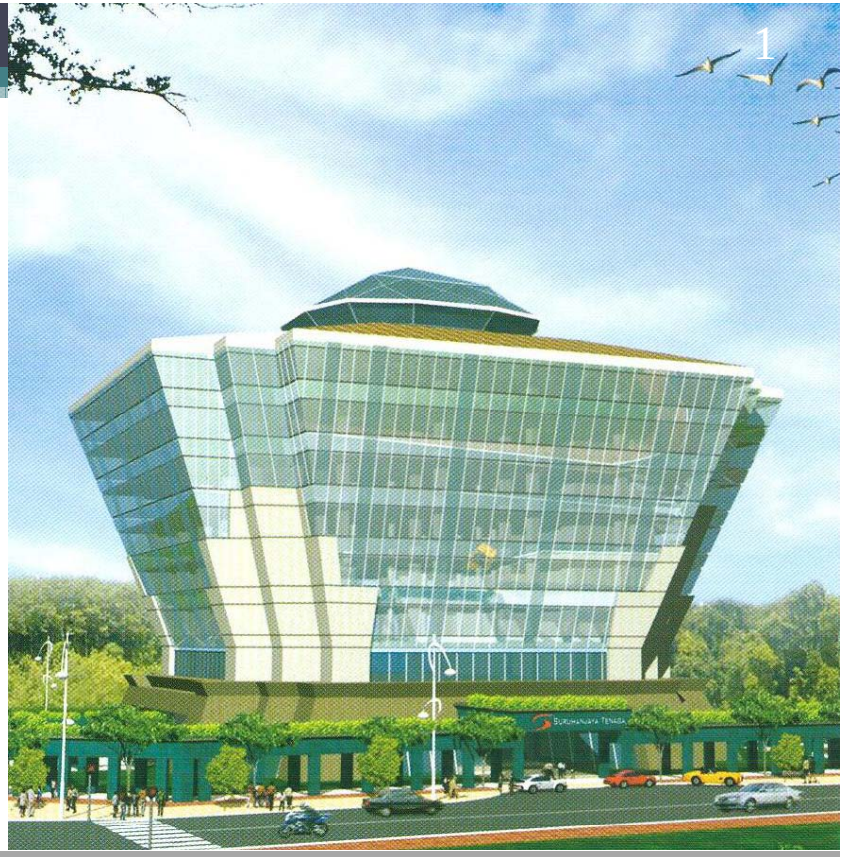
Suruhanjaya Tenaga
Energy Commission

# DEMAND SIDE MANAGEMENT

## ENERGY COMMISSION
## PUTRAJAYA



# Enhancing Energy Efficiency In Malaysia Through Legislation and Policy

# 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 and equipment to meet requirements in respect of the efficient use of electricity.

# Sustainable Energy

**The provision of energy such that it meets the needs of the present without compromising the ability of future generations to meet their need**

# Energy Efficiency

**Energy Efficiency means using electricity wisely or less energy in order to accomplish the same tasks whether at home or at the workplace**

# Function, Duties & Responsibility

1. Efficient Management of Electrical Energy Regulations (EMEER) 2008
2. Minimum Energy Performance Standards (MEPS)
3. Energy Performance Contract (EPC)
4. Incentive for Energy Efficiency Project
5. 24$^{O}$C Policy In Government Buildings
6. Monitoring of Energy Usage in 105 Govt Buildings

# 1. EFFICIENT MANAGEMENT OF ELECTRICAL ENERGY REGULATIONS (EMEER) 2008


- Gazette on 15th December 2008
- Requires all installation consumed or generated electrical energy 3,000,000 kWh for 6 consecutive months to appoint Registered Electrical Energy Manager
- Come out with energy management objective and plan for the installation and to report to Energy Commission on the progress and achievement of the plan every 6 months.

# 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.

# 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.

# Function, Duties & Responsibility

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# 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 gazette on the 3rd Mei 2013.

