Suruhanjaya Tenaga
Energy Commission

ZULKIFLEE UMAR

DEMAND SIDE MANAGEMENT UNIT

PRESENTATION OUTLINE

1. Introduction
2. Efficient Management of Electrical Energy Regulations (EMEER) 2008
3. Minimum Energy Performance Standards (MEPS)
4. Energy Performance Contract (EPC)
5. Other activities by DSM

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1. INTRODUCTION

- Demand Side Management Unit is one of the unit in Energy Management & Industry Development Department.
- The Unit was establish to promote and regulate energy efficiency (electrical) in Malaysia.

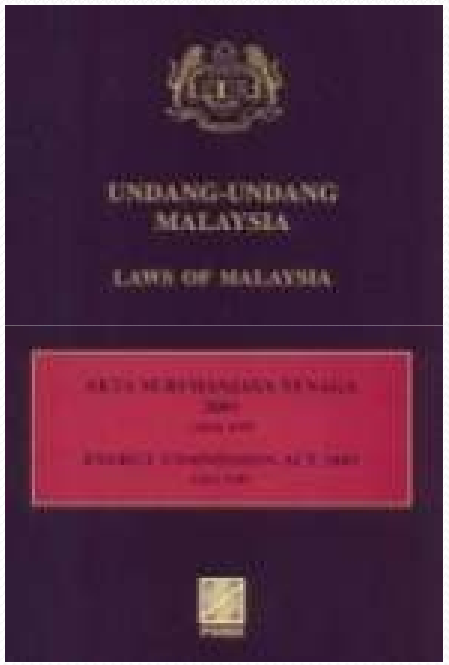
ENERGY COMMISSION ACT 2001

- To promote efficiency, economy and safety in the generation, production, transmission, distribution supply and use of electricity

- To promote the use of renewable energy and the conservation of non-renewable energy

ELECTRICITY SUPPLY ACT 1990

- To promote the efficient use of electricity Efficient Use of Electricity.
- To determine the standards, specifications, practices and measures for the efficient use of electricity.
- Installation to meet requirements in respect of the efficient use of electricity.
- Equipment to meet requirements in respect of the efficient use of electricity



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**

2. EFFICIENT MANAGEMENT OF ELECTRICAL ENERGY REGULATIONS (EMEER) 2008

Improving energy management practices among large consumers through the implementation and enforcement of the **EFFICIENT MANAGEMENT OF ELECTRICAL ENERGY REGULATIONS (EMEER) 2008.**

EMEER has been gazetted on 15th December 2008.

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Key Provisions of EMEER 2008 are:

- Applied to big energy users (equal or exceeding 3 Million kWh over any period not exceeding 6 consecutives months, currently there are about 1600 installations subjected under this regulations)
- Notification by Energy Commission.
- To appoint a Registered Electrical Energy Manager and to submit written confirmation of the appointment.
- To submit Electrical Energy Management Policy.
- To submit Electrical Energy Management Objectives.
- To submit Electrical Energy Management accounts and documents.

- Monitoring and keeping of records and perform periodical reporting.
- Processing, interview and certification of Registered Electrical Energy Managers (REEM).
- Processing and acknowledgement of Institution providing the Continous Professional Development Program for (REEM).
- Processing and analysis of periodical reporting submitted by installations subjected under the Regulations.
- Processsing and analysis the list of installations subejcted under the Regulations submitted by Licensee such as TNB.

REGISTERED ELECTRICAL ENERGY MANAGER

- Need for registration of electrical energy manager for the purposes of the Regulations.

- 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.

QUALIFICATION REQUIREMENTS

- 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.
- The Commission may require the person to attend an interview.

APPLICATION PROCEDURE

- Submit application form (FORM ST(DSM/PTE/2009) and processing fee (First Schedule), and

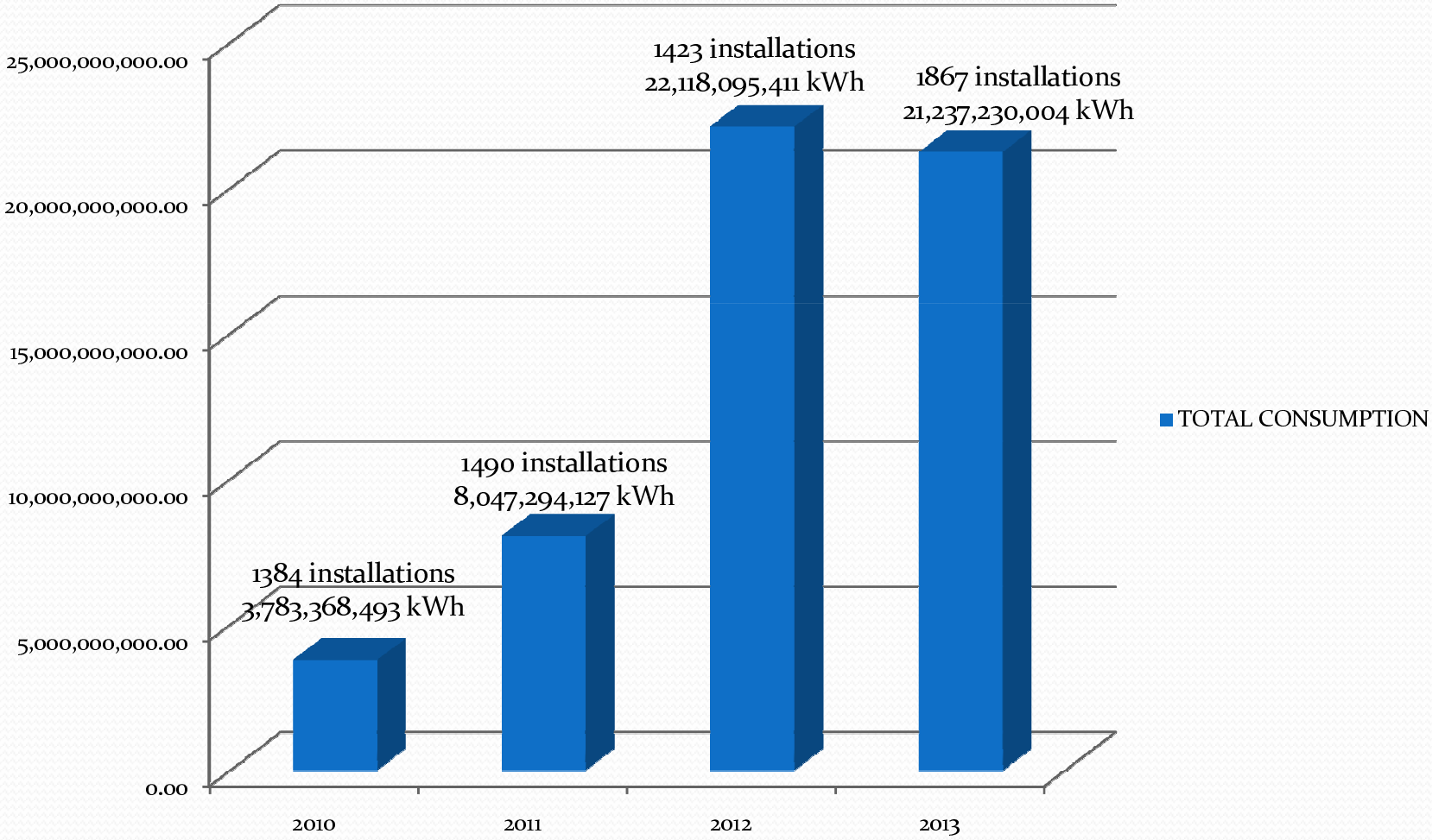
- Information and documents to substantiate track record as an electrical energy manager, or evidence to show that despite the lack of a track record, he has the necessary knowledge, skill and expertise to efficiently manage electrical energy.

