Towards A World-Class Energy Sector

# Energy Malaysia

Suruhanjaya Tenaga
Energy Commission

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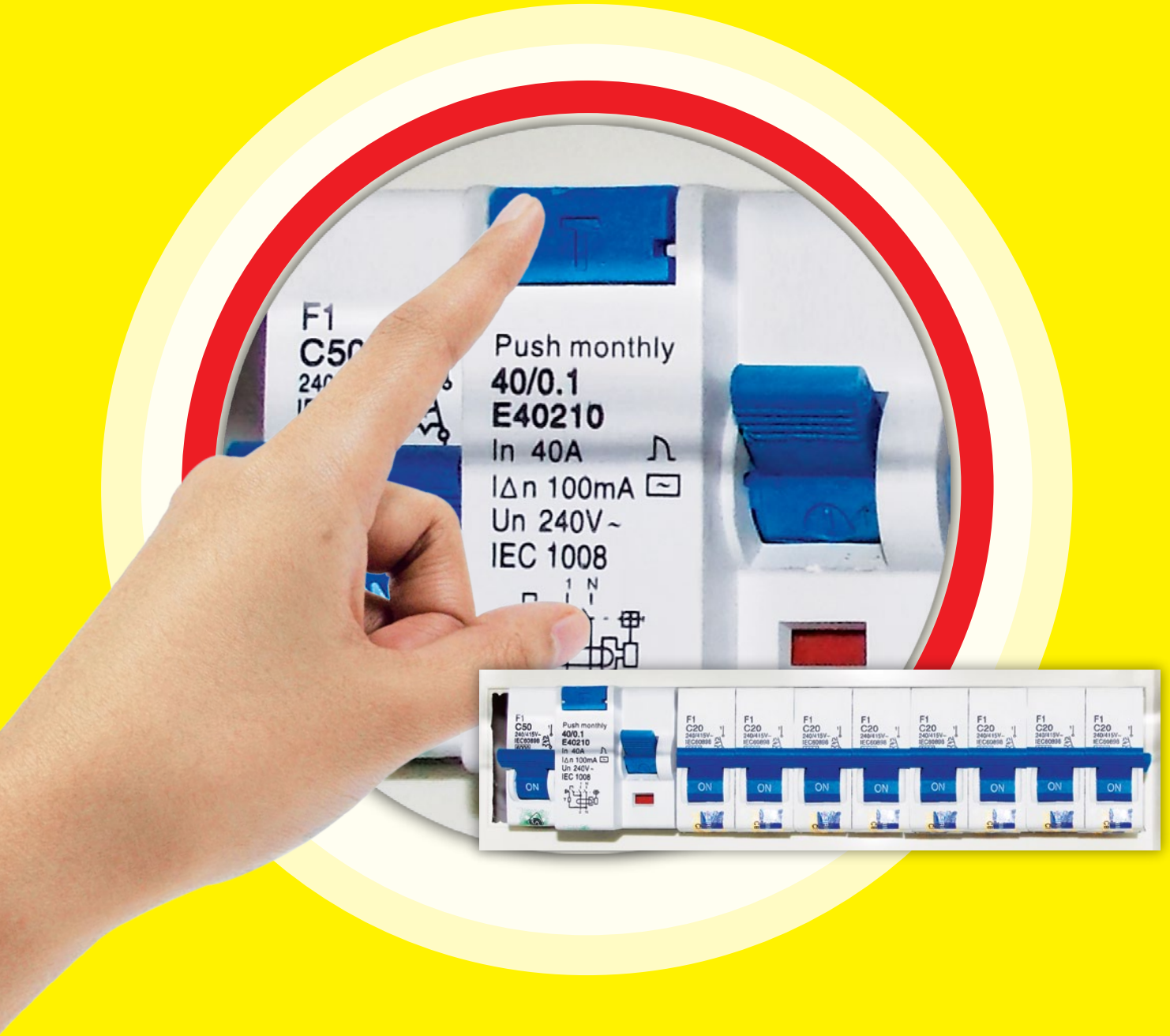


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# State of Safety

## Strengthening Electrical Protection Initiatives

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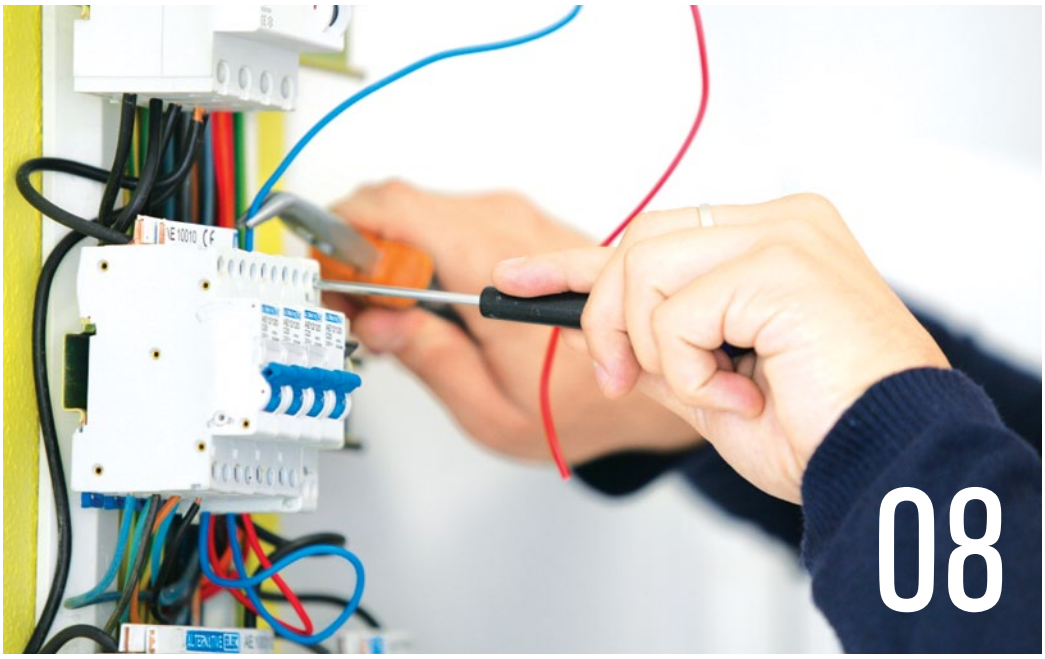





## COVER STORY




## FEATURES





Towards A World-Class Energy Sector

Energy Malaysia

Suruhanjaya Tenaga Energy Commission





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# Collective Responsibility

The use of electricity always comes with an element of risk. This is a risk we have to accept in order to enjoy its benefits, as electricity is crucial to national economic development. However, accepting risks does not mean that we become lackadaisical about safety. It means that we acknowledge that they exist and we work towards mitigating them.

One of the key functions of the Energy Commission is to "protect the industry, consumers and public from dangers arising from the generation, transmission, distribution, supply and use of electricity." Therefore, it has been our continuous effort to ensure that safety measures and standard of practices are checked and adhered to.

For example, since 2010, all our regional offices have a checklist of safety standards and procedures that have enabled them to better monitor electricity safety standards in their regions.

Another initiative is the introduction of inbuilt Residual Current Devices (RCDs) in water heaters. One of the largest causes of domestic electrical accidents in the country comes from the use of faulty wiring system of water heaters. As such, measures have been introduced to address this, including the mandatory testing and labelling of water heaters, as well as the installation of RCDs to stop current leaks.

We have also developed the *Non-Domestic Electrical Installation Safety Code*, which will require commercial and industrial installation operators to create an electrical safety management programme. This is part of the *Electricity Supply (Amendment) Act 2015*, and gives more authority to the Energy Commission to act against those who do not comply with electricity safety regulations.

It is imperative that we enhance electrical safety as energy demand and therefore electricity consumption has been rising. On one hand, this should be welcomed being a sign of economic health. On the other hand, the higher the demand for energy, the more it is invariably being supported by a more extensive network to serve a growing number of population and service personnel.

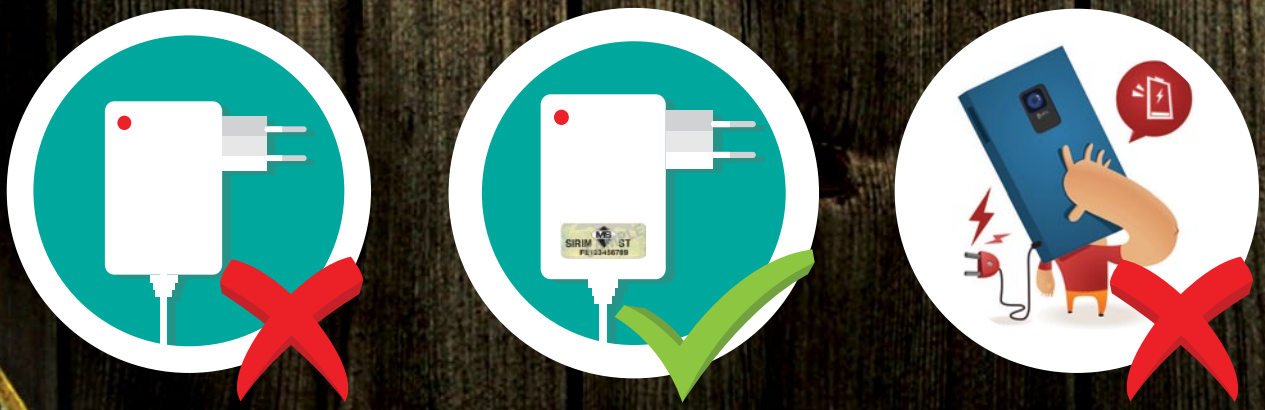
Ultimately, everyone – from regulators to industry stakeholders to private individuals – have a role to play in ensuring and enhancing electrical safety. This is our collective responsibility, and we always think and make safety a way of life, too. EM

**Dato' Abdul Razak Abdul Majid**
*Energy Commission, Malaysia*

# The Dangers Of Uncertified Electronic Goods

## Don't Let Your Gadgets Turn On You!

**Recent incidents of phones and other gadgets electrocuting and harming users has sent shockwaves throughout the country, compelling investigations into the manufacture and sale of unofficial electronic items.**



**To avoid becoming another infamous statistic, users are encouraged to use authentic chargers that are produced in the factories of the manufacturers, as consumers can now verify the safety of the device through its proper certification.**

**Factory makers, distributors, importers and sellers of these products are to only sell chargers with the label of SIRIM-ST and hand phones that have been certified SKMM – these gadgets are ensured to accurately follow the safety guidelines set out by the Energy Commission.**

**Users are advised to always refer to safety guidelines and procedures in the user manual that accompanies the phone charger, as these prove it is authentic and distributed from the factory.**

**Be warned not to use your phone while it is charging as it can cause damage to the charger that can cause an electrical short circuit within the cables and can result in electrocuting the consumer.**

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# Green Mosques

Morocco is pushing to create 'green' mosques across the country with LED lighting, solar thermal water heaters and photovoltaic systems installed in 100 mosques by the end of this year, and 600 green mosques by 2019. The initiative comes ahead of the country's November hosting of the COP22 climate summit to discuss preparations for implementing the Paris climate agreement.

The country has long established itself as a regional leader in high-profile sustainable energy initiatives, with projects such as Africa's largest windfarm and one of the continent's largest solar power plants sited in the Sahara Desert. The Morocco Ministry of Islamic Affairs is providing a 70% initial cost in collaboration with the German government.

The 'green mosque' project is expected to utilise technologies already in existence and can easily be adapted to public buildings and residential homes. The project's energy service contract model allows contractors to be paid by the energy savings generated from the clean power systems they install. With a 40% cut in electricity usage expected from the green renovation, the payment could be significant.

