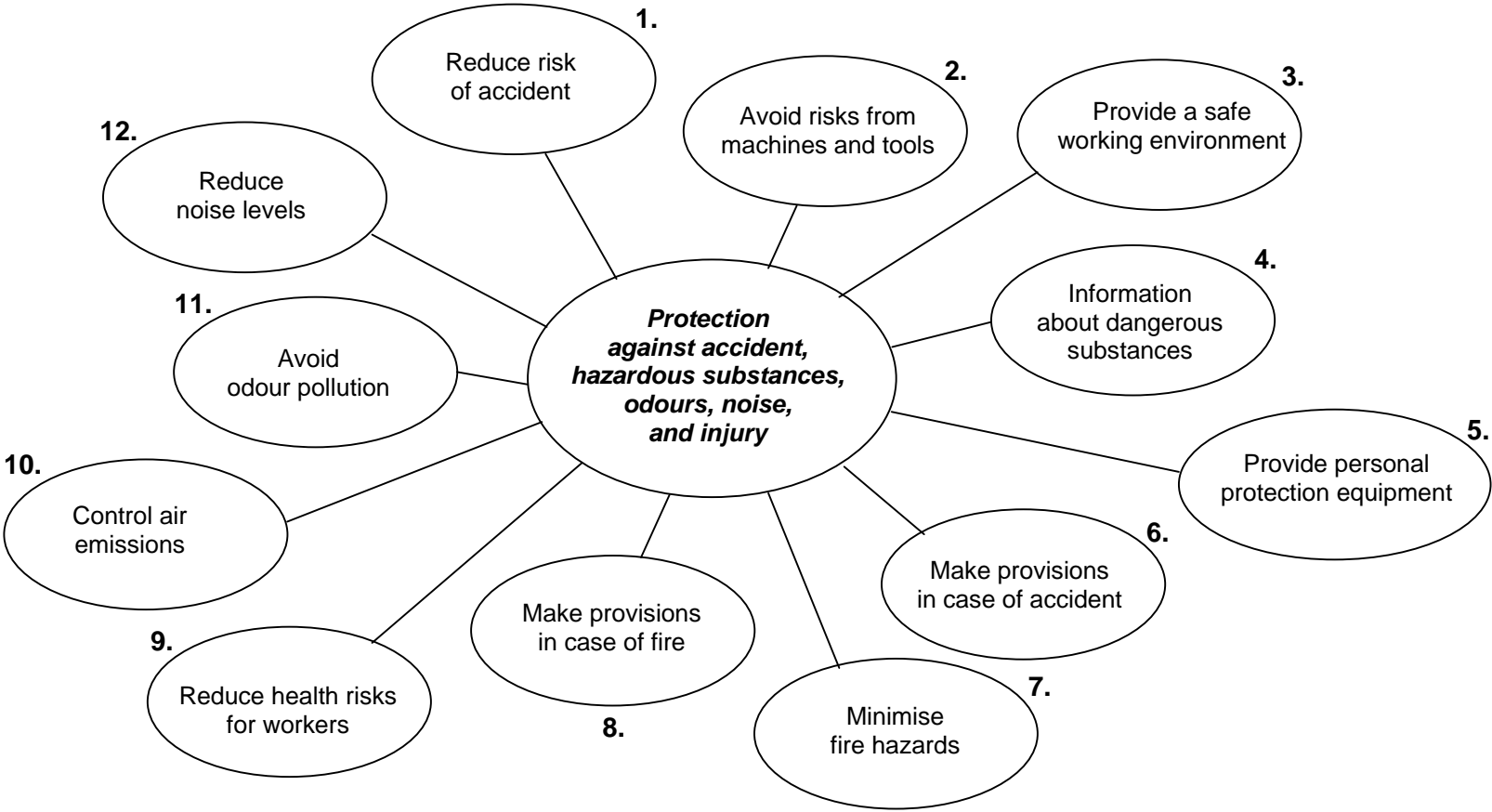
<b>Objective:                      Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Is your <u>cooling/freezing equipment</u> operated in an energy-efficient manner?</p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you checked possibilities to adjust the air conditioning system to a less cool temperature (e.g. 22-24 °C)?</li> <li>• Have refrigerators and freezers been placed in locations that avoid exposure to heat radiation (i.e. not near ovens, heaters, or sunlight )?</li> <li>• Have you made sure that condensers and cooling ribs are sufficiently ventilated and that motors are not in direct contact with a wall?</li> <li>• Have you taken measures to optimise the use of your available cooling volume so that individual units could be switched off when not required for storage?</li> <li>• Have you made sure that the cooling temperature is always properly adjusted to the specific needs of the stored material?</li> <li>• Have you checked possibilities to remove plastic or glass walls within freezers to enhance the circulation of cold air?</li> <li>• Have you instructed employees to remove any unneeded outer packaging before freezing materials or products?</li> <li>• Have you instructed personnel to let warm items cool down before placing them into a refrigerator or freezer?</li> <li>• Have you asked employees to minimise the frequency of opening the doors of cooling units, and have you posted reminders on the freezer/refrigerator doors?</li> <li>• Do you regularly check all seals on doors and covers, defrost refrigerators and freezers, and clean condensers and cooling ribs (after disconnecting from the mains!)?</li> </ul>	

## Checklist 5      Energy

Objective: <b>Reduction of Energy Consumption and Use of Waste Heat and Environmentally-Sound Sources of Energy</b>	
Actions to consider	Observations
<p><b>Do you follow a <u>preventive maintenance</u> programme for your energy equipment?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Does your maintenance programme include responsibilities and intervals for regular checks of emissions to control the efficiency of combustion engines (e.g. heating systems)?</li> <li>• Do you regularly check the catalysts in your vehicles?</li> </ul>	
<p><b>Do you consider the <u>energy-efficiency</u> of equipment when purchasing <u>new goods</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you consider energy consumption characteristics when buying new equipment?</li> <li>• Have you checked whether your energy equipment is more than 10 years old and should be replaced by a more efficient system?</li> <li>• Have you checked whether you can use gas- or fuel-driven equipment, which is more efficient than electrical sources?</li> </ul>	
<p><b>Have you an adequate system to deal with <u>power cuts</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• If your enterprise regularly experiences electricity cuts, do you have your own energy-efficient electricity generators, and are they sufficient in capacity to handle power cuts in the most important production steps?</li> <li>• Have you checked possibilities to replace electrical equipment by machinery that is able to use other energy sources (e. g. gas, fuel) in order to increase independence from public power supplies?</li> </ul>	



# Checklist 6: Workplace Safety and Health Protection





**Checklist 6**

**Workplace Safety and Health Protection**

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Important note: Improving the conditions for worker safety and health protection and reducing the risk of fire can lead to reduced insurance costs for your enterprise.</p> <p><b>Have you taken measures to <u>minimise</u> risk of <u>accident</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you covered all drains and floor openings with grates of corrosive-proof material (e.g. concrete, wood) to prevent falls and accidents?</li> <li>• Do the grates have small holes to prevent solid waste from falling into the drains?</li> <li>• Have you repaired uneven floors to prevent accidents during the general movement of personnel and while transporting materials?</li> </ul>	
<p><b>Do you ensure that your <u>machinery and tools</u> are not causing avoidable risks to your personnel?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you installed safety devices (e.g. guards, fences, covers) to prevent human contact with moving machine parts (e.g. belts, presses, transmission parts, open gears)?</li> <li>• Have you clearly marked all control buttons and switches on machines with colours and labels in the local language so that any worker can take needed action in case of emergency?</li> <li>• Have you checked that all cutting tools are kept in a secure location?</li> <li>• Have you instructed employees to always turn off machines and any cutting equipment before cleaning?</li> </ul>	

