

# APPLICATION SYSTEM FOR EVALUATION & IMPLEMENTATION OF CLEANER PRODUCTION

<http://cp.doe.gov.my/cpit/login.php>



## CLEANER PRODUCTION IMPLEMENTATION TOOL (USER GUIDE)



Department of Environment  
Ministry of Natural Resources and Environment

NOTES

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# APPLICATION SYSTEM FOR EVALUATION AND IMPLEMENTATION OF CLEANER PRODUCTION

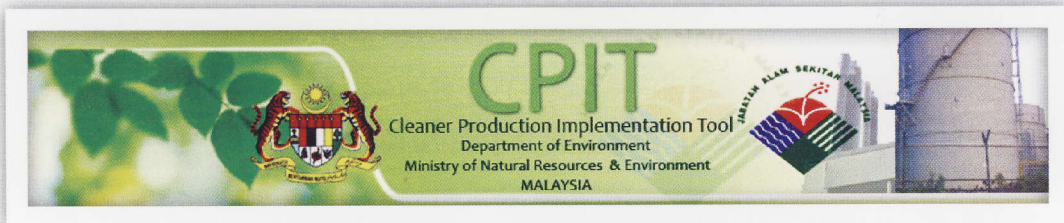
<http://cp.doe.gov.my/cpit/login.php>

CLEANER PRODUCTION IMPLEMENTATION TOOL (CPIT)  
(USER GUIDE)



**Department of Environment**  
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## 1.0 INTRODUCTION

This is the Reference Manual for the Cleaner Production Implementation Tool (CPIT) System (<http://cp.doe.gov.my/cpit/login.php>), released on 2008. This manual will guide the user to well use of this CPIT system.

CPIT works as a self-audit tool for SMEs and SMLs which is able to generate CP options and guide the users through Cleaner Production audits. It consists of 3 audit modules which are **Waste (Material) Module, Waste (Energy) Module and Safety & Environment Module**

The basic layout of this system as figure below:

The screenshot shows the CPIT interface for a 'QUANTITATIVE AUDIT FOR GAS EMISSION'. It features a system banner at the top with the CPIT logo and the Department of Environment, Ministry of Natural Resources & Environment. Below the banner is a green menu bar with 'Waste Audit', 'Help', and 'Logout' links. The main content area includes instructions for data entry and a table for recording gas emission data. A 'Print button' is located in the top right corner. A 'Shortcuts button' is at the bottom. Navigation links for 'Previous step' and 'Click here for the next step link' are also present.

Unit Operations	Value (m <sup>3</sup> )	Duration	Rate (m <sup>3</sup> /hour)
Comminuting	100	2	50
Boiler (by fuel)	200	1	200
Cooling	400	3	133.3

## 2.0 WELCOME

### CPIT LOGIN PAGE

The screen shot below is a representation of the front page of the CPIT system. Some useful 'links' are also available from the green menu bar at the top of the page.

In order to access the web site, the first step should be to select the 'Register' link on the green menu bar. Register and get the username and password for login purposes. Registration is for FREE but only qualified company is accepted.

The screenshot shows the CPIT homepage. It features a system banner at the top with the CPIT logo and the Department of Environment, Ministry of Natural Resources & Environment. Below the banner is a green menu bar with 'CPIT Home', 'Register', and 'Help' links. The main content area includes a login form and registration information. A 'Print button' is located in the top right corner. A 'Shortcuts button' is at the bottom. A callout box points to the login form with the text 'Insert username and password to login for registered user'.

Figure 2.1: CPIT Homepage

## REGISTRATION FOR NEW USERS

In order to have authorized access to CPIT, you must register by completing the **registration form**. Click on the **register hyperlink** in login page to enter the registration form page.

The image shows the CPIT registration process. At the top, the CPIT logo and header are visible. Below the header, there is a navigation bar with 'Register' and 'Help' links. A callout box points to the 'Register' link with the text '(a) Click here to enter registration form'. Below this is a detailed 'Registration Form' with the following fields:

Registration Form	
Company Name *	Unit Perundingan Universiti Malaya
Company Address *	50603 Kuala Lumpur
State *	Kuala Lumpur
Email *	upum@um.edu.my
Telephone No. *	03 77576587
Fax No. *	03 78576567
Category of Industry *	Agriculture
Type of Industry *	SME
Workers No.	50 - 100 Workers
Representative Name *	Mr. Ismail Yahaya
Representative Position *	Project Executive Manager
Establish Since	2003
Company Registration No. *	UM-004A678
Company Nett Income (RM)	RM 100,001 - RM 200,000
<input type="button" value="Register"/>	

Figure 2.2: Registration Form

## REGISTRATION FORM

User must key in all the details with (\*) symbol. All details will be saved in the CPIT database and will not be published to the public without permission.

