

ENERGY AUDIT CONDITIONAL GRANT

TH HOTEL & CONVENTION
CENTRE, ALOR SETAR, KEDAH

16TH NOVEMBER 2016

MOHAMED HAFIZ BIN MD ISA



OUTLINE

- **Introduction**
- **National Green Technology Policy**
- **11th Malaysia Plan 2016-2020**
- **About Energy Audit Conditional Grant**
 - **Requirements**
 - **Application Process & Forms**
 - **Energy Audit Methodology**
 - **Energy Audit Reporting Format**
 - **Implementation Reporting Format**
 - **How to Apply**

INTRODUCTION

- 1994-1998 : Sekolah Tuanku Abdul Rahman, Ipoh
- 1999-2004 : Universiti Teknologi Malaysia, B.Eng. (Chemical Engineering) with Hons.
- 2004 – 2014: Department of Environment, Ministry of Environment & Natural Resources
- 2010-2012 : Nagoya University, Master in Environmental Studies
- 2014 – Current : Universiti Teknikal Malaysia Melaka (UTeM)



ABOUT MALAYSIA GREEN TECHNOLOGY CORPORATION



- First established as Malaysia Energy Centre (PTM) on 12th May 1998.
- Restructured as Malaysian Green Technology Corporation (GreenTech Malaysia) on 7th April 2010.
- GEO building in Bandar Baru Bangi:
 - Officiated by YAB PM on 24th July 2009.
 - The first GBI certified building in Malaysia.
 - BEI = 30 kWh/m²/year.

GREEN TECHNOLOGY

- The development and application of products, equipment and systems used to conserve the natural environment and resources, which minimises negative impact of human activities
- **Criteria**
 - Minimises the degradation of the environment
 - Emits zero or low greenhouse gas (GHG) emission
 - Safe for use and promotes healthy and improved environment for all forms of life
 - Conserves the use of energy and natural resources
 - Promotes the use of renewable resources

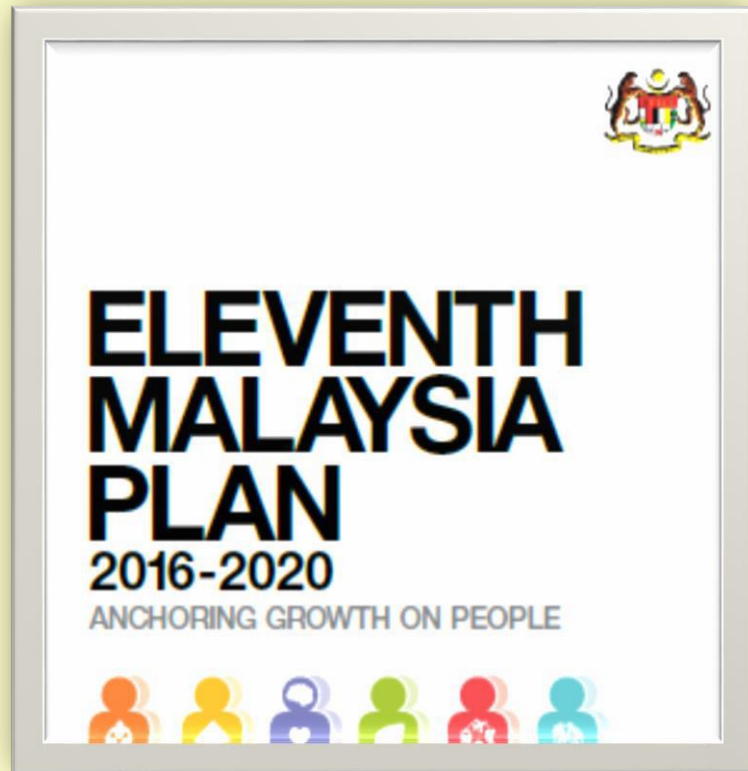
MALAYSIA GREEN TECHNOLOGY POLICY 2009



POLICY STATEMENT

Green Technology shall be a driver to accelerate the national economy and promote sustainable development.

RMK 11 MALAYSIA PLAN 2016-2020



Strategic Trust

1. Enhancing inclusiveness towards an equitable society
2. Improving wellbeing for all
3. Accelerating human capital development for an advanced nation
4. Pursuing green growth for sustainability and resilience
5. Strengthening infrastructure to support economic expansion
6. Re-engineering economic growth for greater prosperity

RMK 11 MALAYSIA PLAN 2016-2020



Strategic Trust No. 4

Pursuing green growth for sustainability and resilience

1. Strengthening resilience against climate change and natural disasters
2. Strengthening the enabling environment for green growth
3. Adopting the sustainable consumption and production concept
4. Conserving natural resources for present and future

RMK 11 MALAYSIA PLAN 2016-2020



Adopting the sustainable consumption and production concept

- Creating green markets
- Increasing share of renewables in energy mix
- Enhancing demand side management (DSM)
- Promoting low carbon mobility
- Managing waste holistically