Jan-Christophe Kuntze, the project's chief pointed out that by training electricians, technicians and auditors, Morocco can direct its clean energy along the path laid out by Germany's *Energiewende* (Energy Transition). "The good thing about this project is that the Moroccan government came up with the idea themselves. It is something new and really innovative and it has not been tried anywhere else before, to my knowledge," he said. EM

***Top left:*** *The US$9 billion Noor Concentrated Solar Power (CSP) plant (one of the world's largest) in Morocco entered operation this year, and is expected to reduce carbon emissions by 760,000 tons annually.*

***Left:*** *Morocco's 'green mosque' project will start with mosques in the urban areas (with 100 expected to covered this year) before spreading across the country.*

# Green Technology Platform


***Above:*** *Dato' Seri Ir. Dr. Zaini Ujang, Secretary-General of the Ministry of Energy, Green Technology and Water (KeTTHA) during his speech at IGEM 2016 noted that Net Energy Metering will allow more building owners to generate electricity for solar PV and use it internally.*

From 5-8 October, delegates from around the world gathered at the Kuala Lumpur Convention Centre (KLCC) for the annual International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM). With the theme 'Green Business for Sustainability', IGEM 2016 aimed to enhance Malaysia's position as a green technology hub in the ASEAN region focusing on five key areas: Green Energy, Green Transport, Green Building, Waste Technology and Management, and Clean Water Technology and Management.

IGEM 2016 was organised by the Ministry of Energy, Green Technology and Water (KeTTHA) and co-organised by Malaysian Green Technology Corporation (GreenTech Malaysia). With an estimated 350 exhibitors from over 30 countries, the event is ASEAN's largest green technology business and innovation platform to promote the growth of the green technology sector. A number of concurrent conferences and meetings were also held alongside the exhibition to encourage attendees to network and explore new business options.

For the first time since it was first initiated in 2010, IGEM 2016 featured a dedicated Solar Energy Zone and a Green Car Pavilion in recognition of growing demand and increasing potential in the renewable energy and sustainable vehicle sectors. The Malaysian Photovoltaic Industry Association (MPIA) and Asian Photovoltaic Industry Association (APVIA) led the Solar Energy Zone as part of the Green Energy pillar, while a range of energy-efficient vehicles including electric vehicles and charging infrastructure were exhibited in the Green Car Pavilion. EM

*An artist impression of the planned Irrawaddy hydro power pilot project in Myanmar as the country turns its focus on increasing the contribution of hydro power to the country's energy mix.*

# Leaning on Hydro

Myanmar plans to overhaul its long-term power strategy and increase the share of hydropower in the country's energy mix. According to the ASEAN country's Ministry of Electricity and Energy, its initial plan was to enhance the share of coal from 3% currently to a one-third share by the end of the next decade, while reducing the contribution of hydropower from 63% to 38%.

However, the public was reluctant to implement coal-fired plants projects. Aung Ko Ko, Director of the Hydro and Renewable Energy Planning branch at the ministry, noted that "That's why we won't be able to implement the planned coal power plant projects. Hopefully hydropower will be the majority in the new plan." He estimated that the share of hydropower in the energy mix could reach 55% by 2031 and imports of liquefied natural gas (LNG) could make up for some of the decline in coal use.

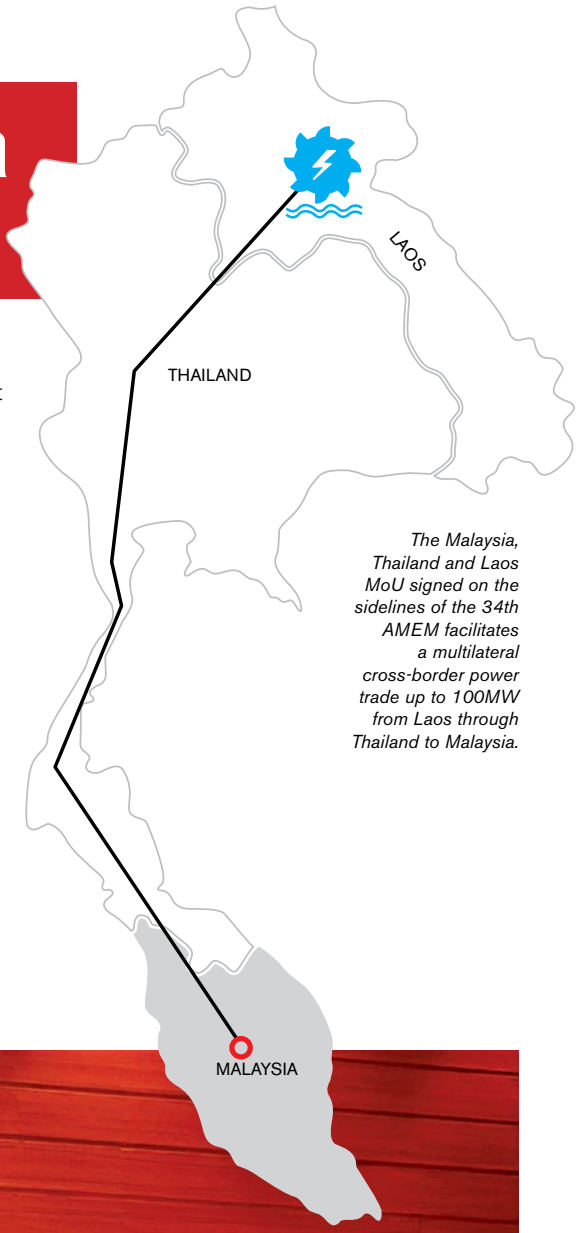
Plans are underway by nine ministries in the country including energy, industry and mining to coordinate their energy strategy and create a master plan draft. The Myanmar government is also reviewing 49 hydropower projects approved by the previous government to determine how quickly they can be completed, how many additional hydropower projects would be needed and securing funds from international lending facilities like the Asian Development Bank (ADB). EM

# Laos-Thailand-Malaysia Power Deal

Malaysia and Laos have signed a memorandum of understanding (MoU) for the implementation of a multilateral cross-border power trade, that will allow Malaysia to purchase up to 100MW of hydro power from Laos transmitted through Thailand by 2018. The MoU was signed on the sidelines of the 34th Asean Ministers on Energy Meeting in Nay Pyi Taw, Myanmar on 21 September 2016.

In a statement, Datuk Seri Panglima Dr. Maximus Johnity Ongkili, Minister of Energy, Green Technology and Water noted that the initial capacity of 100MW could be increased in the future, and "would positively balance our fuel mix to be more environment friendly." Malaysia's fuel mix is currently dominated by coal and gas, and the government is keen to increase its share of renewable energy in line with its commitment in the Paris Agreement in December 2015.

Datuk Seri Maximus pointed out that MoU is part of the initial phase of the ASEAN Power Grid initiative, a flagship project under the ASEAN Vision 2020 aimed at strengthening energy security in the region through a multi-network of connections between member countries. He also expressed his expectations that the agreement will pave the way for other multilateral power trading projects. EM

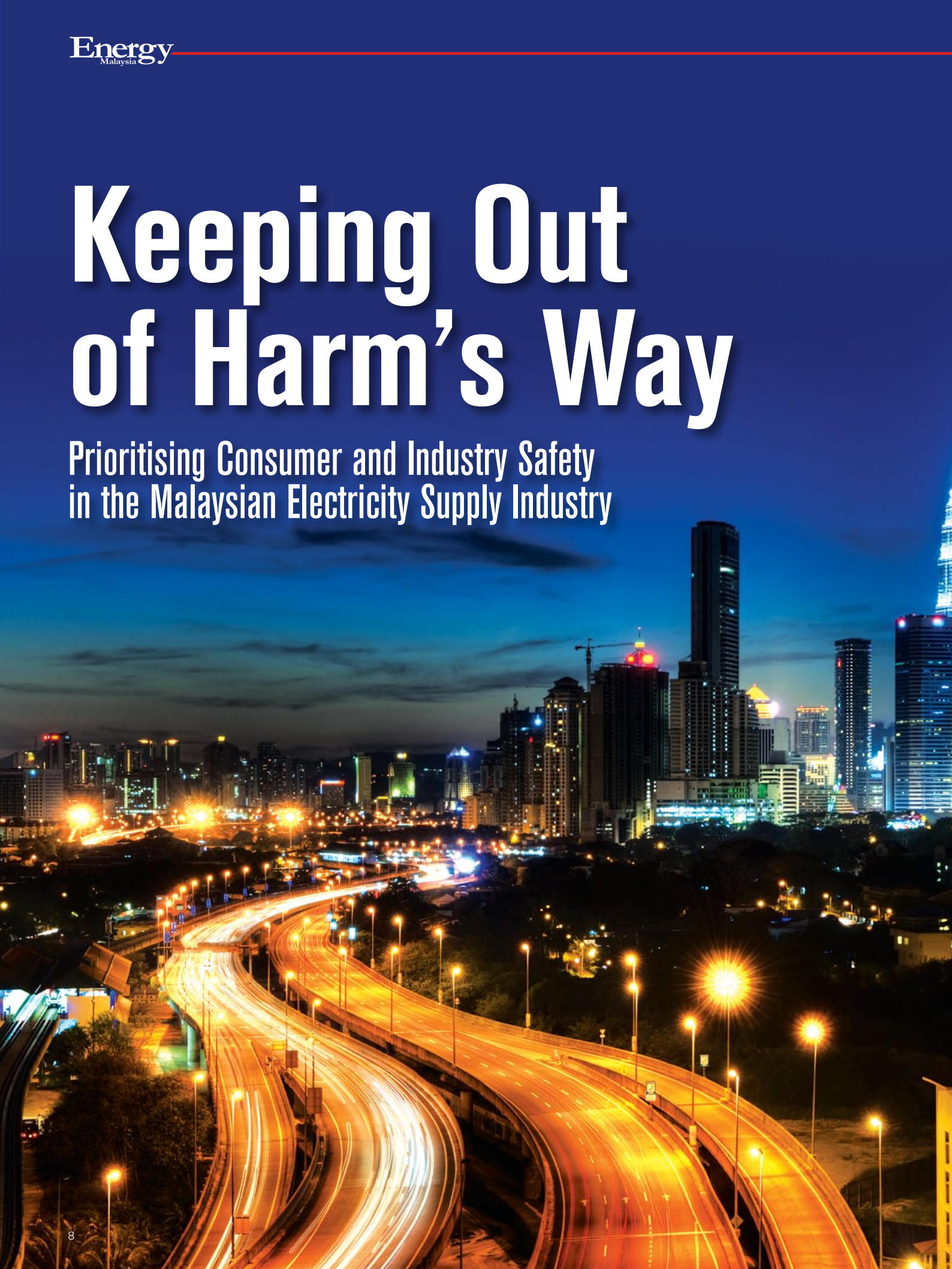



*The Malaysia, Thailand and Laos MoU signed on the sidelines of the 34th AMEM facilitates a multilateral cross-border power trade up to 100MW from Laos through Thailand to Malaysia.*


*National delegates at the 34th ASEAN Ministers on Energy Meetings (34th AMEM) Nay Pyi Taw, Myanmar.*

# Keeping Out of Harm's Way

## Prioritising Consumer and Industry Safety in the Malaysian Electricity Supply Industry

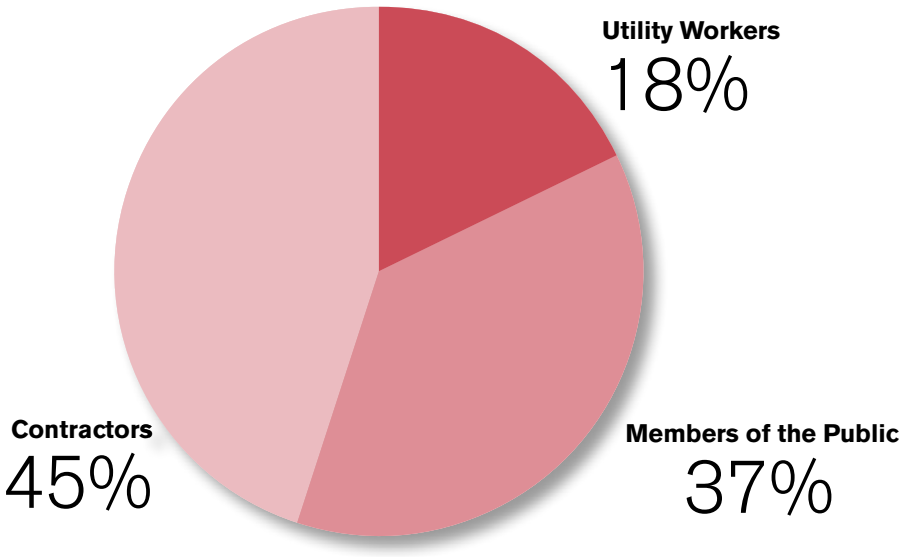


Among the functions of the Energy Commission is protecting the "industry, consumers and the public from dangers in the generation, transmission, distribution, supply and use of electricity and the distribution, supply and use of piped gas." To this end, ***Energy Malaysia*** looks into the information, training and supervision on the best electrical safety practices that is regularly implemented in Malaysia.

