



Sustainable Energy Development Authority (SEDA) Malaysia (SEDA Malaysia)

A colorful, stylized illustration of a sustainable energy cityscape. It features various buildings, solar panels on rooftops, wind turbines, and power lines. The scene is set against a dark blue background with a few white clouds. The illustration is positioned above the main title text.

A POCKET GUIDE

Be Part Of Us For A Better Tomorrow



WHO WE ARE?



SEDA Malaysia is a statutory body formed under the Sustainable Energy Development Authority Act 2011 [Act 726].

The Authority was established on 1 September 2011 after the passing of the Sustainable Energy Development Authority Bill 2010 by the Parliament on 28th April 2011.



WHAT WE DO?



- 1 To promote the deployment of sustainable energy (SE) measures as part of the solutions towards achieving energy security and autonomy.
- 2 Shall have all the functions conferred on it under the sustainable energy laws as well as the following functions:



TO ADVISE

1. The Minister and relevant government entities on all matters relating to sustainable energy
2. Act as a focal point to assist the Minister on
 - a. Matters relating to sustainable energy
 - b. Climate change matters relating to energy



TO PROMOTE

1. The implementation of the national policy objectives for renewable energy (RE)
2. The development of sustainable energy
3. Private sector investment in sustainable energy, including to recommend to the relevant government entities initiatives relating to taxes, customs and excise duties and other fiscal incentives applicable to such investment



TO IMPLEMENT

1. The Feed-in Tariff (FiT) mechanism as well as to manage, monitor, review as well as to carry out investigations, collect records and maintain data concerning the FiT
2. Measures to promote public participation and to improve public awareness on matters relating to sustainable energy



TO CONDUCT

1. Promotion and support where the Authority deems fit on research and innovation activities relating to sustainable energy
2. Promotion and support where the Authority deems fit on trainings or other programmes relating to the development of human resources and capacity building in the sustainable energy sector



TO CARRY OUT

1. Researches, assessments, studies and advisory services, collate, analyse and publish information on the development of sustainable energy
2. Other functions conferred by or under any sustainable energy law

*Source – SEDA Act 2011 [Act 726]

Apart from RE, SEDA Malaysia is also involved with the implementation of energy efficiency and conservation programme that has been mandated by the Government and industry driven initiatives.

MECHANISM OUTSIDE FiT

NEM

Net Energy Metering

LSS

Large Scale Solar

HOW WE DO IT?

- 1 By ensuring that sustainable energy plays an important role in the nation's economic development and environment conservation
- 2 By ensuring existing sustainable energy programmes are managed prudently and efficiently
- 3 By continuously assessing new potential sustainable energy solutions in partnership with our domestic and international stakeholders to diversify and complement the existing portfolio of our existing sustainable energy programmes
- 4 By advocating the public towards accepting responsibility in a paradigm shift towards living sustainably.

NATIONAL RENEWABLE ENERGY (RE) POLICY AND ACTION PLAN

On 20th April 2010, the Cabinet approved the National RE Policy and Action Plan (NREPAP) which was developed by the Ministry of Energy, Green Technology and Water (KeTTHA). The NREPAP subsequently provided SEDA Malaysia with a guiding framework to develop the renewable energy agenda in the country. The five strategic thrusts that formed the operational measures of the Action Plan are:

THE FIVE (5) STRATEGIC THRUSTS



**Introduce Appropriate
Regulatory Framework**



**Provide Conducive
Environment for RE
Businesses**



**Intensify Human
Capital Development**



**Enhance RE
Research and
Development**



**Design and
Implement an
Advocacy Programme**





WHAT ENERGY



RENEWABLE ENERGY RESOURCES (RE)

- Unlimited
- Can be replenished to overcome usage and consumption, either through biological reproduction or other naturally recurring processes
- Price of RE is reaching competitive with non-renewable resources.

NON-RENEWABLE ENERGY RESOURCES (NRE)



- Limited
- Price is subjected to fluctuation influenced by global factors
- These resources will eventually finish
- Price is also distorted as externality costs are not internalized

IS ENERGY?



Energy is the ability to do work such as read, move, think, play, cook and etc.