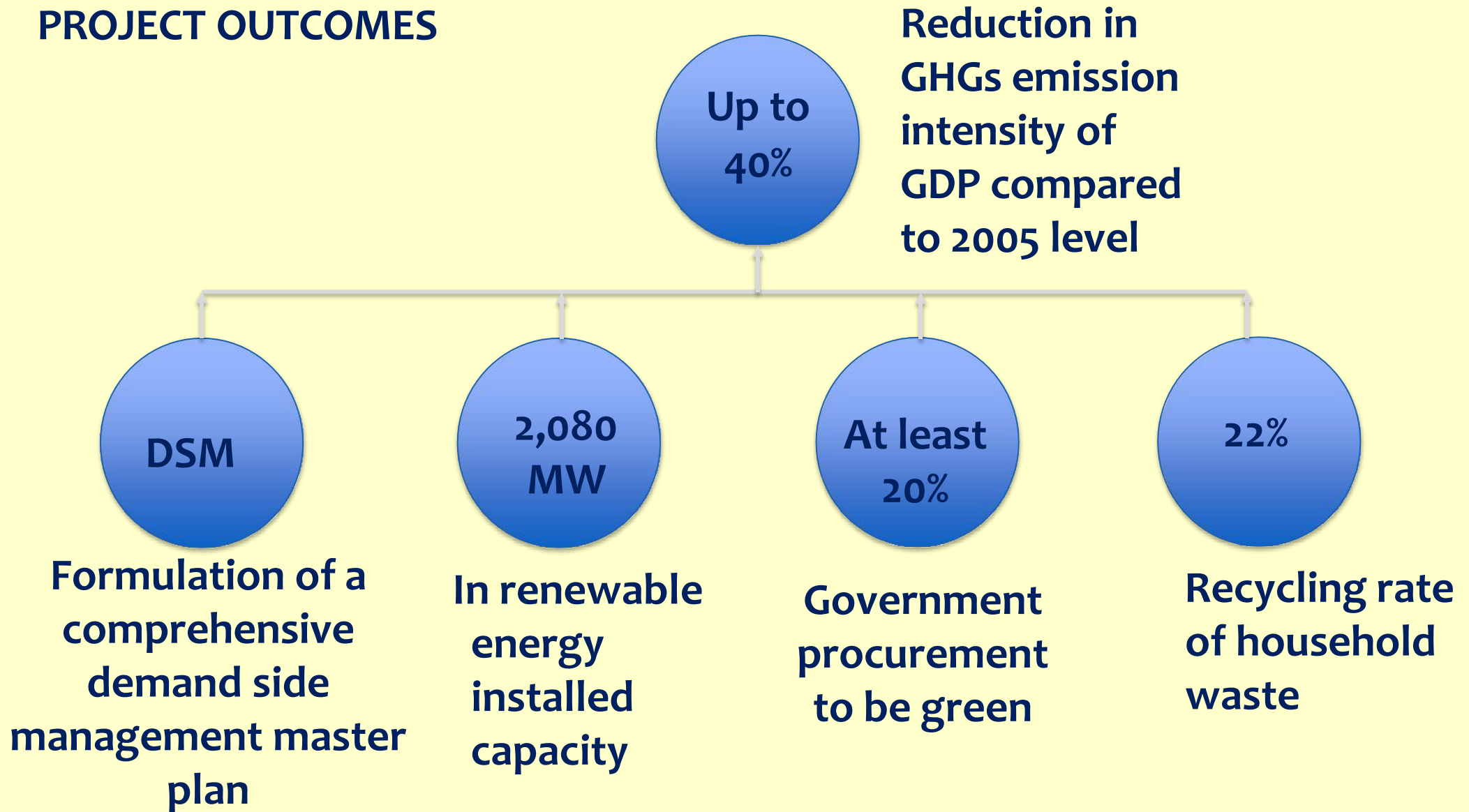
Strategic Trust No. 4

Adopting the sustainable consumption and production concept

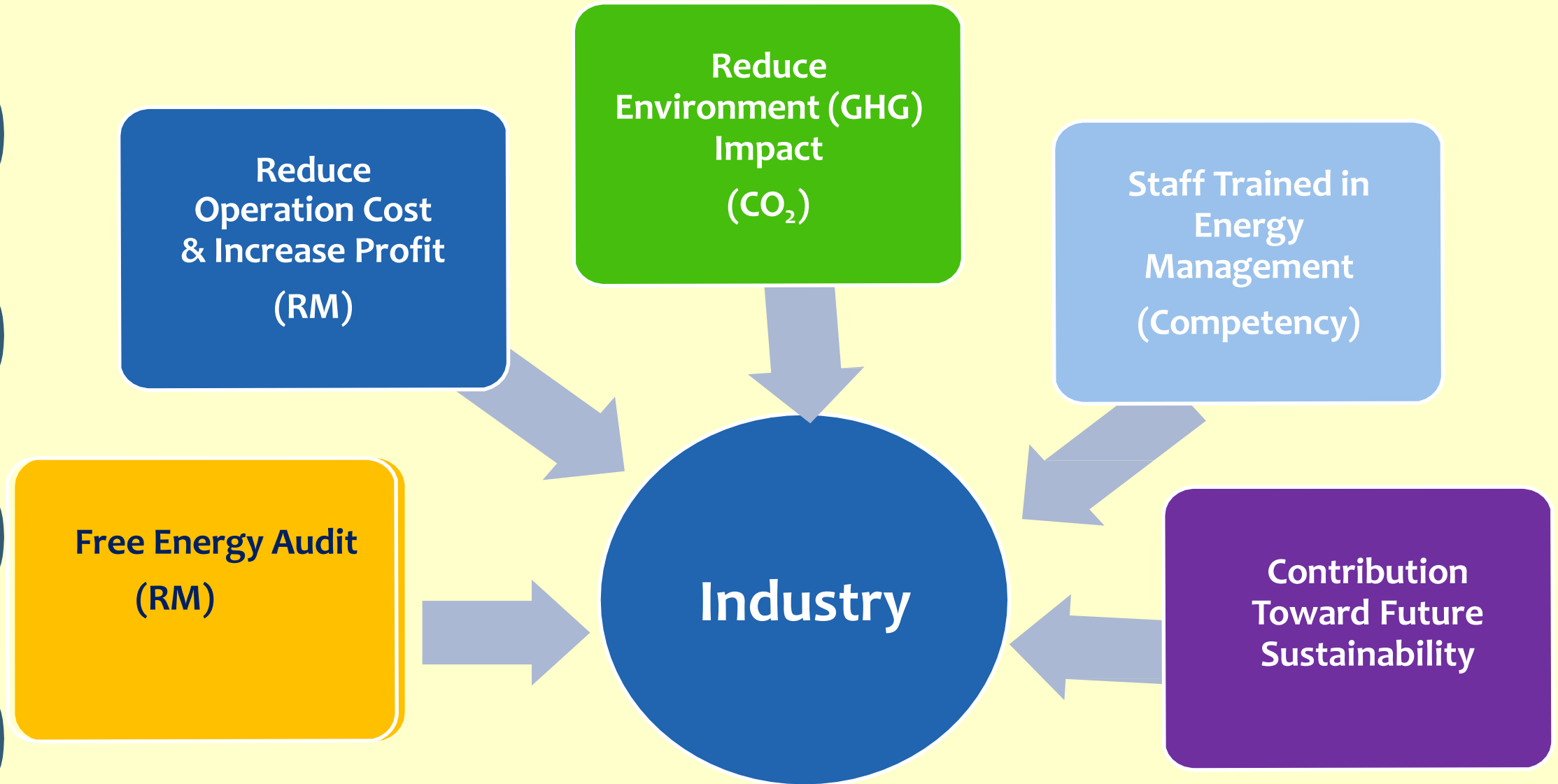
- Creating green markets
- Increasing share of renewable in energy mix
- **Enhancing Demand Side Management (DSM)**
- Promoting low carbon mobility
- Managing waste holistically

