Meeting Energy Management System Standard & Regulation

Enhancing Energy Efficiency in Malaysia Through Legislation and Policies

Bengkel Memperkukuhkan Mekanisma Institusi Industri Hijau Melalui Pendekatan Dan Pembelajaran di Premis Demonstrasi Amalan Industri Hijau Bagi Sektor Pengilangan Beras Tahun 2016

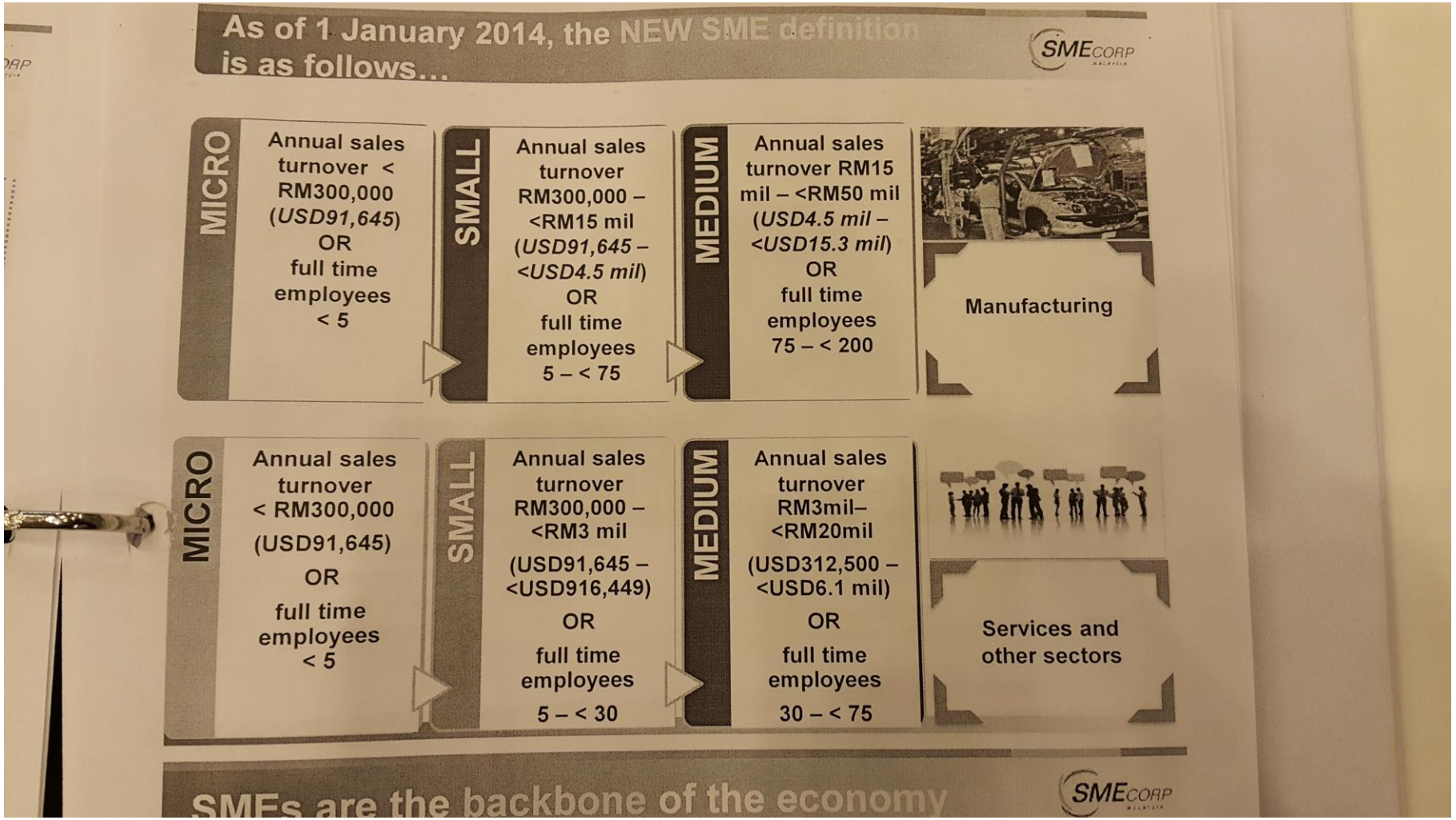
Hotel, TH Alor Setar
16 Nov 2016

Prepared by / for

Ir. Kasim Ahmad REEM, CEA, ESCO

SIRIM

Definition SMEs



Energy Management

Definition

- The judicious and effective use of energy to optimize operating costs and enhance competitive position

Energy Management

Benefits

- Financial
  - Minimizing energy costs
  - Business competitiveness
  - Enhances asset life of equipments

- Environmental
  - Reduces Green House Gas emission
  - Reduces Pollution
  - Helps conserve natural resources

Energy Management

Key factor for the effectiveness of energy management:

COMMITMENT FROM THE TOP MANAGEMENT

ives

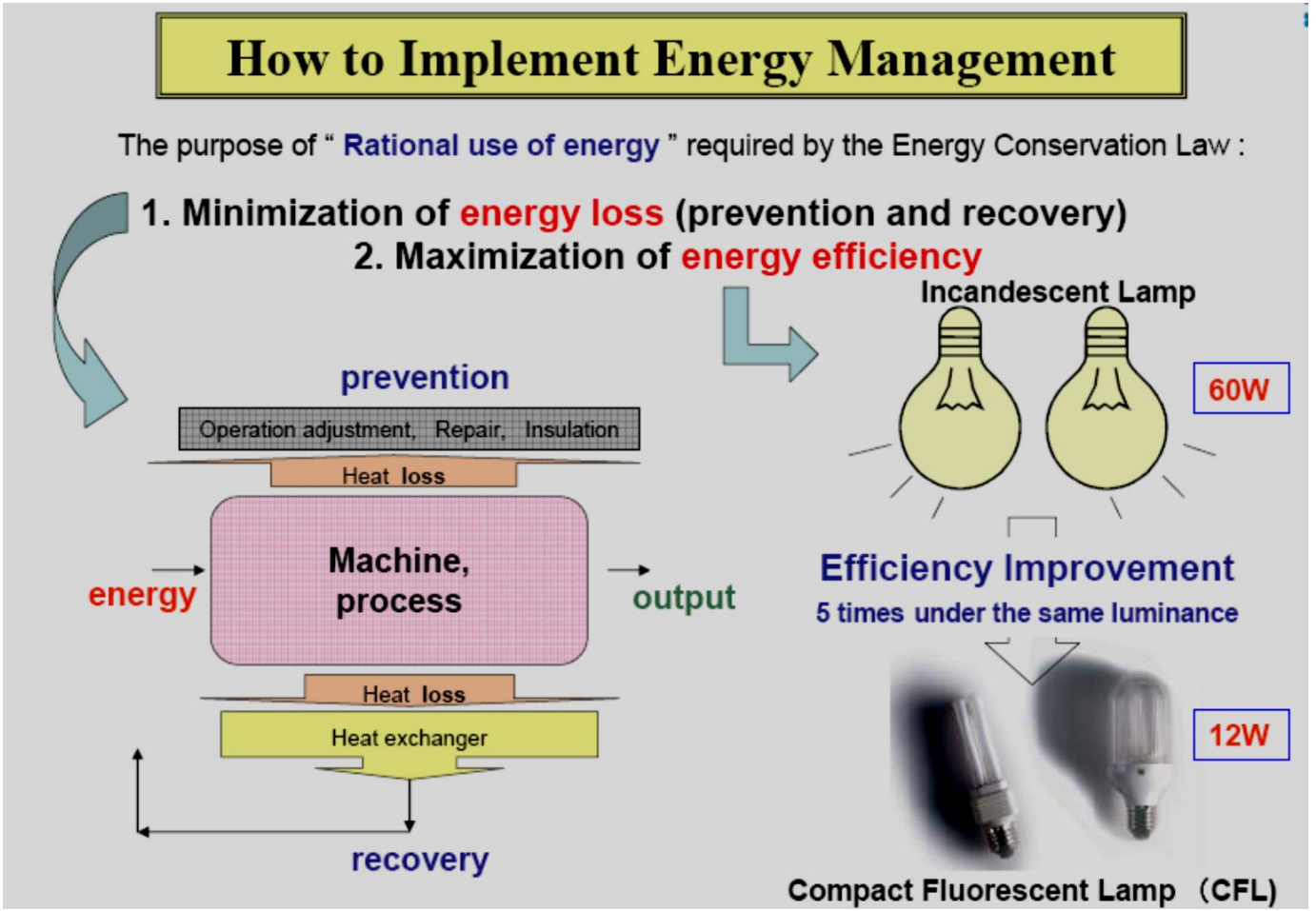
Energy Efficiency and Energy Conservation

- **Energy efficiency** involves the use of technology that requires less energy to perform the same function

- **Energy conservation** is any behavior that results in the use of less energy

Two ways to consume less energy…

1. Have and do less = conservation
2. Improve performance = efficiency



Energy Management Standard

- Energy Management System EnMS ISO 50001: 2011

- Energy efficiency and use of renewable energy for non-residential buildings – Code of practice (Second revision) – MS 1525: 2014

Energy Efficiency in Buildings

MS1525: Energy Efficiency and use of renewable in non residential building- Code of practice