ENERGY RESOURCES

RENEWABLE ENERGY



SOLAR ENERGY



WIND ENERGY



BIOMASS ENERGY



HYDROPOWER ENERGY



GEOHERMAL ENERGY



BIOGAS ENERGY

NON-RENEWABLE ENERGY

ENERGY



FOSSIL FUEL OIL



NATURAL GAS



NUCLEAR



COAL



WHAT IS

RENEWABLE ENERGY?

5 Major Types Of Renewable Energy Resources Under The Feed-in Tariff Portfolio



SOLAR ENERGY

Energy generated from the sun. The sun's light can be harnessed by PV modules and turned into electricity



BIOGAS TECHNOLOGY

Putting agricultural waste, solid municipal waste & animal waste into an anaerobic digester in order to create electricity, natural gas or fertiliser out of the gases that are produced during the degradation process of the wastes



SMALL HYDROPOWER

Harvested by turning kinetic energy from the motion of water into electricity through the use of a dynamo system



BIOMASS TECHNOLOGY

Extraction of energy by combusting organic matter to produce heat. Biomass may directly replace fossil fuel as an energy source or be used to produce biofuel



GEOTHERMAL

Taps into the earth's natural underground heat to generate electricity or for heating purposes



Energy harvested from **natural sources that are recurring and will not run out**

Solar PV System Installation – Government Buildings In Putrajaya

In line with the 2014 budget speech by the Honourable Prime Minister of Malaysia, the Ministry of Energy, Green Technology and Water (KeTTHA) has appointed SEDA Malaysia as the implementing agency for the Government Lead by Example (GLBE) Project for the installation of Solar PV Systems at selected 25 government buildings.

This project is assisted both by the Public Works Department (JKR) for the provision of building and maintenance of solar PV system and Energy Commission (ST) as the regulatory body.

The total amount of estimated energy generation from the total installed capacity for the 25 buildings are 804MWh. From a total of 670kWp PV systems currently installed, the CO₂ avoidance is estimated to be 600 tonnes per year respectively.



The 25 government buildings are shown below:

NO	MINISTRY / AGENCY	CAPACITY
1	Ministry of Energy, Green Technology & Water (KeTTHA)	48kWp
2	Ministry of Agriculture & Agro-Based Industry Malaysia	24kWp
3	Ministry of Natural Resources & Environment (NRE)	30kWp
4	Ministry of Youth & Sports (KBS)	30kWp
5	Ministry of Rural and Regional Development	24kWp
6	Ministry of Urban Wellbeing, Housing and Local Government	12kWp
7	Ministry of Women, Family and Community Development	20kWp
8	Ministry of Tourism and Culture Malaysia	30kWp
9	Ministry of Federal Territories	24kWp
10	Ministry of Domestic Trade, Co-Operatives and Consumerism (KPDNKK)	20kWp
11	Ministry of Plantation Industries and Commodities (MPIC)	20kWp
12	Ministry of Science, Technology and Innovation (MOSTI)	20kWp
13	Ministry of Health Malaysia	20kWp
14	Ministry of Education Malaysia	20kWp
15	Ministry of Finance Malaysia	42kWp
16	National Registration Department	20kWp
17	Royal Malaysian Customs Department	40kWp
18	Public Service Department	24kWp
19	Department of Islamic Development	24kWp
20	Public Works Department (Putrajaya)	20kWp
21	Legal Affairs Division (BHEUU) Prime Minister's Department	48kWp
22	National Housing Department	30kWp
23	Perbadanan Putrajaya Agency Under Ministry of Federal Territories	24kWp
24	Accountant General's Department of Malaysia	20kWp
25	Public Works Department (Blok B) Jalan Sultan Salahuddin	36kWp
TOTAL		670kWp

WHY SHOULD WE BE CONCERNED ABOUT PROMOTING

SUSTAINABLE ENERGY?



To address two key issues of **mitigating climate change** and **achieving energy security through energy autonomy**.

Climate Change, Why Is It Harmful For Us?

The ever-increasing release of greenhouse gases (GHG) due to the burning of fossil fuels comes with a price – climate change. The gases trapped within the atmosphere have a range of effects on global ecosystems – sea level rise, droughts, extreme weather events (EWE), global warming, etc. These have direct detrimental effects to humanity such as loss of life and property. This, in turn would affect the economy of affected area which acts as the indirect effect of climate change. Globally, countries have pledged their Intended Nationally Determined Contribution (INDC) at the 21st Conference of Parties (COP) in Paris at the end 2015 to reduce their carbon emissions. Malaysia intends to reduce its greenhouse gas (GHG) emissions intensity of GDP by 45% by 2030



relative to the emissions intensity of GDP in 2005. This consists of 35% on an unconditional basis and a further 10% is condition upon receipt of climate finance, technology transfer and capacity building from developed countries.