One of the ways that the industry and public safety is improved through capacity building—one of four strategic approaches by the Energy Commission to minimise electrical accidents and increase safety. The other three strategic approaches are Audit and Enforcement, Strengthening Legal Provisions, and Promotion and Education.

According to Mohd Elmi Anas, Director of the Energy Commission's Department of Electrical Safety Regulations, "The Commission, in collaboration with industry experts, is implementing a more focused and structured training and development programme, especially in the areas of electricity hazard identification, risk evaluation and control, electrical safety audit, competency assessment, accident root cause analysis, effective communication and performance-based regulation."

## Individuals Involved in Accidents, 2002 - September 2016



"[We] collaborate with industry experts to implement a more focused and structured training and development programme, especially in the areas of electricity hazard identification, risk evaluation and control."

**– Mohd Elmi Anas**
Director of Electrical Safety Regulation Department,
Energy Commission

**New Codes**

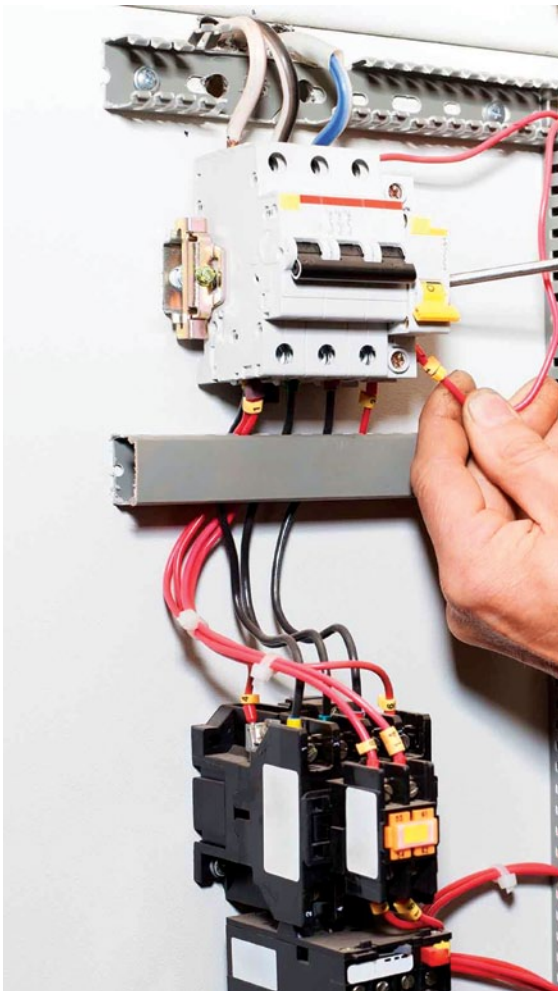
More than capacity building, a number of efforts were taken to increase safety and reduce incidents of electrical accidents across the country. These include the *Non-Domestic Electrical Installation Code* and *the Electrical Infrastructure Safety Code*. These codes concentrate on electrical safety and we are working with industry partners and players to enhance safety.

Both codes are issued by the Energy Commission under Section 50A of the *Electricity Supply (Amendment) Act 2015* encompassing safety requirements. This includes appropriate safety and technical standards, operations, maintenance and protection of the electrical systems, and other issues related to non-domestic electrical and electrical infrastructure installations.

**Building Awareness**

The Act makes it mandatory for electrical installations to have a safety management programme or plan with requirements indicated in the Act or in either Code. This is part of the Audit and Enforcement initiative.

Mohd Elmi emphasised the importance of the Energy Commission's input in enhancing legal provisions (which also includes amendments to the Act) with the inclusion of a statutory regulation in the Electricity Regulations 1994. The requirement covers protection against earth leakage current in wet areas in the final sub-circuit for devices with rated sensitivities of up to 10 milliamps (mA).



*Improper installation of electrical equipment is one of the major causes of accidents. Trained and certified professionals should be hired and should follow required safety and installation procedures.*

## INITIATIVES TO INCREASE THE LEVEL OF ELECTRICAL SAFETY

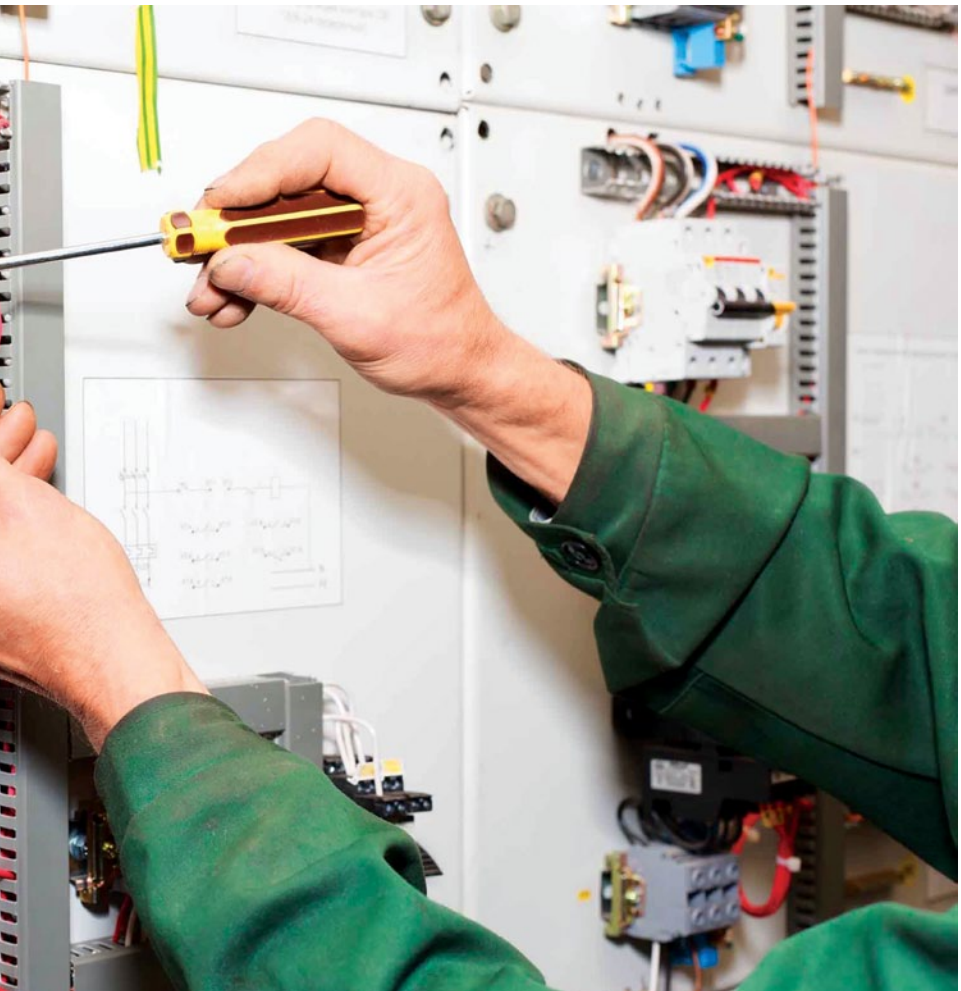
### Intensifying Promotional Activities and Education
- Increasing general awareness with conferences, seminars and exhibitions encompassing the theme Be Energy Smart
- Cooperating with third party agencies, such as in the case with TEEAM, where users are taught to test the residual current circuit breaker (RCCB) at their homes at least once a month

### Performing Audits and Enforcement Activities
- Carrying out safety management audits on electrical installations
- Increasing checks on sales and distribution premises
- Issuing warning notices, seizing equipment and issuing out compounds for non-compliance
- Creating benchmarks and targets for electrical safety performance, and monitoring it thereafter

### Raising Internal Capacity and Competency Levels
- Working with industry experts to increase the skills of the Energy Commission's officers, specifically in the areas of risk management, audit methodology, competency evaluation, investigative and analytical techniques, legal processes and effective communications

### Improving Legal Frameworks
- Stressing on the need to install non-conductive hoses to instant water heaters in the Malaysian Standard MS 1597-2-35-2010
- Stressing on the need to install an isolation barrier for storage water heaters in the Malaysian Standard MS 1597-2-35-2015
- Developing practice and guideline for the design, installation, inspection, testing and maintenance of electrical water heater systems and high-risk location wiring

*Source: Energy Commission*



He also pointed out a revision to the *Malaysian Standard MS 1597-2-35* to enforce the addition of a built-in Residual Current Device (RCD) in instantaneous water heaters. Another change is the amendment to the *Malaysian Standard MS 1597-2-21* which requires storage water heater to be installed with an 'isolation barrier' at the water inlet/outlet of the heater to reduce the magnitude of leakage current if a short circuit occurs.

"To improve customer awareness and practice, we conduct regular electrical safety awareness programmes about current safety issues to these targeted groups through seminars, workshops, exhibitions, road shows and on-site briefings for workers," Mohd Elmi said. The Energy Commission also distributes brochures, posters, booklets and reports as part of its Promotion and Education strategy.

### Slippery Challenges

The main causes of electrical accidents are improper installation or maintenance of electrical equipment. These include installing the wrong rating of protective device in the wiring system, non-performance of scheduled maintenance, failure of safety protection systems and faults caused by repairs performed by non-skilled persons.

Home owners and residents are encouraged to conduct monthly checks on the RCCB buttons in their homes. "A simple push of the button and people would know whether their device is safe to use—at which point they can restore electricity—or not, which means they need to call a certified electrical contractor to repair or replace the RCCB," Mohd Elmi explained.

Another initiative of the Energy Commission includes the Guidelines for the Design, Installation, Inspection, Testing and Maintenance of Water Heater System which is currently at its final stages of fine tuning. The Energy Commission has been engaging stakeholders, suppliers, contractors and consultants, as well as standards testing laboratories to create an effective code to ensure safe water heater installation and maintenance.