Error message as below will appear for registration form:

- 1) Error input : For email address -> Please insert valid email address
- 2) Nothing input : Blink cursor to the unfilled textbox -> you must fill in this textbox first.

All details are compulsory.

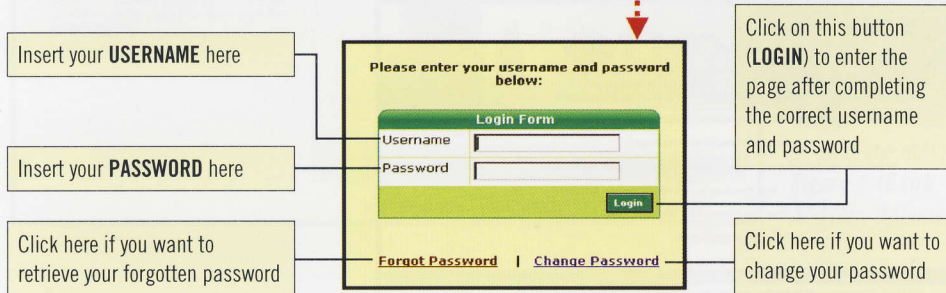
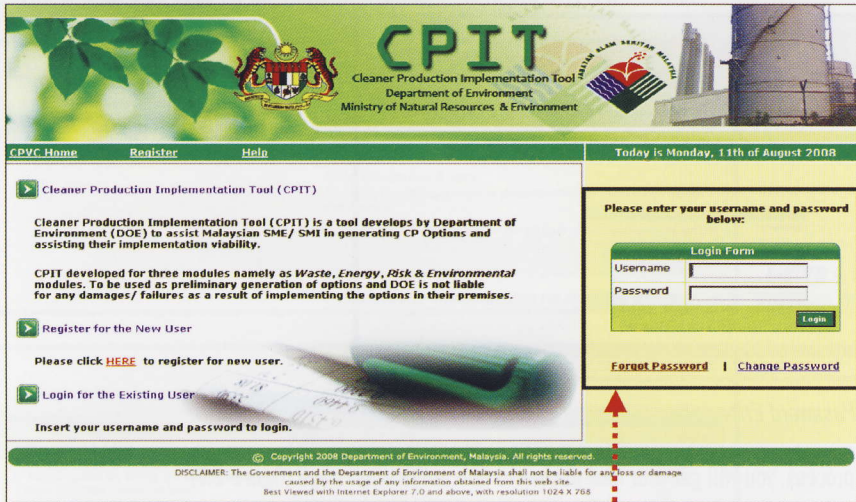
Once you have completed the process, select the **Register** button and allow time for the system to accept your submission. Then, you will be directed to registration notification page. A confirmation email will be sent to you by the administrator.

The image shows the CPIT registration notification page. The page features the CPIT logo and a green banner with the text "Congratulations! You are registered with the Cleaner Production (CP) help tool program." Below this, it says "You will be contacted by E-mail Notification by CP Administrator." and "Go to LOGIN page". At the bottom, there is a disclaimer: "© Copyright 2007 Department of Environment, Malaysia. All rights reserved. DISCLAIMER: The Government and the Department of Environment of Malaysia shall not be liable for any loss or damage caused by the usage of any information obtained from this web site."

Figure 2.3: Registration Notification Page

## LOGIN FOR REGISTERED USERS

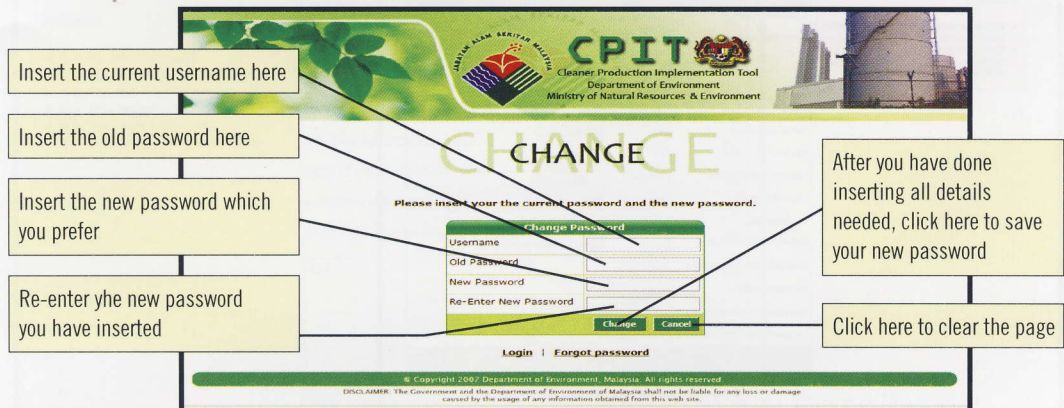
Enter your **username** and **password** in the appropriate text box and you will be directed to CP Audit Main Page as shown in **Figure 2.4** below by clicking on login button:



