WWF

HANDBOOK

HK

2014

LOW CARBON MANUFACTURING PROGRAMME (LCMP)

BEST PRACTICES HANDBOOK

A WWF initiative to reduce carbon emissions in manufacturing

WWF

LCMP

WWF

WWF is one of the world's most respected conservation organizations, with over five million supporters and a network active in more than 100 countries. WWF was founded in 1961 with headquarters based in Switzerland.

WWF'S GLOBAL MISSION ON CLIMATE CHANGE

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. However, the process of climate change threatens to undo everything that conservation organizations like WWF have achieved over the last half century.

Many plants and animals that have adapted to their environments over the course of millions of years are vulnerable to even the slightest changes in temperature. Climate change means that many of these sensitive species may soon face extinction. Warming and acidifying seas threaten coral reefs and krill – the basis of the marine food chain in many parts of the world; while large mammals like whales and elephants may be forced to travel further in search of food, in the process leaving the safety of the protected areas that WWF and other groups have fought so hard to secure.

Human beings are also part of the interwoven web of life on Earth, and this means that we too are not immune to the consequences of a changing climate.

WWF-HONG KONG

WWF-Hong Kong has been working since 1981 to deliver solutions for a living planet through Conservation, Footprint and Education programmes.

In support of our global mission, WWF-Hong Kong's vision is to transform Hong Kong into Asia's most sustainable city where nature is conserved, carbon pollution is reduced, and consumption is environmentally responsible. Reducing regional greenhouse gas emissions and ensuring that the products we consume are produced through low-carbon manufacturing are major components of this vision, as is working towards solving the global climate crisis.

LCMP PROGRAMME OBJECTIVES

WWF-Hong Kong's Low Carbon Manufacturing Programme (LCMP) aims to reduce the carbon emissions generated by manufacturing facilities in China. The LCMP also encourages companies to increase transparency in supply chain carbon emissions and uncover inefficiencies in resource use.

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REVISION HISTORY

Approval

This handbook has been prepared as a guide for companies participating in the Low Carbon Manufacturing Programme (LCMP) organized by WWF-Hong Kong. It provides information about the tools of LCMP and explains how to use the online carbon accounting software as well as how to implement low-carbon manufacturing best practices, including greenhouse gas (GHG) management system, overall energy use in factory facilities, and energy efficiency measures in general utilities and manufacturing processes.

Date of initial version: 10th May 2010

Written by: Ecofys-Azure International Technology Development (Beijing) Ltd (Ecofys-Azure) and Hong Kong Productivity Council (HKPC)

Approved by: WWF-Hong Kong

This handbook has been approved and published by WWF-Hong Kong. Please contact lcmp@wwf.org.hk with questions, comments and improvement ideas.

Revision History

Table 1: LCMP Handbook Revision History

Revision Date	Version /List of Changes	Written by	Approved by
10 May 2010	Version One	Ecofys-Azure and HKPC	WWF-Hong Kong
1 June 2014	Version Two		
	1. Incorporation of the LCMP carbon accounting software user manual	Ecofys	WWF-Hong Kong
	2. Addition of Fabricated Metal Manufacturing Process Energy Efficiency Best Practices	HKPC	WWF-Hong Kong
	3. Addition of Shoe and Footwear Manufacturing Process Energy Efficiency Best Practices	WWF-Hong Kong	

CONTENTS

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INTRODUCTION TO LOW CARBON MANUFACTURING PROGRAMME (LCMP)

LCMP aims at reducing carbon emissions generated by manufacturing facilities in China and developing environmental social governance for those manufacturers. The programme provides manufacturers with a set of tools to easily, quickly and economically assess, report on and improve their energy efficiency and carbon performance.