Guidelines on electrical wiring are also being developed for high risk areas such as water fountains and swimming pools. Current leakage in such situations can be extremely dangerous for the public, hence the need to have proper documentation in place outlining best practices.

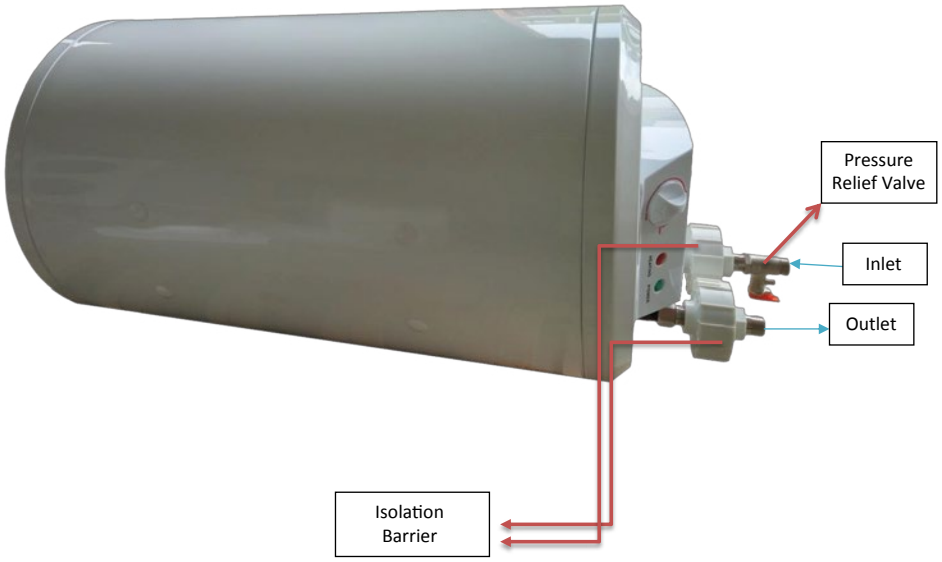
### Bigger Issues

Non-domestic and licensee installation owners and operators are targeted more by the Commission, because between 2002 and September 2016, the highest number of electrical accidents and electrocutions have

## Electrical Accidents by State, 2002 - 30 September 2016

| State | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Perlis** | 1 | 0 | 3 | 3 | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 3 | 1 | 0 | 2 | **17** |
| **Kedah** | 2 | 6 | 5 | 14 | 20 | 3 | 8 | 4 | 3 | 2 | 4 | 2 | 4 | 3 | 1 | **82** |
| **P. Pinang** | 6 | 9 | 9 | 6 | 12 | 9 | 7 | 1 | 9 | 6 | 4 | 1 | 1 | 0 | 3 | **88** |
| **Perak** | 8 | 12 | 6 | 7 | 3 | 7 | 4 | 3 | 4 | 8 | 5 | 5 | 7 | 8 | 4 | **84** |
| **Kelantan** | 1 | 2 | 3 | 4 | 4 | 2 | 4 | 4 | 6 | 1 | 5 | 2 | 18 | 1 | 1 | **59** |
| **Terengganu** | 0 | 1 | 2 | 2 | 2 | 6 | 4 | 6 | 4 | 0 | 3 | 6 | 3 | 2 | 0 | **45** |
| **Pahang** | 5 | 7 | 4 | 5 | 7 | 4 | 5 | 1 | 7 | 5 | 3 | 5 | 5 | 6 | 2 | **70** |
| **Selangor** | 1 | 2 | 1 | 4 | 10 | 8 | 9 | 7 | 19 | 1 | 2 | 4 | 4 | 6 | 7 | **96** |
| **Federal Territories** | 0 | 4 | 2 | 2 | 3 | 2 | 2 | 6 | 3 | 0 | 3 | 2 | 2 | 0 | 1 | **35** |
| **N. Sembilan** | 1 | 2 | 0 | 0 | 0 | 3 | 1 | 0 | 3 | 1 | 4 | 3 | 1 | 2 | 3 | **27** |
| **Melaka** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 6 | 2 | 0 | 2 | 0 | 4 | 3 | 0 | **22** |
| **Johor** | 4 | 3 | 3 | 1 | 10 | 13 | 10 | 6 | 3 | 4 | 5 | 0 | 4 | 5 | 4 | **76** |
| **Sabah** | 2 | 4 | 9 | 9 | 7 | 18 | 13 | 11 | 5 | 2 | 15 | 13 | 9 | 12 | 14 | **152** |
| **Total** | **31** | **52** | **48** | **57** | **79** | **75** | **70** | **56** | **69** | **62** | **55** | **46** | **63** | **48** | **42** | **853** |

*Source: Energy Commission*




With the latest amendment to the safety standards of storage water heaters, an 'isolation barrier' is required to be installed at the water inlet/outlet of the heater.

been due to poor maintenance of installations with 35.5% (303). The second and third major causes are non-compliance to safe working procedures, dangerous activities near installations and public encroachment with 30.1% (259), 11.4% (97) and 10.7% (91) respectively.

The leading location for electrical accidents were also on non-domestic installations. The top site of accidents between 2002 and September 2016 was utility substations, followed by utility low voltage overhead lines and utility high voltage overhead lines.

This is because the persons who worked at the installations do not follow recommended safety procedures such as wearing safety gear, no safety mat and low maintenance of substations, with many instances of overgrown trees around and outside the installations. Mohd Elmi noted that the Energy Commission is working very closely with the licensees to ensure that they comply with safety measures.

These measures include creating a book titled *Switching Procedures* for utilities, licensees, competent persons and electrical industry players to provide them with knowledge on the best ways to implement proper switching safely. "It is extremely important that the utilities follow safety procedures in their electrical installations as that is one of the major causes of accidents," Mohd Elmi explained.

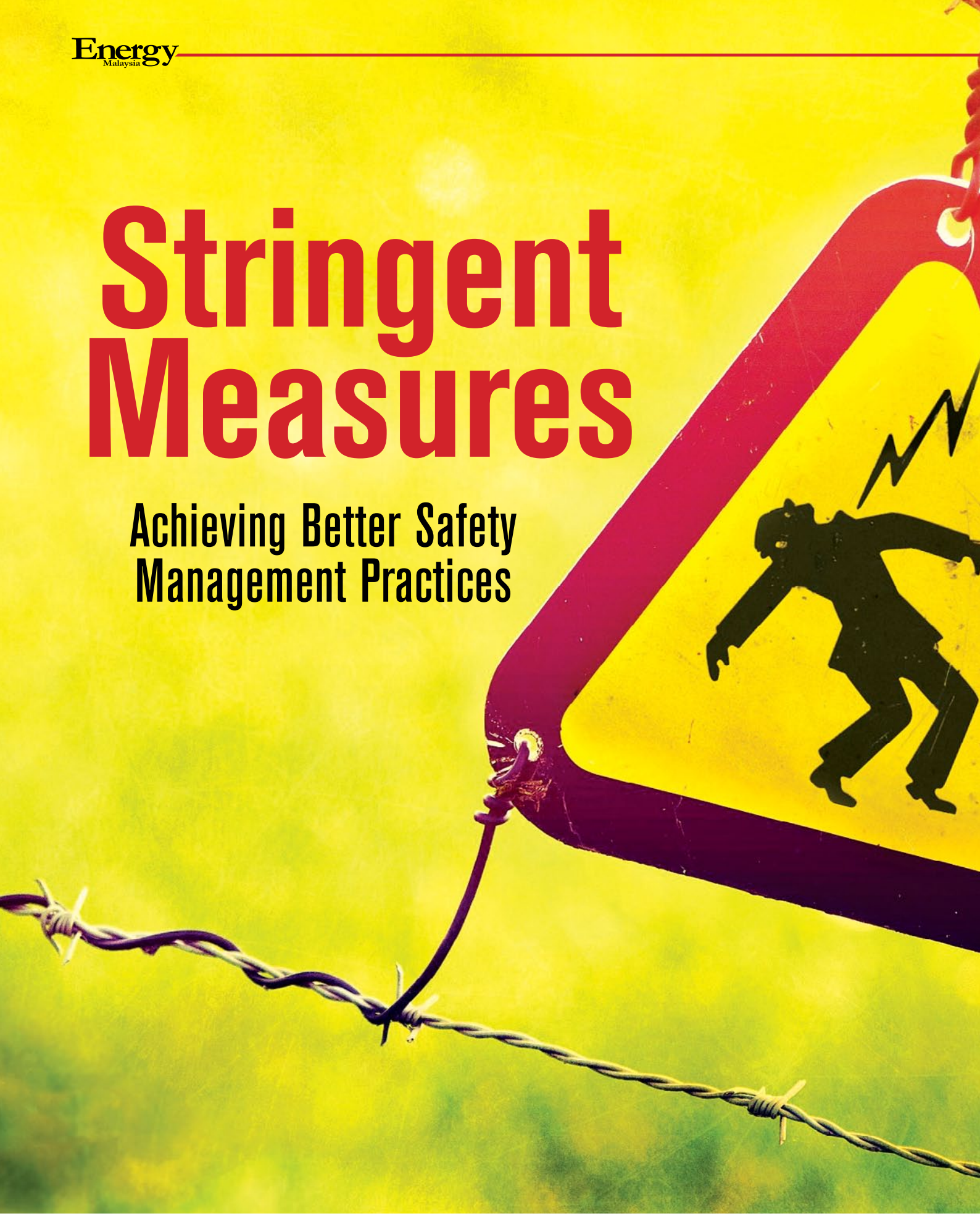
The Energy Commission also conducts annual electricity safety audits on the site of utilities and licensee. "During the audit, we check if they comply with safety procedures, regulations and if their practice is according to the required standards," noted Mohd Elmi. After the audit, a report is created that indicates the areas where the installation needs to improve on to enhance safety and what they need to do, with follow-ups by the Commission.

In addition, installation operators need to engage visiting engineers, with the frequency of visits depending on the voltage level of the installation. The engineers check the installations for best practices and compliance with safety regulations, as well as defective systems that could lead to accidents, and create a report that is sent to the Energy Commission and the installation owners.

Safety management is a crucial part of the Malaysian electricity industry, and new codes of practice, legislations, regulations are regularly being introduced, while amendments and revisions are made to older ones to ensure their effectiveness in the safety of consumers and the industry. So far, efforts to minimise accidents have been mostly effective as the rate of electrical incidents have declined significantly over the last decade. EM

# Stringent Measures

## Achieving Better Safety Management Practices



The number of electrical-related accidents increased from 31 cases in 2002 to a whopping 79 in 2006, and then back down to 40 incidents in September 2016, and is expected to fall even further in the future. This decline is due to an increasing number of safety initiatives implemented in the energy industry to increase awareness about the best safety practices and measures. ***Energy Malaysia*** takes a look at the Commission's role in improving electrical safety in the country.

These initiatives include recently introduced amendments to the *Electricity Supply (Amendment) Act 2015*, such as punitive measures for individuals and utilities that flaunt the regulations of increased electrical safety. Since 2010, the Energy Commission has been giving seminars to the public, licensees and industry to increase awareness about electricity tampering and safety, as well as the need to have safety management systems in place.

Inspections are also carried out to ensure compliance to safety regulations. Installations that do not comply will be issued warning letters. While those who do will be given awards for meeting the requirements. This is expected to encourage more installation operators to comply and meet safety provisions.

**Stronger Protection**

Other aspects of note in the country's safety management system is in power theft, which also increases the incidence of accidents. To this end, new provisions were made in the law to increase penalties and discourage theft. The Energy Commission also undertakes visits to premises suspected of tampering with meters or stealing electricity.