**Figure 2.4:** Login Page for CPIT

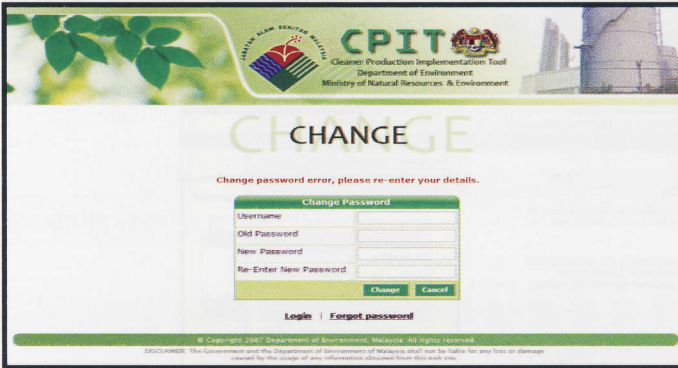
## CHANGE PASSWORD

If you have already registered but want to change your password, you can do it by clicking on the Change Password link in login page. You will then be prompted to enter your username, current and new password and then click on Change button. Your new password will be shown at the next page. **Figure 2.5 - Figure 2.7** shows the change password print screen:



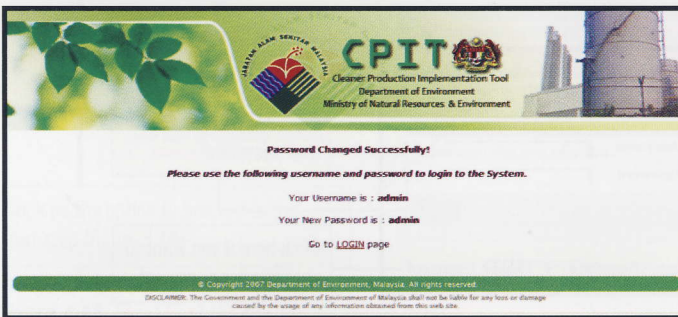
**Figure 2.5:** Change password page

If you have inserted wrong username and password or you wrongly re-enter the new password, the change password error page will appear as **figure 2.6**. You need to re-insert all the information needed to precede the password change.



**Figure 2.6:** Change Password Error page

After completing all process, you will get your new password in a notification page (**figure 2.7**).



**Figure 2.7:** Change Password Notification page

## UPDATE COMPANY PROFILES

User can update company profile that includes all the details as in registration form. User can update the company profiles if necessary, and then they must click on the “Update” button to save all the data.

**Reminder:**

- Please update your company profile if necessary.
- The value with (\*) is required. Click Save button to save your update.

**Update Registration Profile**

**Registration Form**

Company Name*	Unit Perundangan Universiti Malaysia
Company Address*	Universiti Malaysia 50603 Kuala Lumpur
State*	Kuala Lumpur
Email*	upum@um.edu.my
Telephone No.*	03 90807307
Fax No.*	03 90797287
Category of Industry*	Battery
Type of Industry*	SMI
Workers No.	< 10 Workers
Representative Name*	Mr. Nordin bin Mohd. Amin
Representative Position*	CEO
Establish Since	2000
Company Registration No.*	u-287983749w
Company Nett Income (RM)	> RM 500,000

**Save**

[CHOOSE UNIT OPERATIONS](#) | [CHOOSE ACTIVITIES](#)

**Figure 2.8:** Update profiles

### 3.0 INITIAL STEPS

#### CHOOSE UNIT OPERATIONS AND ACTIVITIES

Figure 3.1 shows the unit operations/activities page. Users can pick unit operations/activities by clicking on the drop down menu. New empty rows are automatically added as you progressively enter information as new records. The empty rows can be dynamically displayed as the user selects the unit operation or activity. Selects waste type (Waste Material/ Waste Energy/ Both of above) for each unit operation/ activity and submit it by clicking on the **Save** button.

Click on the **Insert New Operations** link to insert new unit operations/ activities. **Descriptions** of unit operations/ activities can be viewed by clicking (Click **HERE** to view the descriptions...) below of the Unit Operations/ Activities title. Click the “delete” **check box** and then click on the Save button to delete the selected unit operations/ activity/.