RMK 11 MALAYSIA PLAN 2016-2020

PROJECT OUTCOMES



ENERGY AUDIT CONDITIONAL GRANT



ENERGY AUDIT CONDITIONAL GRANT

- Energy Efficiency Projects Malaysia is a program under the Eleventh Plan (RMK-11) approved by the Economic Planning Unit (EPU), Prime Minister Department.
- The program provide conditional energy audit grant for Industrial sectors. It is a **3 years** period project starting from **2016 until 2018**. Any industrial sector which are consuming amount of electrical energy and categorised under the *Efficient Management of Electrical Energy Regulation 2008 (EMEER)* by Energy Commission or Small and Medium Industry, are eligible to apply.
- The **Ministry of Energy, Green Technology & Water (KeTTHA)** and **Energy Commission** are the join executing organisations to ensure the implementation of the incentive will benefits the industrial sector, particularly on the effort to manage and reduce energy consumption.
- **GreenTech Malaysia** has been appointed by KeTTHA as implementing agency on behalf of the government, to promote, facilitate and process the application by the Industrial owner.

PROJECT OBJECTIVES

1 RMK-11: Pursuing green growth for sustainability & resilience



Strategy A

- Strengthening governance to drive transformation
- Enhancing awareness to create shared responsibility
- Establishing sustainable financing mechanisms



Strategy B

- Creating green markets
- Increasing share of renewables in energy mix
- Enhancing demand side management (DSM)
- Promoting low carbon mobility
- Managing waste holistically

2 Green Technology Policy & GTMP



Four Pillars of GT Policy

- Seek to attain energy independence & promote efficient utilization
- Conserve and minimize the impact on the environment
- Enhance the national economic development through the use of technology
- Improve the quality of life for all



Key Enablers

- Green Financing
- Green Procurement
- Low Carbon Cities
- MyHIJAU Mark
- GT Exchange

3 PROJECT OBJECTIVES & BUDGET 2016

- To **create awareness** on the importance of implementing energy audits as part of energy efficiency and conservation program. Energy audit is a systematic process to understand how and where the energy being used, to explore on how to manage it and identify the energy savings potential.
- To **provide financing assistance** to the eligible applicants through grant, as a catalyst for the implementation of energy audit, so that current energy consumption pattern, baseline and energy savings potential can be identified.
- To **attract financial institutions** to provide financing mechanism for energy efficiency projects through energy performance mechanism, to reduce financial burden to the applicants.
- To **develop capacity building** in energy services industry.

Contribute to Malaysia's Carbon Emissions Target*:

**45% reduction in
emissions by
2030**

Compared with 2005 baseline

*Announced by the Prime Minister in 2009

PROJECT IMMEDIATE IMPACT

40%
reduction in
emissions by
2020

OUTCOME under RMK 11 EE Projects	OUTCOME under RMK 11 EE Projects
ENERGY & ECONOMY	ENVIRONMENT
1. Reduction of energy consumption in industrial sector by 2,620 GWh	4. Contribute to the overall environmental quality .
2. Create saving in industrial operation which leads to cost effectiveness production by RM947million	5. Reduce GHG emission and contribute to 40% intensity reduction by 1,942.01 ktCO2eq
3. Economic growth for Energy Performance Contracting (EPC) to ESCOs in Energy Efficiency	
	SOCIAL
	6. Job creation
	7. Improve the quality of life