"Besides domestic installations, we are focused on non-domestic and industry installations because the financial losses to the utilities are higher compared with domestic cases," Iffah Hannah Muluk, Head of Electrical Safety Development Unit of the Energy Commission, explained. "For instance, if the losses in the domestic sector is around RM200, on the industries side, it can come up to RM12 million."

Domestic installations are those in private residential buildings that are not used for commercial purposes, such as hotels or boarding houses. It also describes residential buildings that operate business, trade and professional services. Examples of non-domestic installations include factories and manufacturing plants.

Prior to the amendments, offenders were fined RM100,000. Currently, they can be fined up to RM5 million. The addition also stipulates increased fines and punishment for those found to be repeat offenders. Iffah Hannah pointed out that "Before the amendments, we only had one provision for domestic and industry offenders, which meant they both faced the same amount in fines. It is now divided into two different categories: Non-domestic and domestic, making it more fair."

In the first ten months since the new regulations entered operations, utilities have seen a reduction in the number of theft incidences that she attributes to a more severe Act. Section 38 stipulates that for utilities to claim back their losses, non-domestic installations caught stealing electricity may be disconnected for extended periods.

"Some of the requirements of the code also require operators to inform the Energy Commission in the event of accidents. Some installation operators do not know that if there is an accident, they have to report it to us, and sometimes we only discover it through social media or someone else calling us. With these codes, operators will be made more aware of the requirements and procedures—what they need to do and when."

– Iffah Hannah Muluk,
Head of Electrical Safety Development Unit,
Energy Commission

**Better Awareness**

The Energy Commission is moving to ensure that the public is aware of proper safety management systems. To this end, the Commission has developed two codes: The *Non-Domestic Electrical Installation Safety Code* and the *Electrical Infrastructure Safety Code*, both of which are referenced under Section 33A of the Electricity Supply (Amendments) Act 2015.

The codes stipulate that the licensee (in the case of electricity supply infrastructure) is required to create a safety management plan that deals with issues indicated in the *Electrical Infrastructure Safety Code*. Failure to do so may lead to a fine not exceeding RM100,000 or a term of imprisonment not exceeding two years, or both. Non-domestic installation operators are also required to prepare a safety management programme according to the associated code. Otherwise they face a similar punishment as infrastructure installation operators.

The Energy Commission is in the final stages of preparing the codes, aimed to be completed this year, and implemented next year. She noted that to increase public awareness about the codes, the Energy Commission has held seminars across Peninsular Malaysia and Sabah this year. "We introduced the codes to the public and the utilities and there has been a lot of positive feedback." She noted that the positive feedback is from installation operators who previously did not have any guidelines to go on.

With the *Electricity Supply (Amendments) Act 2015* gazetted on 1 January 2016, there is a substantial push to increase awareness about how the Act helps boost safety in the electricity supply industry. The Commission is also considering amendments to its regulations as a means to further improve electrical safety management in the country. With the introduction of the codes, electrical installation operators that are already following more general safety standards only need to slightly adjust the safety management plan to be more specific to electrical safety. EM

# Electrical Safety Management System Audit Checklist

| | Poor | Fair | Good |
|---|---|---|---|
| **1. POLICY, PLAN AND PROGRAMME** | ☐ | ☐ | ☐ |
| **1.1 Electrical Safety Policy, Plan/Programme:**<br>The licensee/installation has a written policy, plan/programme to ensure electrical safety. The policy signed by the top management, reflects management commitment to implement the plan/programme for the protection of employees and others who may be affected by the electrical installation. The objectives, responsibilities and arrangements for electrical safety management are spelled out. | ☐ | ☐ | ☐ |
| **1.2 Documentation:**<br>Documents related to the electrical safety management system of the licensee/installation are maintained and readily accessible to employees and contractors.<br>The documents contain information on electrical safety policy, plan, programme, risks identification and control measures, legal and regulatory requirements, and other relevant internal guidelines. | ☐ | ☐ | ☐ |
| **2. ORGANISING** | ☐ | ☐ | ☐ |
| **2.1 Responsibility:**<br>The top management of the licensee/installation demonstrates leadership for electrical safety programmes and activities, and clearly assigns duties responsibility for electrical safety management to line management. | ☐ | ☐ | ☐ |
| **2.2 Competence:**<br>Licensee/installation workers and contractors who are exposed to electrical risks are given adequate training and information on electrical safety. The company complies with the requirements under the Electricity Supply Act 1990 and Regulations pertaining to the need to engage registered electrical competent persons and contractors to perform electrical works according to their categories of competency. | ☐ | ☐ | ☐ |
| **2.3 Communication:**<br>There is a communication programme to disseminate information on electrical risks and control measures to employees and others who may be affected by the risks. Warning signs are used to identify, warn and advise on electrical risks. Suitable administrative arrangements are in place for management to receive and follow up on suggestions and complaints on electrical safety matters. | ☐ | ☐ | ☐ |
| **3. PLANNING AND IMPLEMENTATION** | ☐ | ☐ | ☐ |
| **3.1 Planning and Implementation:**<br>The licensee's/installation's electrical safety management plan/programme supports:<br>a. compliance with the Electricity Supply Act 1990, Regulations, Codes and Guidelines;<br>b. implementation of all elements of the electricity safety management system;<br>c. continual improvement in electricity safety performance.<br>The plan/programme provides details on programmes and activities to be implemented and the responsible personnel/units, budgets and targets in efforts to eliminate, minimise and control electrical risks at the installation. | ☐ | ☐ | ☐ |
| **4. RISK CONTROL MEASURES** | ☐ | ☐ | ☐ |
| **4.1 Identification, Evaluation and Control of Risks**<br>Hazards and risks to workers and public are identified, evaluated and controlled on an ongoing basis.<br>*('Hazard' is a potential source of harm or adverse health effect on a person or persons.*<br>*'Risk' is the likelihood that a person may be harmed or suffers adverse health effects if exposed to a hazard.)*<br>Implementation of preventive and corrective control measures for hazards/risks are done according to the hierarchy of risk control as follows:<br>a. elimination (completely eliminate the hazard/risk at source);<br>b. substitution (substitute the hazardous activity, process or equipment with a less hazardous one);<br>c. engineering controls (isolate the hazard from people who could be harmed);<br>d. administrative controls (change the way people work or prevent people's exposure to hazards/risks such as by implementing a permit-to-work system)<br>e. personal protective equipment (PPE) (provide PPE to cover and protect an individual person from hazards. PPE can be used as a temporary control measure until more effective control measures are provided. In most cases, a combination of other control measures and PPE can effectively control the risks) | ☐ | ☐ | ☐ |

| | Poor | Fair | Good |
|---|---|---|---|
| **4.2 Permit-To-Work System:**<br>A written Permit-To-Work (PTW) system with suitable lock-out/tag-out procedures is effectively implemented for high risk electrical works that involves working with live equipment and systems.<br>*(A 'permit-to-work' is a formal, written, safe system of work to control potentially hazardous activities. It aims to remove both unsafe conditions and human error by imposing a formal system which requires formal action. The permit details the work to be done and the precautions to be taken. It should state safety precautions to be taken before work can start and the authorising person should only sign and date the permit when he is satisfied that all precautionary measures have been taken. It should only be in place for a limited duration, be clearly dated and with specific conditions attached. Permits should be issued, checked and signed off as being completed by someone competent to do so, and who is not involved in undertaking the work).* | ☐ | ☐ | ☐ |
| **4.3 Emergency Preparedness:**<br>A written emergency preparedness plan for the licensee/installation is available and made known to employees and regularly rehearsed. The Plan details how the licensee/installation and its employees deal with or manage electrical emergencies. It spells out preparedness, response and recovery activities and clarifies emergency management roles and responsibilities, strategies and procedures to manage electrical emergencies at the installation. | ☐ | ☐ | ☐ |
| **5. PERFORMANCE EVALUATION** | ☐ | ☐ | ☐ |
| **5.1 Investigation of Electrical-related Accidents and Incidents:**<br>Investigations of the direct causes and indirect causes of electrical-related accidents and near-miss incidents are carried out by competent persons, with the appropriate participation of management and workers. Contributing factors arising out of any shortcomings or failures in the electrical safety management system are identified and documented. Recommendations for improvement are communicated to the top management for follow-up corrective actions. | ☐ | ☐ | ☐ |
| **5.2 Performance Monitoring and review:**<br>A system for licensee's/installation's management to regularly monitor electrical safety performance are established. Records and statistics of electrical accidents and near-miss incidents are kept and analysed, and root causes of accidents and incidents are addressed via short-term and long-term measures. Periodic internal audits of each of the elements of the electrical safety management system are carried out to identify the strengths and weaknesses of the system and to put in place improvement measures. Management reviews are conducted periodically to evaluate the overall strategy of the electrical safety management system. | ☐ | ☐ | ☐ |
| **6. ACTION FOR IMPROVEMENT** | ☐ | ☐ | ☐ |
| **6.1 Preventive and Corrective Action:**<br>Arrangements for preventive and corrective actions are established and updated based on the outcome of the ongoing electrical safety performance monitoring and review programme. When the evaluation of the electrical safety management system shows the preventive and protective measures are ineffective, corrective measures are addressed according to the hierarchy of risk control (refer 4.1) in a timely manner. Directives and notices issued by the Energy Commission are acted upon promptly and effectively. | ☐ | ☐ | ☐ |
| **6.2 Continual Improvement:**<br>Programmes and procedures are established for the continual improvement of the electrical safety management system. These take into account the results of risk assessments, performance, measurements, investigations, audits, and changes in Electricity Supply Act 1990, Regulations, Codes and Guidelines, technical or administrative changes in the electrical installation, and the results of electrical safety protection and promotion programmes. The electrical safety procedures, and performance of the electrical installation are benchmarked with other similar organisations to improve electrical safety performance. | ☐ | ☐ | ☐ |

# Forging Regional Connections

## ASEAN Plan of Action for Energy Cooperation

The ASEAN Plan of Action for Energy Cooperation (APAEC) is in essence a range of policy documents that facilitate multilateral energy cooperation to advance regional integration and connectivity goals in ASEAN. With the theme of *Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All*, APAEC 2016–2025 showcases the continued importance that ASEAN places on energy security, accessibility, affordability and sustainability. Ir. Dr. Sanjayan Velautham, the Executive Director of the ASEAN Centre for Energy speaks to ***Energy Malaysia*** about this regional energy initiative.

"The ASEAN Plan of Action for Energy Cooperation (APAEC) serves as a blueprint for better cooperation towards enhancing energy security, accessibility, affordability and sustainability under the framework of the ASEAN Economic Community for a designated period."

– Ir. Dr. Sanjayan Velautham,
Executive Director of the ASEAN Centre for Energy

**Reaching for Salient Targets**

The APAEC 2016–2025 is the fourth series of implementation plan, a continuation of the three previous energy plans: APAEC 2010–2015; APAEC 2004–2009 and APAEC 1999–2004. The latest iteration has several goals in sight, including the development of the ASEAN Power Grid (APG) and the Trans-ASEAN Gas Pipeline (TAGP) for elevated regional energy trade and security. "We are also looking into increasing energy efficiency, by means such as raising the role of renewable sources in the ASEAN energy mix," notes Ir. Dr. Sanjayan.

According to Ir. Dr. Sanjayan, the APAEC 2016–2025 is being implemented in two phases. "Phase I spans the 2016–2020 period for the implementation of short to medium-term measures to enhance energy security cooperation and to take further steps towards connectivity and integration. In 2018, there will be a stocktake of the progress of Phase I, which will guide ASEAN in charting the pathways and directives for Phase II (2021–2025)."