The screenshot shows a web interface for selecting unit operations. At the top, there are instructions and a note. Below is a table titled 'List of unit Operations' with columns for 'Unit Operations', 'Waste type', and 'Delete'. The table lists various machines like 'Sitting machine', 'Jet Dyeing machine', 'Extractor', 'Blower', 'Setting machine', 'Boiler (by coal)', 'Boiler (by other fuel)', and 'Knitting machine'. Below the table is an 'Insert New Unit Operations' button and a 'Save' button. A 'PREVIOUS STEP' and 'CLICK HERE FOR THE NEXT STEP' link are also present. Callouts point to the 'Insert New Unit Operations' link, the 'Unit Operations' column, the 'Waste type' column, and the 'Delete' checkbox.

Instructions:

- Insert new unit operations of the unit operations if it is not listed.
- Always click on Save whenever changes are made.
- View Example

Note:

- Unit operation is a basic step in a process. It may refer to an equipment/ machine involved in the process, i.e. heat exchanger, electrical pump, etc.

Select the unit operations for your company.

List of unit Operations

Unit Operations	Waste type	Delete
Sitting machine		<input type="checkbox"/>
Jet Dyeing machine	Both of above	<input type="checkbox"/>
Extractor		<input type="checkbox"/>
Blower		<input type="checkbox"/>
Setting machine	Both of above	<input type="checkbox"/>
Boiler (by coal)	Both of above	<input type="checkbox"/>
Boiler (by other fuel)	Both of above	<input type="checkbox"/>
Knitting machine	Both of above	<input type="checkbox"/>
Select Unit Operation	Both of above	<input type="checkbox"/>

Insert New Unit Operations

Save

PREVIOUS STEP | CLICK HERE FOR THE NEXT STEP

Click here to add new unit operation/activity

Click on the Insert New Unit Operations link to insert new unit operations/activity

Click here to view the descriptions of unit operation

Click here to choose waste type for selected unit operation/activity

Figure 3.1: Choose Unit Operations and add new unit operations

#### Select Module for Audit

When the users have chosen the unit operations and activities, they have to choose the audit module as in figure 3.2.

The screenshot shows the CPIT Audit Home page. At the top, there is a header with the CPIT logo and navigation links: 'Update profile', 'Help', and 'Logout'. Below the header, there is a section titled 'Please select any module based on your preference:' with three options: 'Waste (Material)', 'Waste (Energy)', and 'Safety & Environment'. Each option has a brief description and a 'Click HERE' link. Callouts point to the 'Update Profile link', 'Help link', 'Logout link', and the three audit module options.

Update Profile link

Help link

Logout link

Click HERE to proceed to Waste (Material) Audit

Click HERE to proceed to Waste (Energy) Audit

Click HERE to proceed to Safety and Environment Audit

Click HERE to proceed to Waste (Material) Audit

Click HERE to proceed to Waste (Energy) Audit

Figure 3.2: CPIT Audit Home

The green menu bar on the top provides users with main menu on CPIT that include Update **Profile link**. Users can update the company details as in registration form and click on the “Update” button to save all the data.

The **Help** will guide you to get guidelines and information on how to use CPIT.

In order to start the Audit processes, users are required to choose any of the three **Audit modules** by clicking on the **Waste, Energy or Safety & Environment** hyperlink. However, for full Cleaner Production Audit, it is recommended that the users start with Waste Audit and followed by the other two.

## 4.0 WASTE (MATERIAL) MODULE

### WASTE (MATERIAL) AUDIT FRONT PAGE: DELETE UNIT OPERATIONS AND ACTIVITIES LIST

User can delete the list by clicking the unnecessary unit operation and activities as shown in **figure 4.1**.

Update the unit operations and activities for waste module

**Reminder:**

- Delete unit operations and activities that does not generate waste.
- Always click on "Save" whenever changes are made.
- "Delete" function will be completed by clicking on delete check-box at the right side and followed by "Save" button.
- [View Example](#)

**IMPORTANT:**

- If the input for an activity is the same as the input for a unit operation, select only one of them for the following.
- i.e. the input into a dyeing machine is the same as the input into the dyeing process;
- Therefore, choose only dyeing process or dyeing machine for the following audits.

Unit Operations / Activities	Delete
Blender	<input type="checkbox"/>
Boiler (by fuel)	<input type="checkbox"/>
Bucket Elevator	<input type="checkbox"/>
Bucket Elevator	<input type="checkbox"/>
Cutter	<input type="checkbox"/>
Boiler (by fuel)	<input type="checkbox"/>
Drying	<input type="checkbox"/>
Knitting	<input type="checkbox"/>
Drying	<input type="checkbox"/>
Molding	<input type="checkbox"/>
Extraction	<input type="checkbox"/>
weqret	<input type="checkbox"/>

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

Figure 4.1: Delete unit operations and activities list

### PRELIMINARY QUALITATIVE AUDIT FOR WASTE (MATERIAL)

Figure 4.2 shows the preliminary qualitative audit for unit operations/ activities and waste stream. It consist all waste streams as the variables for any selected unit operations/ activities to be audited. Users can pick by clicking from radio button of the waste streams and submit it by clicking on the submit button to save the selections. Results (figure 4.3) can be viewed by clicking the **CLICK HERE FOR THE NEXT STEP** link at the bottom of the table.

