

Chapter 1

Introduction



1.1 Background and Importance of Problem

The act of Energy Conservation Promotion declared on 2 April 1992 for promoting the discipline of energy utilization in Thailand. The act aims to promote the investment about the energy conservation in buildings and factories. Thus the control action is used for increasing the efficiency of energy utilization, dual with the supporting budget from the Energy Conservation Fund. The fund controls the payment of budget in each plan and project as shown in figure 1.1 [1,p1].

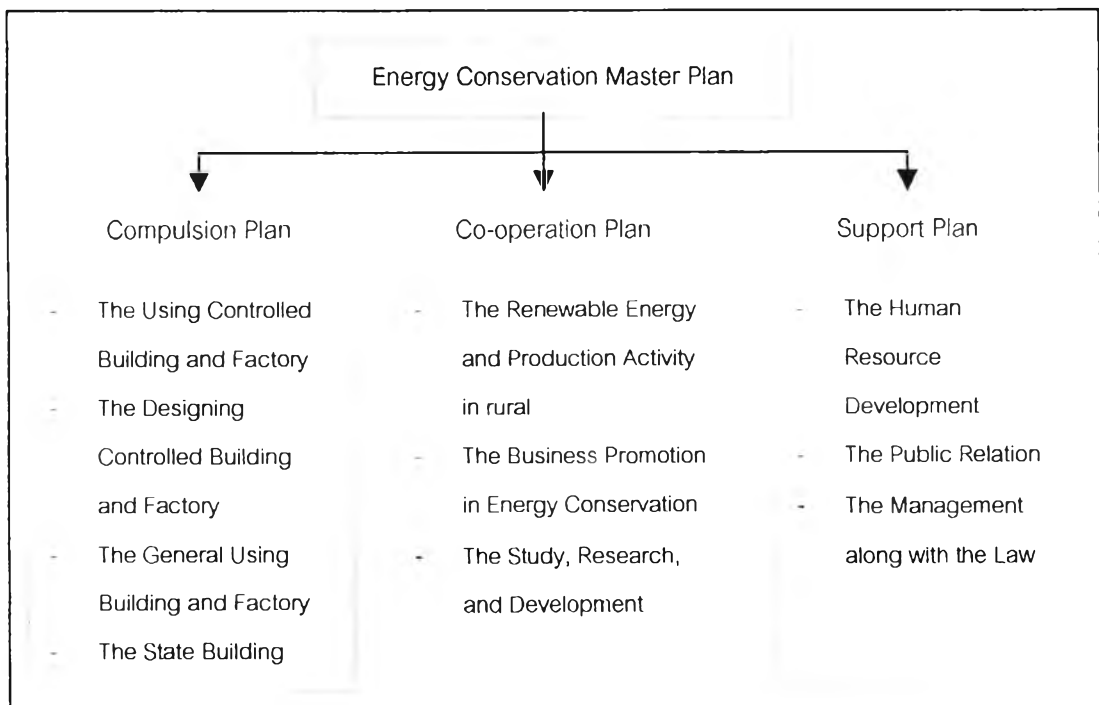


Figure 1.1 the Master Plan and the Project of the Energy Conservation Fund

One project in Compulsion Plan is the Energy Conservation in the State Building project (ECSB) which has 5 main objectives [2].

- To increase the efficiency of the energy utilization in the state building.
- To reduce the expense of the energy in the state building.
- To be an excellent example for people and the private sector about the energy conservation.
- To reduce the demand of the electrical energy utilization of country and to decelerate the investment in electrical energy investment.
- To reduce the environment effect from the electrical energy utilization

The Energy Conservation in the Stated Building project improves 4 main systems with budget about 5,000,000 baht in each building [3].

- Lighting System
- Air-conditioning System
- Thermal Transfer System
- Others

The Department of Energy Development and Promotion (DEDP) is responsible for the Energy Conservation in the State Building project phase 1 from 1995 to 1999. The budget 1,602 million baht was used for 415 government or state-owned buildings in first period (from about 3,000 government or State-owned buildings in Thailand) [2]

The types of state building project are shown below [4].

- 1 Government Organization
 - Government Office
 - State Enterprise Office
 - Ministry Building
 - Department Building
- 2 Hospital
- 3 Educational Institute

The Energy Conservation Center of Thailand (ECCT) is one company whom employed to be an Implement Agency (IA) of the Department of the Energy Development and Promotion. The Energy Conservation Center of Thailand is a representative of the Department of the Energy Development and Promotion to make the energy audit report, to manage the project, to control the site work, to install the equipment, and to assess the result of project as shown in figure 1.2 [5].

From the past running the Energy Conservation in the State Building project should develop the energy audit report which is the beginning and important point to define the following activities of the project.

