

## Cover

Report  
Energy Management  
Year B.E. 25xx

Legal Entity Name:

Controlled Factory Name:

TSIC-ID:

Submit report within March of year B.E. 25yy

# Energy Management Report

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## Certification Page

Certification of Energy Management Report Preparation  
Of the Controlled Factory, Company ..... Limited

1. Chairperson of Energy Management Working Team

I, as the Chairperson of the Energy Management Working Team of the controlled factory, hereby certify that

The energy management has been carried out in full compliance with the Ministerial Regulations

Signature .....

( ..... )

Date ...../...../.....

2. Person Responsible for Energy

I, as the person responsible for energy of the controlled factory, hereby certify that the energy management has been performed

In full compliance with the Ministerial Regulations

Signature .....

( ..... )

( ..... )

Position: Ordinary Energy Responsible Person

Position: Senior Energy Responsible Person

Registration No. ....

Registration No. ....

Date ...../...../.....

Date ...../...../.....

3. Controlled Factory Owner

I, as the controlled factory owner / authorized representative, hereby certify that the energy management has been carried out

In full compliance with the Ministerial Regulations

Signature .....

( ..... )

Date ...../...../.....

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## Basic Information

### General Information

1 Legal Entity Name:

Company ..... Limited

Controlled Factory Name:

Factory .....

TSIC-ID:

.....

2 Specify the group of controlled factory as follows:

Group 1 (Small):

Controlled factory using an electricity meter or energy equivalent to electricity consumption less than sixty million megajoules per year

Group 2 (Large):

Controlled factory using an electricity meter or energy equivalent to electricity consumption from sixty million megajoules per year and above

3 Factory Address:

No. .... Village ..... Road ..... Subdistrict .....

District ..... Province ..... Postal Code .....

Telephone: ..... Fax: ..... Email: .....

4 Office Address:

No. .... Village ..... Road ..... Subdistrict .....

District ..... Province ..... Postal Code .....

Telephone: ..... Fax: ..... Email: .....

6 Industry Type

Stone, Gravel, Soil, Sand

Food, Beverages, and Tobacco

Textile

Wood

Paper

Chemical

Non-metal

Basic Metal

Metal Products

Other Manufacturing

Electricity and Gas

Water Supply

7 Factory began production on:

Month ..... Year .....

Number of operating hours per year:

..... hours/year

Main products of factory:

.....

Annual production volume:

.....

Monthly production schedule:

.....

Energy Responsible Person

Name - Surname:

.....

Position:

.....

Type of Energy Responsible Person:

Ordinary Energy Responsible Person

Senior Energy Responsible Person

Qualifications required for Energy Responsible Person:

(A)

Holding a vocational diploma and having energy-related work experience as certified by the controlled factory owner or controlled building owner.

(B)

Holding a degree in engineering or science, and having energy-related work experience as certified by the controlled factory owner or controlled building owner.

(C)

Completed training on energy conservation or training with similar purpose approved by the Director-General.

(D)

Completed the Senior Energy Responsible Person training course approved by the Director-General.

(E)

Passed the examination criteria for Energy Responsible Person organized by the Department of Alternative Energy Development and Efficiency (DEDE).

Senior Energy Responsible Person

(A)

Completed the Senior Energy Responsible Person training course approved by the Director-General.

(B)

Passed the examination criteria for Senior Energy Responsible Person organized by the Department of Alternative Energy Development and Efficiency (DEDE).

## **Step 1**

### Energy Management Information

#### Step 1: Energy Management Working Team

##### 1.1 Structure of the Energy Management Working Team

(Insert organizational chart of the Energy Management Working Team)

Figure 1-1 Organizational Chart of the Energy Management Working Team

## **Organizational Structure & Responsibilities**

### 1.2 Appointment of the Energy Management Working Team and Roles and Responsibilities

(Insert the appointment order of the Energy Management Working Team)

Figure 1-2 Appointment Order of the Energy Management Working Team

Note:

Please attach a copy of the appointment order of the Energy Management Working Team and the defined roles and responsibilities.