Choose the waste stream for unit operations/ activities.

**Instructions:**

- Please save your data before proceeding to the next page.
- [View Example](#)

**Indicator:**

- Liquid Waste:** Any liquid wastes other than water i.e. used chemical, solvents and others
- Solid Waste:** Any waste which is in solid form including dust, powder and tiny fibres.
- Watervapor Waste:** Any kind of evaporation which includes steam, mist and vapor. It is usually found in boiling process.
- Wastewater:** Any water or liquid from process which is drained directly into open water/drainage or wastewater treatment plant.

Unit Operations / Activities	Liquid Waste	Solid Waste	Watervapor Waste	Wastewater
Boiler (by coal)	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Boiler (by other fuel)	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Knitting	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Setting	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Dyeing	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Knitting machine	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

Shortcuts: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Figure 4.2: Preliminary Qualitative Audit for Waste (Material)

Figure 4.3 is the page of summary for the preliminary qualitative audit. All submissions can be viewed in this summary page. Details of unit operations (figure 4.4) can be viewed by clicking on the unit operation at the left side.

Below is the result for preliminary qualitative audit for respective waste stream and selected unit operation

Unit Operations/ Activities	Liquid Waste	Solid Waste	Watervapor Waste	Wastewater
Boiler (by coal)	No	Yes	Yes	No
Boiler (by other fuel)	No	Yes	No	No
Knitting	No	Yes	No	No
Setting	Yes	No	Yes	Yes
Dyeing	Yes	No	Yes	Yes
Knitting machine	Yes	Yes	Yes	Yes

PREVIOUS STEP | CLICK HERE FOR THE NEXT STEP

Figure 4.3: Summary for the preliminary qualitative audit

Unit Operation/ Activity Card	
Unit Operation	Blender
Descriptions	It is a machine that is used to crush solid raw materials into smooth particles.
Possible Waste	Solid waste, Wastewater, Energy waste
Environmental Issues	Water pollution, Soil pollution
Possible CP Options	<ol style="list-style-type: none"> <li>Determine optimum time for blending.</li> <li>Increase number of blades used.</li> <li>Ensure the blender is always performing well through regular maintenance.</li> <li>Pre cut raw materials into wanted or smaller size before being put into blender.</li> </ol>

Figure 4.4: Activity Card: descriptions of unit operations/ activities

Click on the **waste stream** link to proceed to the **Quantitative Audit**.

A Liquid Waste     B Solid Waste  
 C Watervapor Waste     D Wastewater

Figure 4.5: Waste Stream Audit Menus

## QUANTITATIVE AUDIT

User must click on any of the waste stream links (figure 4.5) to proceed to quantitative audit page as shown in figure 4.6 below. User can fill in all the text-boxes to generate quantitative audit for liquid waste accordingly. Select the quantity and duration unit of the respective unit operations/ activities. Calculation of the rate will be done by the system automatically. After finish inserting the value and the calculation, user can proceed to the next page (figure 4.7) by clicking “CLICK HERE FOR THE NEXT STEP” hyperlink.

Fill in the necessary data on Liquid Waste below.

**Instructions:**

- Fill in all the relevant data.
- The rate will be calculated by the system automatically when you click on **Calculate & Save**.
- Click [HERE](#) if you want to convert the quantity and duration units.
- [View Example](#).

Quantitative Audit for Liquid Waste						
Unit Operations/ Activities	Type of liquid		Quantity (kg)	Duration	Rate (kg/hour)	
Setting	Other (Please state)	Softener&che	1.1	208 Hour	0.01	
Dyeing	Other (Please state)	Chem&dyestuff	138.648	208 Hour	0.67	
Knitting machine	Select Type		0	0 Select Unit	0.00	

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

Figure 4.6: Quantitative Audit

### PROBLEM PRIORITIZATION

Figure 4.7 is problem prioritization page. User can answer the questions for every problem by clicking the drop down menu. Click on prioritizes and save button to get the score and save the answer. Prioritization score will be automatically calculated and viewed at the right-hand side column. Click on the **CLICK HERE FOR THE NEXT STEP** link to proceed to Quantity Prioritization page (figure 4.8).

Answer all the questions and it will be rated by the system

**Instructions:**

- Select the **drop down menu** and choose your rating for questions given.
- Click on the **Prioritize & Save** button to get your rating score for problem prioritization.
- [View Example](#)

**Indicator:**

- Yes, Very Much (3) :** Modification of this unit operation does not have any effects, and this unit operation should be included/ accounted for in the following evaluations.
- Yes, Slightly (2) :** Modification of this unit operation does not have significant effects, it should be included/ accounted for in the following evaluations.
- No, include (1) :** Modification of this unit operation does have significant effects, but I would like to include it in the following evaluations.
- No, exclude (0) :** Modification of this unit operation does have significant effects, I do NOT want to make changes to this unit operation, therefore, it should NOT be included/ accounted for in the following evaluations.