**Meeting Energy Needs**

With the establishment of the ASEAN Economic Community (AEC) as of 2015, a more robust energy sector is necessary to meet the emerging energy challenges. "Our energy requirement (total primary energy supply) is expected to grow by 40% within the APAEC 2016–2025," reveals Ir. Dr. Sanjayan. In this aspect, he explains that the ASEAN Centre for Energy (ACE) supports the ASEAN Member States (AMS) in accelerating the integration of energy strategies by efforts to realise APAEC targets through information sharing, capacity building and policy research.

"When we address challenges we must appreciate that ASEAN Member States are at different stages of development, but the underlining three aspects are that we need to face economic prosperity, social development and environmental preservation as a region," he says. "As such, the conversation must evolve from cooperation to integration. At this stage, we need to take the bull by the horns to truly integrate and make these initiatives reality."

**All Eyes on TAGP**

Adopted in 1997, the ASEAN Vision 2020 calls for cooperation to establish interconnecting arrangements for electricity and natural gas within ASEAN. Among these arrangements is the flagship TAGP project. "At the 20th ASEAN Ministers on Energy Meeting in Bali in July 2002, the Ministers signed the Memorandum of Understanding for cooperative efforts within ASEAN for the expeditious realisation of the TAGP project."

The TAGP Taskforce under the ASEAN Council on Petroleum (ASCOPE), as the ASEAN Specialised Energy Body responsible for the effective implementation of the TAGP project, set key strategies for the project. These include enhancing gas and LNG connectivity via pipeline and regasification terminals in ASEAN, establishing a gas infrastructure database that is accessible to all AMS and conducting studies on gas quality adjustment requirements and ASEAN LNG destination flexibility to enable better interconnectivity.

"As a whole, the TAGP aims to enhance connectivity for energy

security and accessibility via pipelines and regasification terminals in ASEAN. Under the project, the AMS plan to develop at least one new LNG regasification terminal or a cross-border gas pipeline by 2020 and to develop consolidated information on ASEAN gas infrastructures. It also aims to establish a standard clause for LNG cargo diversion and destination flexibility for ASEAN LNG contracts, and to establish a manual and procedures for the operationalisation of ASEAN Petroleum Security Agreement," Ir. Dr. Sanjayan elaborates.

"Currently, the TAGP has 13 bilateral pipelines connecting 6 Member States (Myanmar, Thailand, Malaysia, Singapore, Indonesia, and Vietnam) and there are 6 regasification terminals in the region with the total capacity of 22.5 million tons per annum (MTPA). There will be an additional capacity expansion for 13.5 MTPA from Malaysia, Thailand and Singapore by 2017."

The theme of the APAEC 2016–2025 cuts a wide swathe of pivotal energy objectives within the ASEAN region, picking up where the previous APAEC plans left off. At the crux of these strategies is the intent to strengthen the energy security and efficiency, and with key projects gaining traction, it seems like the APAEC 2016–2025 is on track. EM

## Key initiatives of the APAEC 2016–2025

**(i)** ASEAN Power Grid (APG): ASEAN constructs a regional power interconnection to connect the region, first on cross-border bilateral terms, and then gradually expand to sub-regional basis and subsequently leading to a total integrated Southeast Asia power grid system. As one of the physical energy infrastructure projects in the Master Plan of the ASEAN Connectivity, the APG project is expected to enhance electricity trade across borders that would provide benefits to meet the rising electricity demand and improve access to energy services in the region.

**(ii)** Trans-ASEAN Gas Pipeline (TAGP): to interconnect through multiple physical pipeline interconnections and regasification terminals within ASEAN, to transport gas across borders to ensure greater security of gas supply within the region.

**(iii)** The reduction of Energy Intensity by 20% in 2020 based on 2005 level: with the growing focus on energy security, energy efficiency & conservation (EE&C) this is considered a critical step for ASEAN to achieve sustainable economic growth, market integration and mitigate the adverse impact of climate change.

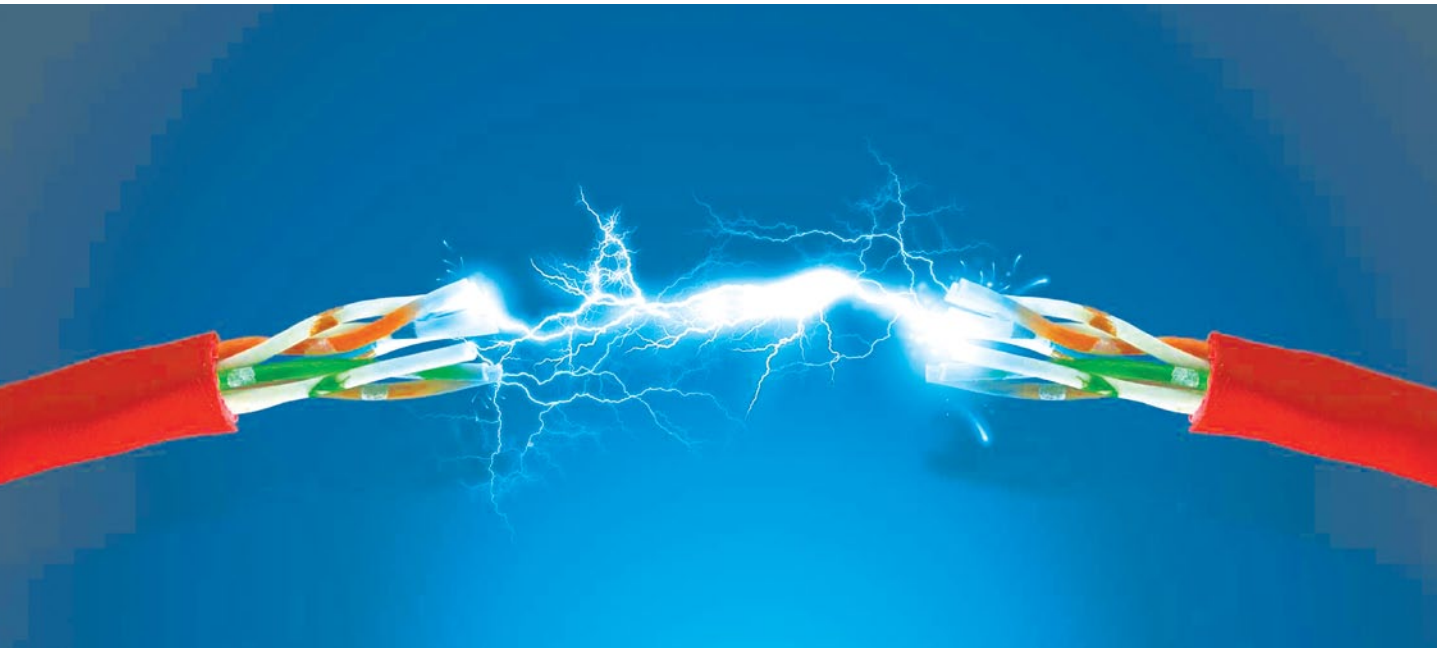
**(iv)** Increasing renewable energy (RE) component to 23% by 2025 in the ASEAN Energy Mix: ASEAN Member States (AMS) recognise that RE is crucial for increasing the diversity of energy supply and reducing the environmental impact of energy use in the region.

**(v)** Civilian nuclear energy: a number of AMS have considered embarking on nuclear energy for power generation. Since it is a clean source of energy, civilian nuclear energy can help ASEAN meet its growing energy demand in the region. AMS are exploring ASEAN-wide cooperation, information sharing and exchange, technical assistance, networking and training on the use of nuclear energy for power.

# The Price of Forgoing Safety

## Electrical Accidents over the Years

Between 2010 and 2015, the Energy Commission investigated 343 electrical-related accidents, of which 163 cases were fatal. ***ENERGY MALAYSIA*** takes a look at these cases and at their chief causes.



### Worrying Trend

The average number of electrical accident cases that occurred over the 6 year period between 2010 and 2015 is 57 cases a year, or 5 cases per month. 2010 saw the highest number of accidents with 69 cases, while the lowest was 46 cases in 2013.

In 2015, a total of 48 cases of electrical accidents were recorded and investigated. Compared to 2014, the number of fatal accidents in 2015 increased by 11.1% to 30 cases, while non-fatal cases decreased by 50% to 18 cases. Overall, the number of accident cases decreased by 15 from 2013.

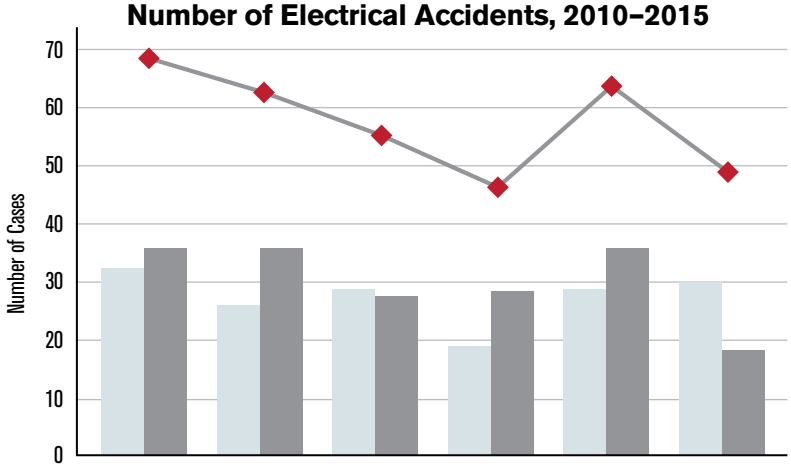
When the number of electrical accidents per one million victims is considered, 2014 shows a higher rate in contrast to the previous year (7.20 versus 6.05), and this is reflected in the fatal and non-fatal case figures. The rate of fatality increased in the year 2014, from 2.37 to 3.09, while the rate of non-fatal cases recorded an increase of 3.68 to 4.12 compared to the year 2013.

### Offending Factors

In the year 2015, the main causes of electrical accidents were improper installation and maintenance,

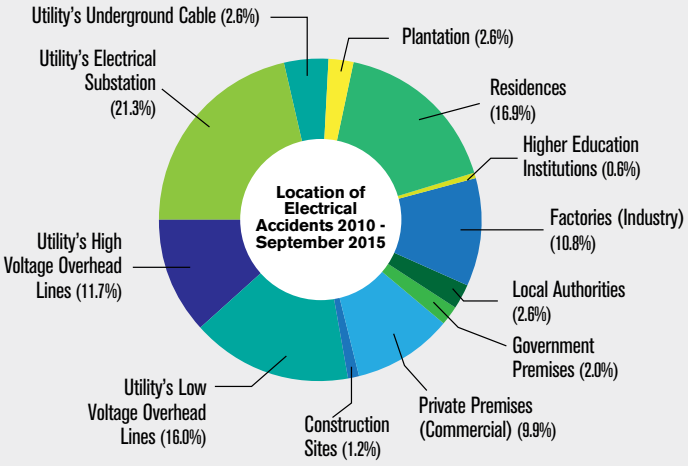
and failure to comply with safe work procedures, with 12 cases respectively. This was followed by public activity near electrical installations with 8 cases, while trespassing into electrical installation areas and other causes each resulted in the occurrence of 5 accident cases. The presence or activities of these individuals within close proximity

**Number of Electrical Accidents, 2010–2015**




| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Fatal | 33 | 26 | 28 | 19 | 27 | 30 |
| Non-Fatal | 36 | 36 | 27 | 27 | 36 | 18 |
| Total | 69 | 62 | 55 | 46 | 63 | 48 |

*Source: Energy Commission*




*Source: Energy Commission*

**Causes of Electrical Accidents, 2010–2015**

| Accident Causes | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Total |
|---|---|---|---|---|---|---|---|
| Improper installation/ maintenance | 18 | 24 | 22 | 12 | 20 | 12 | 108 |
| Non-compliance with work safety procedures | 21 | 15 | 15 | 16 | 21 | 12 | 100 |
| Public activity near electrical installation | 9 | 5 | 5 | 7 | 11 | 8 | 45 |
| Trespassing at electrical installation | 12 | 6 | 5 | 9 | 7 | 5 | 44 |
| Defects on electrical appliance/equipment | 3 | 4 | 4 | 0 | 3 | 3 | 17 |
| Other causes | 2 | 6 | 2 | 0 | 0 | 5 | 15 |
| Misuse of wiring system | 4 | 2 | 2 | 2 | 1 | 3 | 14 |
| **Total** | 69 | 62 | 55 | 46 | 63 | 48 | 343 |

*Source: Energy Commission*

of these installations were either caused by the lack of awareness and knowledge and about the risks, or done with deliberate disregard to them.