- Medical evidence of the physical and mental fitness of the applicant may be required

FUNCTIONS AND DUTIES OF REGISTERED ELECTRICAL ENERGY MANAGER

- To audit and analyse the total electrical energy consumption or generation
- To advise in developing and implementing measures to ensure efficient management of electrical energy at the installation
- To monitor effective implementation of the measures
- To supervise the keeping of records on efficient management of electrical energy at the installation and verify its accuracy; and
- To ensure the timely submission of information and reports under the regulations.

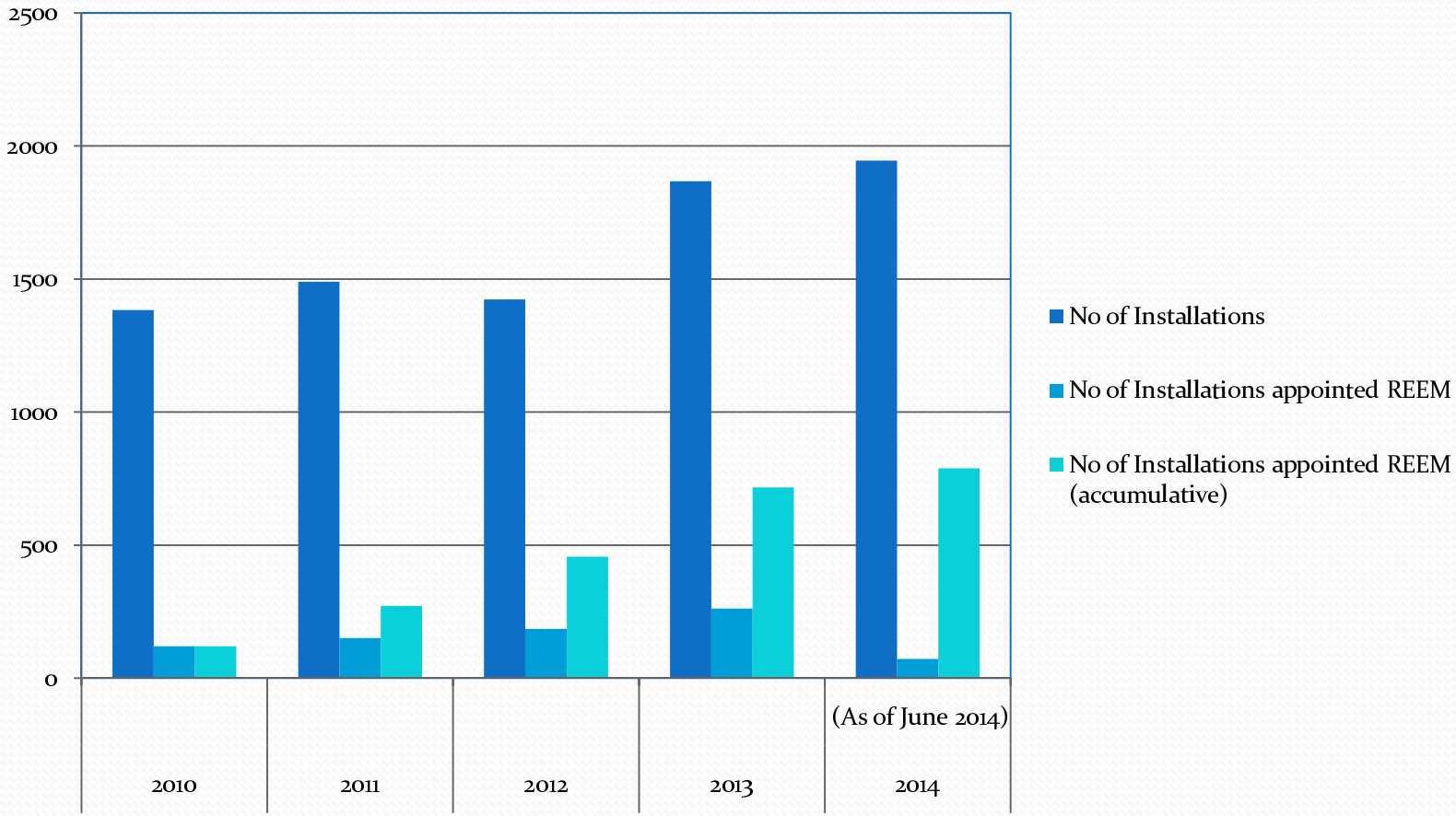
TOTAL CONSUMPTION ELECTRICITY OF INSTALLATIONS SUBJECTED TO EMEER 2008



INSTALLATIONS SUBJECTED TO EMEER 2008

	2010	2011	2012	2013	2014 (As of June 2014)
No of Installations	1384	1490	1423	1867	1945
No of Installations appointed REEM	120	151	185	261	72
No of Installations appointed REEM (accumulative)	120	271	456	717	789