Problem prioritization for Liquid Waste					
Unit Operations/ Activities	Question 1	Question 2	Question 3	Question 4	Prioritization Score
Setting	Reduce liquid without affecting the production No, Include (1)	Reduce liquid without affecting the quality of product No, Include (1)	Reduce operating duration without affecting the production Yes, Very Much (3)	Reduce operating duration without affecting the quality of product Yes, Slightly (2)	7
Dyeing	No, Include (1)	No, Include (1)	Yes, Slightly (2)	No, Include (1)	5
Knitting machine	Select Value	Select Value	Select Value	Select Value	

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

Figure 4.7: Problem Prioritization

### QUANTITY PRIORITIZATION

Figure 4.9 shows the quantity prioritization. This page will inform users of which problem with the most priority. Options for the listed criteria (figure 4.10) can be viewed by clicking on the specific unit operations that want to be viewed by the user.

Please click on the unit operation/ activity link to proceed to the next process

**Instructions:**

- Evaluation for the unit operations can be viewed by clicking of the **specific unit operations**.
- [View Example](#)

Quantity prioritization for Liquid Waste		
Unit Operation/ Activity	Prioritization Score	Prioritization Rating
<a href="#">Setting</a>	7	1
<a href="#">Dyeing</a>	5	2
<a href="#">Knitting machine</a>		3

**Lower Prioritization Score: 5**  
**Higher Prioritization Score: 7**

Page 1 of 1

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

Figure 4.9: Quantity Prioritization

## CHOOSE OPTIONS

User can only choose the maximum four options before the option evaluation process as shown in figure 4.10 (a). Users are required to choose minimum two options to compare the selected options. For new added unit operations/activities, users can click on the **HERE** link (directed to **figure 4.10(b)**) as below.

**Instructions:**

- Click on **Submit** button when you select the options for unit operation or activity.
- [View Example](#)

**Unit Operation** Setting

**Options**

- Optimize blowing method and capacity so that there is no excess of heated air being blown into the atmosphere.
- Collect and recycle heated air from the setting process.
- Optimize the use of softener.
- Optimize the use of water.
- Ensure the setting machine is always performing well through regular maintenance.

\*For new added unit operation/ activity, please click [HERE](#) to update and insert the options.

**Submit** **Cancel**

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

**Figure 4.10 (a):**  
Choose Options

**Instructions:**

- The table shows the options for your selected unit operation/ activity
- Insert option** by filling the empty textbox then click the submit button.
- Update the current option in the textbox.
- Delete the current option by clicking the checkbox at the right side then click the submit button.

**List of options**

Options	Delete
Optimize blowing method and capacity so that there is no excess of heated air being blown into the atmosphere.	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

First Prev 1 of 1 Next Last **Submit** **Cancel**

[PREVIOUS STEP](#) | [CLICK HERE FOR THE NEXT STEP](#)

**Notes:** Please leave at least one option.  
**Figure 4.10 (b):**  
Add New Options

## WEIGHTAGE EVALUATION

**Figure 4.11** is weightage evaluation page. User can select the weightage for criteria listed based on the importance of the criteria. Click save button to save the weightage selection. Click on the **NEXT PAGE** link to proceed to quantity prioritization (**figure 4.12**).

Select rating values for weightage evaluation for criterias given below

**Instructions:**

- Click on **Submit** button when you have inserted the rating values.
- [View Example](#)

**Indicator:**

- 0 = No, not important
- 2 = Yes, but slightly important
- 4 = Yes, but moderately important
- 6 = Yes, important
- 8 = Yes, very important
- 10 = Yes, extremely important

**Weightage Evaluation for Liquid Waste**

Criteria	Weightage (W)
Reduction in treatment/disposal costs	8
Reduction of input material costs	8
Extent current use in Industry	8
Effect on product quality	10
Low capital cost	6
Low Operational and Maintenance cost	10
Short implementation period	10
Ease of implementation	10
Reduction in energy bill	8
Improvement in Health, Safety and Environment (HSE)	8
ABC	8
	0

**Submit** **Delete** **Cancel**

**Figure 4.11:**  
Weightage Evaluation

## OPTIONS EVALUATION

Figure 4.12 is options evaluation page. User can choose the option rating based on the weightage value. The lists of options for selected unit operations are listed below the table. Click on **CLICK HERE FOR THE NEXT STEP** link to view the result of final evaluation (figure 4.13).