## Methods of Publicizing

### 1.3 Methods of Publicizing the Energy Management Working Team

Notice board

Poster

Number of posted notices: ..... locations

Number of posted posters: ..... locations

Printed material

Broadcast announcement

Brochure / newsletter ..... copies

..... times per week during the period .....

Email announcement

Employee meeting

Number of recipients ..... persons

..... times per week

Level of recipients .....

Others (specify) .....

Documents and evidence showing the publicizing of the Energy Management Working Team

(Insert documents showing the publicizing of the working team — Method 1)

(a) .....(Specify the method of publicizing).....

## Publicizing Documents

(Insert documents showing the publicizing of the working team — Method 2)

(b) .....(Specify the method of publicizing).....

Figure 1-3 Photograph(s) of the publicizing of the Energy Management Working Team

Note:

In case there are more than 2 publicizing methods, the factory may add additional documents or photo evidence as needed.

## Step 2

### Step 2: Initial Assessment of Energy Management Status

#### Results of the Initial Energy Management Assessment

Assessment year B.E. ....

#### Table 2.1 Energy Management Assessment of the Organization

##### Score Levels

Energy Conservation Policy

Organization Structure

Motivation and Incentives

Information System

Public Relations

Investment

(Scale descriptions...)

Note:

- 1) The initial energy management assessment is conducted based on departments or individuals totaling .....
- 2) For the second round system, this assessment is optional but recommended annually.
- 3) Other appropriate assessment methods may be used.

## Summary of EMM

ENERGY MANAGEMENT MATRIX of Factory .....

No.

Name - Surname

Department / Section

Score Level

Total

Policy

Organization

Motivation and Incentives

Information System

Public Relations

Investment

Average

## Step 3

### Step 3: Energy Conservation Policy

#### 3.1 Energy Conservation Policy of the Organization

(Insert document showing the announcement of the Energy Conservation Policy)

Figure 3-1 Energy Conservation Policy

Note:

Please attach a copy of the official announcement of the Energy Conservation Policy.

#### 3.2 Publicizing the Energy Conservation Policy

(Methods list and evidence placeholders, as provided previously)

## Step 4

### Step 4: Assessment of Energy Conservation Potential

(4.1) Organizational-level assessment

(4.2) Product-level assessment

(4.3) Machinery/Equipment-level assessment

Implementation guidelines are as follows:

4.1) Organizational-Level Assessment

4.1.1) Production Data for Year 25ww

Table 4.1 Production volume categorized by product type for year 25ww

(Month list and fields as previously translated)

4.1.2) Electrical System Information

4.1.2.1) Transformer Information

(Headers: Transformer Number, Meter Number, Type, Rated Capacity (kVA), Quantity, etc.)

4.1.2.2) Electricity Consumption Information for the Year 25ww

Table 4.3 Electricity Consumption Data for the Year 25ww

(Headers and tariff code notes P/PP/OP1/OP2, months, totals)

4.1.3) Fuel and Renewable Energy Consumption for the Year 25ww

Table 4.4 Fuel and Renewable Energy Consumption

(Types with average heating values, months, totals)

4.1.4) Fuel Consumption for Electricity Generation in the Year 25ww

Table 4.5 Fuel Consumption for Electricity Generation

(Installed Capacity, Main Fuel, Hours, Electricity Generated, Steam Quantity, conditions for pressure/temperature)

4.1.5) Electricity Consumption Proportion for the Year 25ww

Table 4.6 Electricity Consumption Proportion by System

(System, kWh/year, %, Estimated/Measured; Lighting, Office AC\*, Cooling, Production, Compressed Air, Others; Total)

Note: \* Split-type only.