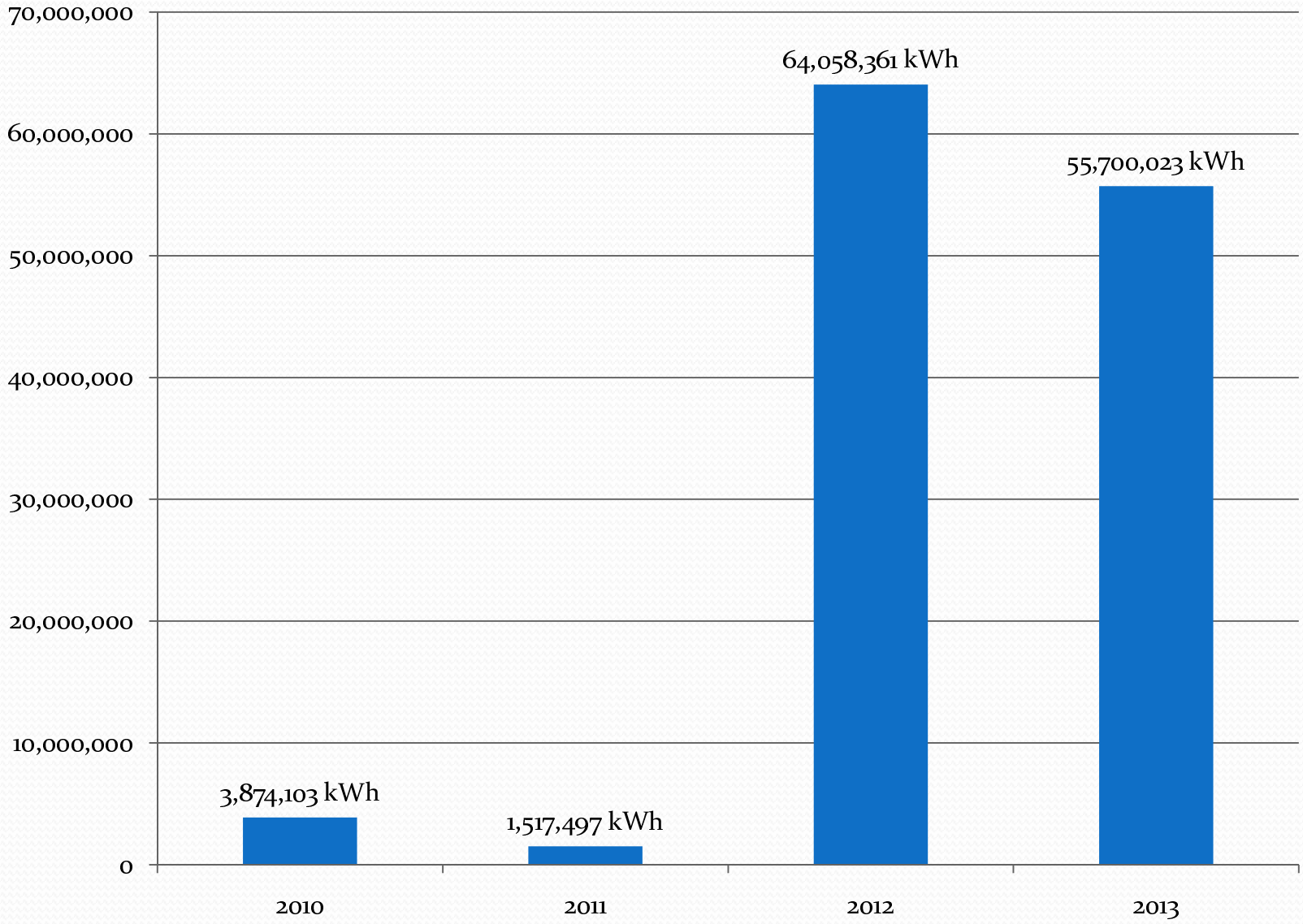
INSTALLATIONS SUBJECTED TO EMEER 2008



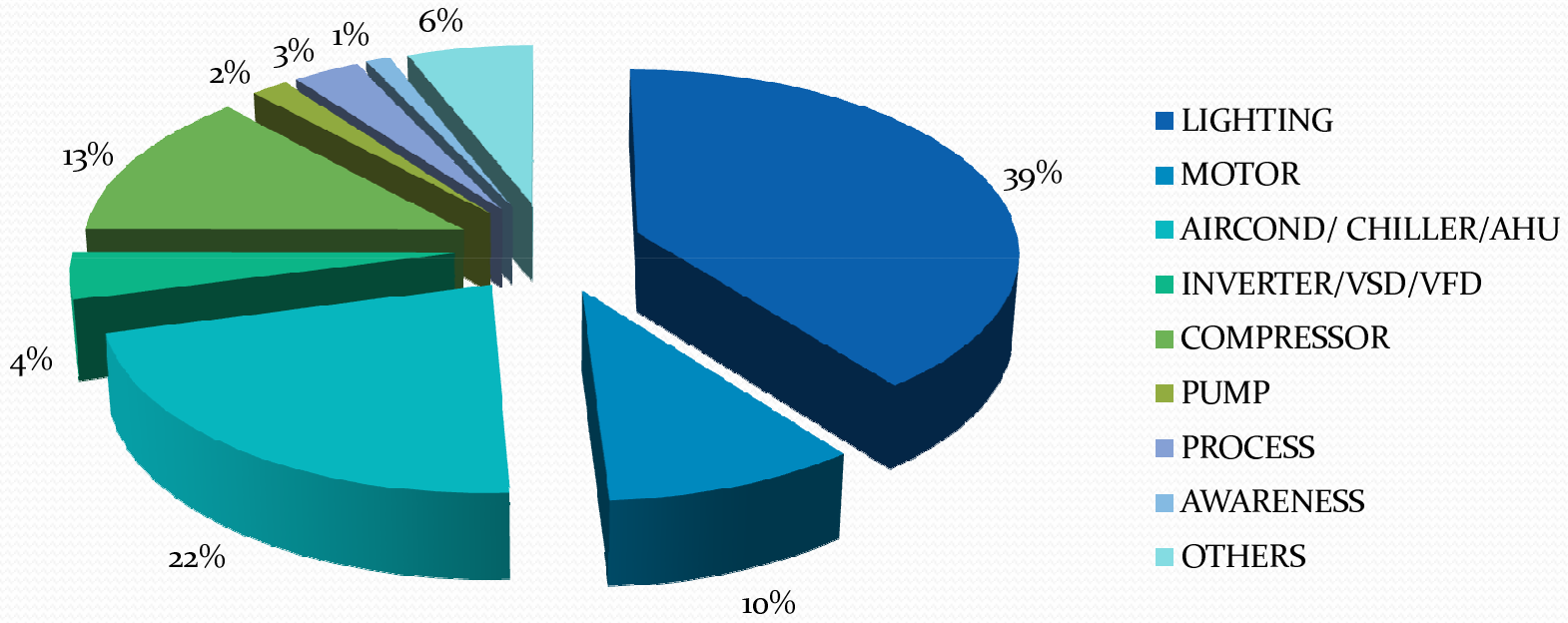
INSTALLATIONS SUBJECTED TO EMEER 2008 WHICH SUCCEEDED TO REDUCE ELECTRICITY BELOW 3 GWH (for 2 consecutive 6 months period)