CONDITIONAL GRANT REQUIREMENT

- a) Any **industry** which are consuming big amount of electrical energy (using electrical energy equivalent or more than 3,000,000 kWh for 6 consecutive months, which listed under the ***Efficient Management of Electrical Energy Regulation 2008 (EMEER)*** by Energy Commission or ***Small and Medium Industry (SME)***, are eligible to apply.
- b) Applicant shall appoint a ***Registered Electrical Energy Manager (REEM)*** for installations under EMEER 2008 or ***Certified Energy Manager (CEM)*** to drive the energy management program.
- c) Energy audit exercise **must be completed within 2 months** starting from the date of contract signing.
- d) Applicant shall appoint an ***Energy Service Company (ESCO)*** before submit grant application to GreenTech Malaysia. The ESCO shall be registered with Energy Commission

CONDITIONAL GRANT REQUIREMENT

- f) Successful **applicants are required to provide amount of funding matching** to the audit grant provided to implement energy saving measures as recommended in the audit report
- g) The implementation of the energy saving measures are according to energy audit report, and shall be within 3 years after the energy audit completed. However, the **No Cost Energy Saving Measures should be implemented immediately** after acceptance of the energy audit final report for the benefits of the applicant.
- h) The energy saving expected **15% within 3 years** by implementing the potential energy saving measures recommended in the final audit report.

TERM AND REFERENCES

GreenTech Malaysia Roles and Responsibilities

1. To provide the **application form, application requirement and criteria, process workflow, conditional agreement, scope of work and grant disbursement** to the applicant;
2. To **manage conditional energy audit grant**
3. To assist KeTTHA and ST in **promotional activities and technical training**;
4. To **review, process and approve** the conditional energy audit grant application;
5. To **monitor energy audit works** at applicant's premise;
6. To **review and verify energy audit report** submitted by applicant;

TERM AND REFERENCES

- GreenTech Malaysia Roles and Responsibilities
 7. To **process and disburse grant** according to progress works;
 8. To **provide facilitation and advice** to applicants on the overall project exercise, to ensure the project direction is according to the objective. This includes advisory activities related to energy management.
 9. To **organise energy management trainings**
 10. To **coordinate and monitor** the implementation of the project from time to time
 11. To **monitor and verify** the implementations of the energy saving measures recommended in the energy audit final report.

TERM AND REFERENCES

Industry Role and Responsibilities – Energy Auditing Exercise Phase

1. Fill-up the relevant forms and **submit official application** to GreenTech Malaysia.
2. Nominate the **focal person / person in charge** for the project.
3. Appoint **own Energy Services Companies (ESCO)** that registered with Energy Commission **to conduct the energy auditing exercise**. GreenTech Malaysia and government are not responsible to the selection and appointment of the ESCO. The appointment and service charges payment to the ESCO is under the responsibility of the applicant.
4. Notify GreenTech Malaysia the **actual commissioning date** of energy audit project timeline once application approved.

TERM AND REFERENCES

Industry Role and Responsibilities – Energy Auditing Exercise Phase

5. Ensure the ESCO **execute energy audit exercise according** to the **methodology, quality and reporting format** outlined in the Energy Audit requirements. GreenTech Malaysia has right to reject any energy audit exercise and reports that not according to the requirements. GreenTech Malaysia will not be held responsible to any additional cost arise due to the delay in complying the requirements
6. Provide **weekly progress report, draft and final reports** to GreenTech Malaysia according to the agreed timeline, GreenTech Malaysia will make comments and revert for improvement.
7. Provide **3 final reports hard copy and a soft copy (Ms Office)** to GreenTech Malaysia.

TERM AND REFERENCES

Industry Role and Responsibilities – Energy Auditing Exercise Phase

7. Submit **2 invoices (upfront and final payment)** to GreenTech Malaysia for payment purposes. **Applicant is responsible** to pay the **additional charges such as GST and/or other taxes.**
8. Attend the **energy management training** conducted by GreenTech Malaysia under the project.