- to be incorporated in UBBL 84

(2012 Amendment on Energy Efficiency)

Brief History

- Building guidelines 1989
- MS 1525 : 2000
- MS 1525 : 2007 (1st Revision)
- MS 1525 : 2014 (2nd Revision)

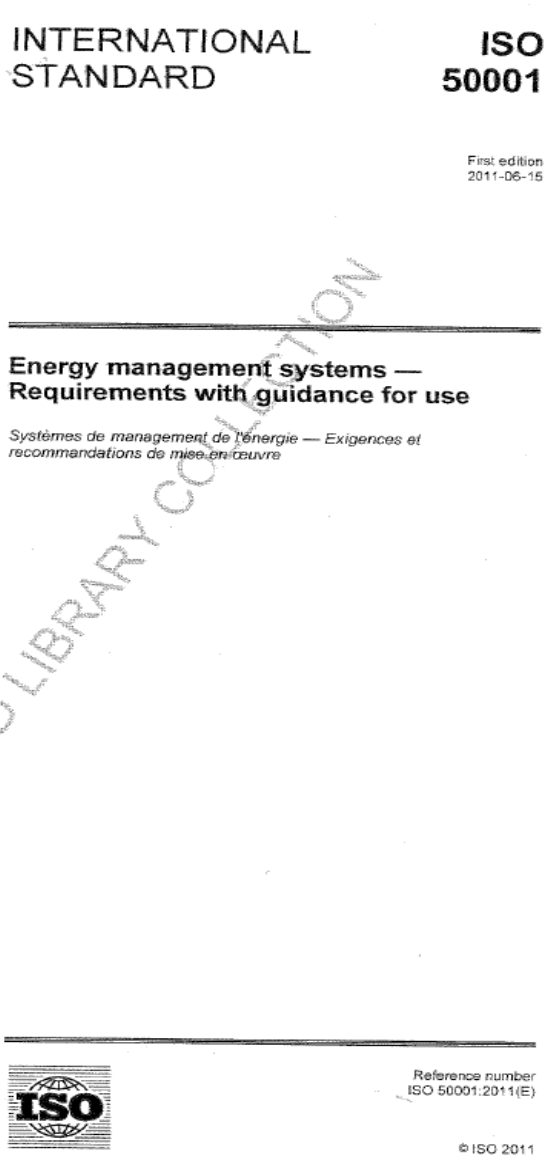
To purchase : Http:// www. msonline.gov.my

or through SIRIM's Library

Energy Management Regulations

- Electricity Supply Act 1990 (Electricity Regulation (Amendment 2013))
- Efficient Management of Electrical Energy Regulation 2008 (EMEER 2008)

EnMS ISO 50001



INTERNATIONAL STANDARD

ISO 50001

First edition
2011-06-15

Energy management systems — Requirements with guidance for use

Systèmes de management de l'énergie — Exigences et recommandations de mise en œuvre

ISO

Reference number
ISO 50001:2011(E)

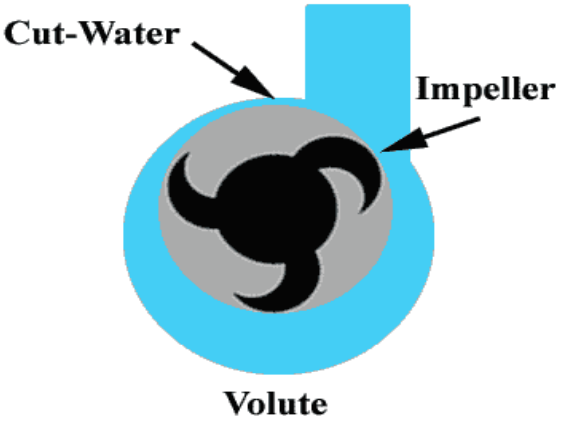
ISO 50001:2011

What is ISO 50001?

Energy Management System Standard

ISO 50001 is a newly developed international standard for an energy management system (EnMS). It's provides a framework for establishing energy management best practice to help organizations to improve their energy efficiency in a logical, controlled and systematic way.

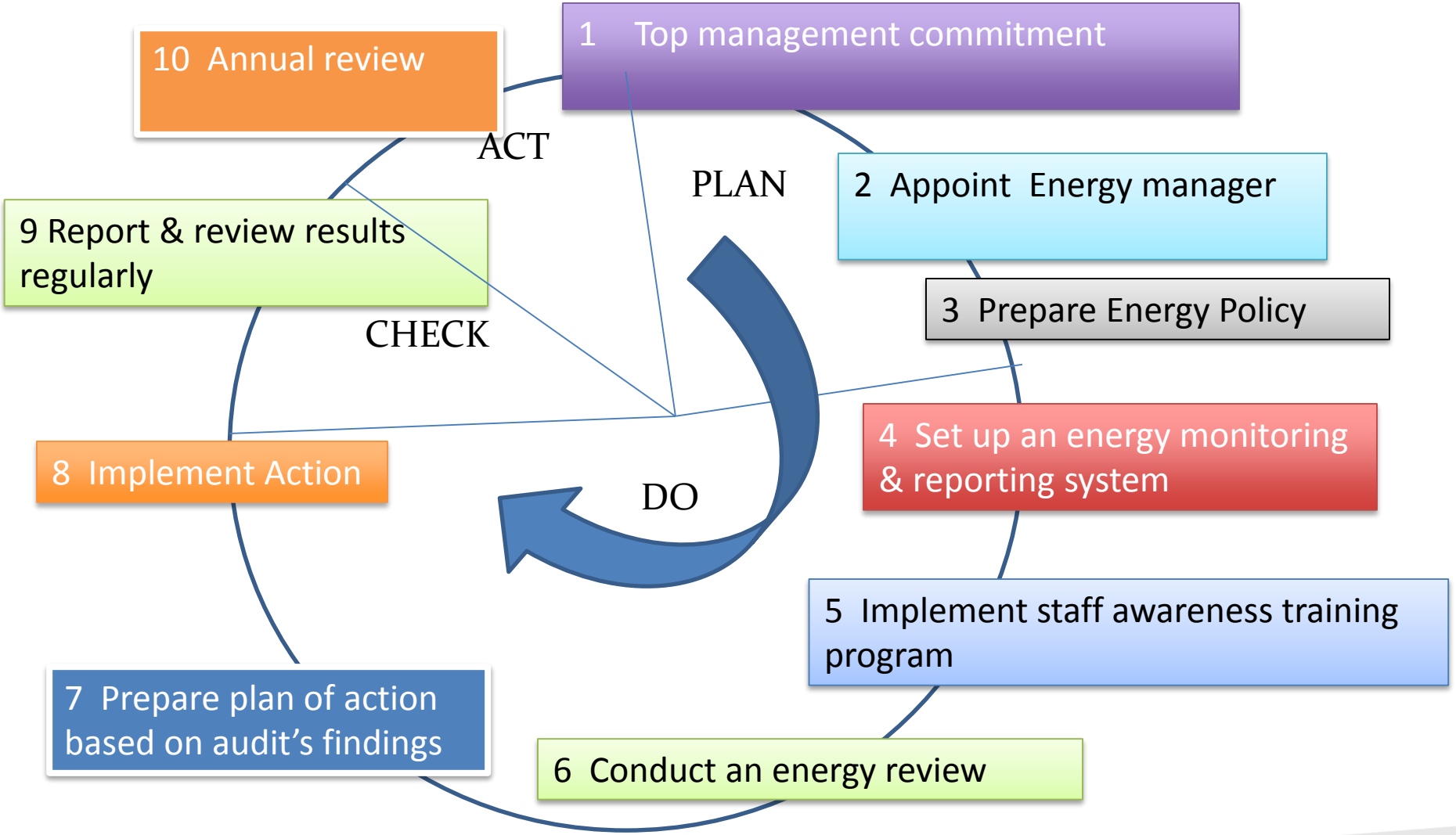
If appropriate can integrate an energy management system (EnMS) with their existing management system(s).