	2010	2011	2012	2013
No of Installations	0	0	0	1

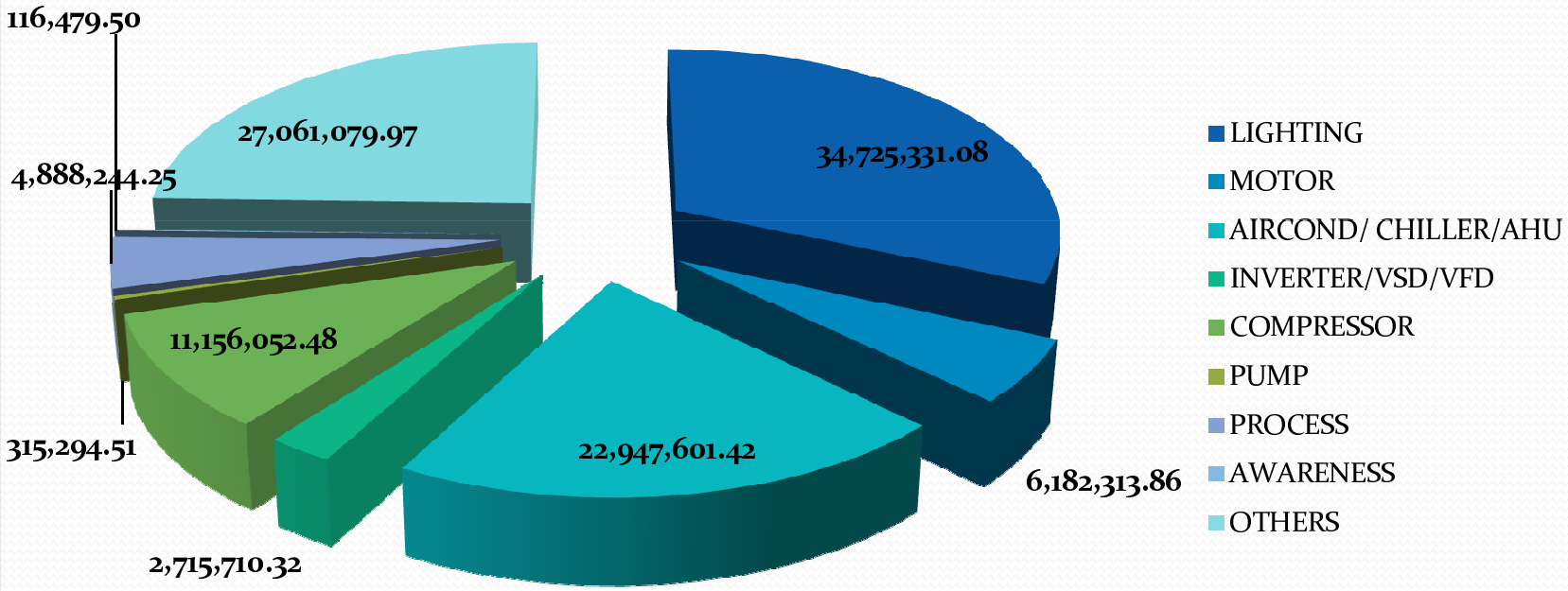
TOTAL kWh SAVING BY AFFECTED INSTALLATIONS



Total ESM implemented in 2013



kWh SAVING PER ACTIVITY IMPLEMENTED IN 2013



2. MINIMUM ENERGY PERFORMANCE STANDARDS (MEPS)

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 gazzetted on the 3rd Mei 2013.

The above 5 appliances msut adhere to the MEPS requirement.

4 Malaysian Standards for MEPS are currently being finalize.

An implementation plan to all stakeholders and the public is in place. A continuous awareness and education program will be conducted before 3rd May 2014.

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Improving the energy efficiency electrical equipment through Product Energy Efficiency Rating & Labeling.

- Energy rating 1 to 5-Star
- Appliance energy rating (equals the number of stars)
- Model information
- Energy consumption (in kWh/year)
- Energy saving compared to an average 3-Star model (in percentage)

EE LABEL- Comparative Label

"FOURTH SCHEDULE

(Subregulation 101A (1))

ELECTRICI TY SUPPLY ACT 1990

ENERGY PERFORMANCE TESTING STANDARDS, MINIMUM ENERGY PERFORMANCE STANDARDS AND EFFICIENCY RATINGS FOR THE PURPOSE OF EFFICIENT USE OF ELECTRICITY

<table>
<tr><th>Equipment</th><th>Type of Equipment</th><th>Energy Performance Testing Standards</th><th>Minimum Energy Perf ormance Standards (MEPS)</th><th>Efficiency Ratings</th></tr>
<tr><td>Refrigerator</td><td>(a) one -door

(b) two -doors</td><td>MS IEC 62552:2011

(Household refrigerating appliances - Characteristic and test methods)</td><td>MEPS's value = 2 Star</td><td>
<table>
<tr><th>Star Rating</th><th>Star Index Value</th></tr>
<tr><td>5</td><td>+25% = Star Index</td></tr>
<tr><td>4</td><td>+10% = Star Inde <+25%</td></tr>
<tr><td>3</td><td>-10% = Star Index <+10%</td></tr>
<tr><td>2</td><td>-25% = Star Index < -10%</td></tr>
<tr><td>1</td><td>-35% = Star Index < -25%</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Equipment</th><th>Type of Equipment</th><th>Energy Performance Testing Standards</th><th>Minimum Energy Perf ormance Standards (MEPS)</th><th>Efficiency Ratings</th></tr>
<tr><td>Air conditioner</td><td>Single split wall mounted air conditioner capacity up to 25, 000 Btu/h</td><td>MS ISO 5151:2004

(Non -ducted air conditioners and heat pumps : Test ing and rating for performance)</td><td>MEPS's value = 2 Star</td><td>(a) Cooling capacity < 4.5kW:
<table><tr><th>Star Rating</th><th>Star Index Value</th></tr><tr><td>5</td><td>?11.94</td></tr><tr><td>4</td><td>11.16 -11.93</td></tr><tr><td>3</td><td>10.37 - 11.15</td></tr><tr><td>2</td><td>9.56 - 10.36</td></tr><tr><td>1</td><td>9.00 - 9.55</td></tr></table>
(b) 4.5kW < cooling Capacity < 7.1kW:
<table><tr><th>Star Rating</th><th>Star Index Value</th></tr><tr><td>5</td><td>?10.71</td></tr><tr><td>4</td><td>9.83 - 10.70</td></tr><tr><td>3</td><td>8.94 - 9.82</td></tr><tr><td>2</td><td>8.03 - 8.93</td></tr><tr><td>1</td><td>7.50 - 8.02</td></tr></table></td></tr>
</table>