Energy Security, Why Should We Be Concerned?

If a country's energy security is secured by importing fuel that is not a true security. A true energy security is achieved via energy autonomy, such approach reduces the country's reliance on imported fuel and helps to stabilise the economy. In many countries, lessons on this have been learnt and there is an **energy transition** from relying on imported fossil fuel to renewable energy to increase their energy independence. Energy economists and analysts have concurred that the future is in electricity, specifically renewable energy, although globally, fossil fuel has not run out. For instance, research has found that we have 500 years of coal reserve, but the truth is that the earth cannot sustain another 500 years of increasing carbon concentration.



Let's Transit To Renewable Energy For Our Electricity!



1. Having an energy mix from different sources is important! So, if one fails, the other can be used to satisfy the nation's energy demand. Keep in mind that energy is being used 24/7 by domestic, commercial and industrial users alike.
2. With the advancement of technology, renewable energy technologies are being researched and developed continuously to create the most cost-beneficial technology to cater to us and to not further jeopardise our environment. It's a win-win situation for many of us.



We haven't run out of fossil fuel, **but we have run out of time to mitigate climate change**



"Without Earth, we have no plan B."

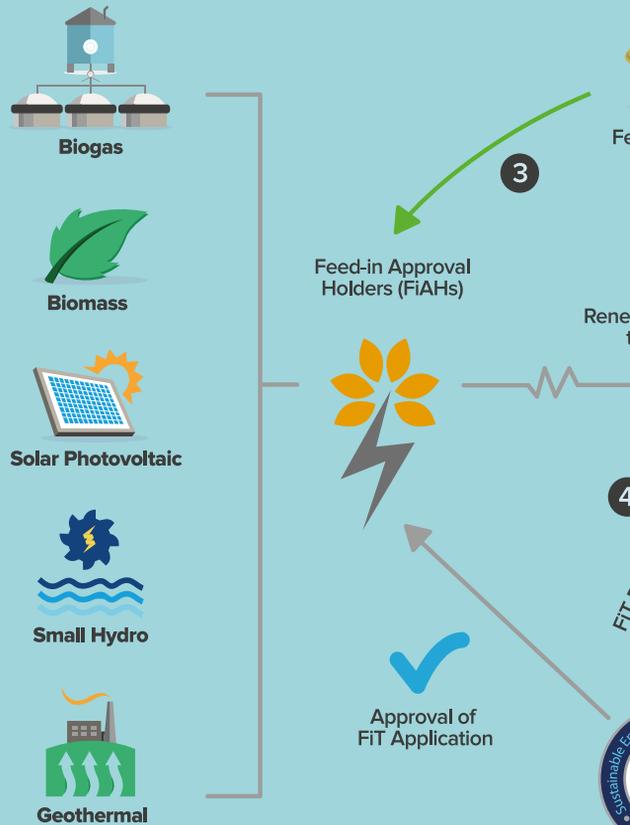


Importance of Renewable Energy

1. Environmental and Health Benefits
2. Jobs and Economy Benefits
3. Energy Security
 - a. Renewable energy (RE) promotes long term sustainable energy (SE) strategy because it will not run out while fossil fuel is finite and will deplete in the future. The use of RE will reduce reliance upon imported fossil fuels and subsequently, reduce risk of being held hostage in a geopolitical crisis
4. Accessibility
 - a. Harvesting new resources of fossil fuel is more difficult and expensive. Sometimes it is also exploiting and dangerous because we need to face challenges in order to get the resources. Renewable energy, by contrast is easier to get such as wind and sunlight because the public has free access to sunlight which enables them to produce their own energy by capturing it through the installation of solar PV systems