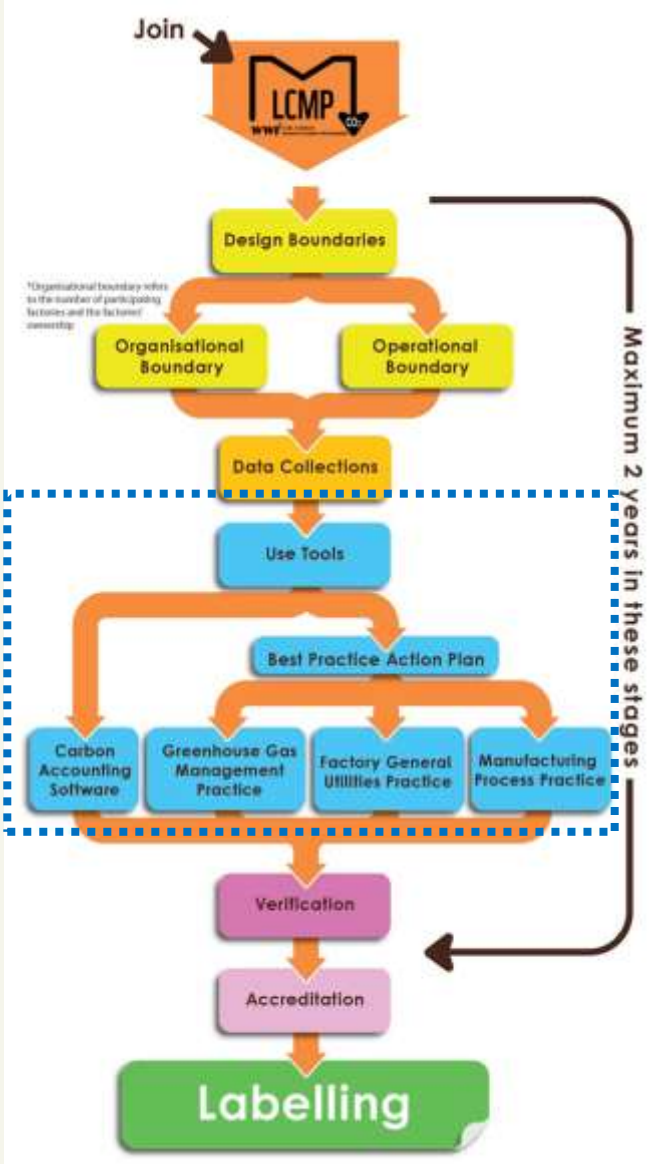
Figure 1 (right) depicts the procedures of implementing LCMP at a factory from application, design boundaries, data collection, use of tools, verification processes, label accreditation, etc.

The LCMP label is granted to individual factories that have properly and thoroughly implemented the programme. WWF believes that manufacturers attaining LCMP labels would be the perfect choices for global retailers and brands looking to engage their supply chain into greenhouse gas emissions control efforts. Competitiveness of manufacturers with LCMP labels will increase against other suppliers.

This handbook is an important resource for manufacturers in LCMP implementation. It provides information about the tools of LCMP which include (a) an on-line carbon accounting software for measuring carbon emissions, and (b) a best-practices action plan detailing low-carbon or energy efficiency measures in greenhouse gas management, factory **general utilities and industry-specific manufacturing** processes.

A labelling scheme with 4-levels is designed to recognize the achievement and encourage continuous improvement in carbon performance. LCMP labels will be granted to manufacturers once their factories are assessed by third party verifiers and the report is vetted by WWF and periodically reviewed by the accreditation committee that comprises of industry practitioners and academics.

Figure 1: LCMP Implementation Steps.
This LCMP Best Practices Handbook provides guidance in areas highlighted in blue.



CARBON ACCOUNTING SOFTWARE


Funded By
碳排放审计软件
Low Carbon Manufacturing Program
Organizational structure:
GHG inventory:

LCMP CARBON ACCOUNTING SOFTWARE USER MANUAL

The LCMP software is a software module designed to enable manufacturers in monitoring and reporting carbon emissions periodically as laid out in the LCMP framework. The software module consists of a web based database in which monthly CO2 emissions data (activity data) of relevant resources are stored. It generates various standardized emissions monitoring reports for management, verifiers as well as LCMP Project Management Office. In addition, the module provides monthly management information about the company's carbon emissions position and facilitates decision-making on all levels within an organization. The software is designed to aggregate and report emissions information on different levels, thus facilitating monitoring and managing emissions for multiple site organizations.

A. Users of the LCMP Software

There are two user groups of the LCMP online carbon accounting software:

- LCMP project staff that is responsible for adding new or editing existing data into the software. Although the LCMP software is user-friendly with "online help" feature, this user group should gain basic knowledge about GHG Protocol* which the LCMP software is built on;
- Managers that want to know their GHG emissions position on a regular basis.

*More details of the GHG Protocol will be covered in the LCMP training.

B. Getting Started

Go to the LCMP Technical Website to access the Login screen:

http://www.wwf.org.hk/en/whatwedo/footprint/climate/corpactions/lcmp/login_to_lcmp_technical_site/

Make sure the browser version is Internet Explorer 7.0 or above.

Figure 2: LCMP Technical Site Login Page

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Figure 3: Screen Capture of the First Input Page after Login

The LCMP software will be used to enter, view and monitor a company's GHG emissions data. Figure 3 shows the first input screen after login the software. A user may set up different levels of the organization in the "Organizational Structure" frame which is in the upper left-hand corner of the screen. The user may choose different levels for more information in this frame. It is possible to define a larger number of business unit levels. It is not necessary that all resources are put on the same level.