Equipment	*Type of Equipment*	*Energy Performance Testing Standards*	*Minimum Energy Perf ormance Standards (MEPS)*	*Efficiency Ratings*
Television	The type of television are of the following list and of size up to or equal to 70 inches: *(a)* plasma *(b)* liquid crystal display (LCD) *(c)* light emitting diode (LED) *(d)* cathode ra y tube (CRT)	*(a)* IEC 62087 Edition 2.0 2008 -10 for power measurement at On Mode *(b)* MS IEC 62301:2006 for power measurement at Standby Mode l	MEPS's value = 2 Star	Star Rating / Star Index Value 5 — +20%? Star Index 4 — +10%? Star Index <+20% 3 — -10%? Star Ind ex <+10% 2 — -20%? Star Index < -10% 1 — -30%? Star Index < -20%

<table>
<tr><th>Equipment</th><th>Type of Equipment</th><th>Energy Performance Testing Standards</th><th>Minimum Energy Perf ormance Standards (MEPS)</th><th>Efficiency Ratings</th></tr>
<tr>
<td>Domestic fan</td>
<td>(a) wall

(b) desk

(c) pedestal

(d) ceiling</td>
<td>MS 1220:2001

(performance and construction of electric circulating fans and regulators) second revision</td>
<td>MEPS's value = 2 Star</td>
<td>(a) Ceiling fan:
<table><tr><th>Star Rating</th><th>Star Index Value</th></tr><tr><td>5</td><td>≥ 3.00</td></tr><tr><td>4</td><td>2.74 – 2.99</td></tr><tr><td>3</td><td>2.66 – 2.73</td></tr><tr><td>2</td><td>2.58 – 2.65</td></tr><tr><td>1</td><td>2.50 – 2.57</td></tr></table>
(b) Pedestal, wall and desk fan:
<table><tr><th>Star Rating</th><th>Star Index Value</th></tr><tr><td>5</td><td>≥ 1.20</td></tr><tr><td>4</td><td>1.12 – 1.19</td></tr><tr><td>3</td><td>1.08 – 1.11</td></tr><tr><td>2</td><td>1.01 – 1.07</td></tr><tr><td>1</td><td>0.93 – 1.00</td></tr></table></td>
</tr>
</table>

<table>
<tr><th>Equipment</th><th>Type of Equipment</th><th>Energy Performance Testing Standards</th><th>Minimum Energy Perf ormance Standards (MEPS)</th><th>Efficiency Ratings</th></tr>
<tr>
<td>Lighting</td>
<td>(a) fluorescent

(b) compact fluorescent lamp (CFL)

(c) light emitting diode (LED)

(d) incandescent</td>
<td>(a) MS IEC 60969:

(Self –ballasted lamps for general lighting services – Performance requirements) for fluorescent lamp

(b) LM 79 -08

(IESNA Approved Method f or the electrical and photometric measurement of solid -state lighting products) for LED lights</td>
<td>(a) Tubular Fluorescent:

<table>
<tr><th>Type</th><th>(W)</th><th>MEPS (lm/W)</th></tr>
<tr><td rowspan="2">T8</td><td>18-30</td><td>70</td></tr>
<tr><td>≥31</td><td>85</td></tr>
<tr><td rowspan="2">T5</td><td>14</td><td>80</td></tr>
<tr><td>≥15</td><td>85</td></tr>
</table>

(b) Other lighting type:</td>
<td>NIL</td>
</tr>
</table>

Equipment	*Type of Equipment*	*Energy Performance Testing Standards*	*Minimum Energy Perf ormance Standards (MEPS)*		*Efficiency Ratings*
		(a) MS IEC 62612 (P) (Self -ballasted LED -lamps for general lighting services - performance requirement)	*Type*	*MEPS (lm/ W)*	
			CFLi (Self ballasted)		
			< 9 W	55	
			9- 15 W	60	
			16 -24 W	60	
			≥25 W	60	
			CFL (Non integrated lamps)		
			?10 W	60	
			11 -26 W	65	
			≥ 27 W	85	
			LED Lamp	55	
			*Incandescent Lamp**	20	

*The Minimum Energy Performance Standards (MEPS) value for incandescent lamp shall not apply for the following use:

(a) components in electrical appliances;

(b) medical and lab equipment;

(c) internal decoration, shows and exhibition;

(d) safety and signaling;

(e) conservation of animals and as repellant for insects;

(f) heating and testing;

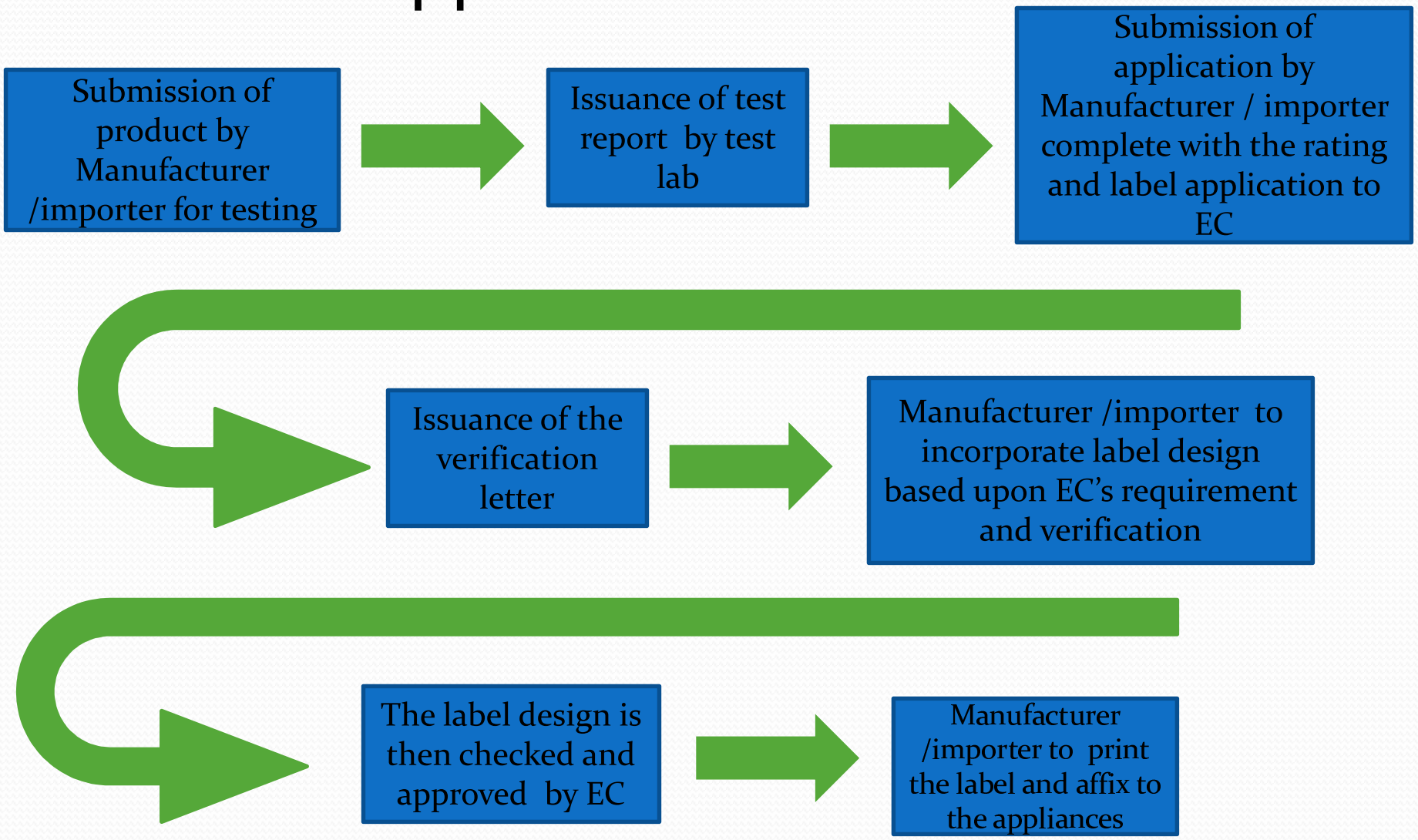
(g) cleanliness and health;