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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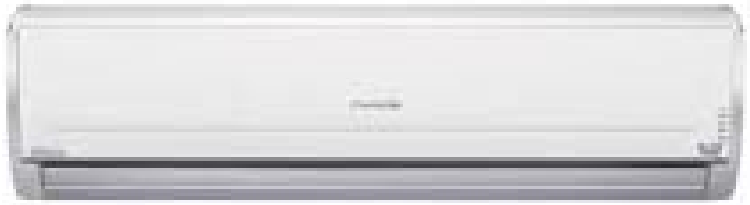


# Improving the energy efficiency electrical equipment through Product Energy Efficiency Rating & Labeling.


Energy rating 1 to 5-Star

Product type

Appliance energy rating
(equals the number of stars)

Model information

Year of rating given

Energy consumption
(in kWh/year)

Energy saving compared to an average 3-Star model
(in percentage)

Testing Standars Used

Approval to manufacture or import

"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<br><br>(b) two -doors</td><td>MS IEC 62552:2011<br><br>(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<br><br>(Non -ducted air conditioners and heat pumps :<br>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>

<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>Television</td>
<td>The type of television are of the following list and of size up to or equal to 70 inches:<br><br>(a) plasma<br><br>(b) liquid crystal display (LCD)<br><br>(c) light emitting diode (LED)<br><br>(d) cathode ra y tube (CRT)</td>
<td>(a) IEC 62087 Edition 2.0 2008 -10 for power measurement at On Mode<br><br>(b) MS IEC 62301:2006 for power measurement at Standby Mode l</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>+20%? Star Index</td></tr>
<tr><td>4</td><td>+10%? Star Index <+20%</td></tr>
<tr><td>3</td><td>-10%? Star Ind ex <+10%</td></tr>
<tr><td>2</td><td>-20%? Star Index < -10%</td></tr>
<tr><td>1</td><td>-30%? Star Index < -20%</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>Domestic fan</td>
<td>(a) wall<br><br>(b) desk<br><br>(c) pedestal<br><br>(d) ceiling</td>
<td>MS 1220:2001<br><br>(performance and construction of electric circulating fans and regulators) second revision</td>
<td>MEPS's value = 2 Star</td>
<td>(a) Ceiling fan:<br><br>
<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>
<br>(b) Pedestal, wall and desk fan:<br><br>
<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<br><br>(b) compact fluorescent lamp (CFL)<br><br>(c) light emitting diode (LED)<br><br>(d) incandescent</td>
<td>(a) MS IEC 60969:<br><br>(Self –ballasted lamps for general lighting services – Performance requirements) for fluorescent lamp<br><br>(b) LM 79 -08<br><br>(IESNA Approved Method f or the electrical and photometric measurement of solid -state lighting products) for LED lights</td>
<td>(a) Tubular Fluorescent:<br><br>
<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>
<br>(b) Other lighting type:</td>
<td>NIL</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></td><td></td><td>(a) MS IEC 62612 (P)<br><br>(Self -ballasted LED -lamps for general lighting services - performance requirement)</td><td>
<table>
<tr><th>Type</th><th>MEPS (lm/ W)</th></tr>
<tr><td>CFLi (Self ballasted)</td><td></td></tr>
<tr><td>< 9 W</td><td>55</td></tr>
<tr><td>9- 15 W</td><td>60</td></tr>
<tr><td>16 -24 W</td><td>60</td></tr>
<tr><td>≥25 W</td><td>60</td></tr>
<tr><td>CFL (Non integrated lamps)</td><td></td></tr>
<tr><td>?10 W</td><td>60</td></tr>
<tr><td>11 -26 W</td><td>65</td></tr>
<tr><td>≥ 27 W</td><td>85</td></tr>
<tr><td>LED Lamp</td><td>55</td></tr>
<tr><td>Incandescent Lamp*</td><td>20</td></tr>
</table>
</td><td></td></tr>
</table>

*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 purposes deemed suitable by the Commission to be excluded