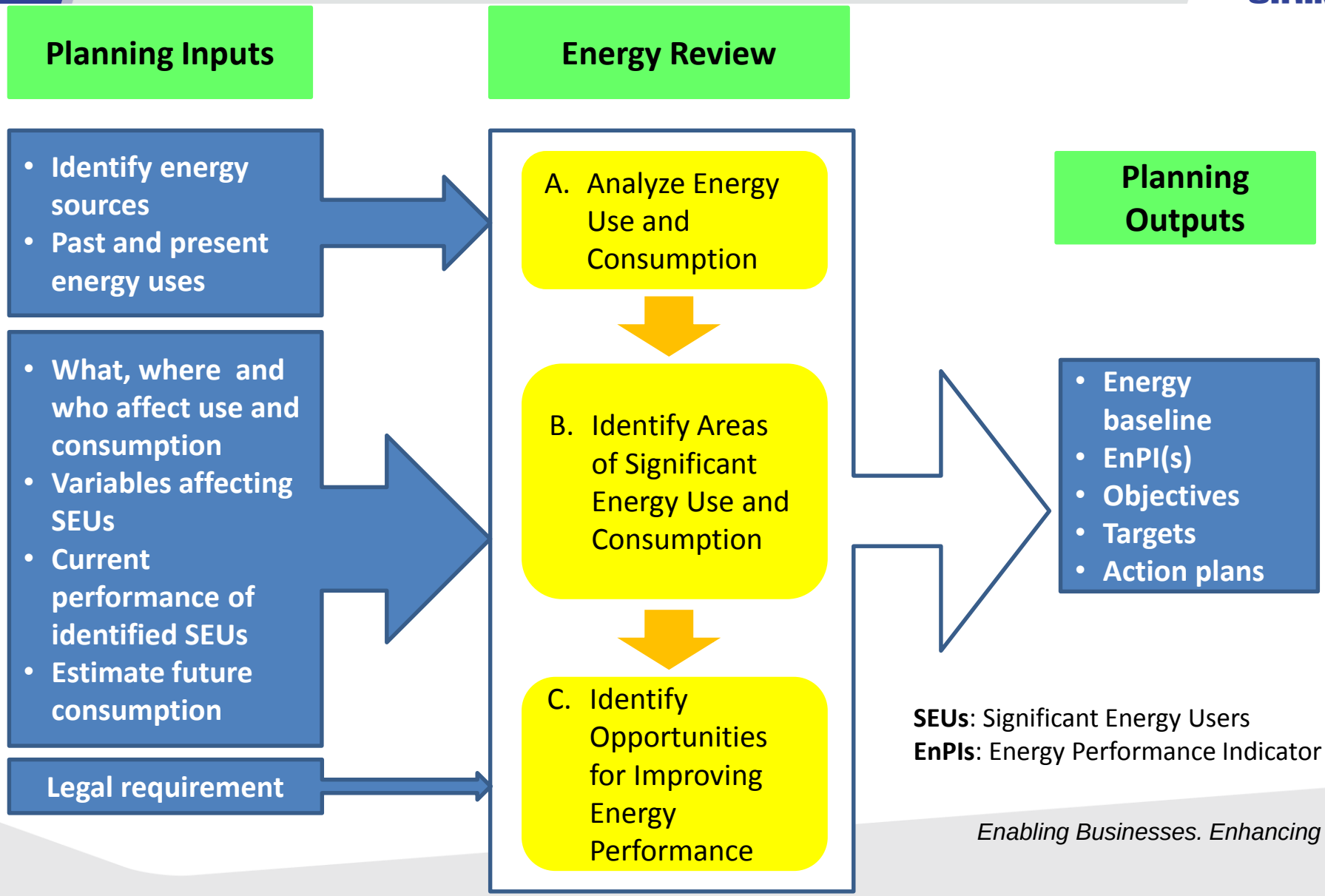
What are the benefits to implements Energy Management System as per ISO 50001?

- Energy cost saving
- Reduced greenhouse-gas emissions and carbon footprint
- Increased energy awareness among staff
- Greater knowledge of equipment efficiency
- Informed decision making processes from system design through to operation
- Structured approach to the Right First Time methodologies
- Improve corporate image and credibility among stake holder, regulators, customers, prospective clients and the public
- Improved operational efficiencies
- Improved maintenance practices

Energy Management System Strategic Plan



Basic Concept of Energy Planning Process



SEUs: Significant Energy Users
EnPIs: Energy Performance Indicator

Three phases of energy management

Planning

Implementing

Monitoring and Evaluation

Legal and other requirements

Energy Review

Energy Performance Metrics

Objectives, Targets & Action Plans

Energy System Components

- Heating, Ventilation and Air Conditioning (HVAC)
- Lighting
- Electrical Devices
- Office Equipment

SIGNIFICANT ENERGY USED (SEUs)

- Heating, Ventilation and Air Conditioning (HVAC)
- Furnace (Industrial)

Bil Elektrik Dan Invois Cukai

TENAGA NASIONAL
Better. Brighter.

SIRIM

[redacted]

Jumlah Perlu Bayar : RM 75,141.20

Tunggakan	:RM	28,318.28	Bayar Segera	
Caj Semasa	:RM	46,822.93	Bayar Sebelum	31.03.2016
Penggenapan	:RM	0.01-		
Jumlah Bil	:RM	75,141.20		

Bil dan Pembayaran Terdahulu

Bil Terdahulu (01.02.2016)	RM	47,930.90	Bayaran Terakhir (29.02.2016)	RM	19,612.62

Caj Semasa

Keterangan		Tidak Kena GST	Kena GST	Jumlah
Kegunaan kWh	kWh	0.00	94,240.00	94,240.00
Kehendak Maksima	kW	0.00	430.00	430.00
Kegunaan kWh	RM	0.00	27,112.16	27,112.16
Kehendak Maksima	RM	-	15,910.00	15,910.00
ICPT (RM 0.0152-)	RM	-	1,432.45-	1,432.45-
Surcaj Angkadar Kuasa (0.82)	RM	1,871.54	-	1,871.54
Kegunaan Bulan Semasa	**RM**	**1,871.54**	**41,589.71**	**43,461.25**
6% GST (6% x RM 41,589.71)	RM			2,495.38
KWTBB (1.6%)	RM			688.35
Surcaj Lewat Bayar	RM			177.95

No. Akaun : 02440017606303
Deposit : RM 20,000.00
No. Kontrak : 00008938
Kod Tarif : E2:037-Industri

Tarikh Bil :
01.03.2016
Tempoh Bil :
01.02.2016 - 01.03.2016 (29 hari)
No. Invois Cukai :
06311734

TNBCareline
1 300 88 5454 (pertanyaan bil & akaun)
15454 (gangguan bekalan)
tnbcareline@tnb.com.my
www.tnb.com.my
www.facebook.com/tnbcareline

Untuk maklumat bil dan bayaran terdahulu, sila layari
https://e-services.tnb.com.my/eservices

Untuk pertanyaan, sila hubungi :
TNB Guar Chempedak
2, 3 & 4 MKM SALA BESAR DAERAH YAN
08800 GUAR CHEMPEDAK KEDAH
Tel: 04-4686020
Faks: 04-4687400

Subsidi Bahan Api oleh
Kerajaan Persekutuan
RM 7,520.35
(untuk makluman sahaja)

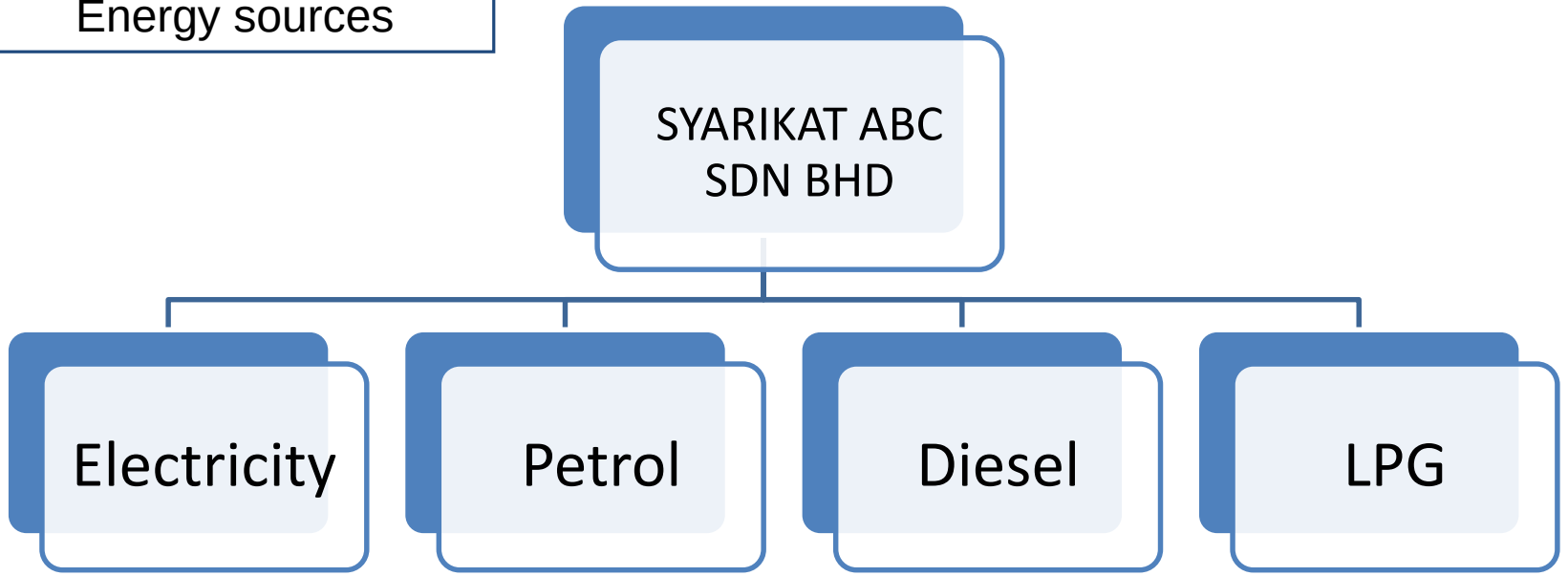
GST bagi penggunaan domestik
300kWh dan ke bawah berkadar sifar

KWTBB - Kumpulan Wang Tenaga

hancing Lives

Identify All Energy Sources

Utilize flow charts
Energy sources



What is Energy Audit / Review?