Below the "Organizational Structure" frame is the "GHG Inventory" frame where factory specific elements are captured. The "GHG Inventory" frame will be discussed in details later.

Different tasks such as "Data" input, "Graph", "Table" and "Report" can be selected on the top right hand side menu bar.

The frames can be re-sized by dragging the double lines separating them.

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A SAMPLE LCMP GHG EMISSIONS REPORT

Below is a sample LCMP GHG Emissions Report generated from the LCMP software.

LCMP Report

This report has been prepared and written in accordance with GHG Protocol and is designed to be used in the LCMP programme.

1. DESCRIPTION OF THE COMPANY AND INVENTORY BOUNDARY

Name of parent company	**Zhongshan factories**
Name of subsidiary company	**No.1 DEF**
Depending companies and factories	
Address	Central
Town	
Province	
Postal code	
Country	
Contact person Name	Mr. Lo
Contact person Telephone	12345678
Contact person Fax	23456789
Contact person Email	abc@gmail.com
Organizational boundaries & approach[1]	Operational control based approach was used to defining organizational boundaries.
Operational boundaries chosen[2]	
Scope 1	Direct Emission from fuel combustion
Scope 2	Indirect emission from purchased electricity/heat/steam
Scope 3	Other indirect emission • Mobile combustion unit • Business Travel
Reporting period	1/1/2007 - 12/31/2007
Base Year	2007
Date of Issue the report	3/8/2010

2. GREENHOUSE GAS EMISSIONS

2.1 Key performance indicators

	Base Year	Previous Year	% Change
Total emissions (Unit : tonne CO_2)	3323.167	0	-
Emissions / tonne of material production Unit : (tonne CO_2 /t)	-	-	-
Emissions / sales (Unit: g CO2/RMB)			

2.2 Emissions Inventory Summary in 2007

Type of emission	**Tonnes[3] CO2-equivalent**
Scope 1	
Biodiesel	302.232
Diesel	456.233
diesel highway	465.443
Total Scope 1 Emissions [tonne CO_2]	**1223.908**
Scope 2	
ElectricitySouthern Grid	213.956
Total Scope 2 Emissions [tonne CO_2]	**213.956**
Scope 3	
Gasoline	12.889
diesel highway	39.574
Intercity (e.g., Amtrak)	14.8

Long Flight (>1600 km)	51.615
Medium Flight (<1600 km)	3.52
Total Scope 3 Emissions [tonne CO_2]	**122.398**
Total Emissions [tonne CO_2]	**1560.262**

2.3 Biological Emission

Type of emission	**tCO_2**
Biodiesel	136.048
Biogasoline	146.914

2.4 Base Year Recalculation

Significant emissions changes that trigger base year emissions recalculation.[4]	None

2.5 Emission sources exclusions

Exclusions of sources/facilities/operations[5]	None

2.6 Offsets

Offset Activity	**Offset Amount : tCO2**	**Verified / Certified Party**
GHG	None	3000

2.7 Renewable Energies Application

Renewable Energies Application	**Year of Installation**	**System Capacity**	**GHG Emission Reduced**
wind turbine	12/31/2007		503.774