#### 4.1.6) Thermal Energy Consumption Proportion for the Year 25ww

Table 4.7 Fuel Energy Consumption Proportion by System for the Year 25ww

System

Equipment

Fuel Energy Consumption

Method

Type of Fuel

Megajoules/year

Percentage

Estimated

Measured

Boiler

Industrial Furnace

Total

#### 4.2 Product-Level Assessment

##### 4.2.1 Product No. 1

(Can specify more than one product — select major products that account for more than 80% of total energy consumption)

Production Process

(Insert process flow diagram and indicate type of energy and percentage of energy consumption at each stage)

Figure 4.1 Production Process Diagram .....

Description of Production Process

Note:

If there are multiple main products, add process flow diagrams according to the number of main products.

#### 4.2.2) Specific Energy Consumption (SEC) per Production Unit

Table 4.8 Energy Consumption per Production Unit of ..... for the Year 25ww

Update year

Month

Production Quantity (Units)

Energy Consumption — Electricity (kWh), Thermal Energy (MJ)

Specific Energy Consumption (SEC) (MJ/unit)

(Include months Jan–Dec, Total, Average; #DIV/0! are spreadsheet formula results)

Note:

If multiple main products exist, increase the number of tables accordingly.

Comparison of energy consumption data or energy consumption index (SEC) with internal factory targets,

or comparison with other factories (if applicable)

SEC Year 25ww (MJ/unit)

Target SEC (MJ/unit)

Minimum Value

Average Value

Figure 4.2 Graph comparing SEC with internal targets or other factories (if applicable)

#### 4.3 Machinery / Equipment-Level Assessment

Identification of significant energy use (SEU) for major machinery/equipment in the controlled factory was done by

measuring and collecting energy consumption and operating hours, and analyzing efficiency and losses for each major machine/equipment.

The summary results are as follows:

4.3.1) Assessment of Significant Machinery/Equipment to Identify Energy Conservation Measures

Energy Use Assessment Form for Major Machinery/Equipment

Department: ..... Date: .....

Major Machinery / Equipment

Type of Energy

(1) Energy Usage Size — Least(1) Low(2) Medium(3) High(4) Highest(5)

(2) Operating Hours — Least(1) Low(2) Medium(3) High(4) Highest(5)

(3) Improvement Potential — Low(1) Medium(2) High(3)

Total Score (1) x (2) x (3) → Priority Level

Remarks:

1) Highest total score = first priority for measures.

2) If multiple departments use energy, add tables.

3) Other assessment methods may be used (e.g., measurement/actual data).

Table 4.9 Significant Electrical Energy Consumption Record for Major Machinery / Equipment for the Year 25ww

Columns:

Energy-using System

Name of Major Machinery / Equipment

Rated Capacity (Rated / Unit)

Quantity

Service Life (years)

Average Operating Hours / Year

Electricity Consumption (kWh/year)

Energy Consumption Proportion in the System

Efficiency or Performance Value

Remarks

Note: Record only major machinery/equipment with significant energy use.

(Developer comments in original sheet noted; retained contextually.)

Table 4.10 Significant Thermal Energy Consumption Record for Major Machinery / Equipment for the Year 25ww

Columns:

Energy-using System

Name of Major Machinery / Equipment

Rated Capacity (Rated / Unit)

Quantity

Service Life (years)

Average Operating Hours / Year

Fuel Type / Fuel Consumption (Unit)

Thermal Energy Consumption (MJ/year)

Energy Consumption Proportion in the System

Efficiency or Performance Value

Remarks

Note: Record only major machinery/equipment with significant energy use.

## Step 5

### Step 5: Setting Energy Conservation Targets and Plans, and Training Plans and Activities to Promote Energy Conservation

The controlled factory has set energy conservation targets and prepared a plan as follows:

#### 5.1 Setting Energy Conservation Targets and Plans

##### Energy Conservation Target

##### Target Setting

##### Target Value

% Reduction of Previous Energy Consumption

Specific Energy Consumption (SEC) Level 1/2/3/...

Note: If target is SEC and multiple products exist, indicate SEC target for each product.

Table 5.1 Measures and Targets for Implementing Energy Conservation

Columns:

No.