- A study of energy use and ways to reduce energy consumption
- Snapshot of energy / mass balance in energy use system
- Identify and analyse the energy use and consumption through current use and management pratices;
- Identify the significant energy use of its process or activities or facilities and variables affecting the use and consumption;
- Estimate the future energy use and consumption;
- Identify and propose energy conservation or energy efficiency opportunities in reducing energy use and consumption;and
- ***Client preparation – requirement for Energy Management System ISO 50001 certification.***

Category of Energy Audit

Level 1 - Preliminary

•Duration: 2 – 3 weeks

•Approach:

– Review of drawings

– O&M manuals

– commissioning reports

– equipment test reports

– 3 years of electric and water bills,

– CMMS system reports

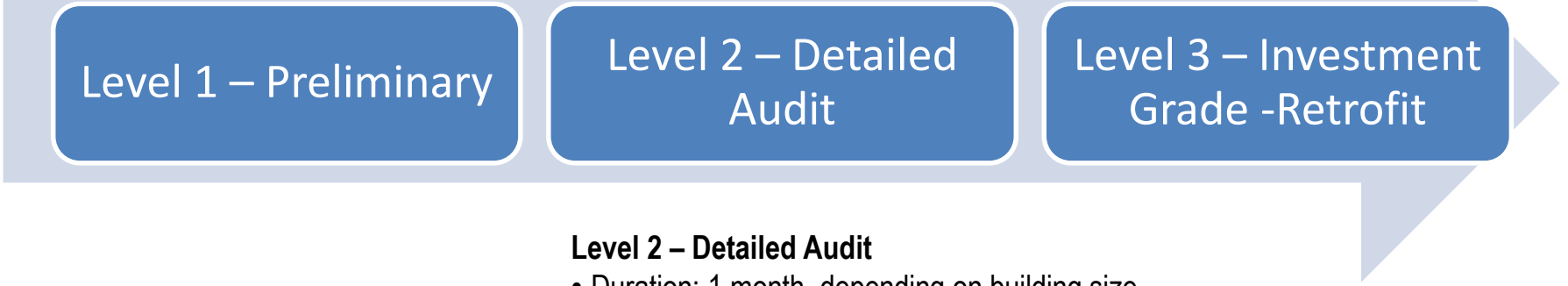
– BMS trend reports.

•Meeting with Facility Manager

•Site inspection of major systems and components

Level 3 – Investment Grade - Retrofit

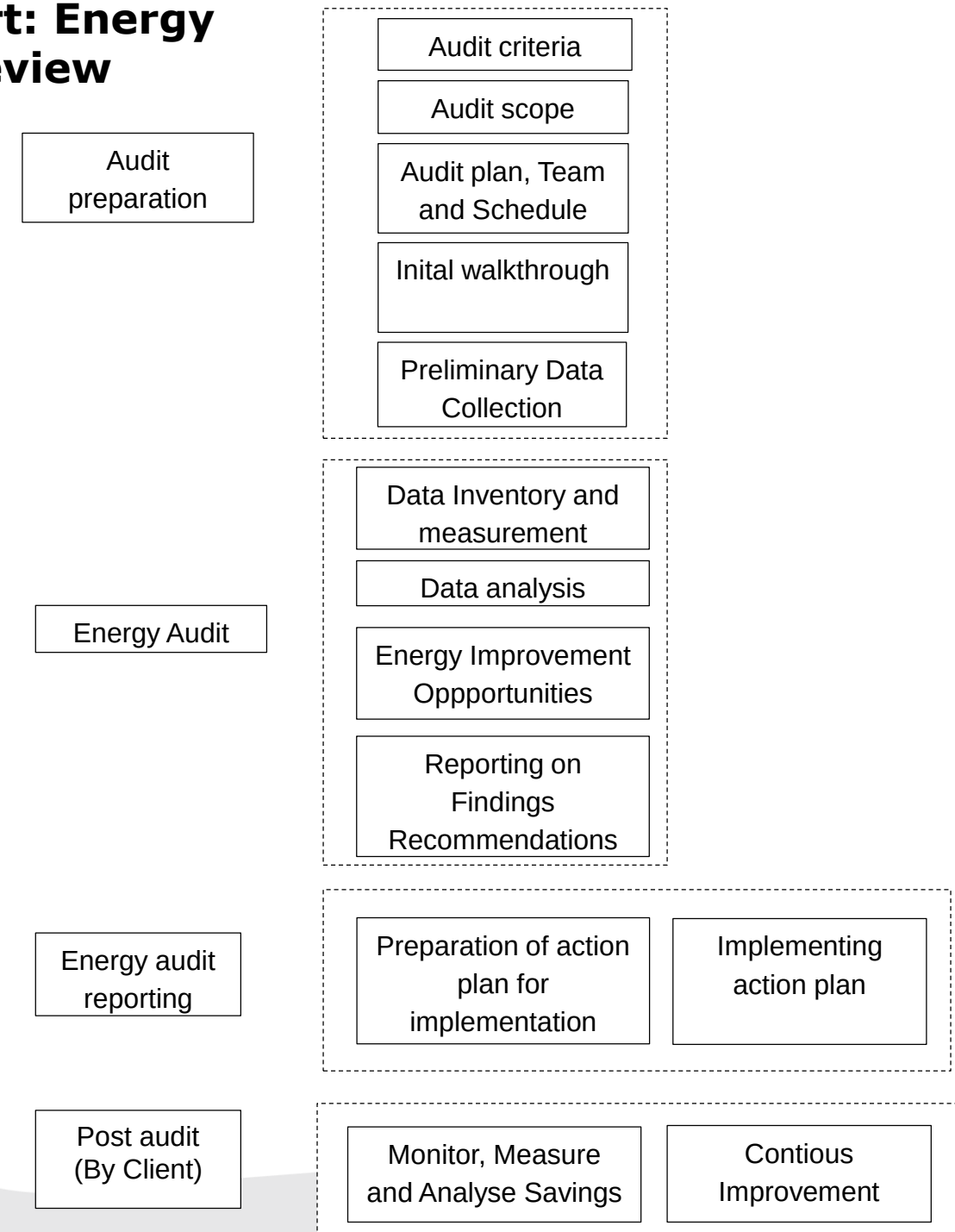
- Technical part - Concept design, Guarantee of saving and Payback Period
- Financial part - financing scheme, contractual framework and tendering documents



Level 2 – Detailed Audit

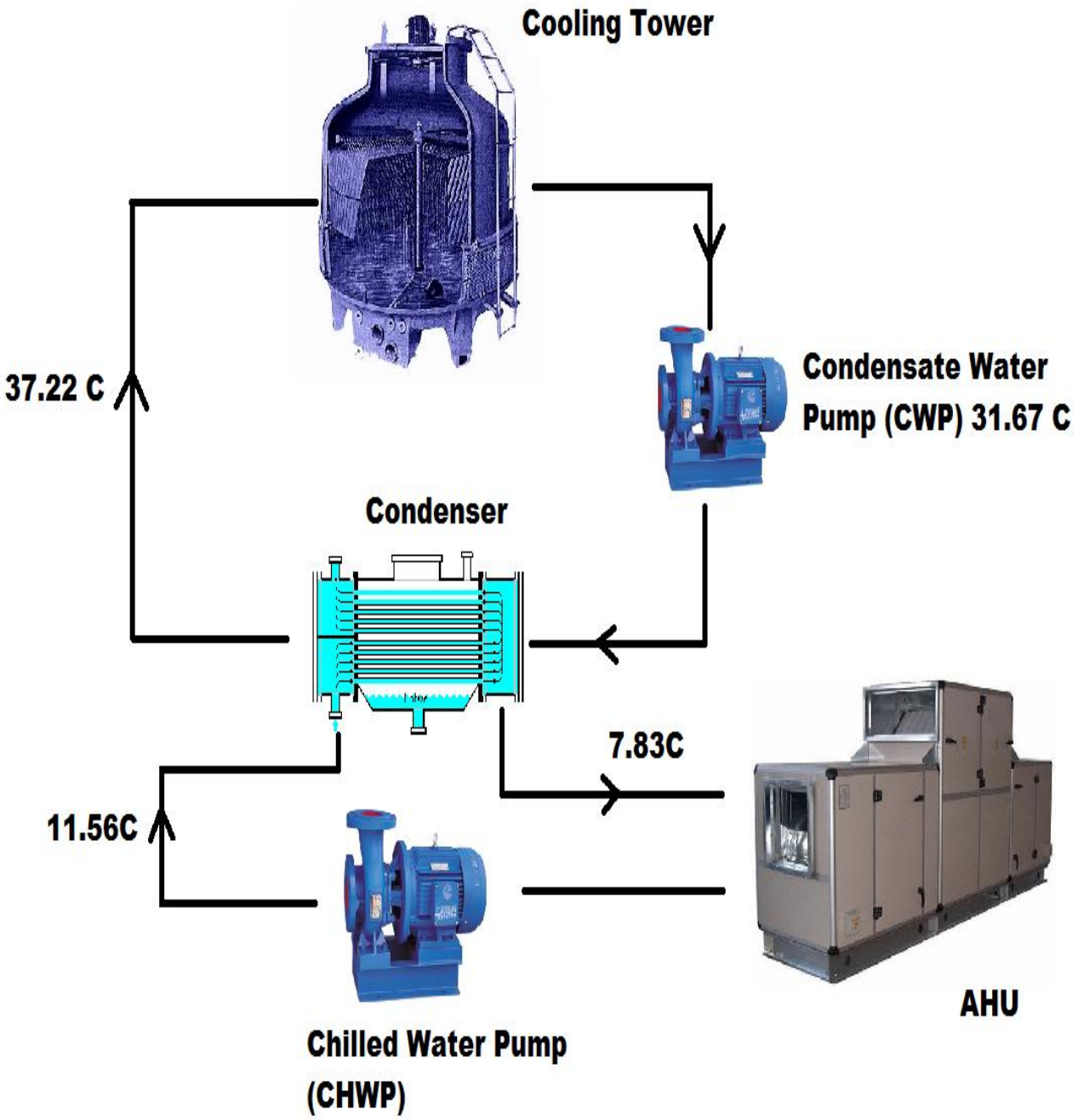
- Duration: 1 month, depending on building size
- Use of measuring equipment to collect energy and usage information at 1 minute interval
- Data analysis input from the clients
- Identify significant energy used (SEUs)
- Detailed energy and cost analysis
- Output: Capital Intensive energy saving opportunities