## Checklist 6      Workplace Safety and Health Protection

Objective:      Protection against Accident, Hazardous Substances, Odours, Noise, and Injury	
Actions to consider	Observations
<p><b>Do you take measures to ensure that the <u>working environment</u> is as safe as possible for employees?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you ensured that shelves can not topple over?</li> <li>• Have you instructed workers not to pile containers and boxes too high?</li> <li>• Have you identified and removed all unnecessary objects from production areas?</li> <li>• Have you checked that all stairs are secure?</li> <li>• Have you installed a non-slippery floor?</li> <li>• Have you sloped the flooring to create natural drainage of water and liquid wastes into waste channels?</li> <li>• Do you avoid having electrical wires, cables, or pipes that cross through doorways or into other working areas?</li> <li>• Are electrical equipment and wires regularly checked and repaired only by competent staff?</li> <li>• Are emergency exits installed in sufficient number and size and is it guaranteed that they are always freely accessible and open?</li> <li>• Are working clothes and personal protection equipment available and used by workers?</li> </ul>	
<p><b>Is information about <u>dangerous substances</u> readily available and accessible?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are the Material Safety Data Sheets (MSDSs) that describe routine and emergency procedures for handling all hazardous chemicals readily available in one designated place?</li> <li>• Have you informed your personnel about materials that may cause environmental or health risks?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Is <u>personal protection equipment</u> for handling dangerous substances provided for workers and properly maintained?</p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are all personnel equipped with working clothes according to industrial health and safety standards?</li> <li>• Is protection equipment on hand (i.e. gloves, aprons, masks, safety goggles, shoes) available in sufficient number (e.g. for the storage and handling of hazardous substances)?</li> <li>• Have workers been trained on the proper use (including when and where the devices should be used) and maintenance of personal protective equipment?</li> <li>• Have you informed workers about the possible health effects from not wearing personal protective devices?</li> <li>• Do you clean, dry, and store personal protective equipment in a secure place to ensure its effectiveness and long life?</li> <li>• Do you regularly replace worn-out or damaged personal protective equipment?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you made sufficient <u>provisions</u> in case of <u>accident</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are first-aid kits available throughout production areas and are these regularly checked (e.g. monthly) to replenish used items and replace items past their expiry date?</li> <li>• Have 1-2 employees been trained and certified to provide basic medical aid?</li> <li>• Is a washbasin or safety shower available near the areas where hazardous chemicals are stored and used that can be used for personal hygiene and emergency situations?</li> <li>• Have the phone numbers of emergency ambulance and fire services been noted visibly on the telephone?</li> <li>• Have you prepared an emergency plan and trained workers in how to alarm and evacuate the facilities, rescue accident victims, and behave in case of injuries?</li> <li>• Have you informed local doctors and the nearest hospital about any safety risks and health hazards of your operation?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Have you taken steps to <u>minimise fire hazards</u>?</p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you prohibit smoking in all production areas and especially in areas where chemicals are stored and/or mixed?</li> <li>• Have you insulated, enclosed, and protected all live parts (exposed/unconnected wires, open fittings) using barriers or by placing transmission lines overhead?</li> <li>• Do you use standard colour coding to clearly identify different types of wiring and connections?</li> <li>• Have you installed protective devices (e.g. fuse and circuit breakers) that immediately disconnect the electrical supply in case of overload?</li> <li>• Do you ensure that the terminal boxes of all motors are covered to avoid sparking?</li> <li>• Do you frequently remove oily rags and easily inflammable waste from production areas?</li> <li>• Do you store fuel for engines in a secure location away from production areas?</li> <li>• Do you immediately clean-up chemical spills to prevent any accidental mixture that could lead to ignition or explosion?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p>Have you made sufficient <u>provisions</u> in case of <u>fire</u>?</p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Are a sufficient number of fire extinguishers available throughout production areas in clearly marked locations?</li> <li>• Are appropriate extinguishers available and marked for the different classes of fires (A, B, C, D, E)?</li> <li>• Do you avoid the use of CFC/halon in fire extinguishers?</li> <li>• Can the appropriate fire extinguisher be easily reached by workers at any time?</li> <li>• Do all employees know the locations of the fire extinguishers, and have they been trained in their use?</li> <li>• Do you carry out checks (e.g. every 1-2 years) to ensure that fire extinguishers are operational and regularly refilled?</li> <li>• Are fire-resistant blankets available, and can these also be easily reached?</li> <li>• Have you informed employees about how to behave in case of fire?</li> <li>• Have you designated a responsible person to co-ordinate action in case of fire?</li> <li>• Are fire exits clearly indicated and not locked?</li> </ul>	



## Checklist 6

## Workplace Safety and Health Protection

<b>Objective: Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Have you taken measures to <u>reduce health risks</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Do you keep all lavatories in a clean condition to minimise health risks to workers?</li> <li>• Have you instructed workers to be sure to properly cover any cuts and wounds to prevent the absorption of any airborne substances?</li> <li>• Do you insist that all workers wear shoes or boots in all production areas?</li> <li>• Have you instructed workers to be sure to wash their hands before eating or smoking during work hours?</li> <li>• Do you prohibit eating, chewing, drinking, and smoking in work areas where hazardous chemicals are present?</li> <li>• Have you instructed workers not to place fingers in their mouth, nose, ears, and eyes while handling chemicals?</li> <li>• Do you ensure that employees wash exposed parts of the body with disinfectant soap after handling chemicals or working in processes involving chemicals?</li> <li>• Have you instructed workers to immediately remove chemical spills on their skin and eyes by using clean running water?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

Objective: <b>Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
Actions to consider	Observations
<p><b>Do you adequately control <u>air emissions</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you provided sufficient ventilation to reduce the concentration of mist, vapours, gases, or dust in the air, and to bring down the level of humidity and temperature in production areas?</li> <li>• Do you achieve low cost overall natural ventilation by taking advantage of the horizontal circulation of air around and through buildings and the tendency of hot air to rise?</li> <li>• Have you removed separating walls and/or increased wall openings to improve the natural flow of air?</li> <li>• Are local exhaust systems* installed on machines with high air emissions, and are these connected to adequate collection or scrubbing devices? * Note: if no extraction systems have been installed, dust masks are ineffective as they will clog immediately</li> <li>• Have you installed an appropriate exhaust system to control air emissions released from the boiler house?</li> <li>• Have you checked possibilities to purify your waste air (e.g. by using activated charcoal, biofilters or other air washing systems)?</li> </ul>	
<p><b>Do you avoid <u>odour pollution</u>?</b></p> <p><input type="checkbox"/> yes   <input type="checkbox"/> no   <input type="checkbox"/> partially</p> <ul style="list-style-type: none"> <li>• Have you identified the sources for any bad odours that are being emitted?</li> <li>• Can you minimise odours resulting from the improper storage of organic waste by disposing of this waste more frequently?</li> </ul>	

## Checklist 6

## Workplace Safety and Health Protection

<b>Objective:</b> <b>Protection against Accident, Hazardous Substances, Odours, Noise, and Injury</b>	
<b>Actions to consider</b>	<b>Observations</b>
<p><b>Do you try to reduce <u>noise</u> levels?</b> * excessive noise may indicate a waste of energy</p> <p><input type="checkbox"/> <b>yes</b>   <input type="checkbox"/> <b>no</b>   <input type="checkbox"/> <b>partially</b></p> <ul style="list-style-type: none"><li>• Have you checked possibilities to reduce noise resulting from your manufacturing processes by cushioning certain equipment?</li><li>• Have you covered all gear boxes and lubricated noisy machine parts to reduce noise pollution?</li><li>• Have you replaced rough-cast gears with machine-cut gears or drums, which emit less noise and vibration?</li><li>• Have you replaced iron-cast pinions with teflon or plastic pinions, which are much less noisy?</li><li>• Have you considered the idea of shifting noisy machines to an isolated location or shielding such machines with a sound-absorbing wall?</li><li>• Have you provided machine operators with hearing protection devices (e.g. ear plugs, ear muffs) in work areas with sustained, high noise levels?</li></ul>	



### **3 Analysing and Implementing Good Housekeeping Measures**

- **Systematically Explore the Potential of Good Housekeeping (Chapter 3.1)**
- **Develop an Action Plan (Chapter 3.2)**
- **Calculate Costs and Savings (Chapter 3.3)**
- **Undertake Employee Training (Chapter 3.4)**
- **Analyse Inputs and Outputs of the Production Process (Chapter 3.5)**



## 3.1 Systematically Explore the Potential of Good Housekeeping

To effectively integrate Good Housekeeping practices into your company's daily business operations and to gain the benefits from cost savings, higher productivity, and improved organisation – you will need to think in a systematic way about improving processes and procedures. In this respect, there are five areas (see Chapters 3.1 – 3.5) for actions that can help you to implement and maintain better performance over the long term.

Following an initial walk-through of a company and an analysis of the Checklists, you will be able to answer the following questions, which are geared to assisting you explore the potential for implementing Good Housekeeping measures:

### **Where is there room for improvement?**

Identify problems to be addressed and/or areas where improvements can be made (Only where problems are perceived and if there is a need or willingness to make changes)

### **Why do these problems exist?**

Analyse the possible causes of these problems (You need to first know the causes in order to adequately address the problems)

### **What could be done to improve the situation / remedy the problem?**

Brainstorm possible action measures (The broader the scope and variety of possible measures, the higher the probability of identifying the most promising ones)

### **What would you like to achieve?**

Establish clear and realistic objectives and define some adequate key indicators to monitor the results achieved. (When defining the indicators, think about how it would feel to achieve the objective: What would be different from the current situation? What additional positive aspects would be achieved or what negative aspects would still exist?)

### **Which measures do you want to undertake?**

Decide on measures to be undertaken and prioritise them.

## How to Identify Potential Good Housekeeping Measures:

Case Study of a Commissary (central kitchen for a restaurant chain) in the Philippines

- Where is there room for improvement?  
A: Too much organic waste is being dumped. Vegetable trimmings are thrown away as waste.  
B: Roast meat trimmings are used for the production of cost-free meals for employees.
- Why do these problems exist?  
A: In the commissary's daily operation, vegetable trimmings have always been thrown away; it was never suggested to do otherwise.  
B: Reuse of meat trimmings has always been seen as a good practice.
- What could be done to improve the situation?  
In the brainstorming process, two interesting measures were identified:  
A: Use vegetable trimmings for the production of stock for sauces and soups.  
B: Use meat trimmings for higher-value products such as meat pies, which could be an additional pastry item for sale.
- What would you like to achieve with these measures (objectives)?  
A: Utilisation of previously wasted vegetable trimmings for higher-quality (higher nutrition value, better taste) and higher-priced products (increase in 20 pesos in the sales price per piece).  
B: Utilisation of a large part (80%) of meat trimmings for new high-value products and creation of additional sales/income by 10%.
- Which measures do you want to undertake?  
A: Use of vegetable trimmings as a substitute for flavouring materials in order to reduce the use by 30-40% of flavouring materials like stock cubes and powders.  
B: Sell meat pies, which have become a popular item among students, and increase value by 50% in comparison to original employee meals.

### Lessons learned:

The proposal to utilise by-products was discovered through a creative brainstorming process. In the food sector, many items can be created from otherwise low-value products.