As for where these accidents took place in the year 2015, most occurred in electricity supply utility installations, which represented 52% of the total. Residences were the next highest contributor, at 20.8%, while industrial premises and farms each claimed a 10.4% share of the cases.

Efforts undertaken to reduce accidents include increasing awareness about electrical safety via promotional events, publications and guidelines, performing safety audits on utility installations, fortifying internal capacity and competency levels and improving legal frameworks to combat negligence that may lead to preventable accidents. In 2015, the Energy Commission suspended the Certificate of Competency of two competent persons after their negligence resulted in fatal electrical accidents. EM

# An Often Overlooked Safety Feature

## The Residual Current Circuit Breaker

Whether it was via official news channels or through word of mouth, we have all heard about tragic electrocution injuries and deaths caused by common household appliances such as water heaters or kettles. While the terrible nature of these electrical accidents mean stories about them spread like wildfire, guidance on how to potentially prevent them in the first place is worryingly distant from the eyes and ears of the public. There is a simple fix, assures Ir Chew Shee Fuee, President of The Electrical and Electronics Association of Malaysia (TEEAM), and he has made it his mission to let everyone know how to help protect themselves from certain harm with the Residual Current Circuit Breaker (RCCB).

### What is the importance of RCCB to the Malaysian public?

"Sometime in September 2014, news broke of the sad deaths of a Japanese couple in Mont Kiara due to a water heater electrocution. The accident occurred while the husband was bathing, and in trying to rescue him, his wife was electrocuted herself. They left behind a six month old baby boy. Upon thorough investigation, we found that the water heater was not at fault. Rather, the suspect was a short circuit elsewhere that caused a current leak.

However, a leakage of this sort should have been quelled by a safety feature found in a building's distribution board, called RCCB, or otherwise known as Residual Current Device (RCD). The RCCB is, in essence, a very sensitive electromagnetic switch that trips when it senses current leakage passing through it. They are often rated at 30mA, as the human body could only survive electrical encounters that are of low amperage, although an additional RCCB rated at 10mA for a water heater circuit is recommended because of the heightened electrocution risk an individual is exposed to in the wet environment of the bathroom.

So why is this device so important? Returning to the Mont Kiara accident and other cases that are similar to it, we frequently discover that the buildings' RCCB units were defective. Therefore, the current leak was not arrested immediately, causing the victims to suffer prolonged electrocution."

## How can one determine whether the RCCB unit in their home is functioning?

"It's an incredibly simple process. If you were to look at the RCCB unit, there is a button marked 'T' adjacent to the switch. The button serves as a quick and easy way to check if the RCCB unit is still functioning as designed – if the unit trips when the button is pressed, it means that it works. If it does not, the building owner needs to call a certified electrician immediately to have a look at the unit. Most RCCB manufacturers indicate that the test should be done every three months, and in my opinion it should be done at least once a year.

I often tell people that the RCCB unit in a house is similar to the seatbelt in a car. Both are used to protect you from harm, but are not relied upon until something catastrophic happens. Similarly, both can be tested by a simple action – pushing the RCCB test button; and tugging the seatbelt."

*The RCCB unit (centre) has an easily spotted test button marked 'T', which is a convenient indicator of the unit's operation status.*

## How has TEEAM been creating awareness about RCCB safety?

"We created an awareness programme called the TEEAM Self-Test RCCB National Campaign, which was launched in June 2014 by Datuk Ir Ahmad Fauzi Hasan, the CEO of the Energy Commission. It involves road shows to educate the general public on the RCCB unit. We collaborated with RCCB manufacturers to manufacture portable demonstration displays, which use electricity to show how the RCCB device works, why it is important and how to perform a self-test. These road shows take place in prime public spots nationwide, including shopping malls, educational institutions and housing areas.

TEEAM has also been distributing awareness flyers and has an online presence in the forms of its own website and social media to further spread the message, replete with educational clips for further understanding of the importance of the RCCB unit. We also get coverage in the media, and other pertinent organisations such as the Energy Commission and Tenaga Nasional Berhad have played their part with press releases and their own campaigns. Recently, the education sector is getting involved as well, including Universiti Putra Malaysia (UPM) which is enlisting our help to assist students in crafting and carrying out their RCCB related projects."


*TEEAM's portable demonstration setup includes a toaster, deliberately rigged to be faulty, that is plugged into a circuit with a functioning RCCB unit, and one with a malfunctioning unit. In the former circuit, the RCCB will trip the moment the toaster is switched on, saving the user from a nasty shock.*

# Safety First

## Boosting Industry and Consumer Protection

Almost every Malaysian home has one, yet as much as they are part and parcel of everyday life. water heaters can also be one of the most dangerous appliances around, as they are capable of electrocuting users. Ir Fairus Abd Manaf, Head of Electrical Equipment, Department of Electrical Safety Regulation of the Energy Commission discusses some of the innovative ways consumers are kept safe from water heater accidents.

Between 2013 and September 2016, six cases of electrocutions related to water heaters have been recorded in Malaysia. In response to this, efforts have been stepped up to improve safety.

For instance, the Electricity Regulations 1994 requires all domestic installations to have an effective earthing system such as earth chamber and an appropriately rated Residual Current Device (RCD), which detects the leak of dangerous current caused by defective equipment. The regulation also requires all power supply to water heaters and wet areas to be mandatorily equipped with an RCD of a sensitivity of less than or equal to 10mA.

Proper installation and maintenance of earthing system is critical to safety. Consumers are therefore encouraged to check their RCD. The RCD and earthing serve as the primary electrical safety protection and the first line of defence in case of a malfunction in the water heater.

**Isolating Leakages**

There are two types of water heaters approved for use in Malaysia; the instantaneous water heater and the storage water heater. In oder to sell them, the manufacturers and suppliers have to ensure that they meet minimum standards and requirements.

As for imported instantaneous water heaters, they have to comply with the *IEC (International Electrotechnical Commission) 60335-2-35:2006 with modification*. "It is marked as 'with modification' because the hose must be made from non-metallic/non-conductive materials and a minimum length of 1 metre," Ir Fairus explained.

## Water Heater Statistics 2016

| NUMBER OF CoA FOR IMPORTED WATER HEATERS | NUMBER OF CoA FOR LOCALLY-MANUFACTURED WATER HEATERS |
|---|---|
| 41 | 338 |

**Includes instantaneous and storage water heater, as well as new and renewed Certificate of Approvals (CoA)**

*Source: Energy Commission*

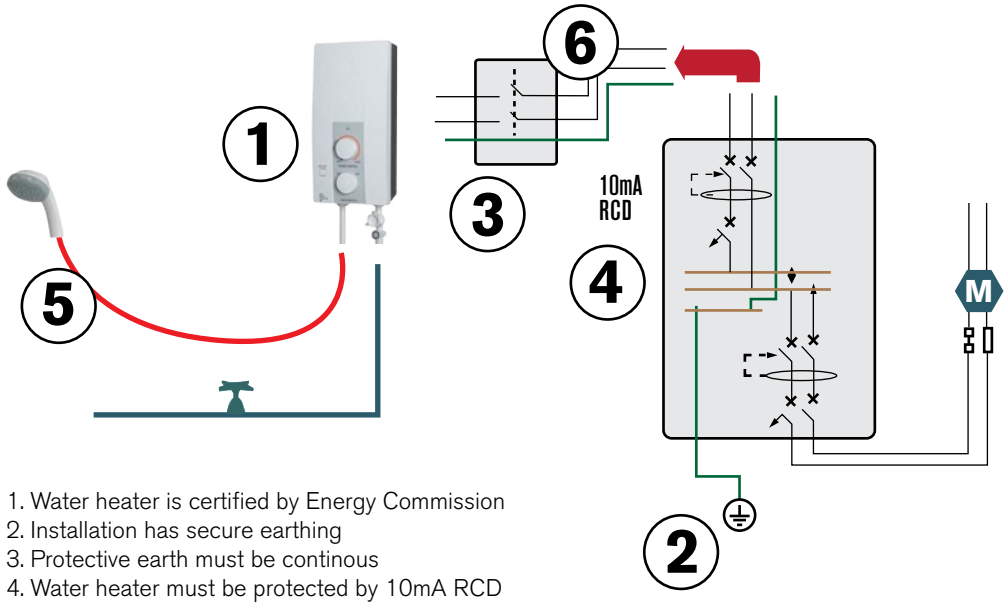
"We have annual electrical safety awareness and educational programmes targeted at the entire public such as importers, retailers, schools, manufacturers and consumers."

**– Ir Fairus Abd Manaf**
Head of Electrical Equipment Unit,
Energy Commission

For imported storage water heaters, the standard that must be followed is the *IEC 60335-2-21:2012 with modification*. In storage water heaters, the component used to ensure safety is an innovative device called an isolation barrier. An isolation barrier is an intrinsic safety module that limits the amount of leakage current that can enter an electrical circuit.

In storage water heaters, the plastic-based isolation barrier is installed on the heater's water inlet and outlet points. "The device decreases the value of leakage current entering or leaving the water heater to below 5mA thus reducing the chances of a fatal accident," Ir Fairus explained.

## Summary of Safety Measures



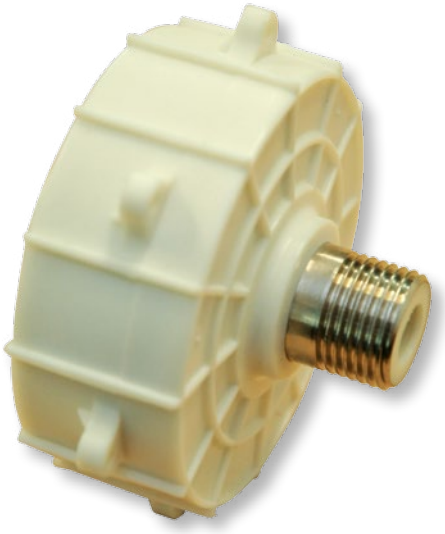

1. Water heater is certified by Energy Commission
2. Installation has secure earthing
3. Protective earth must be continous
4. Water heater must be protected by 10mA RCD
5. Flexible hose to be non-metallic
6. Correct sizing of cables

*Source: Energy Commission*

## Regulatory Provisions

Both types of water heaters are also covered by the *MS 1597-2-35:2010* for instantaneous heaters and *MS 1597-2-21:2015* for storage units. "Instantaneous water heaters are also required to have built-in RCDs," Ir Fairus noted, adding that complying these standards are requirements for manufacturers, suppliers and importers of water heater units in the country.

She also highlighted that the use of the innovative isolation barrier was proposed and discussed with industry stakeholders in 2015.