Flowchart: Energy Audit/Review Process



SIRIM

Enabling Businesses. Enhancing Lives



MS1525: 2014 Code of Practice on Energy Efficiency and Use Renewable Energy for Non Residential Building (2nd Revision)

Table 24. ACMV system components, electrically driven[1] for water chillers: Standard rating conditions - cooling[2]

Conditions		Water Chilling Package
Leaving chilled water temperature °C (°F)		6.67 (44)
Entering chilled water temperature °C (°F)		12.22 (54)
Leaving condenser water temperature °C (°F)		36.11 (97)
Entering condenser water temperature °C (°F)		30.55 (87)
Fouling factor, water[c]		
Condenser	m^2 K/kW	0.044
Evaporator	m^2 K/kW	0.018
Condenser, ambient Temperature		
Air-cooled	°C	35.0 DB
Evaporatively-cooled	°C	24.0 WB

NOTES:

1. Data in this Table apply to the following types of ACMV System Components: Centrifugal or Rotary or Reciprocating water-chilling packages complying to MS 2449.
2. Air-cooled unit ratings shall be rated at sea level at Barometric Pressure of 101.3 kPa.

ENERGY EFFICIENCY RATING (EER) - ACSU

Measure of the relative (and not overall) efficiency of the a cooling or heating appliance or equipment, expressed as the ratio of output, (BTU) per hour to the energy consumed (in Watts).

EER = Btu/kWe

COEFFICIENT OF PERFORMANCE (COP) - CHILLER

Ratio of work or useful output to the amount of work or energy input, used generally as a measure of the energy efficiency of air conditioning in, space heaters another cooling and heating devices.

COP equals heat delivered (output) in BTU per hour divided by heat equivalent of the electric input (1 Watt = 3.413 Btu/hr.) or alternatively, energy efficiency ratio divided by 3.413. Higher the COP, higher the efficiency of the equipment.

COP = kWRT / kWe

Energy Efficiency Ratio = kWe / RT

SITE AUDIT & MEASUREMENT

Chiller: 320RT x 2 unit

Cooling Tower: 2 unit

Energy Audit Equipment

Power Analyzer

Portable Thermo hygrometer

CO2 Meter

Portable Lux Meter

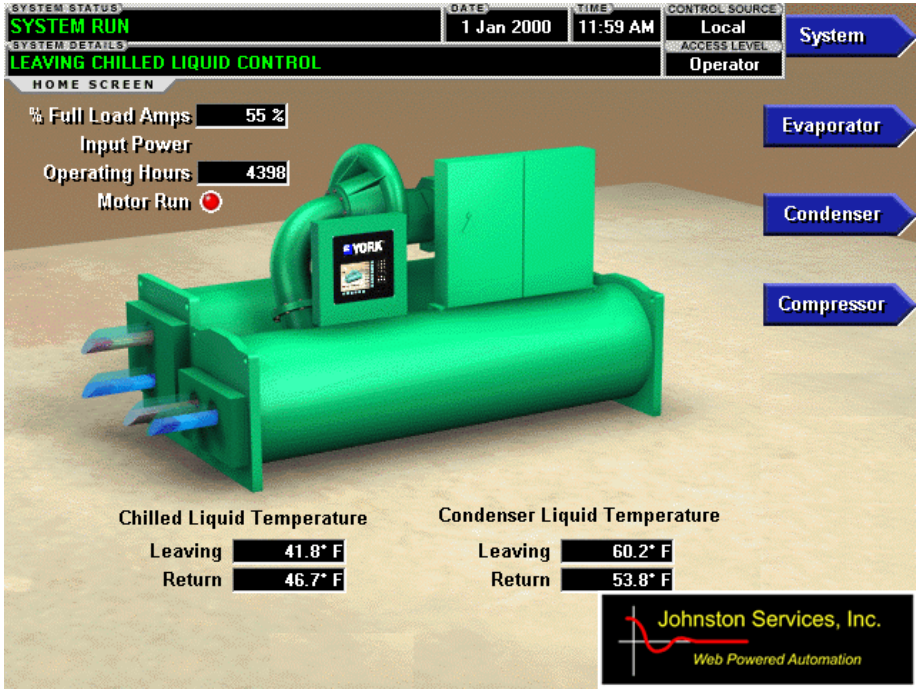
Hand held power analyzer

Anemometer

ives

SITE MEASUREMENT

CHILLER



CHILLER PERFORMANCE

SIRIM

MS1525: Code of Practice on Energy Efficiency and Used of Renewable Energy for Non-Residential Building

e.g. 320RT Water Cooled Centrifugal Chiller

		Measured Data	MS1525
Water Cooled Centrifugal Chiller ≥ 1060kWRT (300 - 600RT)	**COP = kWRT / kWe**	**5.740**	**5.86**
	EER = kWe / RT	**0.613**	**0.60**

Chiller design: 320RT
Measured input power: 196kWe

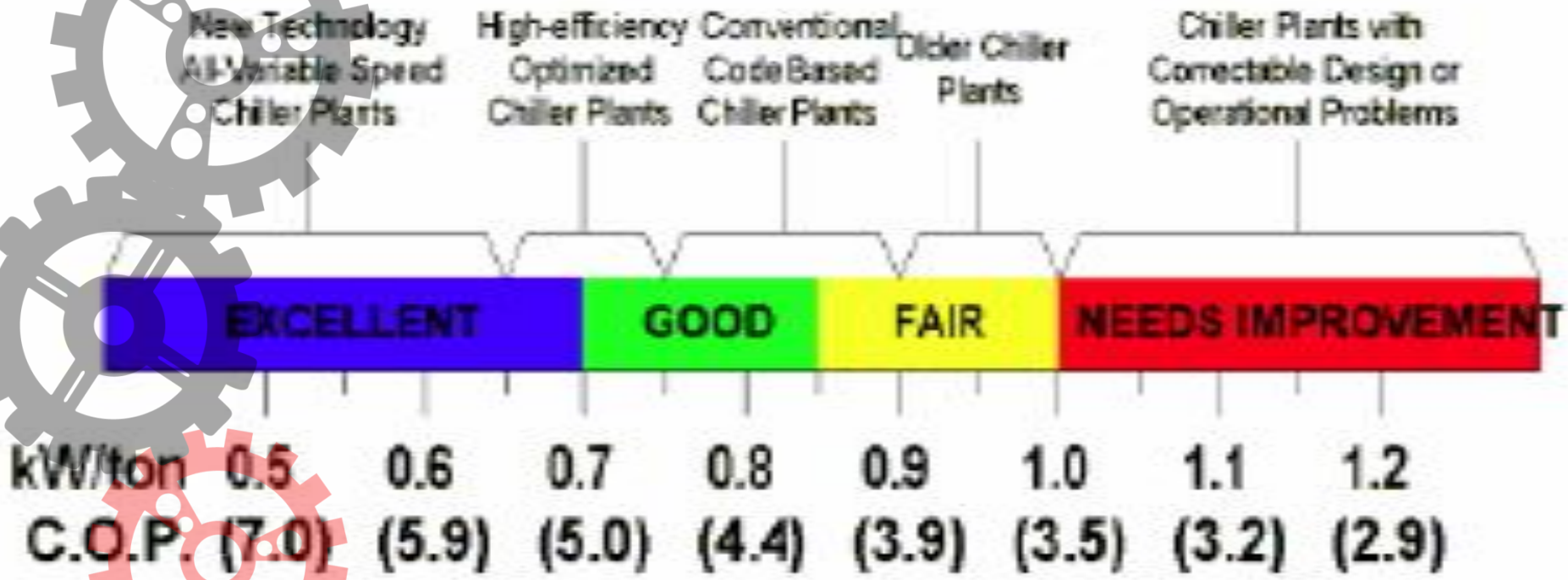
EER = kWe/RT = 196/320 = 0.613
COP = kWRT/kWe = (320X3.516)/196 = 5.740

1RT = 3.516kW(KJ/s)

The energy consumed by the external water pumps circulating chilled water, and the heat rejecting device (cooling tower or heat exchanger) are not included in the COP consideration for the ACMV system component, unless the device (i.e. air-cooled condenser) is integrally incorporated into the package by the manufacturer.