## 3.2 Developing an Action Plan

Having analysed the results of the company walk-through while using the systematic questions in the Checklists to explore the potential for Good Housekeeping measures – you will have identified a number of weak points in the company and objectives to be achieved. Considering the set of questions outlined in Chapter 3.1 is a crucial basis for addressing these weak points. Targeted objectives can be achieved in a more structured way by implementing an Action Plan.

Action Plan						
Objective	Actions To be Taken	Necessary Investment / Additional Running Costs	Cost Saving Potential	Priority	Responsible Person	Time Schedule
Reduce losses of raw materials during storage by 10%	Implement the "first in first out" principle	Little investment for training / no running costs	US\$ 1000 per year estimated	High	Manager of storeroom	1 month implemented until 1.4.2000
	Check packaging materials	No investment / 10 working hours per year	US\$ 500 per year estimated	Medium	Manager of storeroom	Once a week, starting by 15.5.2000
etc.	etc.					

- **Objectives** describe clearly and transparently for all employees the aims to be achieved
- **Actions** relate to the Good Housekeeping measures identified in going through the Checklists and in evaluating the results of the company walk-through (problems, causes, measures), which you now plan to undertake
- **Necessary Investment and Additional Running Costs** can be determined as one criterion for implementing a measure (*refer to Chapter 3.3*)
- **Cost Saving Potential** can be estimated as another criterion, based on the costs that can be saved by implementing the measure (*refer to Chapter 3.3*)

- **Priority** for an action can be specified according to the potential for obtaining cost savings, the level of investment needed compared to possible savings that can be achieved; the desirability, ease, and/or difficulty to implement the measure; and so on.
- **Responsible Person** indicates who is responsible for the implementation of the measure.

**Time Schedule** indicates the time horizon in which the measure should be implemented.

### In developing an Action Plan, be sure to:

- Assign responsibilities by areas and/or for important activities (If no individual is responsible, nothing will happen)
- Develop and implement the required procedures and actions (Who must do what, in what way? etc.)
- Establish a realistic but ambitious timeframe (Who does what by when?)
- Follow-up by checking the results (What progress was achieved by the set deadlines?)
- Evaluate the action and monitor implementation (Were the objectives achieved? Why? Why not?)
- Communicate and reward results
- Establish new targets (Can further improvements to the company's operations be made?)
- Do a yearly assessment of the operations (i.e. 'clean the house') to identify further Good Housekeeping opportunities and check that implemented measures have been sustained.

## 3.3 Calculating Costs and Savings

As part of the process of analysing measures and developing an Action Plan, you should estimate the costs, savings, and environmental impacts to be expected. This analysis will help to determine areas and priorities for action.



**In calculating costs and savings, the following strategies could be useful to you:**

- **Identify processes** where large quantities of materials, water, and energy are used and those that generate a high volume of waste or effluents, and assign priority for action to be taken in these areas.
- **Allocate the costs** of treatment and waste disposal to the operations that generate those wastes, rather than allocating these costs to the general expenses of the company.
- This can create an incentive for the responsible departments to reduce the level of waste generated and use raw materials more effectively. Such an approach may also encourage ideas about how to recycle and reuse waste within the company's own production processes, or sell waste materials and by-products to outside companies or firms specialised in waste recycling.
- **Estimate the actual costs** generated by your actual use of resources (raw materials, water, and energy) and the related waste generation and disposal costs for the weak spots identified.
- **Estimate the potential cost savings** of alternative measures by considering the additional running costs and comparing them to the actual costs of the current inefficient use of resources.
- **Estimate or calculate the necessary investment** for measures that would reduce the consumption of raw materials, water, and energy and have a positive impact on environmental performance (less waste, waste water, toxic materials, etc.).

To calculate, in a simple way, the possible cost savings, reduced environmental impact, and impact of organisational improvements that could be obtained as a result of implementing a Good Housekeeping measure, use the following charts:

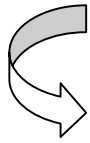
Chart #1 - Calculating the Payback Period of a Good Housekeeping Measure

Chart #2 - Summary Table for the Economic Analysis of Good Housekeeping Measures

Chart #3 - Summary Tables for the Analysis of Environmental Impacts and Organisational Improvements

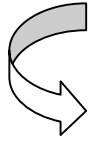
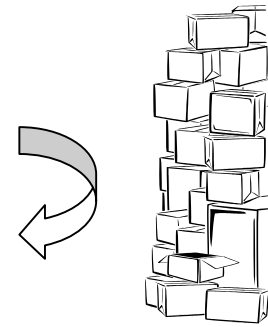
# Chart #1 - Calculating of a Good Housekeeping Measure

## Example of Reducing Packaging Waste



**Observation: Large amount of waste from packaging**

**Causes:** Packaging design requires large amounts of material



**Quantity of losses per year**

All packaging material becomes waste after use.



**Actual costs per year**

You can find the cost for producing packaging material in your accounts or on bills of purchase.

$\Sigma = \$2,400$  per year

If there is no accountant, add the amounts of the bills of the past year to calculate the actual costs incurred per year.



**Measures to reduce these costs**

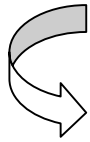
The amount of packaging material used can be reduced by changing packaging design.



**Potential gross savings per year**

Estimate the savings from implementing this measure. In this case, it is possible to save 30% of the actual costs by changing the packaging design.

$30 \times \text{actual costs} \div 100 = \text{gross savings}$	$30 \times \$2,400 / y \div 100 = \$720 \text{ per year}$
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**Additional costs per year**

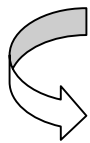
Evaluate the additional running costs caused by the measure. In this case, the company will incur \$50 per year more in costs because additional facilities are necessary for transport.



**Net savings**

To calculate the annual net savings, the additional costs of the measure must be subtracted from the gross savings.

$\text{gross savings} - \text{additional costs} = \text{net savings}$
$\$720 \text{ per year} - \$50 / y = \$670 / y$



**Investment**

The expense to implement the measure. In this case, there is a cost of \$120 for the development of a new design and for the production of a prototype. This cost was estimated by the supplier of the packaging material.

**Payback period**

The total amount of investment divided by the annual net savings shows the payback period in years. To obtain the payback period in months, multiply this number by 12.

$(\text{investment} \div \text{net savings}) \times 12 \text{ months / year} = \text{payback period in months}$	$(\$120 \div \$670 / y) \times 12 \text{ month / year} = 2.2 \text{ months}$
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## Chart #2 - Summary Table for the Economic Analysis of Good Housekeeping Measures

**Observation:** Large amount of waste from packaging

**Measure:** Reduced amount of packaging material by changing packaging design

<b>Economic Analysis</b>				
Criteria	Formula	Data	Information Required	When
<b>Quantity of Losses per year</b>		All packaging		
<b>Actual Costs per year</b>		\$2,400	Accountant and bills	
<b>Gross Savings per year by implementing the measure</b>	$30\% \text{ (known or estimated)} \\ \times \$2,400 \text{ (actual costs)} \\ \div 100$	\$720 (representing 30% of the actual costs)	Chief of the section	
<b>Additional Costs per year by implementing the measure</b>		\$50	Chief of the section	
<b>Net Savings per year</b>	$\$720 \text{ (gross savings)} \\ - \$50 \text{ (additional costs)}$	\$670	Calculated by Good Housekeeping team / responsible person for the measure	
<b>Investment</b>		\$120	Packaging manufacturer	
<b>Payback Period (in months)</b>	$\text{(investment} \div \text{net savings)} \\ \times 12 \text{ months per year}$	$(\$120 \div \$670 / y) \\ \times 12 \text{ months / y} \\ = 2,2 \text{ months}$	Calculated by Good Housekeeping team	

### Chart #3 - Summary Tables for the Analysis of Environmental Impacts and Organisational Improvements

**Observation:** Large amount of waste from packaging  
**Measure:** Reduced amount of packaging material by changing packaging design

Environmental Analysis				
Criteria		Data	Information required	When
Environmental Impact	Positive	<input checked="" type="checkbox"/>	Result of discussion	
	Neutral	<input type="checkbox"/>		
	Negative	<input type="checkbox"/>		
	Relevance	High		
	Consumption of raw material reduced?	About 30% of the paper originally used for packaging has been reduced		
Quantity of waste reduced?	About 30% of the waste packaging paper has been reduced			
Toxicity of waste reduced?	No			

Organisational Improvements				
Criteria		Data	Information Required	When
Status of the measure	Implemented	<input checked="" type="checkbox"/>		
	In progress	<input type="checkbox"/>		
	Delayed until	<input type="checkbox"/>		
	Eliminated	<input type="checkbox"/>		
Organisational Learning	Motivation and awareness of staff increased?	Increased motivation through involvement of staff, relevance of own working area for waste reduction		
	Clear responsibilities defined?	Yes		
	Communication processes improved?	Communication between design department and packaging department has been improved	Head of design department, head of packaging department	

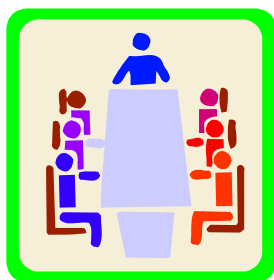
### 3.4 Undertaking Employee Training

Employees play a key role in the implementation of Good Housekeeping practices.

To change behaviour and create a culture of continuous improvement that can lead to higher productivity, cost savings, better organisation, and environmental performance – you may need to carry out information activities as well as train staff to equip them with new skills.