TERM AND REFERENCES

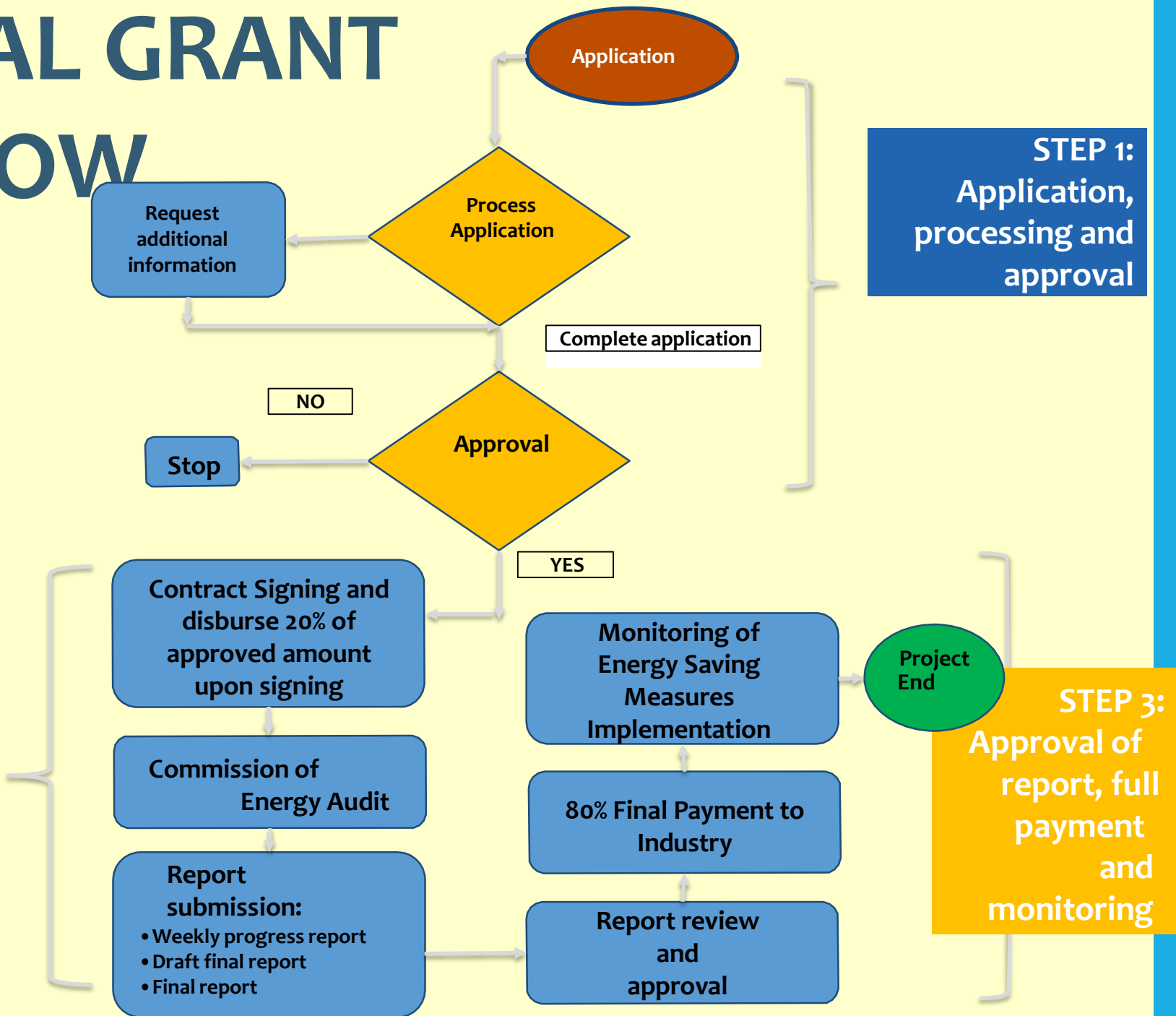
Industry Role and Responsibilities – Implementation of the Energy Saving Measures Phase

1. To comply with **EMEER requirements** issued by Energy Commission.
2. To achieve expected saving by **15% within 3 years**.
3. To Implement the **energy saving measures recommended in the energy audit report** submitted by the ESCO in this project.
4. The **implementation cost could be borne by applicant** or using energy performance contracting (EPC).
5. To communicate with GreenTech Malaysia to ensure the implementation of energy saving measures.
6. To **submit monitoring and evaluation reporting format** to GreenTech Malaysia every 6 months in 3 years.

CONDITIONAL GRANT PROCESS FLOW

- Step 1** • Application & Processing
- Step 2** • Execution
- Step 3** • Reporting

STEP 2:
Signing agreement,
energy audit,
payment according to
progress and
presentation report



CONDITIONAL GRANT APPLICATION FORM

Energy Audit Conditional Grant Checklist



MALYSIAN GREEN TECHNOLOGY CORPORATION

No. Dokumen Permohonan : Industry Name/GL/EACG/2016-000

Tarikh Penerimaan :

Senarai Semak untuk Dana Audit Tenaga Bersyarat di Bawah Projek Kecekapan Tenaga RMK 11

Maklumat Pemohon

Bil	Perkara	Status (Ada - v, Tiada - X) †
1	Surat permohonan yang lengkap dari pemohon	<input type="checkbox"/>
2	<u>Dokumen yang perlu disertakan:</u> a) <u>Maklumat Syarikat – Pemohon (Lampiran A)</u> b) <u>Pendaftaran syarikat (SSM)</u> c) <u>Sijil pemasangan yang di pohon</u> d) <u>Sijil Pengurus Tenaga Berdaftar</u> e) Surat <u>Lantikan Syarikat Perkhidmatan Tenaga</u> f) <u>Senarai Skop Kerja Audit Tenaga</u>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Maklumat Syarikat Perkhidmatan Tenaga

Bil	Perkara	Status (Ada - v, Tiada - X) †
1	<u>Dokumen yang perlu disertakan</u> a) <u>Maklumat Syarikat – ESCO (Lampiran B)</u> b) <u>Pendaftaran syarikat (SSM)</u> c) <u>Pendaftaran ESCO dengan Suruhanjaya Tenaga</u> d) <u>Cadangan Harga kerja Audit Tenaga (Lampiran C)</u> e) <u>Pengalaman syarikat bagi kerja Audit Tenaga dan Senarai pegawai yang terlatih (Lampiran D)</u> f) <u>Pendekatan dan Metodologi Audit Tenaga (Lampiran E)</u>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



Di Semak oleh:

Nama:

Tarikh:

CONDITIONAL GRANT APPLICATION FORM

About Industry. Information Needed from Industry

1. Company information
2. Appointment of Registered Electrical Energy Manager (REEM)
3. Technical Staff related to Energy
4. Annual energy consumption
5. Declaration of information

LAMPIRAN A



MALAYSIAN GREEN TECHNOLOGY CORPORATION

MAKLUMAT SYARIKAT (PEMOHON)

1. Semua maklumat yang diperlukan (kecuali dinyatakan sebaliknya) hendaklah diisi dengan terang, jelas dan tepat sama ada secara bertulis atau ditaip.
2. Penggunaan kertas tambahan adalah dibenarkan sekiranya ruang yang disediakan tidak mencukupi.
3. Syarikat dikehendaki menyertakan salinan fotostat bagi menyokong butiran yang dinyatakan.
4. Lampiran ini hendaklah dikembalikan bersama-sama dengan tawaran.