Energy Conservation Measure

Energy Saving Target — Electricity (kW, kWh/yr, Baht/yr), Fuel (Type, Quantity/yr, Unit, Baht/yr)

Percentage of Savings

Investment Cost (Baht)

Payback Period (Years)

Sections: Electricity, Thermal, Total, Grand Total

Notes:

1) % savings based on total energy consumption from previous year.

2) Average electricity tariff ... Baht/kWh (Year 25ww)

3) Fuel cost ... Baht/(unit) (Year 25ww)

Table 5.2 Electrical Energy Conservation Plan

Columns:

No.

Measure

Objective

Duration — Start (M/Y), End (M/Y)

Investment (Baht)

Responsible Person

Note: Responsible Person = person in charge of the measure.

Table 5.3 Thermal Energy Conservation Plan

Columns:

No.

Measure

Objective

Duration — Start (M/Y), End (M/Y)

Investment (Baht)

Responsible Person

Note: Responsible Person = person in charge of the measure.

## Electrical Measure Details

### Energy Conservation Measure Details (Electrical)

Fields:

- 1) Measure No.
- 2) Measure Name
- 3) Responsible Person / Position
- 4) Equipment to be improved; Quantity (sets)
- 5) Electricity Tariff used for calculation (Average Baht/kWh, Year ...)
- 6) Energy before improvement (V, I, Time, Power, Energy)
- 7) Energy after improvement (V, I, Time, Power, Energy)
- 8) Energy Savings — Electricity (kWh/yr), Cost (Baht/yr)
- 9) Investment Cost (Baht)
- 10) Scrap/Trade-in Value (Baht)
- 11) Payback Period (years)
- 12) Improvement details (with calculation summary)
- 13) Verification method of savings (spec/specs+calc or measurement+calc)
- 14) Savings results after improvement
- 15) Pre-improvement Photograph  
(Figure 5-1 Pre-improvement Photograph)
- 16) Display Calculation Method (show detailed calculation)

### Energy Conservation Measure Details (Thermal)

Fields similar to Electrical:

- 1) Measure No.,
- 2) Name,
- 3) Responsible Person/Position,
- 4) Equipment improved;

- 5) Quantity (sets),
- 6) Location
- 7) Reason for improvement
- 8) Energy before improvement — Fuel type, Quantity, Unit, Energy qty,
- 9) Energy after improvement — Fuel type, Quantity, Unit, Energy qty,
- 10) Savings — Thermal (MJ/yr), Cost (Baht/yr),
- 11) Investment (Baht), 10) Scrap/Trade-in (Baht), 11) Payback (years),
- 12) Payback Period
- 13) Improvement details (with calc),
- 14) Verification method,
- 15) Pre-improvement Photograph  
(Figure 5-2 Pre-improvement Photograph)
- 16) Display Calculation Method (show detailed calculation)

## 5.2 Training Plans and Activities to Promote Energy Conservation

Table 5.4 Energy Conservation Training Plan for Year 25xx

(Columns: No., Course, Group, No. of Trainees, Month (Jan–Dec), Responsible Person, Trainees)

Table 5.5 Activities to Promote Energy Conservation for Year 25xx

(Columns: No., Activity, Target Group, No. of Participants, Month (Jan–Dec), Responsible Person, Participants)

Note: Responsible Person = person in charge of the course/activity.

## 5.3 Publicizing the Training Plans and Activities to Promote Energy Conservation

(Methods list: Notice board, Posters with counts, Printed material, Broadcast, Brochure/Newsletter copies and frequency, Email,

Employee meeting with counts and levels, Others...)

Insert evidence:

(a) Publicizing method 1 (specify)

(b) Publicizing method 2 (specify)

Figure 5-3 Publicizing of Training Plans

Note: If >2 methods, add more evidence.

Documents/evidence for publicizing energy conservation promotion activities

Insert:

(a) Method 1 (specify)

(b) Method 2 (specify)

Figure 5-4 Publicizing of Energy Conservation Promotion Activity

Note: If >2 methods, add more evidence.