Table 25. Water chilling packages, electrically driven: Chiller energy performance rating

Equipment	Size	[1]COP at 100 % Load At M'sian test Conditions		[a]MPLV at MS Std Conditions		[2]COP at 100 % Load at Std AHRI test Conditions		[b]IPLV at AHRI Std Conditions	
		Minimum COP	Maximum kWe/RT	Minimum COP	Maximum kWe/RT	Minimum COP	Maximum kWe/RT	Minimum COP	Maximum kWe/RT
Air cooled, with condenser	< 105 kWr (30 RT)	2.79	1.26	3.20	1.10	2.79	1.26	3.66	[illegible]
	≥ 105 kWr and < 530 kWr (150 RT)	2.79	1.26	3.20	1.10	2.79	1.26	3.66	[illegible]
	≥ 530 kWr and < 1060 kWr (300 RT)	2.79	1.26	3.35	1.05	2.79	1.26	3.74	0.94
	≥ 1060 kWr (300 RT)	2.79	1.26	3.35	1.05	2.79	1.26	3.74	0.94
Water cooled, positive Displacement (Reciprocating, scroll, Rotary screw)	(< 260 kWr) (< 75 RT)	4.34	0.81	4.14	0.85	4.51	0.78	5.58	0.63
	> 260 < 530 kWr (150 RT)	4.34	0.81	4.14	0.85	4.51	0.78	5.67	0.62
	≥ 530 kWr and < 1060 kWr (300 RT)	4.95	0.71	4.45	0.79	5.17	0.68	6.06	0.58
	≥ 1060 kWr (300 RT)	5.41	0.65	4.82	0.73	5.67	0.62	6.51	0.54
Water cooled, Centrifugal	< 1060 kWr (300 RT)	5.33	0.66	5.02	0.70	5.58	0.63	5.86	0.60
	≥ 1060 kWr (300 to 600 RT)	5.86	0.60	5.41	0.65	6.06	0.58	6.39	0.55
	> 600 RT	5.96	0.59	5.58	0.63	6.17	0.57	6.51	0.54



AVERAGE ANNUAL CHILLER PLANT EFFICIENCY IN KW/TON (C.O.P.)
(Input energy includes chillers, condenser pumps and tower fans)

Based on electrically driven centrifugal chiller plants in comfort conditioning applications with 42F (5.6C) nominal chilled water supply temperature and open cooling towers sized for 85F (29.4C) maximum entering condenser water temperature. Local Climate adjustment for North American climates is +/- 0.05 kW/ton

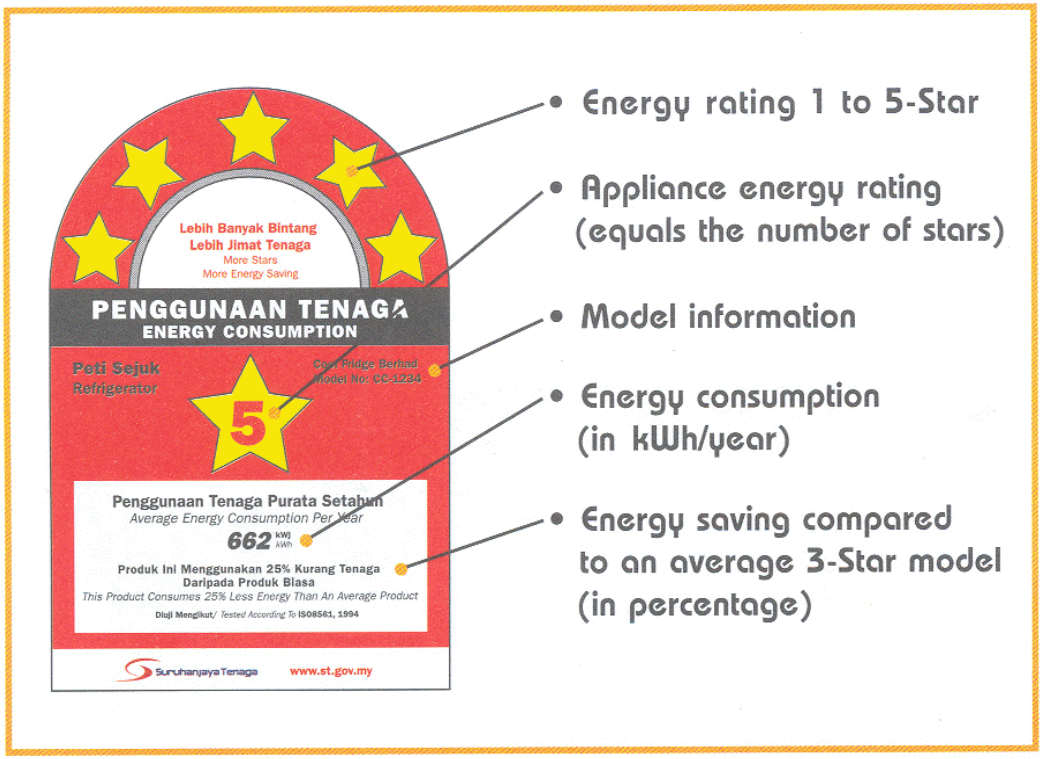
Testimonial – ISO 50001

1. SIME DARBY PROPERTIES
   i. KLGCC
   ii. Wisma Sime Darby
   iii. Sime Darby Convention Center
4. YTL PERAK HANJUNG CEMENT
5. YTL PAHANG CEMENT
6. YTL SLAG CEMENT JOHOR
7. YTL SLAG CEMENT WESTPORT
8. SEMASA SERVICE SDN BHD (MRCB) – KL Sentral
9. INDAH WATER CONSURTIOM (IWK)
10. MPSP (Majlis Perbandaran Seberang Perai)
11. HEAVEABOARD
12. COFRETH (M) SDN BHD
13. IOI Oleo chemical Pasir Gudang

On GOING…??

FUTURE??
YOU…

Energy Labelling for refrigerators
Minimum Energy Performance Standard (MEPS)



Energy Rating Label

Endorsement Label

The more stars the more energy efficient the product is. A 5-Star indicate that it is the most energy efficient model. Information on energy consumption is also indicated MS ISO 8561:2000

Minimum Energy Performance Standards (MEPS) Standards & Labelling

MS ISO 5151:2004

IEC 62087

MS IEC 62301:2006

MS 1220:2001

MS IEC 60969:

- Implementation and Enforcement of Minimum Energy Performance Standards (MEPS) for 5 Domestic Electrical Products (Air Conditioner, Refrigerator, Television, Domestic Fan and Lamps).
- The amendments of the Electricity Supply Regulations has been completed and has been gazetted on the 3rd Mei 2013.
- The above 5 appliances must adhere to the standards and criteria of MEPS and must be affixed with appropriate label.

Energy Saving Opportunities

Switch off power supply (13A) after office hour / out of office
SIRIM HQ: No. of PC / Notebook – more than 2000 units

Estimate 60% out of no. of PC are not switch power supply (13A) after hour.

P = Voltan x Amp x power factor (single phase)
= (240 x 0.134A x 0.85)/1000
= 0.0274kW
= 0.0274kW x RM0.312 / kWh TNB's Tariff x 15hrs (6pm – 8am) x 600 unit computer (did not switch off power supply 13A)
= RM76.76 / day x 25 days / month
= RM1,918 / month
= RM23,027 / year

NO INITIAL COST / NO INVESTMENT… just attitude!!!

Energy Efficient Office Equipment

PC with CRT monitor
Power Consumption:
~120 - 180 W

PC with LCD monitor
Power Consumption:
~70 - 90 W

Notebook / Laptop
Power Consumption:
~15 - 35 W

- Laptop is the least energy consuming in comparison to PC with CRT monitor and PC with LCD monitor.
- 80 % of the PC used in the ZEO Building is laptop.

We want to reduce utility operating cost?

X

RM = RM/kWh X kWh

We want to reduce utility operating cost.

The utility rate is controlled by power service company, which depend on the oil price, coal.

To lower the utility operating cost, we have to lower the kWh since utility rate is non controllable by us.

2014
Increase by 4.99 cent / kWh

14.89%

Legal And Regulatory Framework

Acts of Parliament

1. Energy Commission Act 2001
2. Electricity Supply Act, 1990

Regulations – Power of the Minister to make regulations

3. Electricity Regulations, 1994
4. Licensee Supply Regulations, 1990
5. Electricity Supply (Exemption) Notification 1994
6. Efficient Management Of Electrical Energy Regulations 2008

Licences – Issued by Energy Commission and approved by Minister

7. Licences issued to generators, distributors and suppliers

Licence Conditions

Industry Codes and guidelines – Issued By Energy Commission

9. Grid Code, Distribution Code, Guidelines provide guidance for industry

Agreements – Between Industry Players

10. Power Purchase Agreements
11. Fuel Supply Agreements

Source: Suruhanjaya Tenaga

National Energy Efficiency Action Plan (NEEAP)

OVERVIEW OF NEEAP

NATIONAL ENERGY EFFICIENCY ACTION PLAN (NEEAP) 2016-2025

			
Strategic Thrust 1 : **Implementation of Energy Efficiency Plan**	***Strategic Thrust 2 :*** **Strengthen Institutional Framework, Capacity Development and Training for Implementation of EE Initiatives**	***Strategic Thrust 3 :*** **Establishment of Sustainable Funding Mechanisms To Implement Energy Efficiency Initiatives**	***Strategic Thrust 4 :*** **Promotion of Private Sector Investment in Energy Efficiency Initiatives**

NEEAP KEY INITIATIVES

Equipment Programme Initiative	Industrial Programme Initiative	Buildings Programme Initiative
1. Promotion of 5-Star Rated Appliances	1. Energy Audits and Energy Management in Industries	1. Energy Audits and Energy Management in Buildings
2. Minimum Energy Performance Standards (MEPS	2. Promotion of Co-generation	2. Energy Efficient Building Design

Initiatives under RMK-11 (2016 – 2020)

EE Initiatives Under RMKe-11 (Total Expendture for 2016 is 35,108,400.00

Energy Audit And Energy Management in :

Large Industrial Buildings

Energy Audit
(2016-2018)
2016: RM8,656,600.00

Large Commercial Buildings

Energy Audit
(2016-2018)
2016: RM2,196,000.00

Shared cost of Energy Audit between Government & Private Sectors as an incentive for Private Sectors to pursue retrofit program

Energy Audit, Retrofit And Energy Management in :

Government Buildings

Energy Audit + Retrofit
(2016-2020)
2016: RM24,255,800.00

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.