A. MAKLUMAT SYARIKAT

1.	Nama Syarikat	:	
2.	Alamat Syarikat	:	
3.	No Telefon	:	
4.	No Faks	:	
5.	No Pendaftaran Syarikat	:	
6.	Tarikh Pendaftaran (mula & tamat)	:	

B. PELANTIKAN PENGURUS TENAGA ELEKTRIK YANG BERDAFTAR

CONDITIONAL GRANT APPLICATION FORM

About Energy Service Companies (ESCOs). Information Needed from Industry for ESCOs

1. Company information
2. Services Offered
3. Experiences in Energy Management and Audit
4. Pricing
5. Technical Staff and Competency
6. Methodology and Project Schedule
7. Declaration of information

LAMPIRAN B



MALAYSIAN GREEN TECHNOLOGY CORPORATION

MAKLUMAT SYARIKAT (ESCO)

1. Semua maklumat yang diperlukan (kecuali dinyatakan sebaliknya) hendaklah diisi dengan terang, jelas dan tepat sama ada secara bertulis atau ditaip.
2. Penggunaan kertas tambahan adalah dibenarkan sekiranya ruang yang disediakan tidak mencukupi.
3. Syarikat dikehendaki menyertakan salinan fotostat bagi menyokong butiran yang dinyatakan.
4. Lampiran ini hendaklah dikembalikan bersama-sama dengan tawaran.

A. MAKLUMAT SYARIKAT (ESCO)

1.	Nama Syarikat	:	
2.	Alamat Syarikat	:	
3.	No. Telefon	:	
4.	No. Faks	:	
5.	No. Pendaftaran Syarikat	:	
6.	Tarikh Pendaftaran (mula & tamat)	:	
7.	No. Pendaftaran Suruhanjaya Tenaga	:	
8.	Tarikh Tamat Pendaftaran	:	
9.	Kod Bidang Pendaftaran	:	

CONDITIONAL GRANT APPLICATION FORM

About Energy Service Companies (ESCOs)

LAMPIRAN C


MALAYSIAN GREEN TECHNOLOGY CORPORATION

CADANGAN HARGA
(PERINCIAN SEMUA KOS MESTILAH DINYATAKAN. SILA GUNAKAN KERTAS YANG
BERASINGAN JIKA RUANGAN YANG
DISEDIAKAN TIDAK MENCUKUPI)

JADUAL KOS CADANGAN (KEWANGAN)

NAMA CADANGAN / PROJEK :

NAMA PERUNDING :

A. YURAN PERUNDINGAN

NAMA	JAWATAN	PENGALAMAN (TAHUN)	GAJI (RM)	MAN-MONTHS	JUMLAH
IKHTISAS					
1.					
2.					
JUMLAH YURAN IKHTISAS					

RINGKASAN KOS PERKHIDMATAN PERUNDING DIPOHON (KEWANGAN)

BIL	HURAIAN	JUMLAH KOS (RM)
A	YURAN PERUNDING	
	Ikhtisas	
	Separa ikhtisas	
	YURAN PERUNDINGAN	
	Cukai perkhidmatan 6%	
	JUMLAH YURAN PERUNDINGAN	
B	KOS IMBUHAN BALIK	
	JUMLAH KOS PERKHIDMATAN PERUNDINGAN	

Saya/kami mengaku bahawa saya/kami faham mengenai semua terma dan syarat berkaitan dengan penawaran harga tersebut di atas.

Tanda tangan : _____

Nama : _____

No. Kad Pengenalan/Pasport : _____

Jawatan : _____

Tarikh : _____

Cop Syarikat : _____

CONDITIONAL GRANT APPLICATION FORM

About Energy Service Companies (ESCOs)

LAMPIRAN D



MALYSIAN GREEN TECHNOLOGY CORPORATION

PELANGGAN UTAMA DAN PENGALAMAN TERDAHULU DALAM MENJALANKAN ACARA YANG SEUMPAMA

(SILA GUNAKAN KERTAS YANG BERASINGAN JIKA RUANGAN YANG DISEDIAKAN TIDAK MENCUKUPI)

A. PELANGGAN UTAMA DAN PENGALAMAN TERDAHULU

BIL.	PELANGGAN	SKOP KERJA	TEMPOH KONTRAK
1.			
2.			
3.			
4.			
5.			
6.			

LAMPIRAN D

B. PERKHIDMATAN PERUNDINGAN PERSONEL (SILA LAMPIRKAN RESUME)

BIL.	NAMA	JAWATAN	TANGGUNGJAWAB
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