#### **Two key aspects should be considered:**

- Raise the general awareness of employees about opportunities to be gained from Good Housekeeping
- Carry out training for specific tasks to improve performance.



Information about the benefits and opportunities of Good Housekeeping can stimulate employees to co-operate in activities that reduce waste and economise the use of water, energy, and materials. Encouraging employees to make suggestions for improvements in all the areas of Good Housekeeping can also lead to reduced cost and material savings and reduced risks for human health and the environment.

#### **Furthermore, you might want to consider training staff on:**

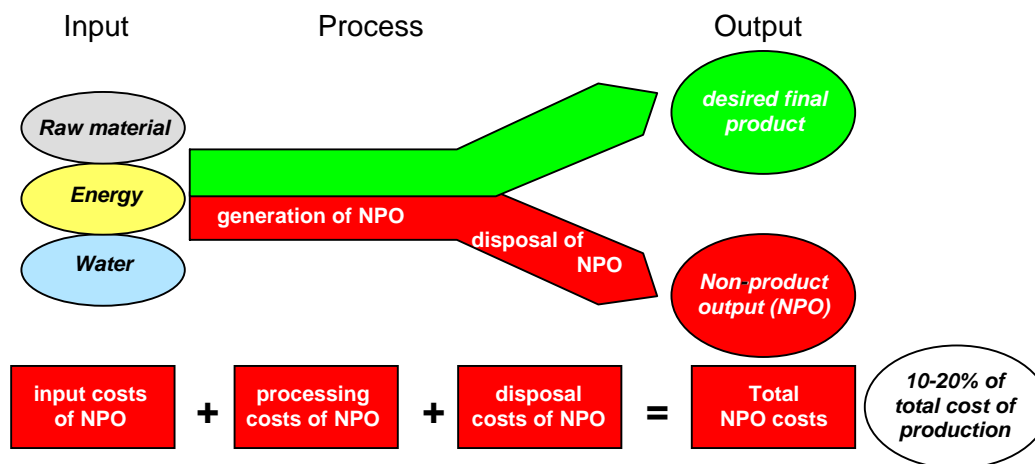
- the correct handling of materials to minimise losses and avoid hazards and accidents
- the use of organisational set-ups and/or equipment to save water, energy, and raw materials
- the detection and minimisation of raw material losses to air, water, and soil
- maintenance routines, and the schedules and procedures to be followed when cleaning and repairs are needed
- emergency procedures that can be implemented when there are accidents in order to avoid and minimise the loss of raw materials and injuries to employees
- the modification of procedures, if possible, and/or use of personal protection equipment to minimise injuries and risks to health.

### 3.5 Analysing Inputs & (Non-Product) Outputs of the Production Process

#### Why Analyse Inputs & Outputs ?

By analysing the inputs and outputs of the production process in a detailed way, companies have an opportunity to look closer into their operations and identify further opportunities to reduce costs and improve productivity. Looking at non-product output (NPO) is an effective approach for identifying these further opportunities for improvement.

NPO = Material, Energy, and Water that is used in the production process but does not end up in the final product



The generation and disposal of NPO are non value-adding activities and therefore create unnecessary costs for a company. Additionally, NPO can block production capacity (e.g. in the case of reprocessing), thus resulting in a loss of production and opportunity costs.

#### Aspects to be considered:

- do a complete overview of the production steps and the relevant inputs, intermediate products, and non-product outputs (NPO) of a business
- identify and address "weak spots" related to economic performance, environmental impact, and workplace safety
- optimise the production process and resource use
- close the flows of materials and substances into complete loops as much as possible (through reuse, recycling and selling by-products and waste)



Two **Charts** have been included within the Manual to help you in analysing the inputs and outputs of the production process. The inputs and outputs of the production process refers to the sum of the inputs and outputs of all the different production steps.

### 3.6 How to Use the Charts for Analysing Inputs & Outputs

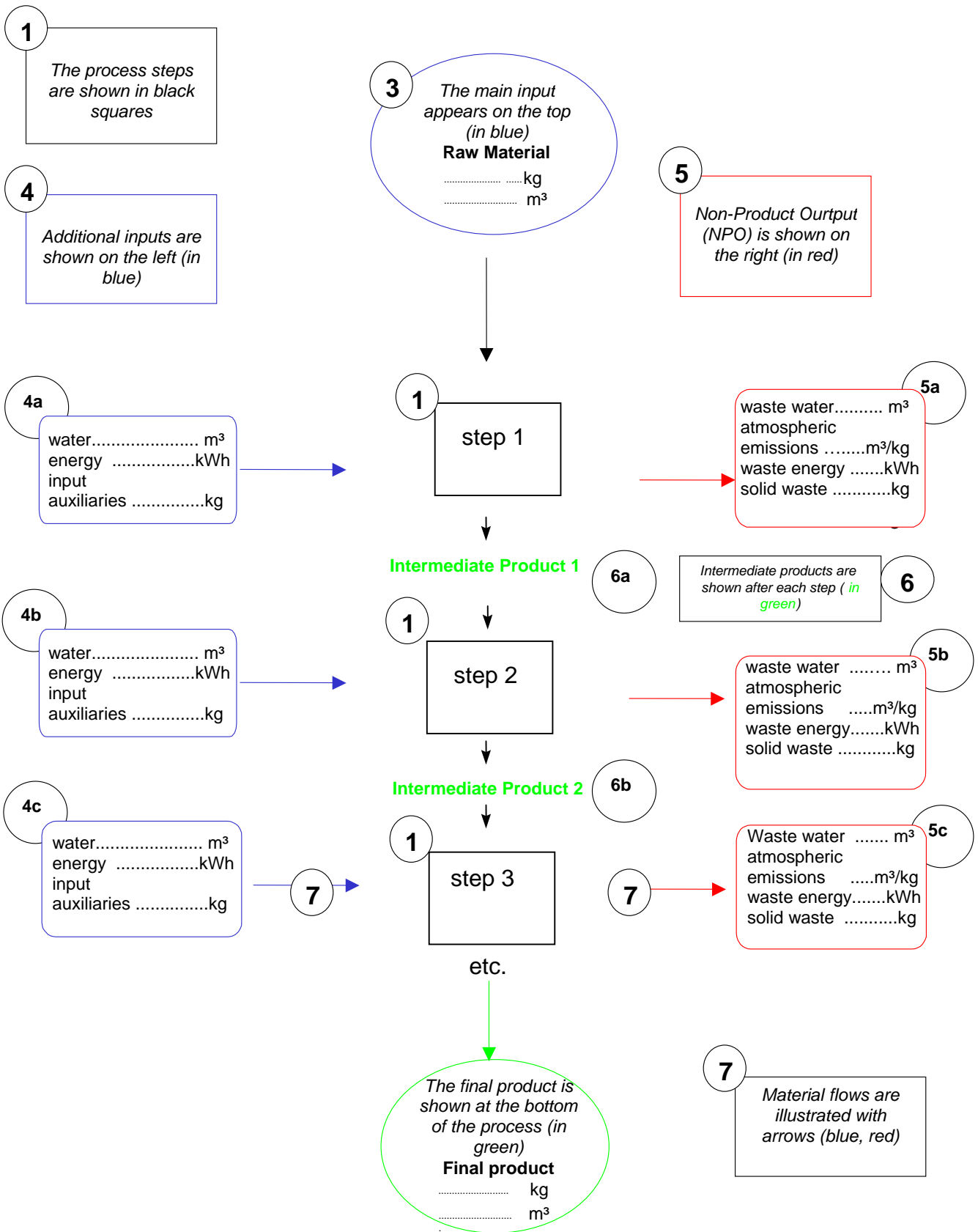
**Chart #4** provides a framework for analysing the Inputs and Outputs of the entire production process. Most of the needed data might already be available in administration or accounting departments. The consumption of raw materials, auxiliaries, water, and energy (Inputs) used per year, and the amount of products produced during one year is usually data that can be easily collected or estimated.

Certain Outputs are more difficult to analyse:

- On the one hand, there are intermediate products, which are outputs from one step of the production and inputs to the subsequent step – which end up in the desired final product.
- On the other hand, there is waste or non-product output (NPO) such as rejects, solid waste, waste water, substances present in waste water, waste heat, and emissions as a result of each step of the production process, which do not end up in the final product and must be dealt with.

