機電工程署 **EMSD**

Energy Consumption Indicators & Benchmarking Tools

User Guide

for

Online Benchmarking Tools

30 January 2012

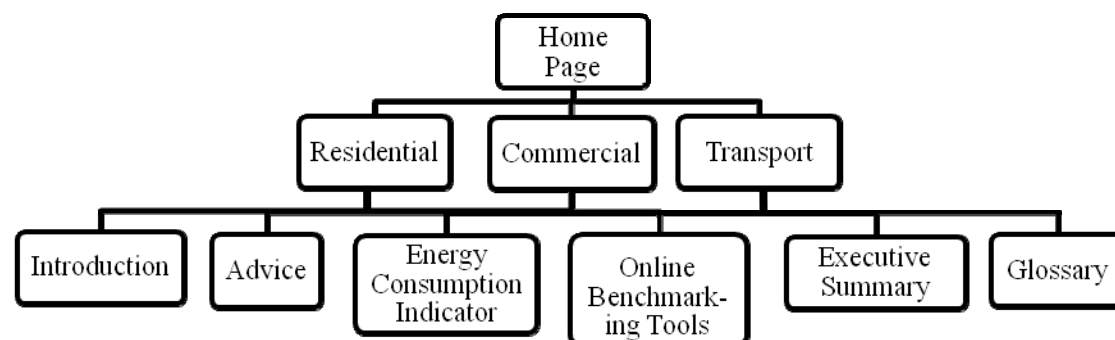## 1. Online Benchmarking Tools Overview

Figure 1 Online Benchmarking Tools layout

The figure above illustrates the structure of the Online Benchmarking Tools. The Online Benchmarking Tools cover three sectors, which are Residential sector, Commercial sector and Transport sector respectively. A more detail description on each feature will be stated below.

Home Page

Figure 2 Home page

Figure 2 shows the home page of the Online Benchmarking Tools. Users can select the language (English or Traditional Chinese) at the top left corner of the website. They can also visit other pages by clicking on the menu on the left.

The green colour represents the Residential sector, the blue colour represents the Commercial sector and the purple colour represents the Transport sector.

Introduction

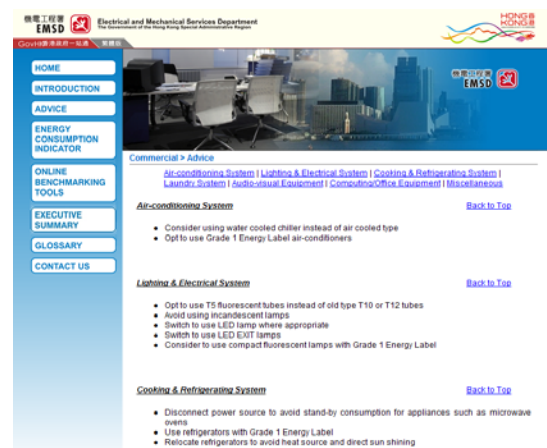Figure 3 shows the introduction page of the Online Benchmarking Tools which describe the background, objectives and approaches of the tool. It also gives users an idea about the classification of subgroups in each sector.

Figure 3 Introduction page

Advice

Figure 4 shows the advice page of the Online Benchmarking Tools which provide general suggestions on energy saving measures that can be carried out for different energy end-use systems, as commonly found in the concerned sectors.

Figure 4 Advice page

Energy Consumption Indicator

Figure 5 shows the Energy Consumption Indicator page which provides information on the average annual energy consumption per area (residential and commercial) or per distance travelled (transport) for different subgroup.