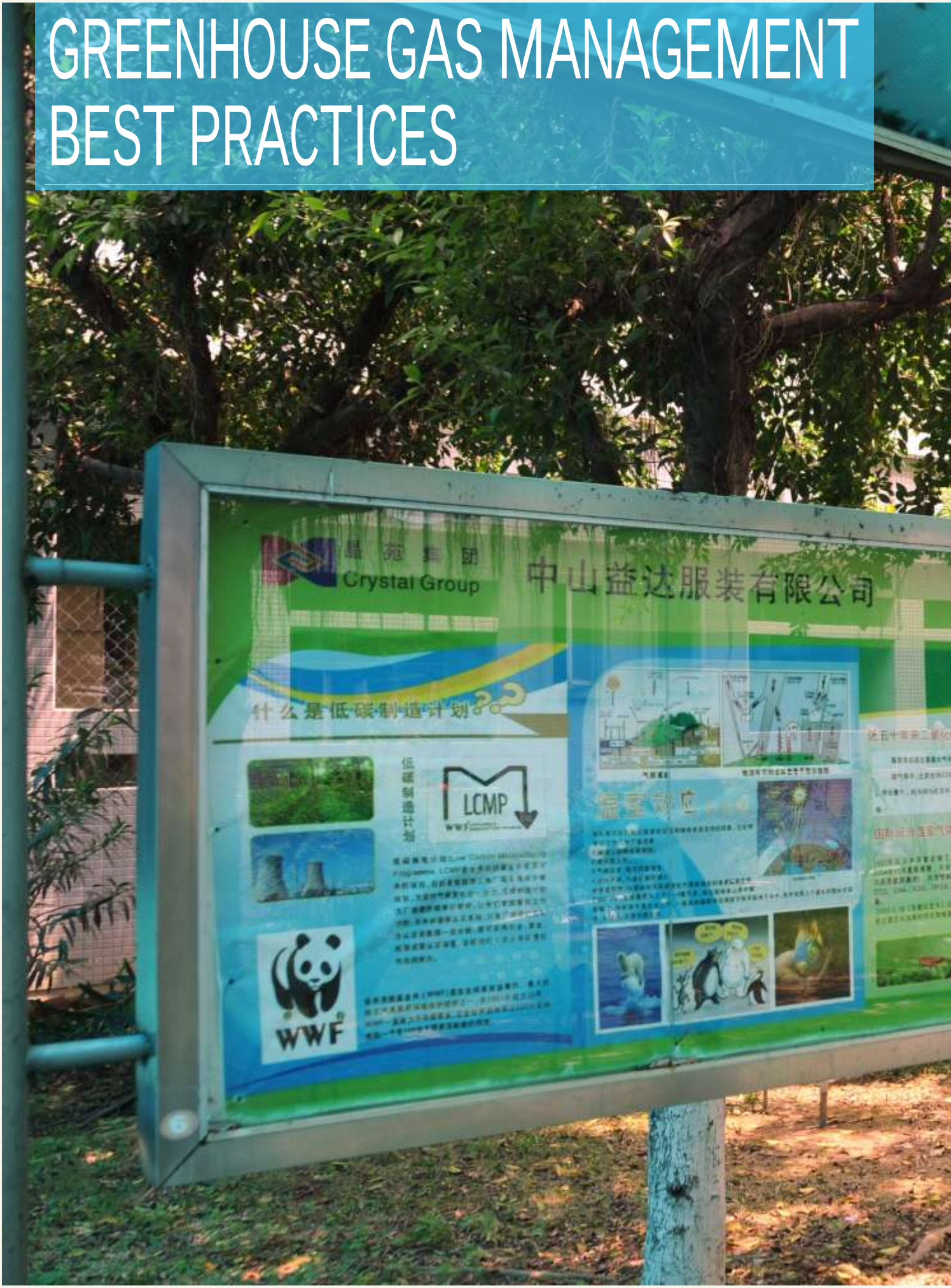
3. OPTIONAL INFOTMATIONS

3.1 Information on emissions and performance

Scope 1 Emissions [tonne CO_2]

Scope 1 Activities			
Type of Activity	stationary combustion unit		
Description of Activity	There is no process emission		
Approach Used/Calculation Measurement	Combustion: General combustion activities		
Type of source	Boiler		
Type of fuel	Diesel		
		Unit	Data
	Activity data	Litre	33821
	Emission Factor	kilo tonne CO2/TJ	0.0403
	Total emissions	Kilo tonne CO2	83.64
Type of Fuel	Biogasoline		
		Unit	Data
	Activity data	kg	7800
	Emission Factor	kilo tonne CO2/TJ	0.1002
	Total emissions	Kilo tonne CO2	124.914
Type of Fuel	Biodiesel		
		Unit	Data
	Activity data	kg	70440
	Emission Factor	kilo tonne CO2/TJ	0.0032
	Total emissions	Kilo tonne CO2	106.048
Type of source	diesel generator		
Type of fuel	Diesel		
		Unit	Data
	Activity data	litre	17500
	Emission Factor	kilo tonne CO2/TJ	0.1003
	Total emissions	Kilo tonne CO2	48.608
Type of Activity	Company owned mobile combustion unit		

GREENHOUSE GAS MANAGEMENT BEST PRACTICES




LCMP低碳制造计划

GREENHOUSE GAS MANAGEMENT SYSTEM

1. Introduction

Greenhouse gas (GHG) management aims to identify and manage the risks and opportunities associated with the emissions of carbon dioxide. The scope of greenhouse gas management extends beyond traditional energy efficiency and includes every aspect of an organization's performance in relation to climate change. GHG management involves helping organization understand their assets and liabilities in terms of greenhouse gas emissions.

Many companies including large retailers and brands in North America and Europe have already adopted greenhouse gas management system and are positioning themselves for the coming carbon constrained future. Companies that apply greenhouse gas management are therefore better prepared for the future and are more competitive.