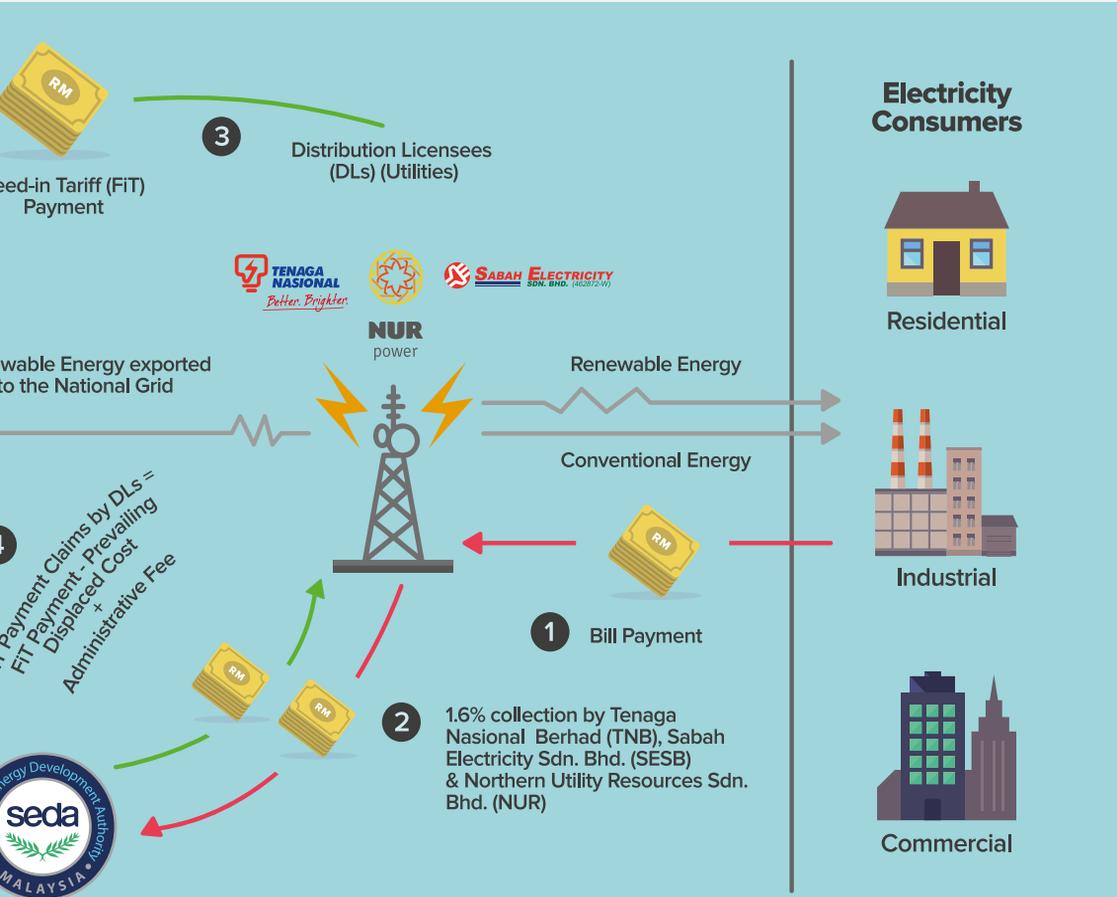
RATIONALE FOR FIT

CONCEPTUAL FRAMEWORK OF THE FEED-IN TARIFF (FiT) MECHANISM



The following criteria were considered carefully in designing an effective policy mechanism to drive the RE deployment in Malaysia:

- 1** A simple approach and does not depend on a combination of many support mechanisms
- 2** Promotes a culture of maintenance
- 3** Offers long term support and promotes domestic and foreign investment
- 4** An effective and efficient public-private partnership



ADVANTAGES OF FiT:



ECONOMIC

- a. Creates green jobs
- b. Hedges against conventional fuel price volatility
- c. RE investor security
- d. Drives economic development
- e. Creates stable condition for market growth
- f. Transparent policy structure encourages new start-ups and innovators



POLITIC

- a. Demonstrates commitment to RE deployment and growth
- b. Increases energy security and autonomy
- c. Promotes democratised form of electricity system
- d. Increases the stakeholder base supporting the RE policies

Our Achievements at the end of June 2016 (projected to 2019)