## Step 6

Step 6 Implementation of the Energy Conservation Plan, Monitoring, and Reporting on Energy Conservation Measures,

including Training Plans and Activities to Promote Energy Conservation

### 6.1 Summary of Monitoring Results of Energy Conservation Measures

Table 6.1 Summary of Monitoring Results of Energy Conservation Plan Implementation

(Columns: No., Measure, Status — Implemented / Not implemented (reason) / Delayed (reason), Remarks)

Monitoring the Achievement of Energy Conservation Targets

Table 6.2 Summary of Monitoring Results of Energy Conservation Target Achievement

Columns include:

- Energy Conservation Plan according to Target
- Actual Energy Conservation Achieved
- % Reduction of Previous Energy Consumption
- Specific Energy Consumption Level 1/2/3/...

Table 6.3 Results of Inspection and Analysis of Energy Conservation Measure Implementation — Electrical Measures

Measure Name / No.

Status of Implementation

Investment Cost

Energy Conservation Results — According to Target vs Actual (kWh/year, Baht/year)

Reasons (if Not Implemented or Delayed)

Comments and Recommendations

Details of Actual Implementation Results (Electrical Measures)

Measure Name / No.

Post-improvement Photograph (Figure 6-1)

Show Calculation Method (detailed calculation)

Table 6.4 Results of Inspection and Analysis of Energy Conservation Measure Implementation — Thermal Measures

Measure Name / No.

Status of Implementation

Investment Cost

Energy Conservation Results — According to Target vs Actual (MJ/year, Baht/year)

Reasons (if Not Implemented or Delayed)

Comments and Recommendations

Details of Actual Implementation Results (Thermal Measures)

Measure Name / No.

Post-improvement Photograph (Figure 6-2)

Show Calculation Method (detailed calculation)

6.2 Results of Monitoring the Implementation of Training Plans and Activities to Promote Energy Conservation

Table 6.5 Summary of Status of Training Plan Implementation

(Columns: No., Training Course Name, Status, No. of Trainees, Remarks, with reasons and delays)

Photographs / Evidence of Training — Figure 6-3

6.2 Results of Monitoring the Implementation of Training Plans and Activities to Promote Energy Conservation

Table 6.6 Summary of Status of Activities to Promote Energy Conservation

(Columns: No., Activity Name, Status, No. of Participants, Remarks, with reasons and delays)

Photographs / Evidence of Activities — Figure 6-4

6.3 Energy Information for the Year 25xx

6.3.1) Production Information for the Year 25xx

Table 6.7 Production Volume Categorized by Product Type for the Year 25xx

(Months, Operating hours, Production units, Actual production volume, Installed production capacity)

### 6.3.2) Electricity Consumption Information for the Year 25xx

Table 6.9 Electricity Consumption Data for the Year 25xx

(Columns: User No., Meter No., Month, Max Demand, Electric Energy, Total Cost, Power Factor, Avg Cost; tariff codes P/PP/OP1/OP2)

### 6.3.2) Fuel and Renewable Energy Consumption Information for the Year 25xx

Table 6.10 Fuel and Renewable Energy Consumption Data for the Year 25xx

(Types with units and average heating values; Electricity equivalent, Diesel, Fuel oil, LPG, NGV, Natural Gas, Coal Briquette, Coal, Rice husk, Bagasse, Municipal waste, Woodchips/Sawdust, Agricultural residuals, Purchased steam, Others; Totals)

Graphs comparing energy consumption

Figure 6-5 Monthly electricity consumption comparison (Year 25ww vs 25xx)

Figure 6-6 Monthly thermal energy consumption comparison (Year 25ww vs 25xx)

### 6.3.4) Fuel Consumption Information for Electricity Generation in the Year 25xx

Table 6.11 Fuel Consumption for Electricity Generation (For internal use / For sale)

(Installed Capacity, Main Fuel, Hours, Electricity Generated (kWh), Steam Quantity (tons), Pressure/Temperature)

Graph — Monthly fuel consumption for electricity generation comparison

Figure 6-7 (Year 25ww vs 25xx; months Jan–Dec)

### 6.3.5) Energy Consumption Proportion by System for the Year 25xx

Table 6.12 Electricity Consumption Proportion by System (kWh/year, %, Estimated/Measured)

(Systems: Lighting, Office Air Conditioning\*, Cooling, Production, Compressed Air, Others; Total)

Note: \* applies to split-type AC.