Figure 5 Energy Consumption Indicator page

Online Benchmarking Tools
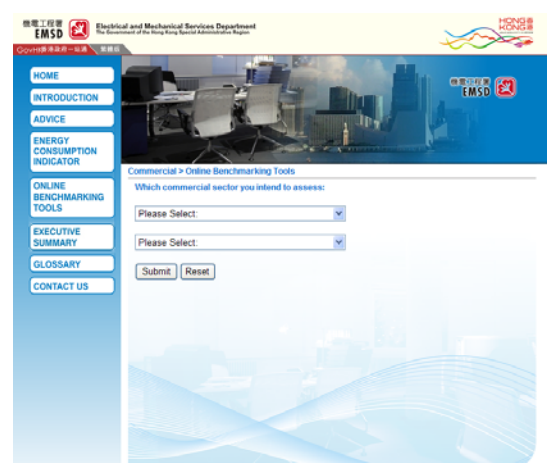
Figure 6 Online Benchmarking Tool

Figure 6 shows the Online Benchmarking Tools entry page. To start with the assessment, users are first required to choose the principal group and sub-group that they are going to assess. After that users will be directed to other pages of subgroups that belong to and to fill in required information. A more detail description on the tool will be illustrated in the next section.

Executive Summary

Figure 7 Executive Summary

Figure 7 shows the Executive Summary page which describes the background of the Online Benchmarking Tools development.

Glossary

Figure 8 Glossary page

Figure 8 is the glossary page. It provides a brief description for each subgroups and terms used in the Online Benchmarking Tools.

2. Flowchart for Online Benchmarking Tools

The figure below is the outline of the Online Benchmarking Tools. The energy benchmarking performance is calculated based on the users' input information including annual energy consumption records, energy affecting parameters about environmental, behavioral, operational factors etc.

Figure 9 Outline of Online Benchmarking Tools

Steps in using Online Benchmarking Tools
Step 1: Selection of group and subgroup
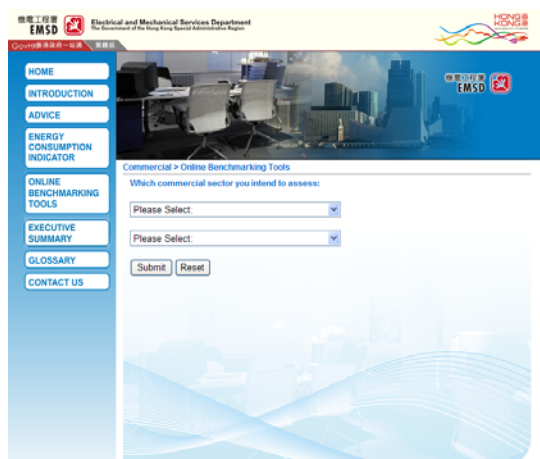
To begin with Energy Benchmarking, users are required to select the group and subgroup which they belong to.

Figure 10 Selection of group and
subgroup page

Step 2 Input of data

Figure 11 Input data page 1

Figures 11 and 12 are the input data pages. After the selection of group, users will be directed to another page in which they are required to fill in some information on the establishment they are assessing. The first input data page requires users to input some general information such as size, no. of people or travelling distance, depending on the group they are assessing. They are also required to fill in their annual energy consumption usage.

Figure 12 Input data page 2

The second input data page requires users to input information on the energy end-use equipment which are commonly used in their subgroup.

Step 3 Energy Consumption results

Figure 13 Results page

The result page shows the user's energy consumption performance rank as compared with other users in the same subgroup. A 10th percentile refers to the best efficiency class of the subgroup. The calculated energy consumption intensity is displayed at the top of the graph.

The calculated end-use results will be assessed by comparing the subgroup's average value. If there are no specific end-use consumption intensity that are

higher than the average, users will be prompted to the advice page as stated in the Section 1 (Figure 4) for advice.

For Private Offices subgroup, the Analysis on Improvement Targets stage provides suggestions for improving energy consumption of the energy end-use system when it has lower than average energy efficiency performance.