Corporations that have implemented significant GHG management have reported related economic benefits. For example: BP America, Inc. reduced its GHG emissions 10% below 1990 levels, creating approximately $650 million in value in the process. Alcoa, the world's third largest producer of aluminum has reduced its direct GHG emissions 25% below 1990 levels through energy efficiency improvements, has captured over $16 million per year in energy savings.[1]

The requirements for LCMP greenhouse gas management system are based on the ISO 14001 standard for environmental management systems. In order to claim adequate LCMP GHG management, an organization must satisfy a number of requirements on the following elements:

- Greenhouse Gas (GHG) Policy
- GHG Targets and Management Programme
- Implementation and Operation
- Checking and Corrective actions

These elements are not only in line with ISO14001, they also follow a structure for energy management that has proven very effective in many energy management schemes worldwide.

2. GHG Policy

The GHG Policy is the foundation for greenhouse gas management system. Top management of the organization should establish and maintain the GHG policy of the organization, which expresses the organization's commitment to GHG emissions reduction, climate change and respective continuous improvement. Senior management's commitment is a prerequisite for a successful GHG reduction programme. It helps to secure the establishment of internal accountability and incentive system and providing adequate resources to achieve the target, which will be difficult without senior management commitment.

3. GHG Targets and Management Programme

The organization should set appropriate GHG emissions targets which should be clearly defined and measurable. Targets should be documented and set a time frame for it. GHG management achievements should be systematically monitored and documented.

The organization should develop appropriate GHG management programme to achieve its carbon reduction targets and the realization of the greenhouse gas management policy. The programme should be documented and should be consistent with and adjustable to the organization's greenhouse gas management policy and its activities, process, scope, products and services.

[1] Greenhouse Gas Management Strategies for U.S. Corporations; The Environmental Counselor, June 15, 2005.

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4. Implementation and Operation

Roles, responsibilities and authorities of staff in the implementation and operation of the GHG management programme should be defined, documented and communicated in order to facilitate effective GHG management. Top management should provide the resources required for the implementation and control of the greenhouse gas management system. Relevant training and awareness activities should be carried out in order to execute greenhouse gas management programme successfully.

5. Checking and Corrective Actions

The organization should systematically measure and monitor its GHG emissions. GHG inventory should be periodically calculated, analyzed and reported. The organization should have an internal audit of the greenhouse gas management system. Actions and practices should be amended for the achievement of GHG targets whenever necessary.

Staff engagement, training and awareness-raising are critical success factors in the implementation and operation of the GHG management programme in a factory.

BEST PRACTICES CHECKLIST ON GREENHOUSE GAS MANAGEMENT

The Greenhouse Gas Management Best Practices Checklist is designed to assess how well an organization has established and implemented its greenhouse gas management system in its organization. Assessment of Greenhouse Gas Management Best Practices forms part of the third party verification in the LCMP accreditation. Verifier will use this checklist to evaluate the performance of an organization. Managers or LCMP project staff of the organization may also use this checklist for self-evaluation or assess the distance to greenhouse gas management best practices.

3-point Mark System: ☐0 = little or no evidence ☐1 = some elements implemented ☐2 = fully implemented

"*" mandatory item, company must score >0 to get label accreditation.

Table 4: Greenhouse Gas Management Best Practices Checklist

Ref	Item	Mark	Assessment criteria	Findings & evidences supporting the marks
1.	GHG / Energy Policy			
1.1	GHG policy statement	☐0 ☐1 ☐2	Does the company have a clear policy statement on GHG emissions pertaining to its activities? Provide reference on the content of this statement, where it can be found and if it is public.	
1.2	Applicable to all activities of the company	☐0 ☐1 ☐2	Does the GHG / Energy policy cover all activities the company is engaged in?	
1.3	Senior management commitment	☐0 ☐1 ☐2	Does the GHG / Energy policy have demonstrable senior management commitment? Evidence from public statements from senior management, statements at company events, support to training, documented senior management responsibility for GHG/energy management.	
1.4	Policy communicated to employees	☐0 ☐1 ☐2	Is the GHG / Energy policy clearly communicated to employees? Provide comments on how and how frequently GHG/energy policy is communicated to employees.	
1.5	Policy available to the public	☐0 ☐1 ☐2	Is the GHG/energy policy available to the public? Provide reference to where public information on the company's GHG/energy policy can be found.	
1.6*	**Compliance with relevant laws and regulations**	☐0 ☐1 ☐2	**Does the GHG/Energy policy include a reference to applicable laws and regulations and does it comply with these?**	
1.7	Continuous improvement	☐0 ☐1 ☐2	Does the GHG/Energy policy include a statement that indicates the company's commitment to continuous improvement of its GHG performance? Provide reference to the relevant section of the company's GHG/energy policy document.	