CONDITIONAL GRANT APPLICATION FORM

About Energy Service Companies

LAMPIRAN E



Green Tech
Malaysia

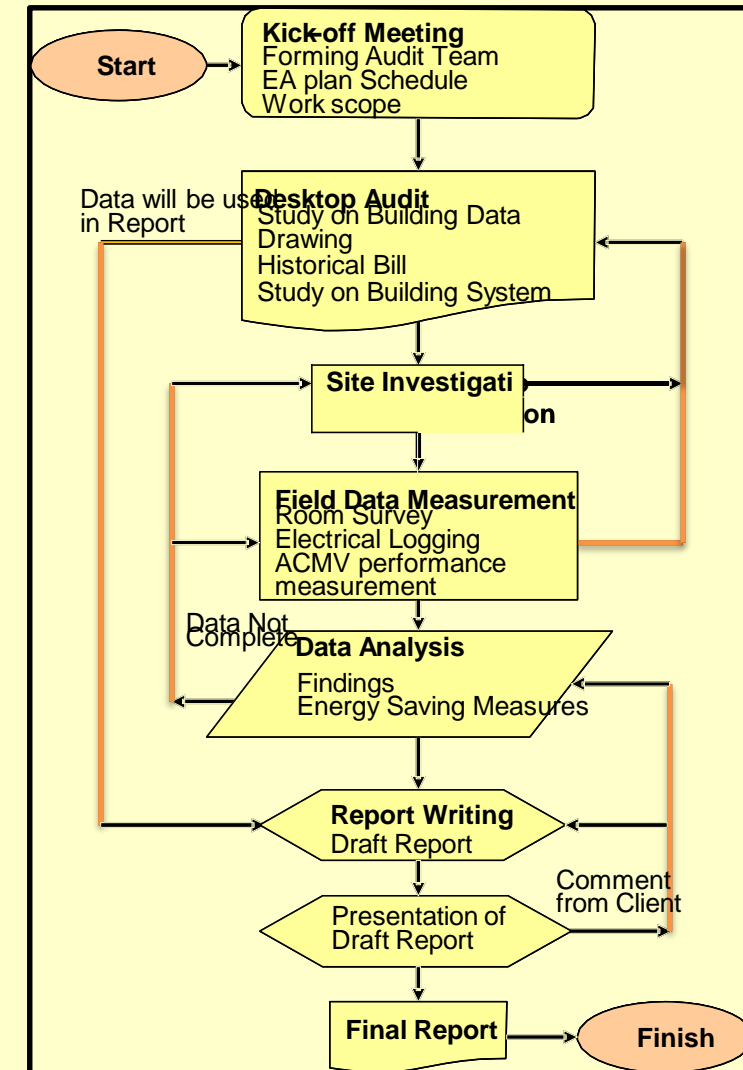
MALYSIAN GREEN TECHNOLOGY CORPORATION

PENDEKATAN DAN METODOLOGI
(SILA JELASKAN SECARA TERPERINCI)

1. Dokumen ini mesti mengandungi maklumat yang diperlukan seperti mana dinyatakan dalam terma rujukan (*Technical Specification*)
2. Nyatakan dengan jelas metodologi dan proses untuk menjalankan tugas (menyediakan aliran proses yang jelas dan terperinci, pendekatan dan metodologi dalam melaksanakan aktiviti)
3. Pelan pelaksanaan yang dikemukakan mesti mengandungi pembangunan kandungan program (developing the content of the programs).

JADUAL PELAKSANAAN (TIMELINE)

KOMPONEN	BULAN							
	MINGGU 1	MINGGU 2	MINGGU 3	MINGGU 4	MINGGU 5	MINGGU 6	MINGGU 7	MINGGU 8



CONDITIONAL GRANT – EA METHODOLOGY

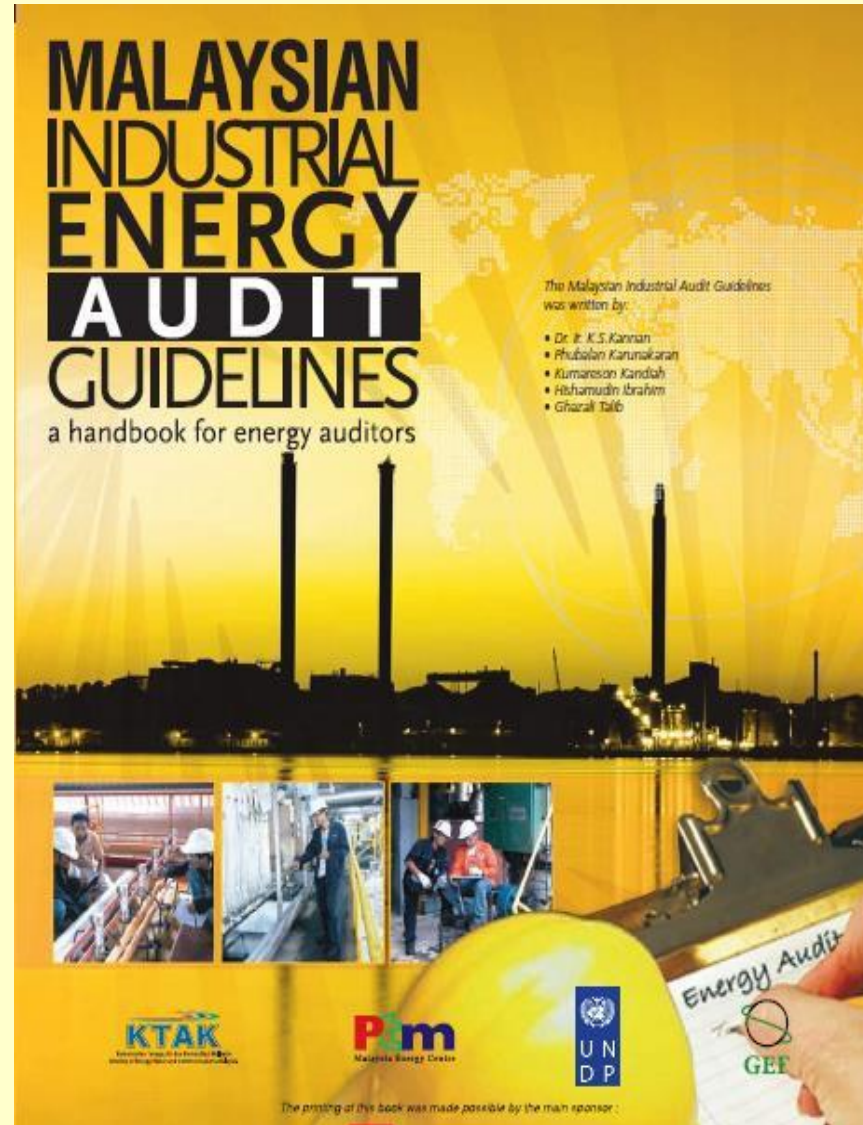
1. Kick-off Meeting
2. Desktop Audit
3. Field Data Measurement
4. Data Analysis
5. Report Writing
6. Presentation Draft Report
7. Submission Final Report
8. Energy Saving Measures (ESM) Implementation
Action Plan