(h) beauty treatment;

(i) lamps that cannot be directly replaced with other type of lamp; and

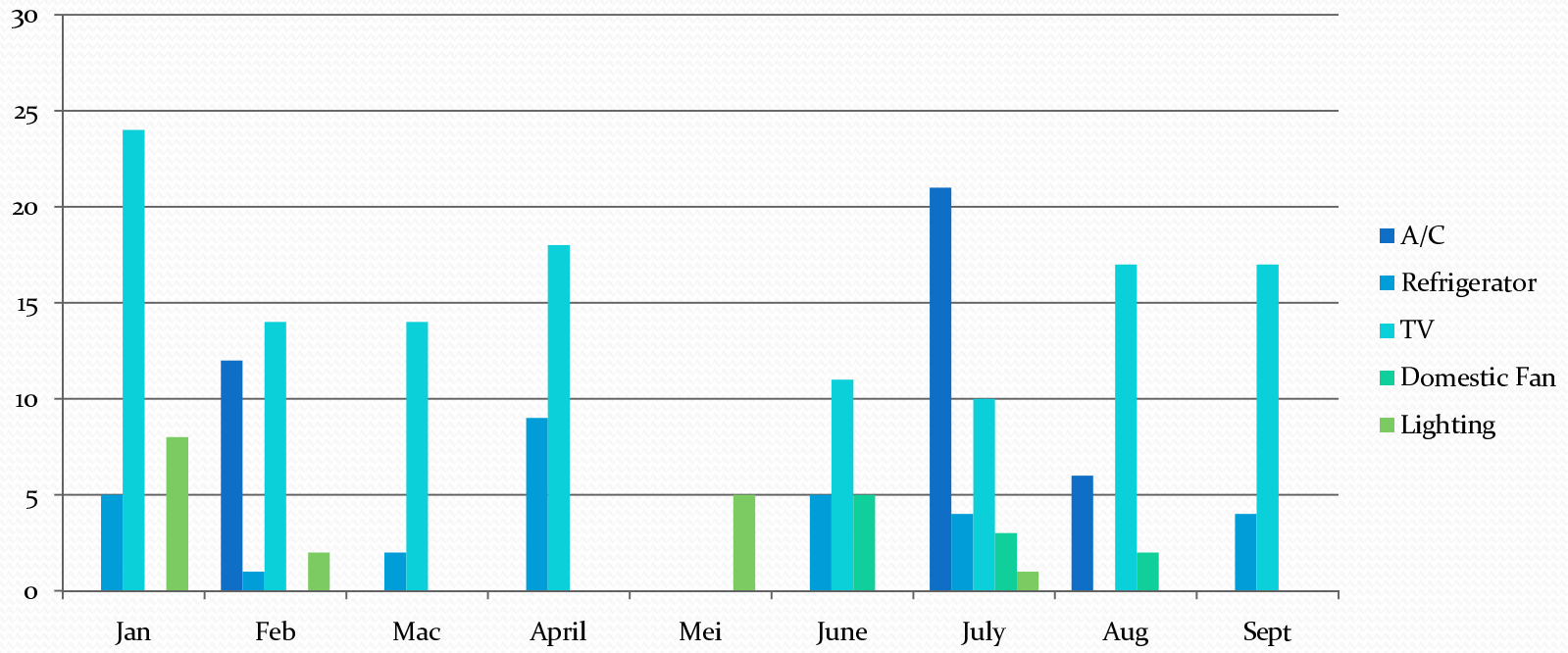
(j) **incandescent lamp for other purpos es deemed suitable by the Commission to be excluded.".**

Application Process



APPLIANCES COMPLIANCE TO MEPS UNTIL SEPTEMBER 2014

	Air –Cond	Refrigerator	Television	Domestic Fan	Lighting
Sept 2014	39	31	125	10	16