3. Residential Online Benchmarking Tools Checklist

In order to facilitate Residential users during the process of benchmarking, please prepare the following information before you start:

- Building information including saleable area of the premises (in m^2) and age of building etc;
- Past <u>one</u> year consumption record of electricity/Towngas/LPG/kerosene consumption; and
- Energy end-use equipment information including specific power ratings and operating hours etc. of the following equipment types for the respective subgroup as listed below:

Subgroup / Equipment	Public Rental Flat (R1)	HS Subsidized Sale Flat (R2)	Private Flat (R3)	Simple Stone Structure/ Traditional Village House (R4)	HA Subsidized Sale Flat (R5)	Villa / Bungalow / Modern Village House (R6)
Water Heater	✓	✓	✓		✓	✓
Fan	✓	✓	✓	✓	✓	✓
Air-Conditioner	✓	✓	✓	✓	✓	✓
Refrigerator	✓					
Washing Machine				✓		
Cooking & Kitchen Equipment	✓	✓	✓	✓	✓	✓
Lighting Equipment			✓			✓
Computer Monitor			✓			
Computing & Office Equipment			✓			
Television					✓	
AV Equipment					✓	

4. Commercial Online Benchmarking Tools Checklist

In order to facilitate Commercial users during the process of benchmarking, please prepare the following information before you start:

- Building information including:
    - Saleable area of the premises (in m^2);
    - Years of operation, operating hours, number of seats and closing days (applicable to restaurant and retail subgroups);
    - Number of rooms and beds (applicable to accommodation subgroups);
    - Number of patients during the past year (applicable to hospital and clinic subgroups);
    - Number of students, staff and rooms (applicable to educational services subgroups) ;
    - Years of operation (applicable to warehouse subgroups);
    - Building's opening hours, indoor temperature setting, number of computers, photocopiers and staff (applicable to private office subgroups);
- Past <u>one</u> year consumption records of electricity/Towngas/LPG/diesel consumption; and
- Energy end-use equipment information including specific power ratings and quantity etc. of the following equipment types for the respective subgroup as listed below:

Restaurant and Retail

Subgroup / Equipment	B1: Chinese Restaurant	B2: Non-Chinese Restaurant	B3: Fast Food Shop	B4: Bar	B5: Other Eating and Drinking Place	B6: Arcade / Basement / Upper Floor Shop	B7: Street Front / Ground Floor Shop
Hot Water Equipment					✓		✓
Space Conditioning Equipment	✓		✓		✓	✓	✓
Refrigerating Equipment	✓						✓
Cooking and Kitchen Equipment	✓	✓	✓	✓	✓	✓	✓
Lighting Equipment	✓	✓		✓		✓	✓
AV Equipment							✓
Computing and Office Equipment						✓	✓
Miscellaneous Equipment (eg. Hair dryer, mosquito trap, sushi conveyor belt etc.)		✓					

Accommodation

Subgroup / Equipment	B8: Hotel	B9: Guest House	B10: Home for the Aged	B11: Service Apartment
Refrigerating Equipment		✓		
Cooking and Kitchen Equipment			✓	✓
Lighting Equipment		✓		
Vertical Transport Equipment	✓			
Miscellaneous Equipment (eg. Hair dryer, mosquito trap, sushi conveyor belt etc.)		✓		

Hospital and Clinic

Subgroup / Equipment	B12: Hospital	B13: Clinic	B14: Private Dental Clinic	B15: Medical Laboratory
Hot Water Equipment	✓			
Space Conditioning Equipment		✓		
Lighting Equipment	✓		✓	✓
Computing and Office Equipment				✓

Educational Services*

Subgroup / Equipment	B16: University	B17: Post-secondary College	B18: Adult Education / Tutorial / Vocational Course	B19: Secondary School
Hot Water Equipment			✓	
Space Conditioning Equipment	✓	✓	✓	✓
Refrigerating Equipment			✓	
Cooking and Kitchen Equipment			✓	
Lighting Equipment		✓	✓	✓
AV Equipment	✓		✓	
Computing and Office Equipment		✓	✓	
Plumbing Services			✓	
Vertical Transport Equipment		✓	✓	

*Please also provide the daily operating hours of the selected equipment

Educational Services* (Cont'd)