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SCORING GREENHOUSE GAS MANAGEMENT CHECKLIST

Compile a scorecard of the Greenhouse Gas (GHG) Management:

1. Fill out the total marks gained in each part of the assessment checklist;
2. Add up the total marks attained in the GHG management;
3. Calculate the Score in GHG Management Practices using formula: Total marks attained in GHG management checklist (step 2) divided by 98 (maximum marks) multiplied by 35 (contribution of GHG management in total labelling score)
4. Make sure score of mandatory item (indicated with "*" in the checklist Ref.) is greater than 0;
5. Examine the scores of each part and identify areas for improvement through studying the comments in the "Findings and Evidences Supporting the Marks".

Table 5: Scorecard of Greenhouse Gas Management Practices

Scorecard of Greenhouse Gas Management Practices		
	Total Marks	
Part 1: GHG / Energy Policy	**A**	**/14** (maximum marks in Part 1)
Part 2: GHG /Energy Targets and management programme	**B**	**/38** (maximum marks in Part 2)
Part 3: Implementation and operation	**C**	**/32** (maximum marks in Part 3)
Part 4: Checking and corrective action	**D**	**/14** (maximum marks in Part 4)
Total marks attained in GHG management	**Y=A+B+C+D**	**/98** (maximum marks in GHG management)
Score in GHG management practices	**Z = Y / 98 x 35**	Total marks attained in GHG management checklist divided by 98 (maximum marks) multiplied by 35 (contribution of GHG management in total labelling score)

ENERGY EFFICIENCY AND GREENHOUSE GAS EMISSIONS REDUCTION BEST PRACTICES


型材，可减排987千克二氧化碳
can reduce carbon emissions by 987 kg

AN OVERVIEW OF ENERGY SAVING AND GREENHOUSE GAS EMISSIONS REDUCTION

An essential and integral part of the LCMP is the assessment of the current greenhouse gas (GHG) emissions reduction practices adopted in the participating factory against the relevant best practices known to the trade.

The emissions of GHG from a manufacturing plant is typically generated from the direct discharge (Scope 1) through the combustion of fuel and release of chemicals or products with global warming potential such as the refrigerants as well as the indirect discharge (Scope 2) by the consumption of electricity and gas. While there is also other indirect discharge (Scope 3) of GHG by a factory through the use of supporting services provided by other service providers such as transportation, water supply, materials supply etc., these other indirect GHG emissions will not be considered in this scoring system due to the complexity involved. In essence, the largest contribution of GHG emissions in the manufacturing sector is from the consumption of energy. Any measures that can reduce energy consumption can also be effective in reducing GHG emissions.

In a typical manufacturing plant, energy is consumed in the operation of the following type of installations leading to GHG emissions:

General utilities – these are the peripheral facilities to provide general electrical and mechanical (E&M) services including heating, ventilation and air-conditioning (HVAC) systems; electrical systems; lighting systems; compressed air systems, steam systems, water supply systems and pollution control systems;

Industry-specific production process facilities – which includes all kinds of production machines, monitoring and control facilities directly related to the production processes.

The types of general utilities installed in different industries are somehow similar although the relative proportion differs from industry to industry and even factory to factory. It tends to vary with the production size, the production processes and the products involved. However, as a rule of thumb, about 50% energy consumed in a typical factory is by the general utilities.

In the LCMP verification protocol, energy use / GHG emissions from a factory will be assessed separately for the general utilities and industry-specific production facilities. Standard checklist approach is adopted for this purpose whereby the factory's current energy consumption patterns are benchmarked with the best practices listed on the checklist. An overall grading matrix is then applied to the two aspects for assigning the final scoring of the factory in the overall performance (0 to 100 scores).

At this stage of the verification programme, a total of four standard checklists are developed for plastic, textile, electronic and fabricated metal industries. By a combined use of two or more standard checklists, the LCMP is able to assess the energy use /GHG emissions reduction best practices of companies belonging to the 11 industry categories:

Table 6: LCMP Applicable Industries

Industry No.	Description of the industries
4	Wearing apparel manufacturing
6	Shoe and footwear manufacturing
7	Textile industries
15	Plastic products manufacturing
18	Fabricated metal products manufacturing
19	Office, accounting and computing machinery manufacturing
20	Radio, televison and communications equipment and apparatus manufacturing
21	Machinery, equipment, apparatus, parts and components manufacturing
23	Electronic parts and components manufacturing
24	Electrical appliances, housewares and electronic toy manufacturing
25	Professional and scientific, measuring and controlling equipment, and photographic and optical goods manufacturing

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GHG EMISSIONS REDUCTION BEST PRACTICES IN FACTORY GENERAL UTILITIES

General utilities in a typical factory include the following systems:

- HVAC (heating, ventilation and air conditioning) systems
- Electrical systems
- Lighting systems
- Compressed air systems, and
- Steam systems

These systems can consume about 50% of the total energy consumption in the factory and thereby contribute similar amount of GHG emissions.