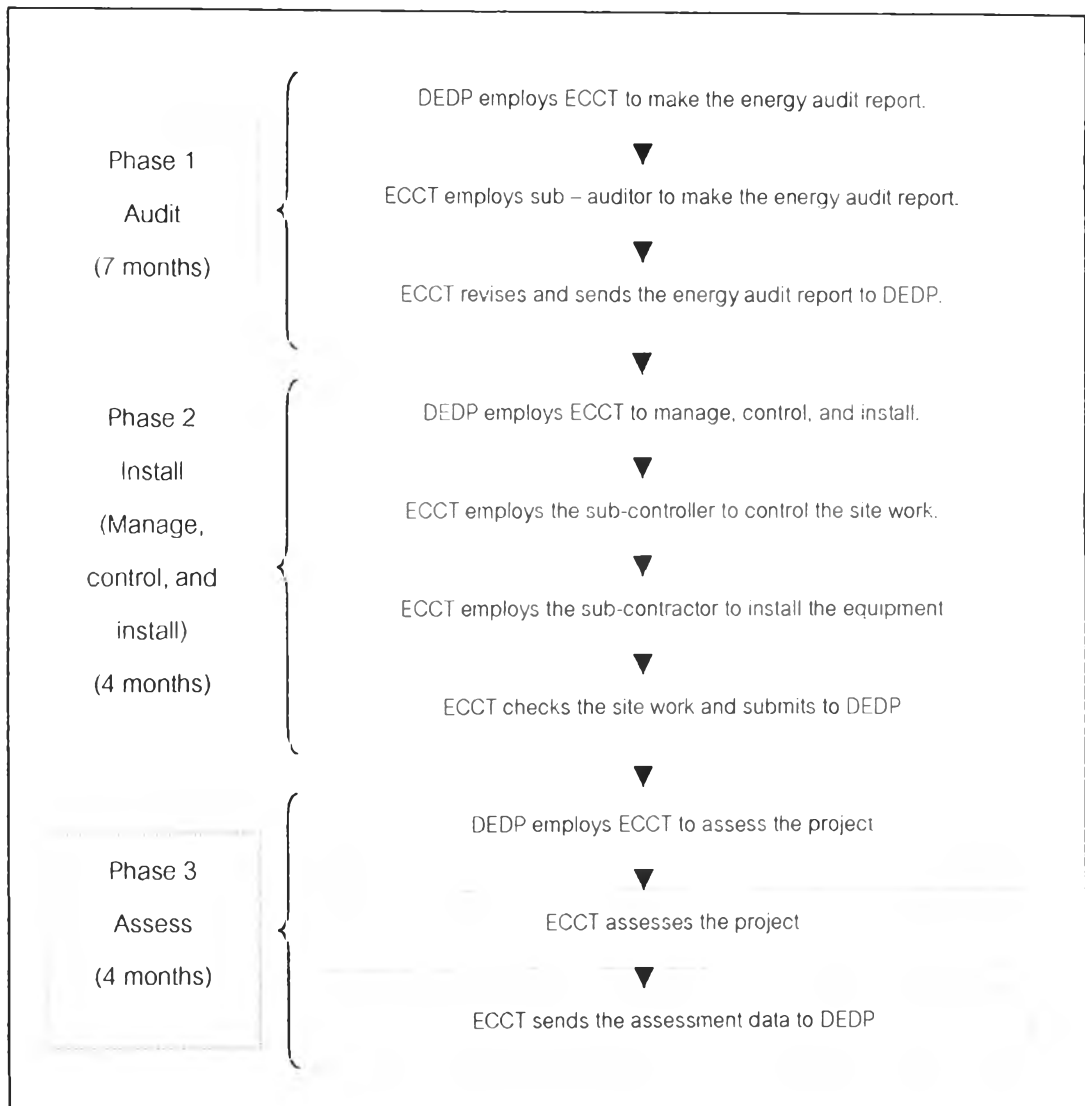


Figure 1.2 the step of work in the Energy Conservation in the State Building project

1.2 State of Problem

Owing to the contents in the term of references of the energy audit report is complex and can be interpreted in many ways and aspects. Then in 1996, 1997, and 1998 sub – auditors submit the variety styles of the energy audit reports to the Energy

Conservation Center of Thailand. The report reviewer has to spend a lot of time to read and understand.

The variety format of the energy audit report should be changed into the standard format.

1.3 Objectives of Research

1.3.1 To study and improve the energy audit report.

1.3.2 To set the standard format of presentation of the energy audit report.

1.3.3 To set an example of the energy conservation plan and bill of quantity for energy audit report

1.4 Scope of Research

There are more than one Implement Agency of the Department of Energy Development and Promotion. Each one has its own format of the energy audit report. So the standard format of the energy audit report is used only in the Energy Conservation Center of Thailand, the Department of the Energy Development and Promotion, and the building owner.