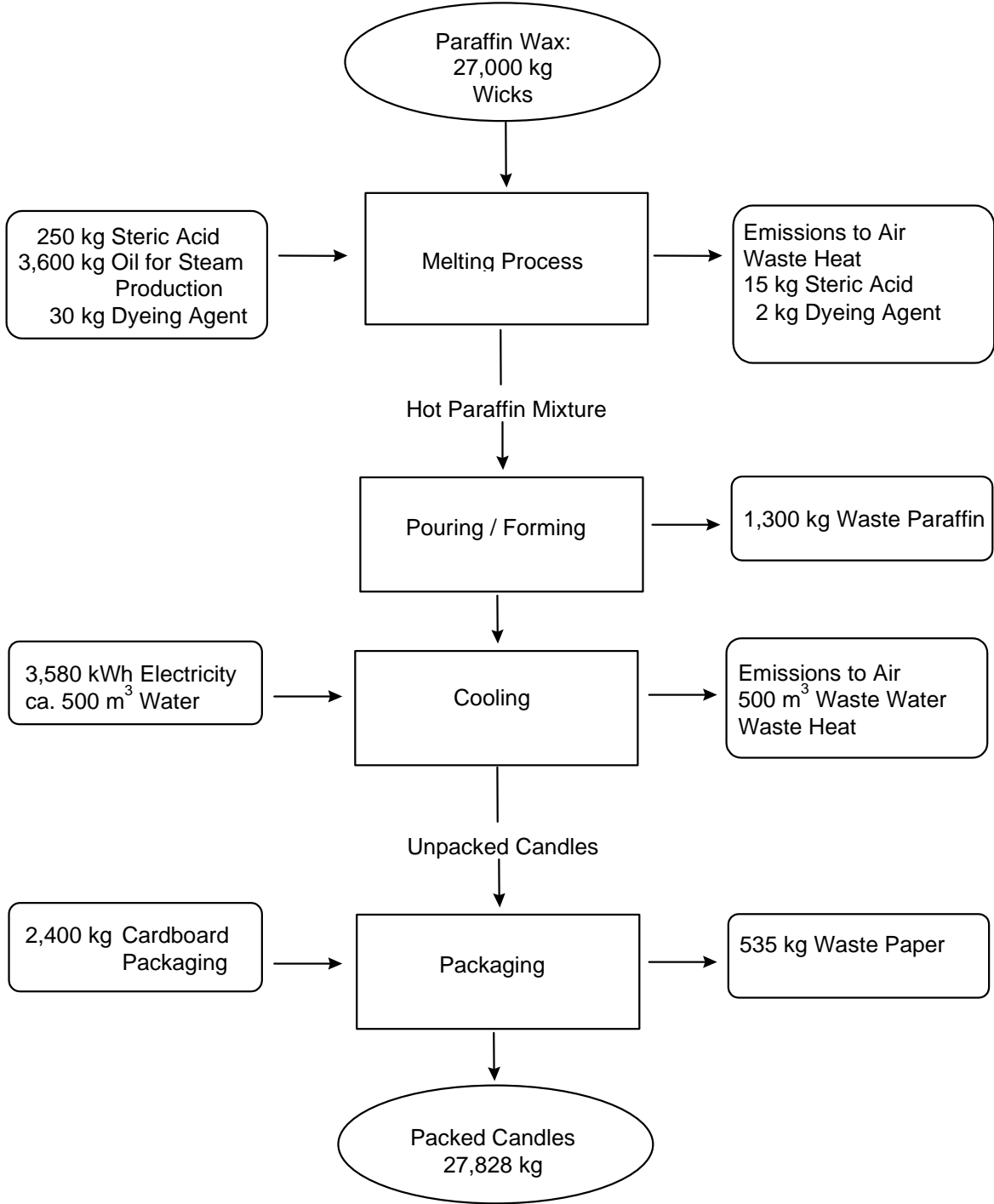
For illustration purposes, chart 5 shows an example from the production of candles.

# Chart #4 - Flow Chart of the Complete Production Process



# Chart #5 - Example of a Simple Flow Chart of a Candle Producer

Please note: All figures are related to a production period of one year.





## 4 Conclusions

Good Housekeeping practices are based on common sense and involve little or no investment. Adopting these basic measures to conserve materials, water, and energy can considerably enhance the productivity of an enterprise by reducing the costs of production. Minimising, reusing, and recycling wastes and by-products prevents pollution at source where it is easier and less expensive to deal with than at the end-of-the-pipe.

Companies in many different industrial sectors have already recognised that they can achieve significant reductions in costs and wastes by making simple changes in organisational and production procedures. Further improvements can be gained through more fundamental changes in operations, product design, materials, and the adoption of cleaner technologies — which are beyond the scope of this Good Housekeeping Manual.

The Checklists and concepts contained within this Manual are intended to give you a starting point for establishing a more systematic approach to managing quality and environmental aspects and improving the basic working environment of your enterprise as first step to the more comprehensive approach of Profitable Environmental Management (PREMA). This Manual provides you with the essential framework to establish a process for managing quality, environmental, cost and workplace safety issues based on:

- Identifying obvious weaknesses and their causes in a business
- Observing existing processes and procedures to identify strengths and best practice
- Measuring and recording data
- Defining objectives and selecting measures to improve production
- Setting priorities for action and delegating responsibility
- Implementing identified actions
- Measuring the results related to cost savings, improved quality, reduced environmental impact, and enhanced workplace safety
- Regularly reviewing progress in key areas.

By establishing such a management procedure within your enterprise, you will naturally embark on a programme of continuous improvement, leading your company to become even more profitable and sustainable.

In addition, the principle of continuous improvement also underlies international standards on quality and environment. You may therefore consider utilising additional, and even more systematic tools, such as Environment-Oriented Cost Management (EoCM<sup>©</sup>)\*, certifiable Quality or Environmental Management Systems according to ISO standards or Integrated Management Systems.

Getting on the path to continuous improvement is important for all companies interested in enhancing their competitiveness and improving their environmental performance as well as the image of the enterprise and its products with customers, suppliers, regulatory authorities, and the community.

Any comments, suggestions, and experiences in applying Good Housekeeping practices are welcomed by GTZ/P3U as a contribution to the improvement and dissemination of these concepts. We would kindly ask you to provide us with cases or material in the following form (see *Annex III*) which can also be provided in electronic form.

\* EoCM<sup>©</sup> is a Cost Management instrument that focuses on the efficient use of resources relevant for the environment, such as material, energy, and water where costs can be reduced and environmental performance improved as well as effective organisational changes implemented by reducing non-product output (NPO). Reducing the hidden costs associated with the generation and processing of NPO ( i.e. those materials, energy, and water that are used in the production process but do not end up in the final product) can enhance the productivity and competitiveness of an enterprise.

Refer to the GTZ/P3U publications:

- Key Elements of Environment-oriented Cost Management (EoCM<sup>©</sup>)
- Steps to be taken in the establishment of process-oriented management systems (Integrated Management System)

Please contact GTZ/P3U for more information about these and other management tools and concepts suitable for small- and medium-enterprises. (gtzp3u@aol.com)

## **Annex**

- **Annex I: Labelling Dangerous Substances**
- **Annex II: Applications in Companies – Case Studies**
- **Annex III: Applications in Companies – Format for Case Study**
- **Annex IV: Regulations for the utilisation**





ANNEX I

Labelling  
Dangerous Substances



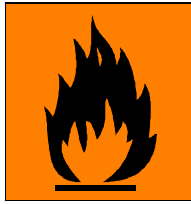


**Labelling symbols used in the European Union, in European Economic Area  
and selected other countries:**




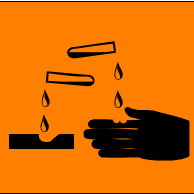


Source: International Labour Organisation, International Occupational Safety and Health Information


Centre (CIS/ILO), Information compiled from:

<http://www.ilo.org/public/english/protection/safework/cis/products/safetytm/classify.htm>

(last update September 1999)

<b>DANGEROUS CHARACTERISTICS</b>	<b>Label</b>	<b>MEANING</b>
Highly Flammable (F)	<p align="center">F</p> 	<p>This symbol (F) with the words 'highly flammable' denotes a substance which may become hot and finally catch fire in contact with air at ambient temperature or is a solid and may readily catch fire after brief contact with the source of ignition and which continues to burn/to be consumed by chemical reaction after removal of the source of ignition. If it is gas it may burn in air at normal pressure. If it is a liquid it would catch fire with slight warming and exposure to a flame. In contact with water or damp air the substance may release highly flammable gases in dangerous quantities.</p>
Extremely Flammable (F+)	<p align="center">F+</p> 	<p>The same flammable symbol as above with words 'extremely flammable' denotes e.g. a liquid which would boil at body temperature and would catch fire if vapours are exposed to a flame.</p>
Oxidising (O)	<p align="center">O</p> 	<p>The symbol with the word 'oxidizing' refers to a substance which releases a lot of heat while it reacts with other substances, particularly flammable substances.</p>










<b>DANGEROUS CHARACTERISTICS</b>	<b>Label</b>	<b>MEANING</b>
Explosive (E)	<p style="text-align: center;">E</p> 	This symbol with the word 'explosive' denotes a substance which may explode under the effect of a flame or if subjected to shocks or friction.
Toxic (T)	<p style="text-align: center;">T</p> 	The symbol with skull and crossed bones with the word 'toxic' denotes a highly hazardous substance.
Very Toxic (T+)	<p style="text-align: center;">T+</p> 	The same symbol as above with the words 'very toxic' is used to label a substance, which, if inhaled or ingested or, if it penetrates the skin, may involve extremely serious immediate or long-term health risks and even death.
Corrosive (C )	<p style="text-align: center;">C</p> 	The symbol with the word 'corrosive' will be found on a label of a substance which may destroy living tissues on contact with them. Severe burns may result from splashes of such substance.
Harmful (Xn) (less than T)	<p style="text-align: center;">Xn</p> 	The symbol with word 'harmful' denotes to substances which may cause health hazards less than toxic. It could refer to other types of risks e.g. to allergic reactions.
Irritant (Xi) (less than C)	<p style="text-align: center;">Xi</p> 	The same symbol as above with the word 'irritant'.