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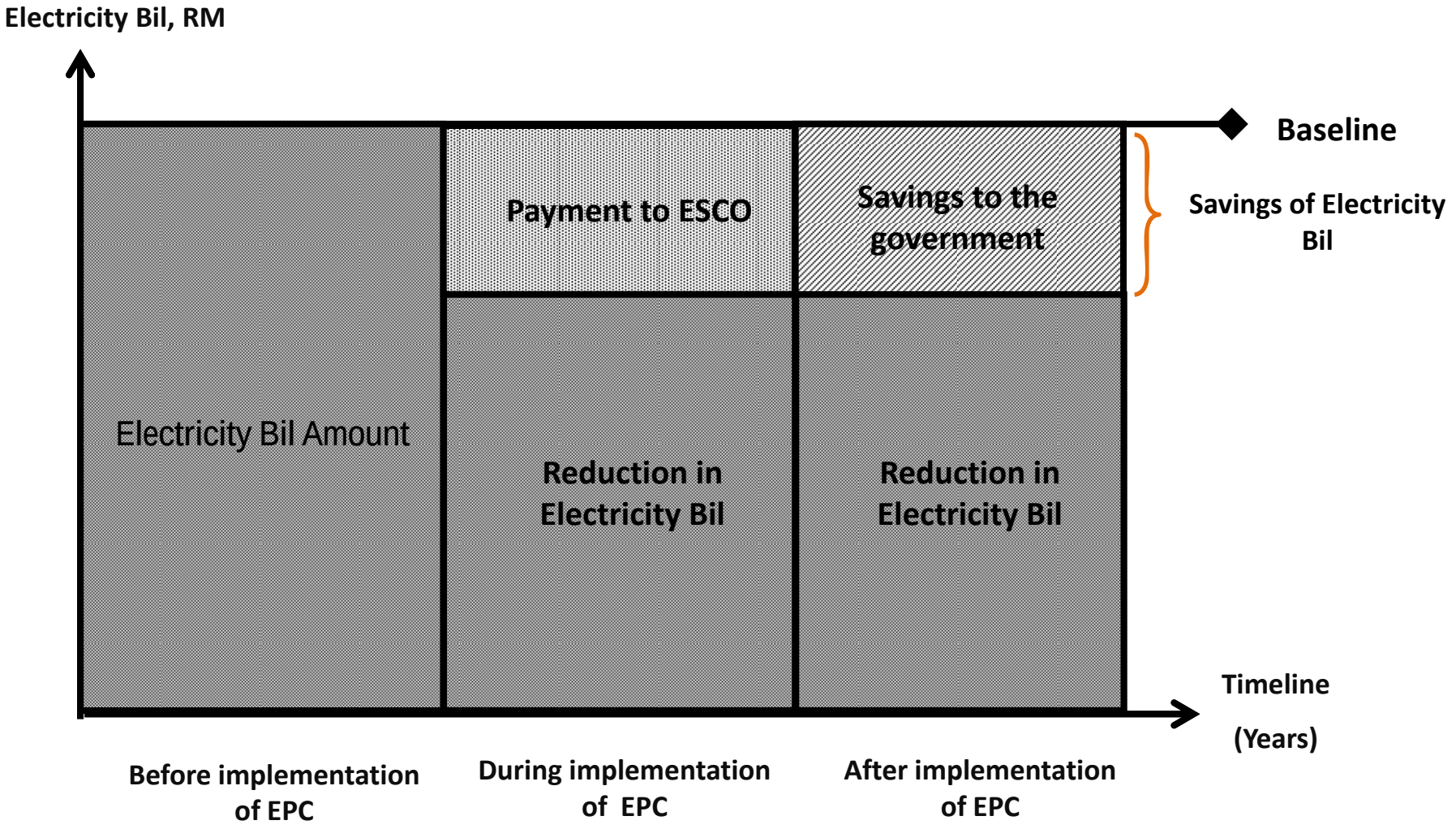
# 3. ENERGY PERFORMANCE CONTRACTING (EPC)

- 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.