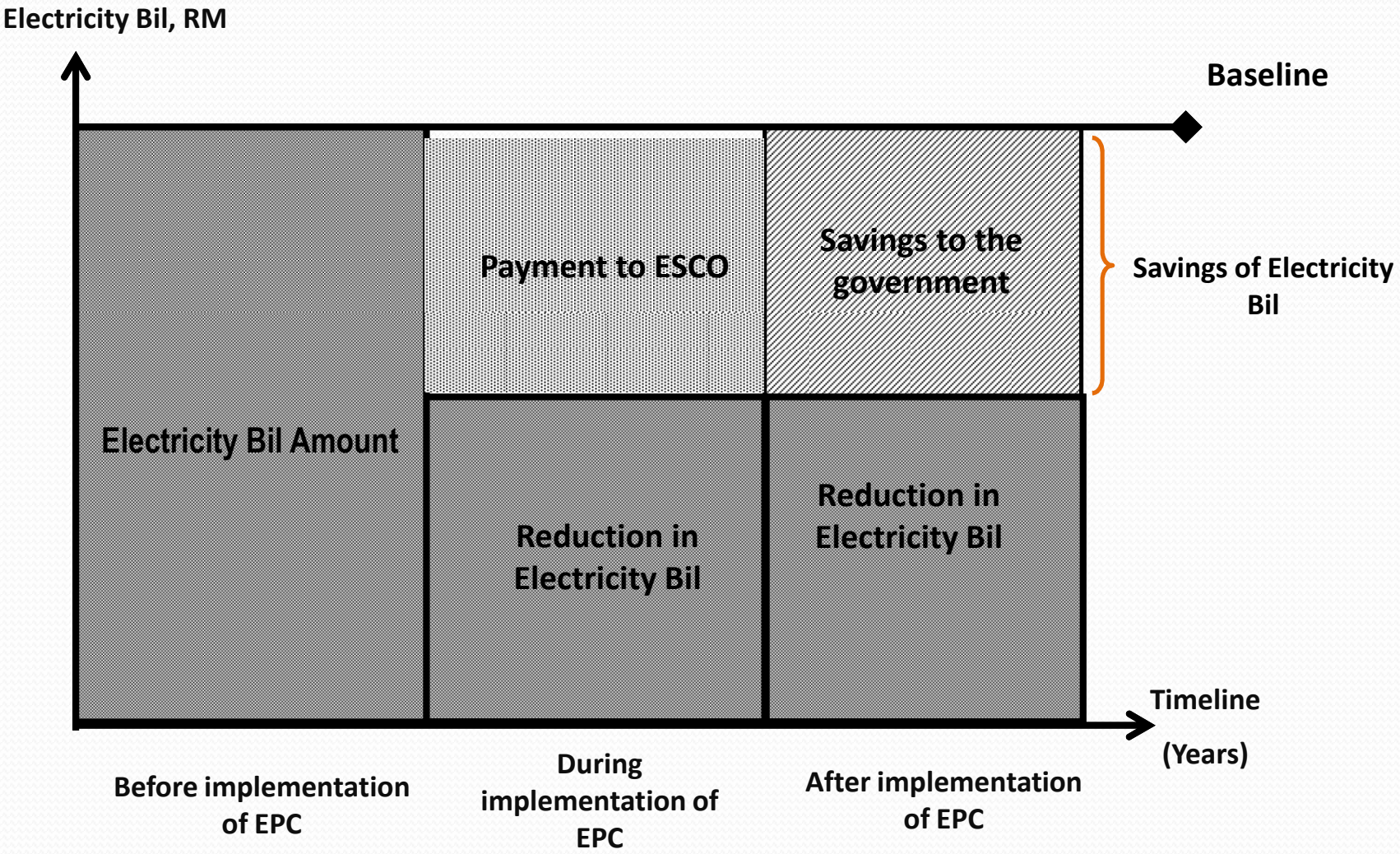
3. ENERGY PERFORMANCE CONTRACTING (EPC)

- The Cabinet in January 2013 has approved the Energy Performance Contracting (EPC) to be implemented in government buildings.
- EPC is developed to overcome the capital costs/financing barriers in implementing cost-effective energy efficiency measures.
- Provides customers with a comprehensive set of energy efficiency, renewable energy and distributed generation measures and often is accompanied with guarantees that the savings produced by a project will be sufficient to finance the full cost of the project.

- How will Energy Performance Contracting (EPC) in government sector be implemented?
  - To engage the service of ESCO in the energy efficiency improvement project of a facility;
  - To perform energy audit at a facility in order to evaluate the level of savings that can be accomplished;
  - ESCO will offer to implement and finance the project;
  - Guarantee the savings over an agreed terms;

- Payment to ESCO is based upon the guaranteed savings achieve;
- The actual amount to be paid will be based upon the agreed sharing value between the ESCO and the owner of the government facility.
- After the agreement ended, the ownership of all the equipment and system installed at the facility will be transferred to facility's owner (Government).

EPC Implementation Concept



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- Summary:

NO UPFRONT COST to the Government

ESCO will finance and implement the Energy Saving Measures.

Saving achieved without compromising user's comfort

ESCO install & maintain the E.E equipment involved

ESCO payment based on actual savings achieved in electricity bill

All equipments installed become the property of the Government after the contract period ended

REGISTRATION OF ENERGY SERVICE COMPANY (ESCO).

In supporting this effort, Suruhanjaya Tenaga has been appointed as the implementation agency by the Ministry of Energy, Green Technology and Water.

One of the task is to register the ESCOs before they can register with Ministry of Finance.

Suruhanjaya Tenaga will also be responsible for the Measurement and Verification (M&V) of energy saving potentials and the actual savings achieved.

Requirement For Registration

For purposes of registration of ESCOs with the Energy Commission, the list of requirements and criteria to be fulfilled by applicants are as follows:

i. the applicant has registered his business with either the Registrar of Business or the Registrar of Companies,

ii. the applicant has employed, on a full time basis, a Registered Electrical Energy Manager as prescribed under the Efficient Management of Electrical Energy Regulations 2008,

iii. the applicant has access to suitable monitoring and testing equipment and instruments required (i.e. electrical power and energy data logger, thermal energy data logger, flow data logger) for energy efficiency management works , and

iv. the applicant has satisfactorily furnished all the information as stipulated in the Application Form.

- The Letter of Registration issued is valid for a period of one year from the date of issuance of the said Letter of Registration.

- The renewal of the Letter of Registration as an Energy Service Company must be made not less than 1 month before the date of expiry of the registration.

- Energy Commission may cancel a Certificate of Registration of an Energy Service Company if-
    - the holder of the Letter ceases to carry on the business in respect of which he is registered;
    - the holder of the Letter has been adjudicated a bankrupt;
    - the company goes into liquidation.

- The Letter of Registration as an Energy Service Company may not be transferred unless with the written approval of the Energy Commission.

- Any change of name, address and other details of the business or company stated in the Letter of Registration must be informed in writing to the Energy Commission within 14 days of such change.

- All electrical works in relation to the Energy Services provided by the Registered Energy Service Company must be performed by Competent Persons in accordance with the Electricity Supply Act 1990 and the Electricity Supply Regulations 1994.

Number of ESCO registered with ST

	2013	2014
No. of ESCO	9	36

4. TECHNICAL EVALUATIONS FOR EE&C-PROJECT (APPLICATION FOR THE INVESTMENT TAX ALLOWANCE INCENTIVE).

This incentive is applicable to any establishments who wishes to invest in an Energy Efficiency Project which involves capital investment.

An application for Investment Tax Allowance must be submitted to MIDA and Suruhanjaya Tenaga. The application will be processed technically and the evaluation will then be submitted to MIDA for the committee's approval.

5. MONITORING OF THE ENERGY CONSUMPTION IN 25 GOVERNMENT BUILDINGS (54 BLOCKS).

- Directive for all government buildings to reduce by 5% their utility comsumption.
- Electrical energy consumption in all government buildings.
- Periodical reporting to KeTTHA.