View example for more details

Compare the weightage

Click on the Submit button when you rate the options for Setting  
View Example

Criteria Indicator and weightage evaluation values

C1=Reduction in treatment/disposal costs (8)	C7=Short implementation period (10)
C2=Reduction of input material costs (8)	C8=Ease of implementation (10)
C3=Extent current use in Industry (8)	C9=Reduction in energy bill (8)
C4=Effect on product quality(10)	C10=Improvement in Health, Safety & Environment (8)
C5=Low capital cost (6)	C11=ABC (8)
C6=Low Operational and Maintenance cost (10)	C12= (0)

Options	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
Optimize blowing method and capacity so that there is no excess of heated air being blown into the atmosphere.	8	8	6	8	10	6	8	4	6	6	6	0
Collect and recycle heated air from the setting process.	8	8	8	8	6	6	6	4	4	10	10	0
Optimize the use of softener.	10	10	10	10	10	10	6	8	8	8	6	0
Optimize the use of water.	4	2	8	10	4	4	6	10	8	8	10	0
Ensure the settingmachine is always performing well through regular maintenance.	4	8	8	8	8	8	6	6	6	4	4	0

Submit Cancel

PREVIOUS STEP | CLICK HERE FOR THE NEXT STEP

Figure 4.12: Option Evaluations

**Instructions:**

- Click on the Click Here link to proceed to Economic & Benefit Analysis.
- You can choose the suitable options by comparing the sum of weightage ratings.
- The highest sum of weighted rating is the best option to be applied for your unit operation/ activity
- View Example

List of options for Setting

#	Options	Sum
1	Optimize the use of softener.	812
2	Collect and recycle heated air from the setting process.	692
3	Optimize blowing method and capacity so that there is no excess of heated air being blown into the atmosphere.	664
4	Ensure the settingmachine is always performing well through regular maintenance.	604
5	Optimize the use of water.	560
		<b>Count: 5</b>
		<b>Min: 560</b>
		<b>Max: 812</b>

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PREVIOUS STEP

Figure 4.13: Final Evaluations

## ECONOMIC BENEFIT ANALYSIS SHEET: COST AND BENEFIT

Figure 4.14 shows the option page which provides the user to calculate and analyze the usage of the chosen option based on cost-and-benefit analysis. User can put the estimation of investments cost, return cost and operational cost. Results can be calculated by clicking on the 'calculate and save' button.

**Instructions:**

- Insert all the necessary data in the textbox given below.
- Results can be calculated by clicking on the Calculate & Save button.
- View Example

**Notes:**

- Cost criteria includes capital costs, maintenance costs, operation costs, etc.
- The costs and savings should be calculated on monthly basis

Economic Benefit Analysis Sheet: Cost and Benefit

Cost criteria	Cost (RM)	Duration
Unit Operation:Setting		
Option applied: Optimize the use of softener.		
<b>INVESTMENTS</b>		
Inv 1	50000	
Inv 2	10000	
	0	
	0	
	0	
<b>TOTAL INVESTMENTS</b>	<b>60000</b>	
<b>RETURNS</b>		
Ret 1	1000	5 Month
	0	Select Value
	0	Select Value
	0	Select Value
	0	Select Value
<b>TOTAL RETURNS (PER MONTH)</b>	<b>5000</b>	
<b>OPERATIONS</b>		
operation1	300	2 Month
	0	Select Value
	0	Select Value
	0	Select Value
	0	Select Value
<b>TOTAL OPERATIONS (PER MONTH)</b>	<b>600</b>	
<b>PAYBACK PERIOD (PER MONTH)</b>	<b>14</b>	
Calculate & Save		

Figure 4.14: Economic Benefit Analysis Sheet

## ACTUAL OPTION IMPLEMENTATION SUMMARY

The unit operations/ activities, the payback period (by month), the returns (by month), the operations cost (by month), the options list and the compulsory action for users are included in option implementation summary as in **figure 4.15**.

Unit Operation: Setting

[View Example](#)

Economic Benefit Analysis Sheet Summary: Cost and Benefit for liquid waste					
Options	Investment Cost	Return Cost	Operation Cost	Payback Period	Acceptance
Optimize blowing method and capacity so that there is no excess of heated air being blown into the atmosphere.	RM 30000	RM 13400	RM 4000	3 Month	<input checked="" type="radio"/> Accept <input type="radio"/> Not Sure <input type="radio"/> Decline
Collect and recycle heated air from the setting process.	RM 10000	RM 5000	RM 2500	4 Month	<input type="radio"/> Accept <input type="radio"/> Not Sure <input type="radio"/> Decline
Optimize the use of softener.	RM 60000	RM 5000	RM 600	14 Month	<input type="radio"/> Accept <input type="radio"/> Not Sure <input type="radio"/> Decline
Optimize the use of water.	RM 0	RM 0	RM 0	Month	<input type="radio"/> Accept <input type="radio"/> Not Sure <input type="radio"/> Decline
Ensure the setting machine is always performing well through regular maintenance.	RM 45000	RM 4000	RM 2000	23 Month	<input type="radio"/> Accept <input type="radio"/> Not Sure <input type="radio"/> Decline