		No. of Jobs Created
BIOGAS		4,444
BIOMASS		6,507
SMALL HYDROPOWER		4,577
SOLAR PV		10,167
GEOTHERMAL		555
TOTAL		26,250



SOCIAL

- a. Fairer wealth distribution and empower citizens and communities
- b. Increases exposure to renewables and public support
- c. Encourages citizens and community engagement with various activities in protecting the climate and environment
- d. Makes RE a common part of the landscape and cityscape



ENVIRONMENT

- a. Reduces carbon emission and pollutions
- b. Energy efficiency measures
- c. Reduces the dependency on fossil fuels which is depleting from time to time

Source: Mendonca et al (2010)

RE Generation (MWh)	Installed Capacity (MW)	FITCD Capacity (MW)	CO ₂ Reduction (tonnes)	Total Investment (RM)
1,239,312.70	177.74	52.02	836,027.48	1,460,325,302.97
1,337,457.70	216.89	87.90	866,429.64	1,556,404,325.97
1,875,533.99	305.14	30.30	1,269,723.11	2,733,680,684.40
564,749.03	406.70	338.02	391,101.47	3,931,553,520.79
236,520.00	37.00	-	126,774.72	687,354,322.00
5,253,573.41	1,143.47	508.24	3,490,056.42	10,369,318,156.13

HOW FIT IS FUNDED



Who pays for FiT?

The FiT in Malaysia is not generated from tax revenues. Instead, the FiT is financed by the RE Fund which is derived by passing the FiT cost to final electricity consumers. It is applicable throughout Malaysia except for the state of Sarawak. However, the passing of the cost is limited to only 1.6% additional charge imposed on electricity bills of utilities. Domestic utility's customers who consume less than 300 kWh per month will be exempted from contributing to this RE fund.

Step 1

Electricity consumers pay electricity bills to distribution licensees (DLs) i.e. Tenaga Nasional Berhad (TNB), Sabah Electricity Sdn Bhd (SESB) & NUR Power Sdn. Bhd. (NUR)



Step 2

1.6% of additional charge imposed on electricity bills

1.6%
ADDITIONAL
CHARGE

Step 3

DLs make FiT payment to FiAHs



Step 4

Distribution licensees claim from RE Fund, the positive differential between FiT payments and the prevailing displaced cost, including administrative fee



DISPELLING THE COMMON RENEWABLE ENERGY (RE) MYTHS



RE is too expensive

During biddings in the United Arab Emirates (May, 2016) – solar is now cheaper than gas-fired power in this region, with major implications for energy strategies. According to Bloomberg New Energy Finance, “Developers bid as little as 2.99 cents a kilowatt-hour to develop 800 megawatts of solar-power projects for the Dubai Electricity & Water Authority, the utility for the Persian Gulf emirate.”

Is it possible to have high percentage of RE in the energy mix?

Denmark has set their energy mix benchmark at 100% RE by 2030. On May 8th and 15th, 2016 Germany hit a new high in renewable energy generation of 87%: nearly 90% and 100% of electricity consumed came from RE respectively. China 20% by 2030, Norway’s energy mix today is 98% RE (hydro).

RE is confined to token capacities

Global renewable energy generation capacity increased by 161 gigawatts (GW) in 2016, making the strongest year ever for new capacity additions, according to data released by the International Renewable Energy Agency (IRENA). Renewable Energy Capacity Statistics 2017, estimates that by the end of 2016 the world’s renewable generation capacity reached 2,006 GW, with solar energy showing particularly strong growth.

Energy Efficiency

The most affordable, easiest, and effective ways for us are to use less energy, reduce carbon footprint and save money on both household expenses and transportation costs are through ENERGY EFFICIENCY and ENERGY CONSERVATION.

What is Energy Efficiency?

Uses minimum / lesser energy to do a large amount of work without compromising the user's comfort, safety and quality.

What is Energy Conservation?

Refers to reducing energy consumption through using less of an energy service.