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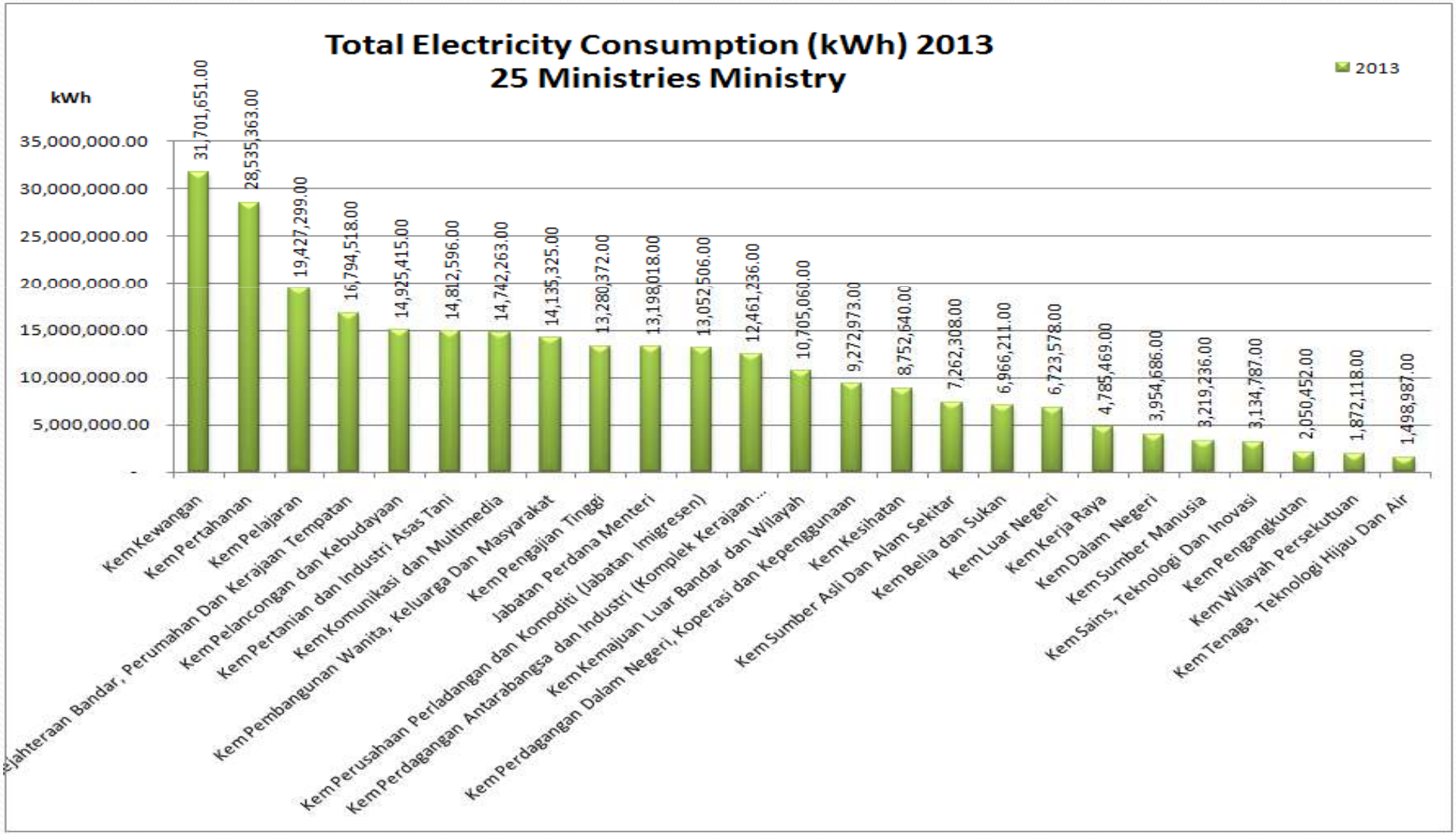
ELECTRICITY CONSUMPTION IN 25 GOVERNMENT MINISTRIES



6. SUSTAINABLE ENERGY COMMUNICATIONS PLAN (2014/2015)

ST has been appointed by KeTTHA to execute the Sustainable Energy Communications Plan 2014-2016. The plan aims to disseminate information and knowledge on the Energy Efficiency and Renewable Energy Initiatives by the government and ST.

7. ELECTRICITY CONSUMPTION IN 105 GOVERNMENT BUILDINGS

105 government buildings currently subjected to the EMEER 2008 (using equal or more than 3 million kWh. These buildings energy usage are currently being closely monitored. Data obtained from TNB.

8. IMPLEMENTATION OF FIVE (5) EPC PROJECTS IN GOVERNMENT BUILDINGS

ST to promote and implement five (5) EPC projects in government buildings in 2014.

One project has been initiated:

- Politeknik Merlimau

Other proposed projects:

Kem. Dalam Negeri

UPM

9. IMPLEMENTATION OF ENERGY AUDIT AND RETROFIT IN SELECTED GOVERNMENT BUILDINGS

ST has been requested to implement the energy audit and retrofit projects in 5 government buildings in 2014.

These projects are currently in progress.

10. IMPLEMENTATION OF EPC PILOT PROJECT WITH BSEEP IN HOSPITAL PUTRAJAYA

ST and BSEEP/JKR will be conducting an EPC pilot project in Hospital Putrajaya.

The success of the project will enable implementation of EPC in other government buildings.

11. IMPLEMENTATION OF ENERGY EFFICIENCY PROGRAMME

To conduct energy efficiency:

- Enforcement work;(EMEER 2008 and MEPS)
- Seminars;
- Dialogues;
- Workshops and;
- Capacity buildings.

Secretariat to the ST's Energy Efficiency Committee.

12. MALAYSIAN STANDARDS

Adopting MS ISO 50001:2011 (Energy Management Systems) which specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.

MS 1525 Code Of Practice On Energy Efficiency And Use Of Renewable Energy For Non-residential Buildings which provides guidance on the effective use of energy, including the application of renewable energy in new and existing non-residential buildings.

13. PROMOTING ENERGY EFFICIENCY MEASURES AND PUBLIC AWARENESS PROGRAMMES

- Demonstration projects for buildings and industries for e.g by GBI Malaysia
- EE incentives enhancement.
- EE/Demand Side Management project.
- Development of energy efficiency guidelines.
- Building Sector Energy Efficiency Project (BSEEP).
- Safety and Awareness Campaign by Regional Office, KeTTHA and other agencies.
- MyHIJAU Pelabelan Program.
- Malaysian Standards Development Committee.
- Green Technology and Climate Change Committee.

Thank you

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