CONDITIONAL GRANT – SCOPE OF WORK

1. Energy Management Practices
2. Electricity Supply and Consumption
3. Compressed Air System
4. Electric Motors as Drives of Machines
5. Fans and Blowers
6. Ventilation
7. Pumps
8. Air Conditioning System
9. Lighting
10. Furnace
11. Steam Generation and Distribution

Complimentary
when your
application
approved



CONDITIONAL GRANT – ENERGY AUDIT EQUIPMENT

1. Portable Power Meter
2. Portable AC Clamp Meter
3. Portable Temperature Meter
4. Portable Pressure Meter
5. Portable Strabo-Tacho Meter
6. Portable Combustion Analyser
7. Portable Air Leak Tester
8. Portable Steam Trap Tester
9. Portable Illuminance Meter
10. Portable Temperature/Humidity Meter
11. Portable Ultrasonic Flow Meter



ENERGY AUDIT CONDITIONAL GRANT REPORTING FORMAT

Chapter 0 : Executive Summary synthesises the findings of the audit and energy saving measures recommended. It includes a priority list of the measures, which have been found to be cost effective and are recommended for implementation. This chapter is mainly addressed to the top management and the decision-makers and is therefore the most important chapter with regard to follow-up and implementation.

The executive summary must be a stand-alone document. It is brief, yet it provides a complete picture of the entire auditing work without making any reference to the main part of the report. It is advisable that this chapter does not contain, or refer to tables or figures from the main report.

In Chapter 1 : Introduction and Scope of Work, the name and address of the audited company is written along with the names of the audit team members. It also contains a list of the metering equipment used during the on-site survey. This chapter is common in all audit reports with minimal changes involving details of the audited companies. The scope of work with regards to which sections of the plant were audited must be given.

Chapter 2 : Operational Review of the Factory contains a brief outline of the companies' profile and products as well as the energy consumption for the base-year. The overall objective of this section is to present the specific energy consumption figures, to compare them with benchmarks and to make a first rough assessment of the energy savings potential as a whole. Energy profiles and breakdown are also included.

Chapter 0 : Executive Summary

Chapter 1 :
Introduction and Scope
of Work

Chapter 2 :
Operational Review of
the Factory

ENERGY AUDIT CONDITIONAL GRANT REPORTING FORMAT

Chapter 3 : Technological Description of the Processes contains the process flow diagram and a description of the individual stages of the process. The overall objective is description of the process and identification of inefficient energy usage. This is done by evaluating observations during the on-site inspection, discussions with the operating staff, analysing data obtained by records of the companies and sub-metering.

In **Chapter 4**, the energy supply and demand structures of all the energy-related facilities of the factory are investigated and evaluated with regard to the inefficient practices as outlined above.

Chapter 5 : Technical-financial Framework and Constraints is also common in all the audit reports. Tables are presented with the main technical parameters and pricing for energy and fuels and utilities and a brief description of the evaluation scheme for energy saving measures. The prices must of course be adjusted for each individual audited company.

Chapter 6 : Energy Saving Measures contains a technical description and evaluation of the savings for each of the identified energy saving opportunities. The calculations for the evaluation of the measures are conducted in excel sheets, which contain all the necessary base data and parameters that are necessary for the calculation.

← Chapter 3 :
Technological
Description of the
Process

← Chapter 4 : Energy
Supply and Demand

← Chapter 5 : Technical-
Financial Framework and
Constraints (Findings)

← Chapter 6 : Energy
Saving Measures (ESMs)

IMPLEMENTATION MONITORING REPORTING FORMAT

List of ESM Activities/Project Proposed in Energy Audit Report

No	ESM Activities/Projects	Brief description	Investment cost (RM)	Status (Completed/ Rejected/In progress)	Remark/Comment(s)

IMPLEMENTATION MONITORING REPORTING FORMAT

Summary of ESM activities/Project Savings

No	ESM Activities/ Projects	Brief description	Baseline Consumption	Current Consumption	Investment Cost	Saving			Return Of investment	Duration of measurement	Remark/ Comment (s)
			kWh	kWh	RM	kWh	RM	%	year	day/week/ month	
						Estimate:	Estimate:	Estimate:	Estimate:		
						Actual:	Actual:	Actual:	Actual:		
						Estimate:	Estimate:	Estimate:	Estimate:		
						Actual:	Actual:	Actual:	Actual:		
						Estimate:	Estimate:	Estimate:	Estimate:		
						Actual:	Actual:	Actual:	Actual:		



THANK YOU....
TERIMA KASIH....

CONTACT PERSON

Any enquiries regarding Energy Audit and Management
Conditional Grant, please contact

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Fax: 03-8921 0801

muhtazam@greentechmalaysia.my