<b>DANGEROUS CHARACTERISTICS</b>	<b>Label</b>	<b>MEANING</b>
Dangerous for the environment (N)	<p style="text-align: center;">N</p> 	Can cause damage to fauna or flora or can cause pollution in natural waters

## Symbols of the United Nations Committee for the Transport of Dangerous Goods

Source: International Labour Organisation, International Occupational Safety and Health Information

Centre (CIS/ILO), Information compiled from:  
[http://www.ilo.org/public/english/protection/safework/cis/products/safetytm/danger/un\\_symbol.htm](http://www.ilo.org/public/english/protection/safework/cis/products/safetytm/danger/un_symbol.htm)  
 (last update September 1999)

 <p>UN Transport symbol for explosives</p>	 <p>UN Transport symbol for Class 1.4 Explosive substances which present no significant hazard</p>	 <p>UN Transport symbol for Class 1.5 Very insensitive substances which have a mass explosion hazard</p>
 <p>UN Transport symbol for non-inflammable gases</p>	 <p>UN Transport symbol for inflammable gases</p>	 <p>UN Transport symbol for poisonous substances (gases Class 2., other poisonous substances Class 6.1)</p>
 <p>UN Transport symbol for inflammable gases (Class 2) or liquids (Class 3)</p>	 <p>UN Transport symbol for inflammable solids (Class 4)</p>	 <p>UN Transport symbol for substances liable to spontaneous combustion</p>

 <p>UN Transport symbol for substances which, in contact with water, emit inflammable gases</p>	 <p>UN Transport symbol for oxidizing substances and for organic peroxides</p>	 <p>UN Transport symbol for infectious substances</p>
 <p>UN Transport symbol for radioactive substances, Category I</p>	 <p>UN Transport symbol for radioactive substances, Category II</p>	 <p>UN Transport symbol for radioactive substances, Category III</p>
 <p>UN Transport symbol for radioactive substances</p>		 <p>UN Transport symbol for corrosive substances</p>





# ANNEX II

## Application in Companies Case Studies



## REUTILISATION OF WOOD REMAINDERS TO CREATE A NEW PRODUCT

### Móveis Kolossal, a small Brazilian carpentry

#### IN BRIEF

In the business of producing furniture components for the local market, this small carpentry in Rio Negrinho, Santa Catarina, was able to dramatically reduce wood waste generated during cutting and processing steps by reprocessing cut remainders into slats and boards during less busy working hours. This process yielded high quality products at a significantly lower cost than virgin timber and eased storage space and waste disposal issues for the company.

#### THE CHALLENGE

Before deciding to invest in a process to reuse wood scraps, the owner wanted to be sure that the resulting products would be of a quality that was equal or superior to virgin material. Furthermore, the owner had to negotiate with clients to be assured that they would accept to purchase products that were made using such materials. Until now, waste wood was periodically given away or burned.

#### APPLICATION OF THE GOOD HOUSEKEEPING MANUAL

During the monthly meetings of the Carpenter's group of the local "Commercial and Industrial Association" (ACI), the owner of Móveis Kolossal learned about the Good Housekeeping Manual of GTZ-P3U in the context of Fundação Empreender's AntiCusto project. In discussions with a consultant from the Chamber of Commerce and Industry, attention was specifically put on the **Waste Checklist**, which points to the possibility to reduce costs and gain benefits through reusing/recycling waste. Realising that the carpentry's wood scraps could be reutilised to produce new raw material, the owner decided to take action.



#### ACTIONS TAKEN WITHIN THE CARPENTRY SHOP

As a first step, the owner outsourced the reprocessing of wood remainders to a nearby factory which had a special machine designed to cut the scraps into triangles and then glued them together to form a 2-4 meter length of slat or board (called the finger-joint process).

Having assured a market for such products, the owner subsequently purchased a second hand finger-joint machine, which was reconditioned in the carpentry's own workshop.

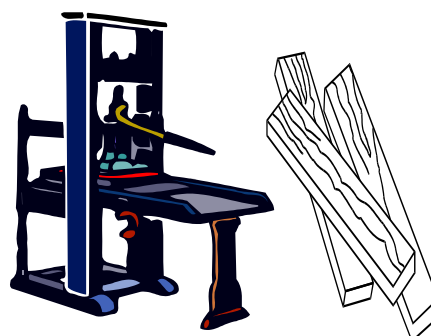
Workers were trained to operate this special machine, which was used during less busy periods to reprocess wood remainders into slats and boards.

Problem → Solution

Step 1 → Step 2

Outsourced  
reprocessing

Bought & reconditioned own  
finger-point machine



---

## ENVIRONMENTAL BENEFITS

By reprocessing 4m<sup>3</sup> of wood scraps into useable products, purchases of virgin timber could be reduced, thereby saving natural resources. Moreover, the generation of CO<sub>2</sub> (which leads to global warming) from burning wood scraps is now avoided entirely.

---

## ECONOMIC BENEFITS

Investment cost	360 Real (R\$) or US\$180	For the purchase and reconditioning of a used finger- point machine
Annual savings	R\$ 12'000 * or US\$6'000	On raw material purchases due to reprocessing 7% (i.e. 4m <sup>3</sup> ) of wood scraps at 17% of the cost of virgin timber
Payback period	About 10 days	

\* Initially, the company purchased 60m<sup>3</sup> of raw planks at a cost of R\$ 300 / m<sup>3</sup> = R\$ 18'000

*Costs to produce the same amount of slats and boards by reprocessing wood remainders:*

56m<sup>3</sup> of new timber at R\$ 300 / m<sup>3</sup> = R\$ 16'800  
4m<sup>3</sup> of reprocessed timber at R\$ 50 / m<sup>3</sup> = R\$ 200  
Total = R\$ 17'000

Monthly savings: R\$ 18'000 - R\$17'000 =R\$ 1'000

Annual savings: R\$ 1'000 x 12 months = R\$ 12'000

---

## ORGANISATIONAL IMPROVEMENTS

Until now, wood scraps accumulated in a disorganised pile in one corner of the working area. The decision to invest in the finger-point process liberated precious storage space, addressed the need to regularly dispose of such waste, and made the working environment more safe for employees as they were no longer tripping over wood remainders (now seen as valuable raw material and treated accordingly) in the production area.

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## FOR FURTHER INFORMATION:

### GTZ-P3U PROGRAMME

Pilot Programme for the Promotion of Environmental Management  
in the Private Sector of Developing Countries (P3U)  
German Technical Cooperation (GTZ)  
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Fax: +49 (228) 985 7018  
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Contacts: Dr. Edith Kürzinger, Director  
Petra Kontny-Eimer, Deputy Director

### Fundação Empreender

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Email: [fe@fe.org.br](mailto:fe@fe.org.br), web: [www.fe.org.br](http://www.fe.org.br)  
Contacts: Jairo Aldo da Silva, Supervisor  
Max Hermann, Project Coordinator

---

## WHAT TYPE OF INSTRUMENTS DOES GTZ-P3U DEVELOP?

GTZ-P3U is developing tools for use by micro, small, and medium-sized companies to identify "triple win" opportunities, i.e. to reduce the costs of production, improve environmental performance, and enhance organisational capabilities. These tools include: **Good Housekeeping (GHK)**, a **Resource Management Module (RMM)**, **Environment-Oriented Cost Management (EoCM<sup>®</sup>)** and an **Integrated Management System (IMS)**. All of these instruments are designed to be simple, cost-effective, easily and widely applicable across industry sectors.

## IN WHICH COUNTRIES IS P3U WORKING?

P3U is working in Brazil, Mexico, Zimbabwe, Sri Lanka, the Philippines, Thailand, Vietnam, Kenya (through Swiss Contact), among other countries. Further activities are planned for India, Central America, Chile, Zambia, and Morocco.

---

## WHO IS FUNDAÇÃO EMPREENDEUR?

al Associations (ACIs) in Santa Catarina, Brazil.

## WHAT ARE ITS TASKS?

- Promote the development of an information, cooperation, and support network among enterprises, its representative institutions, training and support institutions, and the general public with the aim of contributing to the development of companies and the economy.
- Advise and support ACIs and their participating sector networks
- Facilitate the flow of information, experience, and cooperation amongst ACIs.
- Establish contacts with national and international agencies.
- Disseminate its know-how and experience among business associations in Santa Catarina and in Latin America.

## REDUCING ENERGY CONSUMPTION BY EXPLOITING NATURAL DAYLIGHT

### Mecânica do Amarildo, a small Brazilian garage

#### IN BRIEF

The monthly energy bill for this small garage employing 2 people (including the owner) had come to represent a major cost for the operation. By making better use of natural light and reflection, it was possible to reduce the use of artificial lighting by 75%, dramatically lowering electricity costs.

#### THE CHALLENGE

Like many small garages in Brazil, illumination was provided by fluorescent tubes. This garage's 24 lighting tubes of 40 watts each were usually switched on for 12 hours each working day, consuming 115 kilowatt hours on a daily basis. While fluorescent tubes are more energy-efficient than conventional electric light bulbs, the garage was still paying 45.62 Real (R\$) or US\$23 each month for electricity, which was a high fixed cost for such a small operation in this sector.