Design optimization and effective operation and maintenance are energy efficiency best practices in centralized HVAC system

INDUSTRY-SPECIFIC MANUFACTURING PROCESS ENERGY USE AND ENERGY EFFICIENCY BEST PRACTICES

Apart from the emissions from the operation of the general utilities as described above, GHG will also be generated from the operations of the industry-specific processes which are unique to that particular industry or individual factory.

The LCMP currently examines and covers the best GHG reduction practices through improved energy efficiency for the following industrial processes:

- **Plastic industry:** covering injection moulding process and blow moulding process only;
- **Textiles industry:** covering spinning industry, bleaching and dyeing industry, and garment industry only;
- **Electronics industry:** covering the three electronics manufacturing services (EMS): surface mount technology (SMT) assembly, through-hole assembly process, and printed circuit board (PCB) manufacturing only;
- **Fabricated metal products industry:** covering metal casting process, metal forming process, and metal machining process only; and
- **Shoe and footwear industry: c**overing basic procedures only.

An injection moulding machine equipped with servo motor

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A. Plastics Industry

1. Plastics industry process workflow

In general, the majority of the plastics industry is related to the injection moulding industry and the blow moulding industry. Both industries feature primary and secondary operations. Some factory may even have a recycling process. Usually, the primary operations are more energy consuming.

1.1 Plastics injection moulding industry

In the Plastics Injection Moulding Industries, there are two major operations, namely Primary Operations and Secondary Operations.

1.1 (a) Primary Operations

In the Primary Operations, plastics resins are firstly dried in a hopper dryer. Then the plastics resins are loaded into the plastic injection moulding machine with an autoloader. Molten plastic is injected at high pressure into a mold, which is the inverse of the product's shape. Depending on the design of the mould and the nature of the products, the temperature of the mould may be controlled by either circulating cold water generated from a chiller or hot oil from a mould temperature controller.

1.1 (b) Secondary Operations

Depending on the design and the nature of the products, the following secondary operations are common in the industry:

- Assembly - over moulding, screwing, snap fit, adhesive, ultrasonic, high frequency welding.
- Decorations - In-mould decoration (IMD), labels, screen print, pad print, laser marking, painting, and heat transfer.

1.1 (c) Recycling

There are usually 3 steps in this process:

- Granulate the plastic waste into granules by a granulator
- Load the granules into an extruder to produce new plastic tubes
- Granulate the plastic tubes into plastic resins by a granulator

1.2 Plastics blow moulding industry

Plastic blow moulding is a manufacturing process by which hollow plastic parts are formed. The typical Primary and Secondary Operations in the Plastic Blow Moulding Industries are as follows:

1.2 (a) Primary Operations

In Primary Operations, plastics resins are dried in a hopper dryer. Then the plastics resins are loaded into the plastic blow moulding machine with an autoloader. The blow molding process begins with melting the plastic and forming it into a parison or pre-form. The parison is a tube-like piece of plastic with a hole in one end in which compressed air can pass through.

The parison is then clamped into a mold and air is pumped into it. The air pressure then pushes the plastic out to match the mold. Once the plastic has cooled and hardened the mold opens up and the part is ejected.

1.2 (b) Secondary Operations

Depending on the design and the nature of the products, the following secondary operations are common in the industry:

- Assembly - snap fit, adhesive.

C. Scoring Energy Efficiency Best Practices Checklist

Assessment of performance in general utilities and industry-specific manufacturing processes are rated individually, based on which the overall performance of the factory is assessed using equal weighting assigned to each of the two checklists. Thus, for a factory with marks of 40% and 60% in general utilities and industry-specific manufacturing process checklists respectively, the overall achievement of the factory is 50% (average of 40% and 60%).

As the maximum score of Energy Efficiency Best Practices in the overall LCMP Labelling score is 40, the performance of this factory in this criterion will then be 20 ([50% (Marks attained in Best Practices Checklist) multiplied by 40].

A factory will not be qualified for any LCMP label if its marks in both the general utilities and industry-specific manufacturing processes checklists are lower than 40% simultaneously. The factory will remain in the Preparatory Level.