1.5 Primary Commitment in Research

The average time for reviewing and mistake the energy audit report is the criteria for comparison and evaluation between the consumed time and mistake in the past and the consumed time and mistake after the implementation of the standard format for the energy audit report. The less time for reviewing and mistakes in the energy audit report means the better format whereas the contents of the energy audit report are maintained.

1.6 Limitation of Research

The standard format of the energy audit report can define the work only in the audit phase but cannot define in the install phase. So in the real site work requires the fully attention and controlling from the project engineer of the Energy Conservation Center of Thailand to check the site work according to the energy audit report

1.7 Assumption of Research.

The skill of all of the energy audit report reviewers and auditors are not different.

1.8 Definition of Word in Research

Energy conservation means the efficiency and economy of the energy generating and utilization.

Small project means the project, which has these characteristics [6].

- Spend the time about 3 - 12 months.
- Use the budget about 500,000 –5,000,000 baht.
- Improve the system of work frequently.
- Use 3 – 4 account codes for accountant to classify the expense.
- Project manager works closely with the project team.

The Energy Conservation Fund means the fund for supporting factory and building, which aim to conserve the energy. The fund receives the primary money from the Petroleum fund about 1,500 million baht on August 24, 1992. Moreover the National Energy Policy Office (NEPO) define to gain the yearly income for the fund from 0.07 baht per liter of benzene, kerosene, diesel, and fuel oil selling in Thailand. Thus each year the fund receives about 2,000 millions baht [2].

Controlled building means the building, which consumes the electrical power up to 1,000 kW or uses the single or overall transformer up to 1,175 kVA or uses any energy up to 20 million MJ between 1 January and 31 December of each year in the past. [1].

The Department of Energy Development and Promotion or previously named the National Energy Administration (NEA), which is one government department under the Ministry of Science, Technology and Environment (MOSTE). The Department of the Energy Development is responsible for survey, study, regulate, control, define the rate of return for the investment in the energy utilization, and transfer the technologies about the energy conservation [3].

The Energy Conservation Center of Thailand was founded by government and the Federation of Thailand Industries (FTI) to operate the energy conservation activity [3].

The Implement Agency (IA) means the representative from the Department of Energy Development and Promotion to manage the project, to control the site work, and to install the equipment in The Energy Conservation in Government or State-owned Building project [3].

The energy audit report is composed of 7 main parts.

- Introduction of the Energy Audit Report
- Chapter 1 General Data and Characteristic of Building
- Chapter 2 Characteristic of the Energy Utilization
- 4 Chapter 3 Suggestion for Energy Conservation
- 5 Chapter 4 Potential of Energy Conservation in Building

6 Chapter 5 Energy Conservation Plan

7 Appendix

8 Energy Conservation Improvement Drawing (A3 paper show the location and detail of the new equipment installation)

1.9 Benefit from Research

1.9.1 The time for reviewing the energy audit report are reduced.

1.9.2 The mistake in the energy audit report is reduced.

1.9.1 The energy audit report in the next year can use the standard format of the energy audit report.

1.10 Methodology of Research

The methodology of the research is divided into 10 steps and also shown in figure 1.3 the schedule of research.

1.10.1 Review the proposal of thesis.

1.10.2 Collect the concerned document.

1.10.3 Review the time for reviewing the energy audit report in 1996 - 1998.

1.10.4 Draw the existing flow chart and organization of the energy audit report making

1.10.5 Record the mistake from the revision of the energy audit report in the past and do the Pareto Analysis to find the major and minor mistakes.

1.10.6 Analyze the caused of mistake by using the fishbone diagram and put the correction measure into the process and the standard format of the energy audit report making. After that use Pugh Matrix to compare the standard format to the report in the past.

1.10.7 Check the completion of the items in the standard format as the term of reference.

1.10.8 Implement the new format of the energy audit report and record the consumed time for revising.

1.10.9 Compare and show the consumed time before and after implementing the standard format. Then use Microsoft Excel for improving the energy conservation plan and bill of quantity.

1.10.10 Conclude and show the suggestion of the research.

1.11 Schedule of Research

Work	February	March	April	May	June	July	August	September	October
1 Review the proposal of thesis.									
2 Collect the concerned document.									
3 Review the consumed time for reviewing in the past.									
4 Draw the existing flowchart and organization of the energy audit reports making. Then set it for reviewer to review it in the same time as concept of simultaneous engineering.									
5 Record the mistake from the revision in the past and do the Pareto Analysis.									
6 Analyze the mistake by using the fishbone diagram and set the correction measure. Use Ms Excel for preparing the energy conservation plan.									
After that use Pugh Matrix to compare an example of standard format to the report in the past.									
Check the completion of the standard format as the term of reference.									
Implement the standard format and record the consumed time for revising.									
Compare the consumed time and mistake before and after implement the standard.									
0 Conclude and show the suggestion of the research.									