RMK 11 Energy Audit Conditional Grant Project;

ELEVENTH MALAYSIA PLAN 2016-2020
ANCHORING GROWTH ON PEOPLE

- Embarked under the RMK11 Energy Efficiency Projects (2016 – 2020).
- In general the project component consists of ;
  - Energy Auditing (3 years project starting in 2016 - 2018.)
  - Implementation of the Energy Saving Measures, including Monitoring & Reporting (until 2020).
  - Capacity building & trainings.
- 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.

- Open to any existing commercial and industrial building which are using electrical energy more than 100,000 kWh per month.

1) The energy audit shall be conducted by the Energy Service Company (ESCO) registered with Energy Commission / relevant authorities (for buildings in Sarawak).

2) The energy audit exercise must be completed within 2 months starting from the date of contract signing with SEDA Malaysia.

3) To implement energy saving measures.
   - The cost of implementation is equal or more than the amount of energy audit grant received.

4) 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, for the benefit of the applicant, the No Cost Energy Saving Measures should be implemented immediately***

- The energy saving target is 5% per year in 3 years (15% total refer to baseline)

	Energy Saving Measures Recommended in the Energy Audit Report	Minimum Energy Saving to Achieve	Period of implementation
1	No Cost Energy Saving Measures	Minimum 5% energy saving compared to baseline.	1st year
2	Low Cost and Medium/High Cost Energy Saving Measures	Minimum 5% per year energy saving compared to baseline	2nd and 3rd Year
	Total Energy Saving Measures implemented	Total minimum of 15% compared to baseline	

Energy Efficiency Initiatives In Malaysia

- Energy efficiency promotion in the Seventh Malaysia Plan (1996-2000).
- Malaysian Industrial Efficiency Improvement Programme (MIEEP) (1999).
- Fiscal incentives for EE (2001).
- Development of Malaysian Standard MS 1525 (2001).
- Capacity building in the Energy Commission and related key institutions on energy efficiency and Demand Side Management (2002).
- Energy audit on government buildings (2002).
- EE and RE in education curriculum and university courses (2002).
- Energy efficient building demonstration projects (2004).
- Development of EE guidelines for Malaysian Industries (2006).
- **Efficient Management Of Electrical Energy Regulations (2008).**
- Green Building Index (GBI) (2009).
- **Minimum Energy Performance Standards (MEPS) (2013).**
- **NATIONAL ENERGY EFFICIENCY ACTION PLAN (NEEAP) 2016-2025**
- **Initiatives under RMK-11 (2016 – 2020)**

ELECTRICITY SUPPLY ACT 1990
EFFICIENT MANAGEMENT OF ELECTRICAL ENERGY REGULATIONS 2008

[P.U.(A)444]

ARRANGEMENT OF REGULATIONS

PART I
PRELIMINARY

Regulation

PART II
ELECTRICAL ENERGY MANAGEMENT

PART III
REGISTERED ELECTRICAL ENERGY MANAGER

11. Registered electrical energy manager of installation
12. Qualification requirements
13. Application for registration
14. Issuance of certificate of registration
15. Medical evidence of fitness of applicant
16. Functions and duties of a registered electrical energy manager
17. Validity period of registration and renewal
18. Cancellation of registration of a registered electrical energy manager

PART IV
GENERAL

19. Register
20. Replacement of certificate of registration
21. Certified true copy of certificate of registration
22. General penalty
23. Extension of time
24. Service of notice

FIRST SCHEDULE
SECOND SCHEDULE

Application

3 (1) These Regulations shall apply to –

(a) any installation which receives electrical energy from a licensee or supply authority with a total electrical energy consumption equal to or exceeding 3,000,000 kWh as measured at one metering point or more over any period not exceeding six consecutive months; or

(b) any installation which is used, worked or operated by a private installation licensee with a total net electrical energy generation equal to or exceeding 3,000,000 kWh over any period not exceeding six consecutive months.

Notification by the Commission

6. (1) The Commission may, at any time by written notice, direct any private installation licensee or consumer whose total net electrical energy generation or total electrical energy consumption, as the case may be, equals to or exceeds 3,000,000kWh-

(a) to appoint or designate a registered electrical energy manager to carry out the functions and duties under regulation 16 at the installation;

(b) to submit a written confirmation of such appointment or designation under paragraph (a) to the Commission containing the name and particulars of the registered electrical energy manager as well as the date of expiry of his registration as an electrical energy manager;

(c) to submit information regarding -

(i) the statement of policy for efficient electrical energy management of the installation;

(ii) the objectives of efficient electrical energy management; and

(iii) the accounts and documents pertaining to efficient electrical energy management:

(d) to submit the report in Form A of the Second Schedule that has been duly signed; and

(e) to submit any other information which the Commission may require.

SENARAI PEPASANGAN YANG TERLIBAT DI BAWAH PERATURAN-PERATURAN PENGURUSAN TENAGA ELEKTRIK DENGAN CEKAP 2008 (PPTEC 2008) - PERAK

NO	NAMA PEPASANGAN	BANDAR
1	APL PRODUCTS SDN BHD	AYER TAWAR
2	IDS ELECTRONICS (M) S B	BANDAR SERI ISKANDAR
3	IDAMAN PHARMA MANUFACTURING SDN BHD	BANDAR SERI ISKANDAR
4	SETIA AWAN PROPERTIES SDN BHD	BANDAR SERI ISKANDAR
5	MURATA ELECTRONICS (MALAYSIA)	BATU GAJAH
6	TKN CALCIUM INDUSTRIES (M) SDN BHD	BATU GAJAH
7	JURUTERA DAERAH(LAP) LEMBAGA AIR PERAK (PUKAL)	BOTA
8	CHIP LAM SENG BHD	CHEMOR
9	FINISAR MALAYSIA SDN BHD	CHEMOR
10	HOVID BERHAD	CHEMOR
11	LAFARGE CEMENT (ASSOCIATED PAN MALAYSIA)	CHEMOR
12	F Y FOOD PROCESSING SDN BHD	CHEMOR
13	HEVEA KB SDN BHD	CHEMOR
14	MYDIN MOHAMED HOLDINGS BERHAD	GOPENG
15	CENTRAL ALUMINIUM	HUTAN MELINTANG
16	HUP LEAN AIK FEEDMEAL &	HUTAN MELINTANG
17	SUN MINERALS SDN BHD	IPOH
18	TESCO STORES (M) SDN BHD	IPOH
19	TESCO STORES (MALAYSIA)	IPOH
20	TESCO STORES(MALAYSIA)	IPOH
21	ACME FERRITE PRODUCTS SDN BHD	IPOH
22	TAI KWONG - YOKOHAMA	IPOH
23	LION IPOH PARADE SDN BHD	IPOH
24	MASIF LATEX PRODUCTS SDN BHD	IPOH
25	U.A.C. BERHAD	IPOH
26	TOP GLOVE SDN BHD	IPOH
27	LEMBAGA AIR PERAK	IPOH
28	MALAYSIA AIRPORTS BHD	IPOH
29	SOUTHERN WIRE INDUSTRIES (MALAYSIA) SDN BHD	IPOH

SENARAI PEPASANGAN YANG TERLIBAT DI BAWAH PERATURAN-PERATURAN PENGURUSAN TENAGA ELEKTRIK DENGAN CEKAP 2008 (PPTEC 2008) - PERAK