Table 18: Scorecard of Energy Efficiency Best Practices

Scorecard of Energy Efficiency Best Practices		
	Total Marks	
Part 1: General utilities	**A**	(The value of A must be equal to or greater than 40%)
Part 2: Industry-specific manufacturing processes	**B**	(The value of B must be equal to or greater than 40%)
Total marks attained in energy efficiency best practices	**Y=(A+B)/2**	(Equal weighting between general utilities and industry-specific manufacturing processes)
Score in Energy Efficiency Best Practices	**Z = Y x 40**	Total marks attained in Energy Efficiency Best Practices checklist multiplied by 40 (contribution of Energy Efficiency Best Practices in total labelling score)

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MY LCMP

This LCMP Best Practices Handbook is a self-learning resource designed to assist project staff in implementing the LCMP in a manufacturing company. WWF recommends the LCMP project staff to spend some time in studying the best practice measures in carbon accounting, GHG management, and energy efficiency in general utilities and industry-specific manufacturing processes.

WWF and the LCMP secretariat also offer a range of services, engagement activities and communications support to LCMP participating companies and help them on their journey to becoming a low-carbon factory:

- Introductory materials: LCMP flyer, video
- LCMP secretariat @ITS datalink information exchange[(a)]
- Employee engagement: posters, machine labels
- Training and communication: carbon reduction hotline[(b)], webinar training, quarterly newsletter, case studies, annual report
- Other activities: seminar, workshop, onsite visit and free consultancy[(b)], certification, label accreditation, annual labelling award ceremony

(a) The ITS datalink is a communication platform for information exchange among the LCMP participating company, the LCMP secretariat office and the LCMP programme management office. Each LCMP participating company has its own (unique and security password log) record at the ITS datalink information exchange platform. All related documentation and progress monitoring are kept at the platform for centralized and easy reference.

(b) Carbon reduction hotline and free consulting services are provided by WWF assigned experts and partners, and the level of details for responses are subject to availability of experts/partners and specific questions.

SCORING CARBON INTENSITY

Carbon intensity is calculated by examining the average rate of greenhouse gas emissions produced (converted to CO2-equivalent) relative to a company's business volume, production volume, and other factors.

In a company's first verification, two years of carbon intensity data, compiled using the LCMP's online carbon accounting software, are submitted by the company – the first year is the base year, while the second year is the performance year. Data from the performance year is then compared with the base year to determine the percentage change in the company's carbon intensity. This figure contributes 25% of the overall label calculation score. The marks in this section are calculated as follows:

Change in carbon intensity (%)	0	-0.5	-1	-1.5	-2	-2.5	-3	-3.5	-4	-4.5	-5	>-5
Marks added in carbon intensity	0	10	20	30	40	50	60	70	80	90	100	100

The scoring method remains unchanged in the second and subsequent verifications. Regardless of the results of the first verification, marks in this section will be deducted if the carbon intensity increases and exceeds the tolerance level of 10%. The marks deducted will depend on the percentage increase in carbon intensity, and can be referenced in this table:

Change in carbon intensity (%)	Actual increase less than or equal to 10%	Actual increase in between 10% to less than 100%	Actual increase is more than 100%
Marks deducted in carbon intensity	0	Actual increase x 50	50

LCMP label accreditation

The LCMP label accredits each factory based on the measurement, reporting and verification report by a qualified verifier of the factory's carbon performance in the following three areas:

- Achievement of GHG emissions reductions i.e. change in carbon intensity between base year and performance year;
- Quality of GHG management;
- Level of best practice energy efficiency for processes and operations.

Table 19: LCMP label rating

LCMP Label Rating			
Evaluation Criteria	Assessment Methodology	Maximum Score	My Score
Carbon intensity	Data from online carbon accounting software	25	Refer to p.81
Greenhouse gas management practices	Best practice checklist	35	Refer to p.41
Energy efficiency best practices: - **General utilities** - **Manufacturing process**	Best practice checklist	40	Refer to p.80
Total		100	

LCMP label categories

Platinum Label: Total score equal to or greater than 80

Gold Label: Total score between 60 to 79.9

Silver Label: Total score between 40 to 59.9

Certified Label: Total score between 20 to 39.9

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Please contact below parties for further enquiry.

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ABOUT LOW CARBON MANUFACTURING PROGRAMME (LCMP)

62

Number of factories in the LCMP*

37,080

Tonnes of carbon emissions that have been reduced by 29 LCMP-accredited companies* from business-as-usual

2010

The LCMP was launched in 2010

85,000

Total number of employees in LCMP-participate companies*

*as of 30 Sept 2013