ENERGY

DEMAND MANAGEMENT



On 7th July 2011, the Ministry of Energy, Green Technology and Water (KeTTHA) Malaysia has mandated SEDA Malaysia as the implementing agency for EPP9: Improving Energy Efficiency under National Key Economic Area (NKEA) for Energy Sector. Within SEDA Malaysia, the Energy Demand Management Unit was established to manage the following programmes:

- 1 Government Lead By Example (GLBE) – 105 government buildings
- 2 SAVE Rebate Programme
- 3 Development of Energy Performance Contracting (EPC) (*Until Sept 2012*)
- 4 Assisting KeTTHA/Government on National Energy Efficiency Master Plan (2011-2012) (*Until Sept 2012*)
- 5 Assisting Government on the development of the Energy Efficiency & Conservation Act (*Until Sept 2012*)
- 6 Responsible for KeTTHA's KPI related to EE implementation
- 7 Retrofitting government buildings such as MAMPU & NRE in 2012
- 8 Provide EE facilitation, technical and advisory services
- 9 Sustainable Low Carbon Building Facilitation Programme to Local Authorities, States and Government Agencies



- 10 Low Carbon Information and Communication Technology (ICT)
- 11 RMK11 Energy Audit Conditional Grant (2016-2020)
- 12 Low Carbon Building Assessment System for EE Buildings (using CIS20 – Green PASS and UNEP-SBCI'S CCM)
- 13 Online Energy and Carbon Monitoring System

DEMONSTRATION OF ENERGY EFFICIENCY FEATURES

SEDA Malaysia is responsible in demonstrating energy efficiency features under the UNDP-BSEEP project through the award-winning SEDA's Low Energy Office in Likas Square, Kota Kinabalu, Sabah.

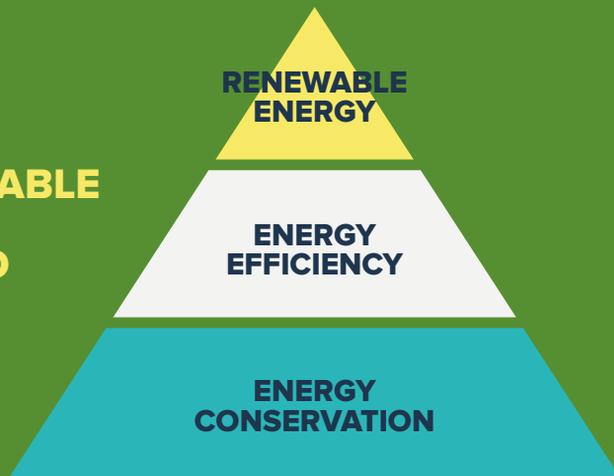
HUMAN CAPITAL DEVELOPMENT

SEDA Malaysia also involves in various facilitation projects with other ministries and local authorities as well as providing trainings on energy efficiency and energy demand management.

IMPORTANCE OF EE IN YOUR LIFE

Improving your energy efficiency and energy conservation are the first and most important steps towards adopting and complementing renewable energy. The more efficient use of energy throughout our country results in less money spent on energy by homeowners, schools, government agencies, businesses, and industries and reduces carbon emissions too!

SUSTAINABLE ENERGY PYRAMID



TOP 5 Reasons To Be Energy-Efficient



Saves money



Improves the economy



Improves national security



Good for the environment



Enhances quality of life

YOU SHOULD START WITH ENERGY EFFICIENCY!

SEDA Malaysia's Low Carbon Equation:

$$\text{LOW CARBON} = \text{SUSTAINABLE ENERGY} \times \text{OPERATIONAL CARBON FACTOR}$$

“The most practical solution to achieve low carbon programme”

SEDA

MALAYSIA'S

TRAININGS



SEDA Malaysia is the implementing agency for the development of Renewable Energy (RE) and Energy Efficiency in the country. Apart from the implementation of FiT mechanism, SEDA Malaysia recognises the importance of developing soft infrastructure to sustain the RE and EE growth in the country.

With the help of training partners such as Performance Management Delivery Unit (PEMANDU)'s Strategic Reform Initiatives (SRI), one of the six key initiatives under the Government's Economic Transformation Programme (ETP), local universities and training centres, SEDA Malaysia has embarked on a programme to build up the capacity and competency of the local workforce in the sustainable energy industry.

1. **Grid-Connected Photovoltaic (GCPV) Systems Design Course**

This 8-day course is offered to those who want to design, learn and enhance knowledge about grid-connected PV system. The objective is to ensure that the PV system is in good quality and comply with Malaysian standards.

2. **Introduction To Grid-Connected Photovoltaic (GCPV) Systems Design For Non-Engineers**

This 8-day course is now open for non-engineers or those without any technical qualification who wish to learn and understand on how grid-connected PV system works and its applications. At the end of the course, participants will have better understanding on the system itself, how it works and performs in the local climate and its applications.