NO	NAMA PEPASANGAN	BANDAR
30	LION IPOH PARADE SDN BHD	IPOH
31	MYDIN MOHAMED HOLDINGS BERHAD	IPOH
32	SYARIKAT NAM AH SDN.BHD.	IPOH
33	B.K.B. HEVEA PRODUCTS SDN. BHD.	IPOH
34	IMPERIAL GARMENTS SDN BHD	IPOH
35	TASEK CORPORATION BERHAD	IPOH
36	TOP GLOVE SDN BHD	IPOH
37	TOP GLOVE SDN BHD	IPOH
38	MYDIN MOHAMED HOLDINGS BERHAD	IPOH
39	CAROTECH BF SDN BHD	IPOH
40	ZANTAT SDN BHD	IPOH
41	SEAL POLYMER INDUSTRIES BHD	LAHAT
42	KERETAPI TANAH MELAYU BERHAD	LAHAT
43	CHIN LEAN PLASTIC FACTORY SDN BHD	LANGKAP
44	SYARIKAT LUMUT QUARRY SDN	LUMUT
45	SINN HWAT HENG EDIBLE OILS SDN BHD	LUMUT
46	PENCAWANG TNB SYARIKAT LUMUT QUARRY SDN	LUMUT
47	MAJU AKUAKULTUR SDN BHD	PANTAI REMIS
48	UIE PALM OIL MILL	PANTAI REMIS
49	PENGURUS LEMBAGA AIR PERAK (LAP)	PARIT
50	DRAGON & PHOENIX SDN BHD	PARIT BUNTAR
51	SUPER ELECTRONICS IND SDN BHD	PARIT BUNTAR
52	T.E.M CASTING PRODUCTS SDN BHD (59172 -V)	PARIT BUNTAR
53	NIBONG TEBAL PERSONAL CARE SDN. BHD	PARIT BUNTAR
54	BINARY RELIANCE SDN BHD	PENGKALAN HULU
55	YOONSTEEL (M) SDN. BHD.	PUSING
56	YOONSTEEL (MALAYSIA) SDN. BHD.	PUSING
57	GSL WATER SDN BHD	SEMANGGOL
58	ATLAS EDIBLE ICE (IPOH)	SERI MANJUNG
59	DOMINO PLASTIC ENTERPRISE	SERI MANJUNG
60	PEGAWAI MEMERINTAH	SERI MANJUNG

REGISTERED ELECTRICAL ENERGY MANAGER

Registered electrical energy manager of installation

11. (1) No person shall engage in, be employed or hold himself out as a registered electrical energy manager for the purposes of these Regulations unless the person has been registered by the Commission.

(2) Any person who fails to comply with sub regulation (1) commits an offence under these Regulations.

QUALIFICATION REQUIREMENTS

Regulation 12

- Malaysian citizen aged **23 years and above**; and
- is a **Professional Engineer** and possesses at **least six months** working experience in the efficient management of electrical energy, ***or***
- holds a degree in Science, Engineering, Architecture or its equivalent and possesses at least **one year working experience** in the efficient management of electrical energy; ***or***
- holds a certificate of competency as an Electrical Services Engineer or as a Competent Electrical Engineer as in the Electricity Regulations 1994 and possesses at least **nine months working experience** in the efficient management of electrical energy; ***and***
- Demonstrates knowledge of the requirements of the Act and these Regulations; ***and***
- The Commission may require the person to attend an interview

FUNCTIONS AND DUTIES OF ELECTRICAL ENERGY MANAGER

Regulation 16. The registered electrical energy manager shall have the following functions and duties:

(a) he shall be responsible –

(i) to audit and analyze the total electrical energy consumption or total net electrical energy generation at the installation, including the significant end use of electricity;

(ii) to advise the private installation licensee or consumer in developing and implementing measures to ensure efficient management of electrical energy at the installation; and

(iii) to monitor effective implementation of the measures referred to in subparagraph (ii);

(b) he shall supervise the keeping of records on efficient management of electrical energy at the installation and verify its accuracy; and

(c) he shall ensure that the private installation licensee or consumer submits the information and report under paragraphs 6(1)(c),

(d) and (e) within the periods as specified in regulation 7.

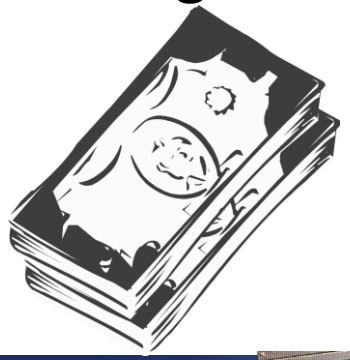
PART IV
GENERAL

General penalty

22. Any person who commits an offence under these Regulations shall, on conviction, be liable to a fine not exceeding five thousand ringgit or to imprisonment for a term not exceeding one year or to both.

OFFENCE UNDER THESE REGULATIONS REGULATION 22

- **FINE** : not exceeding **RM 5,000.00**
- **IMPRISONMENT**: not exceeding one (1) year
- or **BOTH**



OTHERS LEGAL REQUIREMENTS

REGISTERATION OF ENGINEER

SIRIM

LEMBAGA JURUTERA MALAYSIA
Tingkat 17, Ibu Pejabat JKR, Kompleks Kerja Raya Malaysia
Jalan Sultan Salahuddin, 50580 Kuala Lumpur, MALAYSIA.

Rev. No.: 2
Date: 3.12.2011
BEM/CL/APP/06

PENDAFTARAN JURUTERA SISWAZAH

Seksyen 24A (1), Akta Pendaftaran Jurutera 1967

"No person shall employ a person, sole proprietorship, partnership or body corporate, other than a registered Engineer or an Engineering consultancy practice, to perform professional engineering services"

Warganegara Malaysia yang ingin memohon untuk Pendaftaran Jurutera Siswazah di bawah Seksyen 10(1) Akta Pendaftaran Jurutera 1967 hendaklah menggunakan BORANG A dan disertakan:

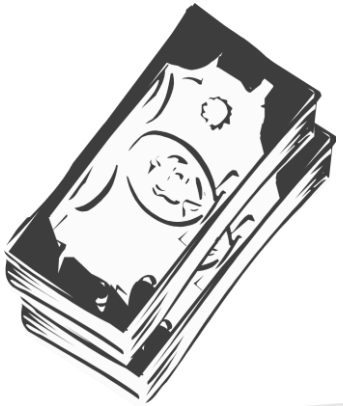
25. (1) General penalty. [Act A1288]

Any person, sole proprietorship, partnership or body corporate who contravenes this Act or any regulations made thereunder shall be guilty of an offence and shall, where no penalty is expressly provided therefor, be liable, on conviction, to a fine not exceeding ten thousand ringgit or to imprisonment for a term not exceeding one year, or to both.

PENALTY who contravenes this Act Section 25 (1)

- **FINE** : not exceeding **RM10,000**
- **IMPRISONMENT:** not exceeding **one (1) year**
- or **BOTH**

REGISTRATION OF ENGINEERS ACT 1967
(Incorporating amendments up to 2007)



DEVELOPED COUNTRY??

Statistics

Professional Engineer	**10403**
Graduate Engineer	**73332**
Temporary Engineer	**4**
Sole Proprietorship	**911**
Body Corporate	**886**
Partnership	**187**
Accredited Checker	**30**
Multidisciplinary	**19**

** Updated daily. Showing renewed and active records for the year **2014** only. Records shown excluding voluntary de-registered, cancelled, inactive & deceased engineers.*

Source: BEM

Criteria for developed country

- Ratio for Doctor 1:434
- (Malaysia 1:758)
- Engineer, scientists and researcher 1:138
- Malaysia ???

Source: Berita Harian 2/10/2013

Legal and other requirements

Factory Machinery Act 1967
- Certificated machinery e.g.; air compressor, lift, crane, unfired pressure vessel

Environmental Quality Act 1974
- Generator set
- Schedule waste

Energy Commissioning Act
- Gas piping, Generator set, Competent Person

Electricity Supply Act & Regulations
- Efficient Management of Electrical Energy Regulation 2008
- Generator set, Metering DB

BOMBA Act
- Fire Extinguisher, Fire Certificate

OSHA94
- Safety Committee
- Incident reporting

Other requirements

A Premier Total Solution Provider in Quality and Technology Innovation

Services from Us….

SIRIM TRAINING

SIRIM

SIRIM

SIRIM QAS INTERNATIONAL
SIRIM QAS International
CERTIFICATION • INSPECTION • TESTING

Energy Management Training & consultancy EnMS ISO 50001

Energy Audit/Review
Endorsement REEM energy report
Renewable Energy
- **Solar PV / Solar Thermal**
- **Wind turbine technology**
- **Hydro technology**
- **Biomass**

Waste water treatment / management

Certified Energy Mgt. System ISO 50001

TESTING ENERGY EFFICIENCY EQUIPMENT

Enabling Businesses. Enhancing Lives

Ir. Kasim Ahmad

Ir. Kasim Ahmad
MEng (HSE), BEng (Mech),
REEM, PEng, CEA

Working experience:

12 years – building services
3 years – auditor & consultant for management system (Quality, Environment and Safety)
7 years – energy auditor and consultant for energy management

SIRIM Berhad / Head of Energy Efficiency Section
Renewable Energy Research Centre

- Responsible for the development research on renewable energy. Commercial activities are giving consultancy on energy conservation and energy audit at building and industry
- Appointed as Advisor on Safety Management System OHSAS 18001 for Department
- Appointed as Registered Electrical Energy Manager (REEM) for SIRIM Berhad in fulfil the legal requirement on Efficient Management Of Electrical Energy Regulations 2008
- Certified Energy Auditor (CEA) from The Association of Energy Engineers, AEE

SIRIM Berhad was incorporated in November 1995 as a wholly-owned Government institution under the Ministry of Finance. With over 40 years of experience and expertise in technology innovation and research, SIRIM is a champion of quality and a recognized technology partner.

… Assist a government in enhancement of energy efficiency policy and SMEs in practicing EE

THANK YOU

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