Notes: Please [click here](#) or page 13 to continue with the economic benefit analysis of the other CP options.  
Please [click here](#) or page 9 to conduct the audit of the other unit operations and activities.  
Please [click here](#) or page 6 to conduct the audit of the other waste streams.  
Please [click here](#) or page 2 to conduct the audit of the other aspects.

Figure 4.15: Options Implementation Summary

## 5.0 WASTE (ENERGY) MODULE

The Waste (Energy) module shares the same steps as Waste (Material) module. Please refer to Waste (Material) Module manual for help at page 12.

## 6.0 SAFETY & ENVIRONMENT MODULE

### MAIN MENU FOR SAFETY & ENVIRONMENT MODULE

Select the Safety and Environment module to proceed to the third Audit, and then you will be directed to Main Menu page. Safety and environment module only provides the checklist questions on safety and environmental issues.

Select any of the image buttons given (as shown in **figure 6.1**). You are required to answer all the questions given based on your factory safety conditions.

The screenshot displays the CPIT (Cleaner Production Implementation Tool) interface for the Safety & Environment Audit. At the top, it features the CPIT logo and the text 'Cleaner Production Implementation Tool, Department of Environment, Ministry of Natural Resources & Environment'. Below this is a navigation bar with 'Safety & Environment Audit', 'Help', and 'Logout' buttons. The main content area is titled 'Please click on the image button below. You are required to answer all the questions based on your factory safety conditions.' and contains four evaluation categories, each with an icon and a label: 'Environmental Quality' (graph icon), 'Scheduled Wastes' (wastewater icon), 'Occupational Safety' (warning sign icon), and 'Others' (person with trash can icon). To the right of the 'Others' icon is a box labeled 'Others Evaluation'. Below the icons are five numbered shortcuts (1-5). At the bottom, there is a footer with copyright information: 'Copyright 2008 Department of Environment, Malaysia. All rights reserved.' and a disclaimer: 'DISCLAIMER: The Government and the Department of Environment of Malaysia shall not be liable for any loss or damage caused by the usage of any information obtained from this web site. Best Viewed with Internet Explorer 7.0 and above, with resolution 1024 X 768.'

Figure 6.1: Menus for safety & Environment Audit

## EVALUATIONS

A set of question (figure 6.2) will be given for each of the safety & Environment Issues.

The screenshot shows the CPIT (Cleaner Production Implementation Tool) interface. At the top, it features the CPIT logo and the text 'Cleaner Production Implementation Tool, Department of Environment, Ministry of Natural Resources & Environment'. Below the header, there are navigation links for 'Safety & Environment Audit', 'Help', and 'Logout', along with a 'Print this Page' button. The main content area is titled 'Others issues checklist' and contains a table with the following questions and options:

ID	Questions	Answers
1	Is there regular housekeeping?	<input type="radio"/> Yes <input type="radio"/> No
2	Is there any training on safety awareness?	<input checked="" type="radio"/> Yes <input type="radio"/> No
3	Are there any complaints from the workers? E.g. temperature is too high, ventilation problem, etc.	<input type="radio"/> Yes <input checked="" type="radio"/> No

Annotations on the right side of the image point to the radio buttons with the text 'Click Yes OR No for the questions' and to the 'Submit' button with the text 'Question to evaluate'. Below the table, there are navigation buttons for 'PREVIOUS STEP' and 'CLICK HERE FOR THE NEXT PAGE', and a 'Shortcuts' section with buttons numbered 1 to 5. A footer contains copyright information for 2008 and a disclaimer.

Figure 6.2: Set of question on Safety & Environment Issues

Click on the submit button to save your answers. Click on the **CLICK HERE FOR THE NEXT STEP** link to proceed to summary page (Figure 6.3). Audit is completed.

## EVALUATION SUMMARY

Table below is Others summary

Others summary	
Criteria	Compliance Status
Regular Housekeeping	Non Comply
Safety Awareness Training	Comply
Records keeping/Complaints	Non Comply

Annotations on the left side of the image point to the table with the text 'Evaluation question is summarizing into its specific criteria'. An annotation on the right side points to the 'Compliance Status' column with the text 'Compliance Status'. Below the table, there are navigation buttons for 'PREVIOUS STEP' and 'CLICK HERE FOR THE NEXT PAGE'.

Figure 6.3: Summary table