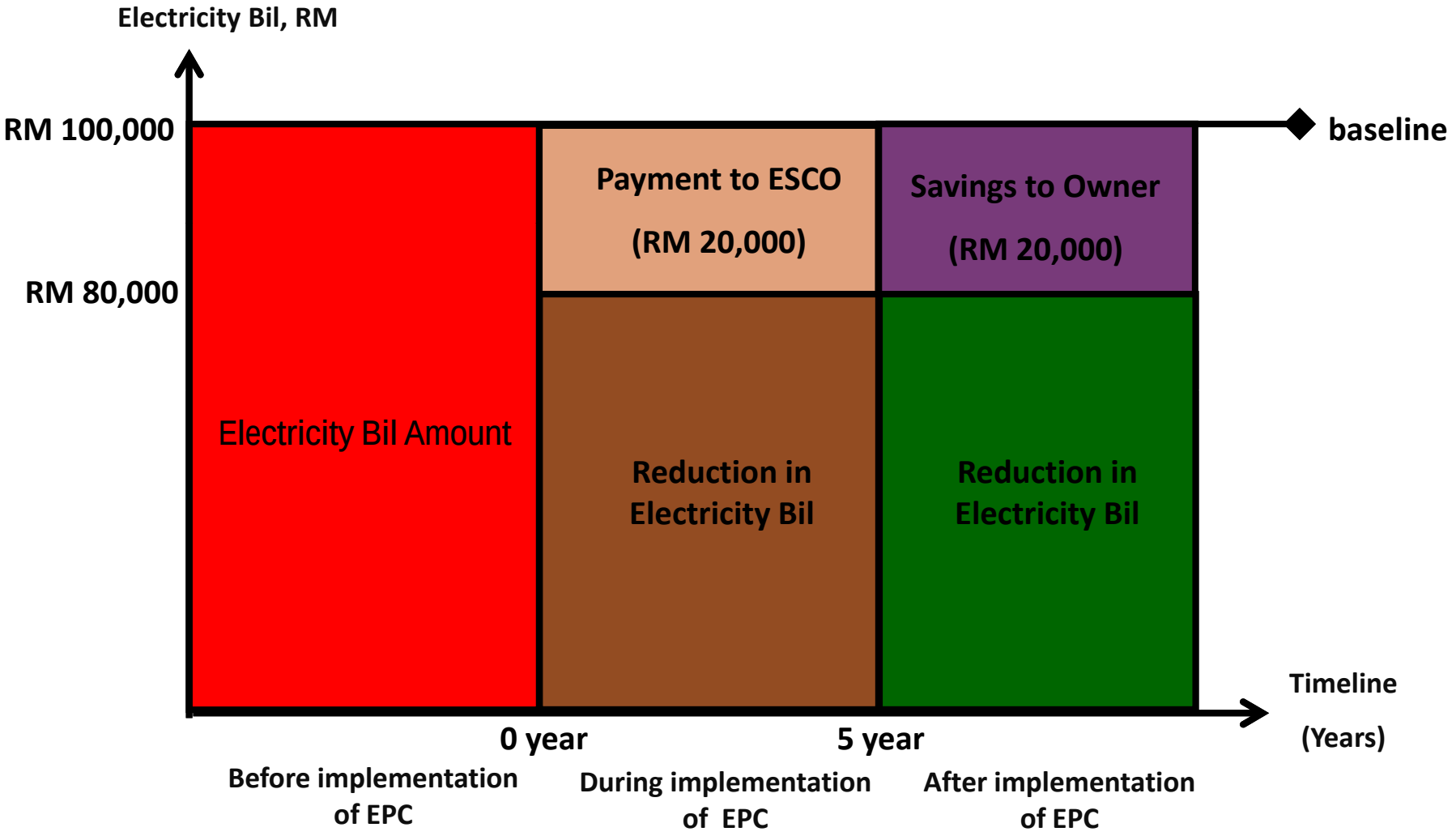
# Energy Performance Contracting (EPC) in government sector

- 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



# Example:


Electricity Bil, RM
RM 100,000
RM 80,000
baseline
Payment to ESCO
(RM 20,000)
Savings to Owner
(RM 20,000)
Electricity Bil Amount
Reduction in
Electricity Bil
Reduction in
Electricity Bil
Timeline
(Years)
0 year
5 year
Before implementation
of EPC
During implementation
of EPC
After implementation
of EPC

# Summary:

- NO UPFRONT COST to the Owner
- 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 Owner after the contract period ended