### 6.3.6) Thermal Energy Consumption Proportion for the Year 25xx

Table 6.13 Fuel Energy Consumption Proportion by System (MJ/year, %, Estimated/Measured)

(Systems: Boiler, Industrial Furnace; Total)

Graphs comparing energy consumption proportions

Figure 6-8 Energy consumption proportion comparison (Year 25ww vs 25xx)

Figure 6-9 Electricity consumption proportion comparison (Year 25ww vs 25xx)

Figure 6-10 Thermal energy consumption proportion comparison (Year 25ww vs 25xx)

6.3.7) Specific Energy Consumption (SEC) per Production Unit

Table 6.14 Energy Consumption per Production Unit of ..... for Year 25ww and 25xx

(Monthly tables Jan–Dec for both years; totals and averages; SEC = MJ/unit)

Graph: Product SEC comparison for Year 25ww vs Year 25xx

Figure 6-11 (Monthly values; #DIV/0! are spreadsheet formula results)

## Step 7

### Step 7 Monitoring and Evaluation of Energy Management

#### 7.1 Internal Energy Management Audit Team

Appointment order (Figure 7-1). Note: Attach copy of appointment order.

#### 7.2 Publicizing the Internal Energy Management Audit Team

Methods: Notice board, Posters (with counts), Printed material, Broadcast, Brochure/Newsletter (copies and frequency),

Email, Employee meeting (counts and levels), Others...

Evidence (a) and (b); Figure 7-2.

#### 7.3 Results of Internal Audit

##### Table 7.1 Internal Monitoring of Energy Management Implementation

(Requirements with Documents/Evidence; Audit Results — Yes/No, Complete/Incomplete; Recommendations)

Covers: 1) Team, 2) Initial Assessment, 3) Policy

##### Table 7.1 Internal Monitoring of Energy Management Implementation (continued)

Covers: 4) Potential assessment, 5) Targets/Plan, 6) Implementation & Monitoring (electric/thermal), training & activities, 7) Others

##### Table 7.1 Internal Monitoring of Energy Management Implementation (continued)

Covers: 7) Internal audit and evaluation, 8) Review/Analysis/Correction & Publicity

Signature lines for Chairperson of Internal Energy Management Audit Team and date.

## Step 8

### Step 8 Review, Analysis, and Correction of Deficiencies in Energy Management

#### 8.1 Review of Energy Management Implementation

##### Table 8.1 Review of Energy Management Implementation for the Year 25xx

(Review No., Months Jan–Dec; note for reviews after December with additional entries)

Insert the Energy Management Review Meeting Summary Report / Evidence of the Energy Management Review Meeting

##### Figure 8-1 Summary Document of the Energy Management Review Meeting

##### Table 8.2 Summary of Review, Analysis, and Correction of Deficiencies in Energy Management for the Year 25xx

Steps 1–7 with columns:

Review Results — Appropriate / Needs Improvement

Deficiencies Found

Improvement Actions

Remarks

#### 8.2 Publicizing the Results of Review, Analysis, and Correction of Deficiencies in Energy Management

Methods (notice board, posters with counts, printed material, broadcast, brochures/newsletters with frequency, email, employee meetings with counts/levels, others)

Evidence (a) and (b); Figure 8-2.

Note: If >2 methods, add more evidence.

## **Appendix**

Appendix A — Three-Year Energy Conservation Measure Implementation Plan

Appendix B — Other Supporting Documents