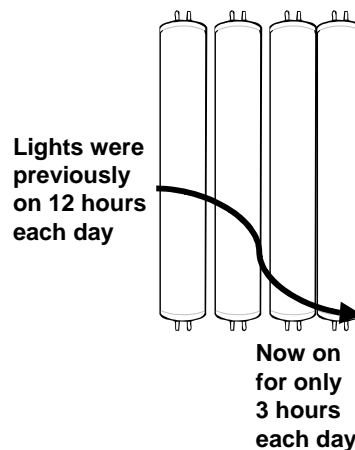
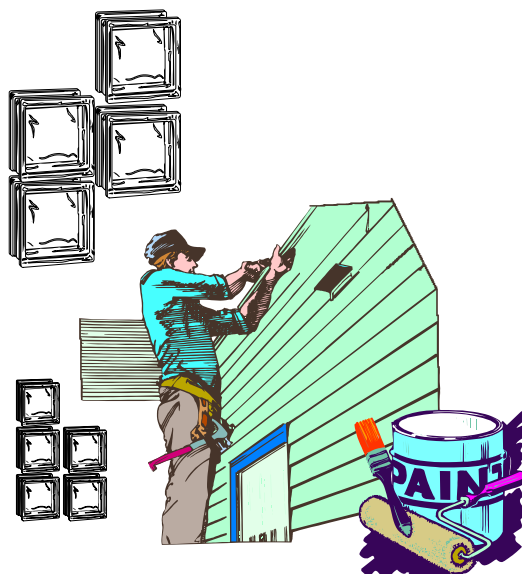
#### APPLICATION OF THE GOOD HOUSEKEEPING MANUAL

In the context of Fundação Empreender's AntiCusto project and in discussions with a consultant from the local "Commercial and Industrial Association" (ACI), the garage owner learned about the Good Housekeeping Manual of GTZ-P3U. Specifically, the Manual's **Energy Checklist** drew his attention to the idea of designing windows and walls in ways that can allow the maximum of natural light to enter a building, and to keep windows clean at all times in order to reduce the need for artificial lighting. The owner was also interested in the Manual's idea that energy consumption can be further reduced by plastering or whitewashing walls and roofs (which reduces heat generated through natural reflection).



#### ACTIONS TAKEN WITHIN THE GARAGE

- Transparent sheets were purchased and installed on the roof and back wall of the garage respectively.
- The garage's bare cement walls were painted in white to better reflect natural light within the facility.



---

## ENVIRONMENTAL BENEFITS

By exploiting natural daylight, electricity for artificial lighting was significantly reduced. In the bigger picture, such an action helps reduce the demand for energy, therefore creating less need for hydro generation plants, which use water resources and whose construction alters the local eco-system.

---

## ECONOMIC BENEFITS

Previous cost of electricity consumption per month	24 light tubes x 0.040 kW x 12 hours/day x 22 days/month > R\$ 0.18/kWh = 45.62 Real (R\$)/month or US\$23/month	
Investment cost	R\$ 196 or US\$98	For the purchase and installation of 4 transparent sheets at R\$ 26 each plus 5 transparent sheets costing R\$ 12 each = R\$ 164 For the purchase of white paint, which cost R\$ 32
Cost savings per month	24 light tubes x 0.040kW x 9 hours/day x 22 days/month > R\$ 0.18/kWh = R\$ 34.21/month or US\$17/month	
Payback period	Less than 6 months	R\$ 196 investment cost divided by R\$ 34.21 (monthly savings) = 5.73 months

---

## ORGANISATIONAL IMPROVEMENTS

During less busy hours, the garage's employees installed the transparent sheets. Similarly, during periods of low activity, the walls were whitewashed. Attention was put on switching on the fluorescent lights only when they were needed, and to ensuring that the lights were shut off at night and on the weekends. As a result, the lights that were previously on for 12 hours each working day were now only switched on for an average of 3 hours daily. Additionally, the application of the Manual led to higher motivation to implement new ideas.

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## OCCUPATIONAL HEALTH & SAFETY IMPROVEMENTS

The environment for working was considerably improved due to the increased availability of excellent natural daylight during most of the working day.

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Petra Kontny-Eimer, Deputy Director

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### AVOIDING THE LOSS OF RAW MATERIALS AND MINIMISING ENVIRONMENTAL IMPACT

## A Lebanese Bottler of Olive Oil

### IN BRIEF

With 27 employees, this company's main product was bottled olive oil. By using Good Housekeeping principles and thinking in ecological terms, the Production Manager was able to identify and make a small technical improvement thereby avoiding the loss of valuable raw materials during the bottling process. At the same time, this action reduced water pollution and clean-up time in the factory.

### THE CHALLENGE

Prior to bottling, an operator visually monitored and controlled the level to which a reservoir was being filled with olive oil. In this small enterprise, some employees had responsibilities for several tasks at the same time. When this particular operator was away from his post performing other duties, the reservoir occasionally overflowed. This resulted in the loss of primary material (olive oil), which was subsequently cleaned up by using water and detergents.

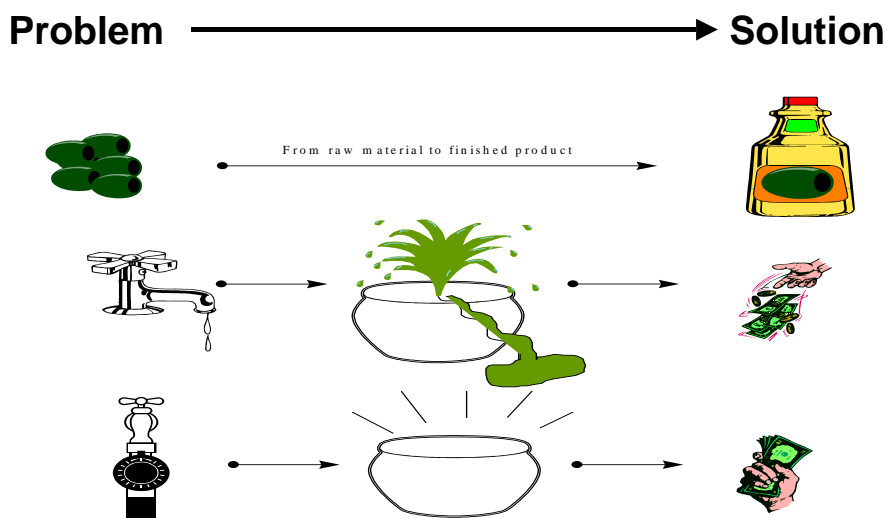
### APPLICATION OF THE GOOD HOUSEKEEPING MANUAL

As part of the DELTA Programme initiated by SBA, this company learned about the Good Housekeeping Manual of GTZ-P3U. In going through the Manual's **Materials Checklist**, the attention of the Production Manager was drawn to need to optimise the use of materials moving through the production process in order to minimise losses to waste. Having noticed that there were sometimes large quantities of oil olive on the floor, he asked the operator to explain. He discovered that the olive oil reservoir flooded several times each day.



### ACTIONS TAKEN WITHIN THE ENTERPRISE

- Purchase and installation of a floater in the olive oil reservoir.
- This device automatically stops the filling process as soon as the reservoir becomes full.





---

## ENVIRONMENTAL BENEFITS

By ensuring that the maximum amount of raw material is bottled in the final product, this company gained significant cost savings and at the same time, reduced its environmental impact by generating less waste. Furthermore, the company's waste water is now less saturated with vegetable oils and is therefore more easily cleaned in the local sewage treatment system—which is a benefit from the environmental point-of-view.

---

## ECONOMIC BENEFITS

Investment cost	US\$ 40	For the purchase of an automatic floater and 1-2 hours of labour for its installation
Annual savings	US\$ 4'000	From optimising the amount of raw material that ends up in the finished product
Payback period	Less than 3 days	

---

## ORGANISATIONAL IMPROVEMENTS

While the loss on a daily basis of a small amount of raw material may not seem important, the accumulated cost of such losses can be significant for a small enterprise. In this case, Good Housekeeping principles were used to identify a simple measure that could be implemented very easily and at low cost. This action led to the recovery of valuable raw materials during the production process and cost savings.

---

## FOR FURTHER INFORMATION:

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Contacts: Dr. Edith Kürzinger, Director  
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### DELTA Lebanon

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Contact: Samir Haddad, Head  
Commission on Environment

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### WHAT TYPE OF INSTRUMENTS DOES GTZ-P3U DEVELOP?

GTZ-P3U is developing tools for use by micro, small, and medium-sized companies to identify "triple win" opportunities, i.e. to reduce the costs of production, improve environmental performance, and enhance organisational capabilities. These tools include: **Good Housekeeping (GHK)**, a **Resource Management Module (RMM)**, **Environment-Oriented Cost Management (EoCM<sup>®</sup>)** and an **Integrated Management System (IMS)**. All of these instruments are designed to be simple, cost-effective, easily and widely applicable across industry sectors.

### IN WHICH COUNTRIES IS P3U WORKING?

P3U is working in Brazil, Mexico, Zimbabwe, Sri Lanka, the Philippines, Thailand, Vietnam, Kenya (through Swiss Contact), amongst others. Further activities are planned for India, Central America, Chile, Zambia, and Morocco.

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### WHAT IS THE DELTA PROGRAMME?

DELTA stands for Developing Environmental Leadership Towards Action. The DELTA Programme has focussed on gathering industrialists into 'business and environment' networks (DELTA Networks) in ten countries of the Mashrek and Maghreb. These Networks are composed of industrialists interested in taking a proactive leadership role on environmental issues. The DELTA Networks are working structures for industrialists to obtain information and contacts; exchange experiences; develop environmental know-how; and gain access to practical management tools that can offer 'win-win' options based on eco-efficiency.

### WHERE ARE THE DELTA NETWORKS?

DELTA Networks are operating in: Algeria, Egypt, Jordan, Lebanon, Libya, Mauritania, Morocco, Palestine, Syria, and Tunisia.



### REDUCING COSTS AND WASTES THROUGH BETTER UTILISATION OF RAW MATERIALS

## Sautéed Shrimp Producer in the Philippines

### IN BRIEF

This Manila-area food processor employed 31 people and an additional 9 seasonal workers to cope with peaks in production. The company's main product was sautéed tiny shrimp. Realising that valuable raw material was being lost during the bottling process, an inexpensive rubber scraper was purchased and used to fully empty the cooking pans, thereby saving the company costs and reducing waste.