3. **Grid-Connected Photovoltaic (GCPV) Systems Course For Wireman and Chargeman**

This 5-day course is structured to intensify human capital development in Malaysia RE industry especially in solar PV. One of the objectives of the course is to expose the wireman and chargeman in Malaysia with regards to solar PV installation dealing with direct current (DC) side and components.

4. **Solar PV Installation and Maintenance Course**

This 4-month training programme (2 months of theory class and 2 months of industrial/on-job training) covers methods for the installation and maintenance of Solar PV installations. In addition, the participants will be exposed on the guide and practice of occupational health and safety that is required to be emphasised by employees.

5. **Off-Grid Photovoltaic (OGPV) Systems Design Course**

This 10-day course is offered to those who want to design, learn and enhance knowledge about off-grid solar PV systems. The objective of this training is to make sure that the PV system is of good quality and comply with the Malaysian standards.



ENERGY MANAGEMENT AWARENESS, CAPACITY BUILDING & TECHNICAL TRAININGS

1. ENERGY MANAGEMENT IN BUILDING

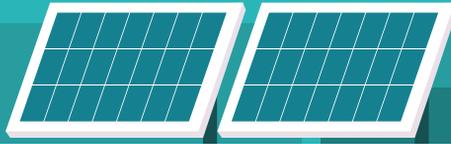
To increase understanding of residents and facility managers on energy management in buildings as well as to provide platform among public and private sectors to be involved in energy efficiency and energy management in buildings.

3. PRINCIPAL & APPLICATION IN COMPLIANCE TO MS1525

The main focus of this training is to foster interest and build awareness level among the building designers, builders, contractors and building operators on climate change, energy and environmental issues.

2. ENERGY EFFICIENT MANAGEMENT IN AIR-CONDITIONING AND MECHANICAL VENTILATION (ACMV) SYSTEM

The objective of this training is to increase awareness on energy efficiency practices and saving measures in building ACMV system for building operators.



4. ENERGY AUDIT IN BUILDING

This training aims to raise the level of understanding and auditing skills of energy management to a more comprehensive and detailed information for the auditor or competent professionals in the building sector and industry.

5. FACILITATION ON SUSTAINABLE LOW CARBON BUILDING PROGRAMME

Developed based on a series of R&D, pilot projects, studies and continuous actual building performance monitoring since 2002. The Sustainable Low Carbon Building Performance mostly refers to the technology, applications and management that have impact to the energy and environment related to building operation and service.

- a. Design : Sustainable energy (energy efficiency and renewable energy)
- b. Office appliances
- c. Operation: Energy and environment management in the operation and maintenance (O&M)
- d. Other renovation/retrofits:
 - i. Paper and water recycling
 - ii. Indoor air quality
 - iii. Solid waste management/separation
- e. End user awareness

For more information on trainings please visit SEDA Malaysia's website at www.seda.gov.my



INTERNATIONAL SUSTAINABLE ENERGY SUMMIT (ISES)



The International Sustainable Energy Summit (ISES) is organised by SEDA Malaysia in partial fulfilment of Strategic Thrust 5; the inaugural summit began in 2012 and it is held on biennial basis. In 2016, the ISES was given an official logo.





Rationale behind ISES official logo

- Just about all the energy we use comes from the sun; the sun is a star.
- 13 stars represent 13 states of Malaysia.
- 13 stars lined up in crescent shape – inspired by Jalur Gemilang (the Malaysian flag) – symbolic of integration of sustainable energy into the national agenda.
- The increasing size of the stars depicts that ISES shall grow from strength to strength in coming years.
- The crescent also represents the letter ‘C’ which has embedded messages on climate change mitigation measures, carbon reduction and clean energy generation.
- The circular nature of the crescent denotes the globe; there is the element of convergence of local and international knowledge in the symbol.
- The blue colour indicates authority – the ISES is an authorised platform (by SEDA Malaysia) in knowledge sharing in fulfilment of the Strategic Thrust 5 under the National Renewable Energy Policy and Action Plan.
- White colour depicts clean, and clean energy messages (via Renewable Energy & Energy Efficiency) shall take centre stage in all ISES platforms.



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