Equipment \ Subgroup	B20: Primary School	B21: Kindergarten	B22: Special Education School
Hot Water Equipment		✓	✓
Space Conditioning Equipment	✓	✓	
Refrigerating Equipment		✓	
Cooking and Kitchen Equipment		✓	
Lighting Equipment	✓	✓	
AV Equipment			
Computing and Office Equipment	✓		
Plumbing Services	✓		
Vertical Transport Equipment	✓	✓	✓

*Please also provide the daily operating hours of the selected equipment

Warehouse, Office Flatted Factory and Central Services for Shopping Arcade

Subgroup / Equipment	B23: Refrigerated Warehouse	B24: Non-refrigerated Warehouse	B25: Office Flatted Factory	B26: Central Services for Shopping Arcade
Hot Water Equipment		✓		
Space Conditioning Equipment			✓	
Refrigerating Equipment	✓		✓	
Cooking and Kitchen Equipment		✓		
Lighting Equipment	✓			✓
Computing and Office Equipment		✓	✓	
Vertical Transport Equipment				✓
Motor Drive System				✓

Private Office

Equipment \ Subgroup	B27: Central services for building (multiple tenants) with central air-conditioning supply for tenants	B28: Tenant lighting and power in building (multiple tenants) with central air-conditioning supply for tenants	B 29: Central services for building (multiple tenants) without central air-conditioning supply for tenants	B30: Tenant lighting and power in building (multiple tenants) without central air-conditioning supply for tenants	B31: Whole building (single tenant)
Space Conditioning Equipment	✓				✓
Lighting Equipment			✓	✓	
Vertical Transport Equipment	✓		✓		
Energy saving practice		✓		✓	

* Please also provide the type of refrigerant used in space conditioning equipment, type of elevator driving system and its power rating.

5. Transport Benchmarking Tools Checklist

In order to facilitate transport users during the process of benchmarking, please prepare the following information before you start:

- Average monthly fuel consumption;
- Average passenger number on each trip;
- Average monthly travelling distance;
- Vehicle equipped with air-conditioning;
- Presence of regular check-up practice;
- Other information for the specific subgroup as listed below:

Private Car and Motorcycle

Subgroup / Information	V1: Motorcycle (Petrol)	V2: Private Car (Diesel)	V3: Private Car (Petrol)
Engine Size	✓	✓	✓
Vehicle Age	✓	✓	
Average Travelling Frequency	✓	✓	✓
Travelling Proportion in Hong Kong Island, Kowloon, New Territories and Mainland		✓	✓
Refilling Proportion in Hong Kong and Mainland			✓
Travelling Proportion on Highway	✓		✓
Ownership			✓
Recent refuel date	✓		✓

Bus

Subgroup / Information	V11: Private Bus (Double Deck) (Diesel)	V12: Private Bus (Single Deck) (Diesel)	V13: Non-franchised Public Bus (Double Deck) (Diesel)	V14: Non-franchised Public Bus (Single Deck) (Diesel)
Engine Size		✓		
Gross Vehicle Weight				✓
Average Travelling Frequency		✓		✓
Travelling Proportion in Hong Kong Island, Kowloon, New Territories and Mainland	✓	✓	✓	✓
Travelling Proportion on Highway				✓
Recent Refuel Date	✓		✓	

Light Bus

Subgroup \ Information	V15: Private Light Bus (Diesel)	V16: Public Light Bus (Diesel)	V17: Private Light Bus (LPG)	V18: Public Light Bus (LPG)
Vehicle Age			✓	✓
Travelling Proportion in Hong Kong Island, Kowloon, New Territories and Mainland	✓			
Recent Refuel Date	✓	✓	✓	✓

Taxi and Goods Vehicle

Subgroup \ Information	V21-V23: Taxi	V31-V32: Goods Vehicle (Petrol)	V33-V41: Goods Vehicle (Diesel)
Engine Size			✓
Gross Vehicle Weight			✓
Average Vehicle Loading			✓
Vehicle Age	✓	✓	
Average Travelling Frequency	✓	✓	✓
Travelling Proportion in Hong Kong Island, Kowloon, New Territories and Mainland			✓
Travelling Proportion on Highway	✓		
Recent Refuel Date	✓		

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