### THE CHALLENGE

The procedure for processing and bottling shrimp was a long-established practice in this small, family-run business. For as long as anyone could remember, a large wooden ladle had been used to empty the cooking pans of sautéed shrimp in order to fill the material into bottles, which were then sealed. When asked, the Production Manager estimated that it was possible that upwards of 3kg of the cooked final product was being put to waste in the washing water each day as a result of this procedure.

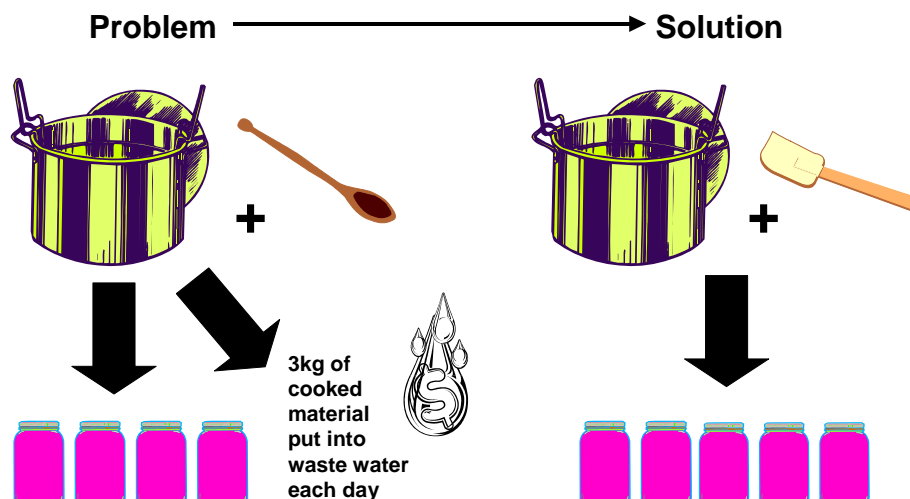
### APPLICATION OF THE GOOD HOUSEKEEPING MANUAL

As part of the programme initiated by the PTTC and financed by the DEG the Production Manager learned about the Good Housekeeping Manual of GTZ-P3U. Specific attention was put on the Manual's **Materials Checklist**, which suggests the idea of evaluating production processes in order to spot opportunities to optimise the use of materials as they move through the process—thereby minimising losses to waste. The Checklist also draws attention to several measures that can be taken to reduce the use of cleaning agents, reducing both costs and environmental impact.



### ACTIONS TAKEN WITHIN THE ENTERPRISE

- Purchase of a rubber scraper.
- Employees were instructed to use this utensil in place of the wooden ladle and to completely clear the pans of the cooked material prior to washing.



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## ENVIRONMENTAL BENEFITS

By ensuring that the maximum amount of raw material ended up in the final product, this company gained significant cost savings and at the same time, reduced its environmental impact by generating less solid waste. The company's waste water is also now less polluted and therefore more easily cleaned in the local sewage treatment system due to two factors: 1) less food residues end up in the washing water; and 2) a smaller amount of cleaning agents is consequently being used to remove any last remaining residues from the cooking pans.

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## ECONOMIC BENEFITS

Investment cost	US\$ 1.95	For the purchase of a rubber scraper
Annual savings	US\$ 8'795	From optimising the amount of raw material that ends up in the finished product
Payback period	Immediate	

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## FOR FURTHER INFORMATION:

### GTZ-P3U PROGRAMME

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)  
German Technical Cooperation (GTZ)  
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## ANNEX III

# Application in Companies Format for Case Study



## TITLE OF CASE STUDY

### Name of Company, Country

#### IN BRIEF

*Please summarise the problem faced and the Good Housekeeping measures that were undertaken (also include information on the company's industry sector, products, number of staff members, etc.).*

#### THE CHALLENGE

*Please describe the problem(s) that the Good Housekeeping Manual helped you to address.*

#### APPLICATION OF THE GOOD HOUSEKEEPING MANUAL

*In which context did you apply the Manual? Who was involved? Which **Checklist** in the Manual made you think about possible actions to undertake?*



#### ACTIONS TAKEN WITHIN THE ENTERPRISE

*Please describe the actions undertaken and use a graphic to illustrate the problem and the solution.*

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#### ENVIRONMENTAL BENEFITS

*How did the actions undertaken reduce the operation's environmental impact (re: reduction, reuse, recycling of water; conservation of energy; reduced use of materials and hazardous substances, etc.)?*

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## ECONOMIC BENEFITS

*How much money did the company save by taking the measures described?*

Investment cost		<i>in terms of money and time</i>
Running cost		<i>in terms of money and time</i>
Annual savings		<i>amount / in which area?</i>
Payback period		<i>within what period?</i>

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## ORGANISATIONAL IMPROVEMENTS

*Please describe any organisational changes (e.g. changes in responsibilities, procedures, timing, location of process) that led to improvements in quality, productivity, costs, motivation of staff members etc.*

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## OCCUPATIONAL HEALTH & SAFETY IMPROVEMENTS

*Please describe any changes in procedures that improved the working conditions for personnel (e.g. reduction of health risks, improved safety of the working environment, etc.).*

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## FOR FURTHER INFORMATION:

### GTZ-P3U PROGRAMME

Pilot Programme for the Promotion of Environmental Management  
in the Private Sector of Developing Countries (P3U)  
German Technical Cooperation (GTZ)  
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### LOCAL CONTACT INFORMATION

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Email:

# ANNEX IV

## Regulations for the Utilisation





## Regulations for the Utilisation of the Consultancy and Training Instruments Developed by GTZ-P3U

On behalf and with the funding of the German Ministry for Economic Cooperation and Development, GTZ has developed, via its *Pilot Programme for the Promotion of Environmental Management in Developing Countries (P3U)*, the consultancy approach "Profitable Environmental Management (PREMA) and the following instruments:

- Resource Management Module (RMM)
- Good Housekeeping (GHK)
- Environment-oriented Cost Management (EoCM)
- PREMA plus

The implementation of PREMA enables micro, small, and medium-sized enterprises (SME) to achieve a triple win:

- improvement of their economic competitiveness through a reduction of production costs,
- reduction of the environmental impact caused by production, as well as
- sustainable implementation of improvements through organisational learning.

PREMA trainings and consultancies are implemented by qualified and licensed national and international consultants and trainers. In order to ensure the quality of the PREMA product and PREMA services, the instruments have been registered as trade marks both nationally with the German Patent and Trade Mark Office and internationally with the World Intellectual Property Organization (WIPO). Furthermore, a capacity-building system for trainers and consultants (see annex) has been established on the basis of experience made so far.

The responsibility for quality assurance of PREMA and its components as well as the copyright are with GTZ-P3U, supported by the international PREMA network ([www.pruma.de](http://www.pruma.de)). Publications in other than the five GTZ-P3U working languages (i.e. German, English, French, Spanish and Portuguese) are welcome, but should be coordinated with GTZ-P3U in advance.

In cooperation with the international PREMA network, GTZ-P3U annually offers at least one basic PREMA training for multipliers in Germany, as well as in other regions on demand. For the more complex modules, facilitators will additionally require special trainings which include a training on the job; these training, as well as various coaching models (supervision, internet coaching, co-moderation) can be arranged according to individual requirements on request. GTZ, in cooperation with the PREMA network, will ensure the legal protection, marketing and product care once the P3U project has been terminated.

Since the trainers to a certain degree also will be ambassadors for environmental management, the PREMA approach and for GTZ-P3U, a minimum of environment-oriented behaviour and the respective know-how are considered indispensable. We further encourage an active involvement by *female* trainers and consultants.

The following supports is offered to trainers and consultants by GTZ-P3U and the PREMA network:

- In accordance with the capacity-building system (see annex), you will receive certificates for your participation in training measures;
- In line with your qualification as a PREMA trainer or consultant, you will receive temporary or permanent national or international licences;
- You will be included in GTZ-P3U's online register of trainers and consultants and thus recommended to PREMA clients;
- You will be contracted by GTZ-P3U and/or recommended to other institutions that intend to implement PREMA modules;

- You will be member of the international PREMA network for trainers and consultants (possibly subject to a membership fee);
- You will be involved in further methodological developments, receive updated materials (possibly against reimbursement of costs) and advice on specific implementations (through coaching).

For reasons of quality assurance, the members of the PREMA network are expected to respect the following regulations:

1. observation of the product names and their registration as trade marks;
2. observation of the copyright for PREMA publications and training materials;
3. acceptance of the PREMA system of quality assurance, especially with regard to the documentation of case studies, network meetings and workshops (see annex);
4. coordination of planned PREMA events with GTZ-P3U in good time, in order to ensure an optimum support by GTZ-P3U and the use of updated concepts and materials (information on cooperation partners, participants and training concept; especially if you are planning modifications to the basic module);
5. adequate information of participants about the PREMA system of quality assurance (e.g. by having them signed the regulations) and the use of the GTZ-P3U certificates;
6. evaluation of the event by the participants (see questionnaire attached), including a quantitative and qualitative evaluation and submission to GTZ-P3U for purposes of impact monitoring and the further development and marketing of PREMA;
7. a summary report on the event according to the attached form in order to feed back the learning experience to GTZ-P3U and the PREMA network.

I agree to the rules of utilisation of the instruments for trainings and consultancies developed by GTZ-P3U.

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(Date)

(Signature)

(Name in block letters)