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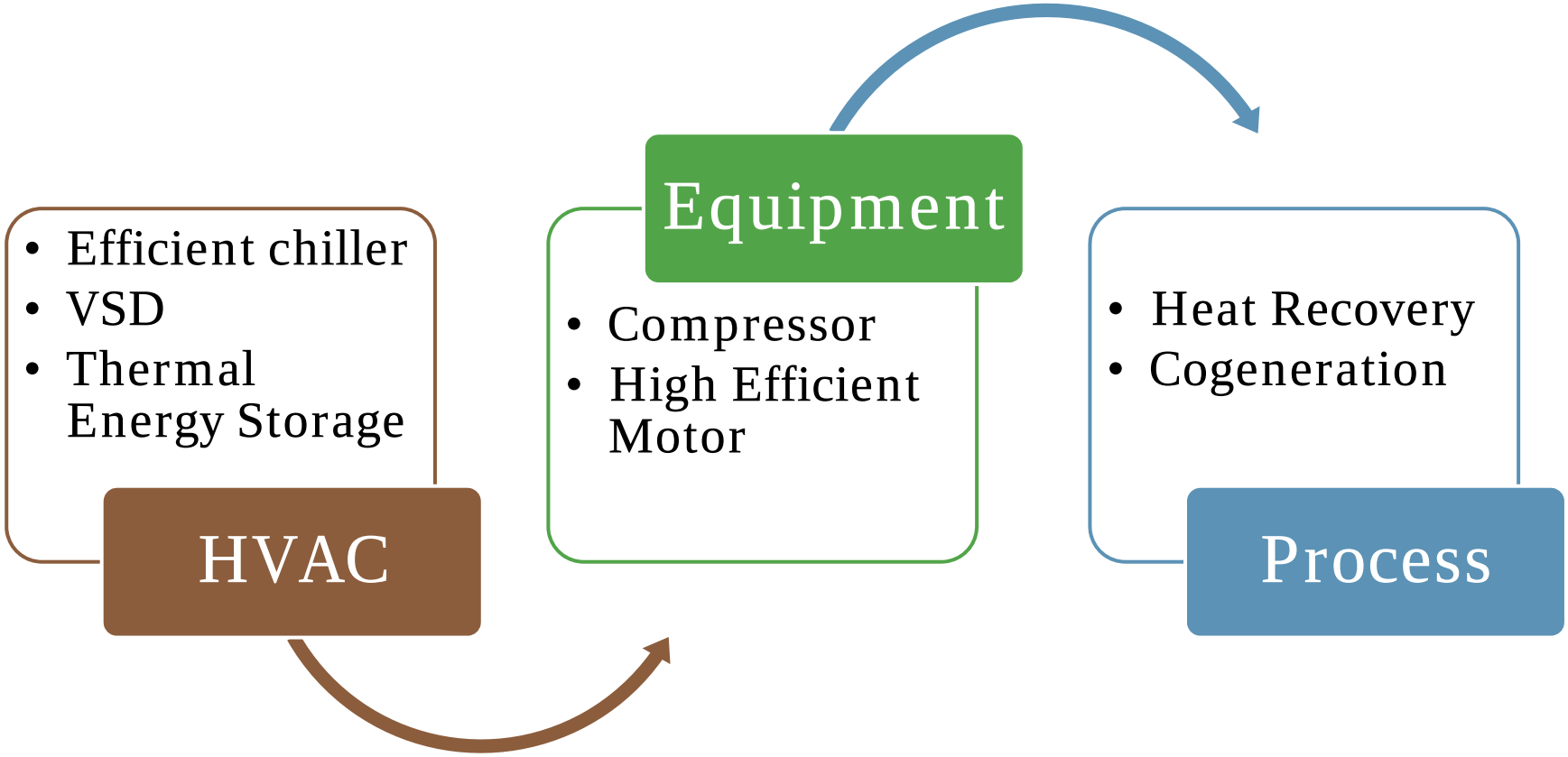
# 4. INCENTIVE FOR ENERGY EFFICIENCY PROJECT

- Since 2009, Government has offered incentives to all company who wish to embark on energy efficiency projects in their installation
- To apply to MIDA, and Energy Commission will evaluate the viability of the projects and proposed for approval
- Investment Tax Allowance, Pioneer Status, Sales Tax and Import Duty Exemption
- Valid until December 2015

# TYPE OF PROJECTS TO BE CONSIDERED



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# 5. 24 $^{O}$C POLICY IN GOVERNMENT BUILDINGS

A guideline from the Secretary General of KeTTHA has been sent to all government departments and agencies about the 24 Degree policy in government buildings.

Suruhanjaya Tenaga has been entrusted to monitor and enforce the implementation.

However, at the moment, the monitoring is focused on government buildings in Putrajaya who has participated in the Building Consumption Input System (BCIS) managed by Malaysian Green Technology Corporation (MGTC).

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# 6. MONITORING OF ENERGY USAGE IN 105 GOVERNMENT BUILDINGS

There are 105 government buildings currently subjected to the EMEER 2008. These buildings energy usage are currently being closely monitored by us using the data obtained from TNB. The analysis of these data are continuously reported to KeTTHA

A seminar on all the representatives of these 105 government buildings was conducted in 2012 to ensure that the adhere to the regulations.

Suruhanjaya Tenaga
Energy Commission

# Thank you


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