*An isolation barrier is an innovative device used in storage water heaters to limit the amount of leaked current to enter or leave the circuit, mitigating any chances of electrical accidents. While the safety systems implemented may not seem very high-tech, they are innovative and highly effective solutions to industry and consumer protection.*

*An exploded water heater as a result of improper installation. The Energy Commission provides guidelines for proper and safe water heater installation to prevent accidents like these.*

In addition, *the Guideline for the Installation and Maintenance of Water Heater Systems* has also been developed. This guideline for industry players and consumers ensures proper safety and maintenance procedures are followed for water heaters.

## Tested and Approved

Everyone has a role in ensuring water heater electrical safety. For manufacturers and producers, she urged a change in focus from profit to public and consumer safety by meeting the minimum safety requirements for water heaters. "If they can meet a higher standard, that is even better for everyone," she said.

"For consumers, please buy only water heaters (and other electrical appliances) that have been tested and approved by the Energy Commission. Don't buy a cheap, untested and unverified product because of the price as it could cost more in the long run."

Approved devices and appliances have a SIRIM-ST safety label in line with stipulations in the *Electricity Regulations 1994*. This indicates that such appliances have gone through rigorous procedures to ensure that they are safe for public use." EM

# Going Green in ASEAN

Energy security is one of the top concerns for ASEAN as the region consolidates to be among the fastest growing in the world. One major challenge is striking a balance between maintaining fast-paced economic development and ensuring that resources and the environment are not overburdened by energy demand. According to the International Energy Agency (IEA), energy consumption in Southeast Asia rose by 50% from 2000 to 2013. To optimise power consumption and encourage efficient energy use, ASEAN member states agreed in November 2015 to a target of 23% renewable energy (RE) use by 2025.

***Energy Malaysia*** looks at how three other ASEAN states – Singapore, Thailand and Indonesia – are approaching this situation.

**Solar in Singapore**

When it comes to renewable energy, Singapore's options are rather limited given the country's lack of resources. According to the city-state's National Climate Change Secretariat (NCCS), certain geographical disadvantages mean that Singapore is unable to utilise several forms of alternative or Green energy sources.

For instance, average wind speed is at 2 metres per second whereas wind turbines need 4 metres per second to operate. So that rules out wind power. Hydroelectricity and tidal power are also out of the question, as the rivers there are not powerful enough to run a generator, and the coastal areas are mainly used for ports and shipping.

Land is extremely limited, which means that planting crops for biomass is also not an option.

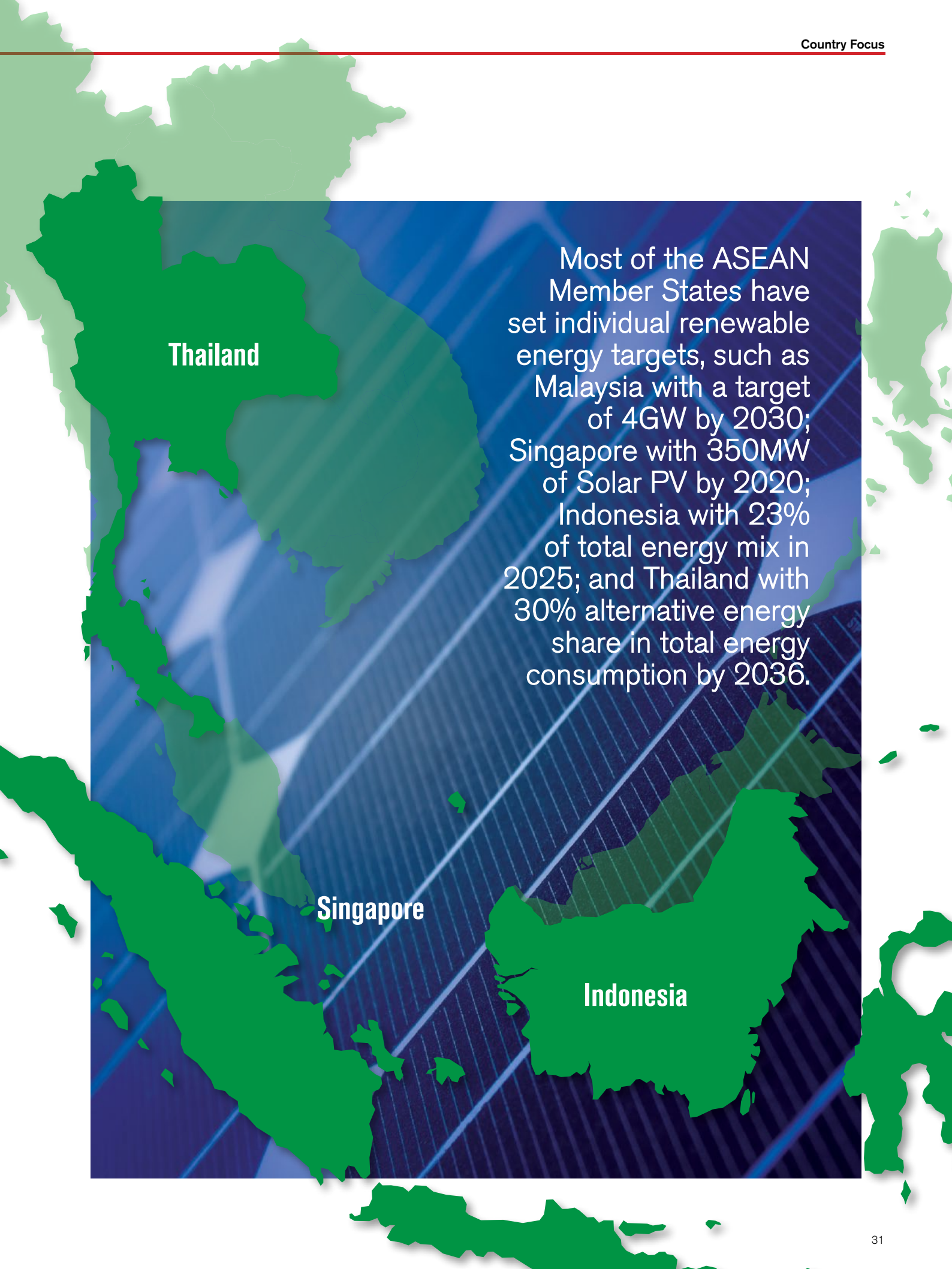
But what Singapore has in abundance is sunlight. The NCCS has noted that the island receives average annual solar irradiation of 1,500 kWh/m2. This has led to a focus on solar photovoltaic as the alternative energy source of choice for the country. Presently, solar power in Singapore stands at 47 megawatt peak (MWp), and the aim is to increase it to 350 MWp by 2020.

To achieve that, several initiatives have been introduced. Since Singapore does not have the landmass for huge solar farms, it is seeking to place them on new and existing urban structures. For instance, the Housing Development Board is installing solar panels on high-rise apartments, while the Economic Development Board and Public Utilities Board are looking to place floating solar PV panels on the surface of reservoirs.

With this concerted effort to promote solar power, the NCCS hopes that the energy source contributes 8% of Singapore's energy mix by 2030.

**Thailand's Multi-Pronged Approach**

Although Thailand has very little sources of traditional energy such as coal and gas, it does have the potential to




Most of the ASEAN Member States have set individual renewable energy targets, such as Malaysia with a target of 4GW by 2030; Singapore with 350MW of Solar PV by 2020; Indonesia with 23% of total energy mix in 2025; and Thailand with 30% alternative energy share in total energy consumption by 2036.

To address the challenges of sustainable energy growth and climate change, ASEAN member states have developed and implemented several renewable energy initiatives, such as bio-fuels, solar PV programmes, as well as promoting open trade, facilitation and cooperation in the renewable energy sector.


be a regional leader in the utilisation of RE. To drive the goal forward, the Alternative Energy Development Plan (AEDP) 2015 was formulated by the Department of Alternative Energy Development and Efficiency at the Ministry of Energy.

Currently, RE accounts for 12% of Thailand's energy mix. The AEDP has identified six sources of RE as focus areas: municipal solid waste (MSW), biogas, biomass, hydro power, wind power, and solar power. It calculated the potential of each energy source with MSW at around 631 MW, hydro power at 2,906 MW, biogas at 4,567 MW, biomass at 8,492 MW, wind at 14,141 MW, and solar at 42,356 MW.

The AEDP also calls for the use of MSW, biomass and biogas among the farming communities, while RE development will take into account electricity demand and RE potential in the country's various provinces. By 2021, Thailand hopes to have RE account for 25% of its energy production.

*A municipal solid waste plant in Thailand that converts waste into energy that is used in the plant and fed into the national grid.*


*The Rantau Dedap geothermal project in Central Java, Indonesia – one of the country's initiatives to boost the alternative energy sources.*

Driving this objective is the understanding that energy demand will rise by 75% over the next 20 years, with energy imports increasing by 78%. Through a focus on indigenous renewable sources, the Thai government targets reducing the country's dependency on energy imports and significantly enhance its energy security.

**Indonesia's Untapped Potential**

Indonesia is the country that most closely resembles Malaysia in terms of energy resources. Both are oil and gas-producing nations and have huge biomass potential in the form of oil palm and oil palm by-products, while Indonesia also has the advantage of being a coal producing nation.

While Indonesia is able to produce enough gas and coal to sustain itself, it is also focused on increasing the use of RE. In the country's National Energy Plan which was introduced in 2014, the objective is to have an energy mix of 30% coal, 23% renewables, 22% oil, and 25% natural gas by the year 2025.

One of the main reasons for this is to reduce dependency on oil, of which Indonesia has become a net importer owing to infrastructural problems.

When it comes to RE, Indonesia has huge untapped potential. The country's main electricity distributor - Perusahaan Listrik Negara (PLN) – estimates that there is 75 GW of hydro power potential, 27.5 GW of geothermal potential, 50 GW of biomass potential, and 9 GW of wind power potential.

In order to tap that, the authorities have opened up the market for foreign investment in RE. In the first quarter of 2016, Indonesia attracted US$327 million worth of overseas funds for RE projects. These include US$250 million for bioenergy and US$75 million for geothermal power. Investors are attracted to the archipelago by the great opportunity there, with initiatives such as reduction of import duties and faster approvals acting as further incentives.

Singapore presents useful lessons on implementing solar power in urbanised areas, Thailand's strategy may prove useful in extending RE to rural communities, while Indonesia's focus on attracting foreign investments in that sector is one that should be studied. Perhaps the most important lesson is that the experiences and knowledge gained from pursuing RE in each member state has to be shared with the rest of ASEAN. Only through consolidation and cooperation will the region's aims be reached. EM

# Solar Power in Malaysia

## Making Way while the Sun Shines

Trace the equatorial line on a world map with your finger, and you are bound to see your fingernail underline Malaysia. The fact that it is located along this latitude means that the country is a prime recipient of bright sunlight nearly every day of the year, making solar power harvesting a feasible long-term endeavour. This ripe energy potential has not been ignored, as the Malaysian government – with its commitment to increase the portion of green energy in the overall energy mix of the power sector – has channelled considerable effort to ensure that this natural resource is utilised effectively. ***Energy Malaysia*** looks at how solar power has impacted the Malaysian energy landscape so far, and what its future holds.

*A list of sunlight-harnessing projects which will see completion in the coming years is set to boost the share of solar power in the Malaysian energy mix.*

**Supplementary Energy Source**

According to Ir Azhar Omar, the Senior Director of Industry Development and Electricity Market Regulation Department at the Energy Commission, solar power is a growing presence in Malaysia. "Up until June 2016, 261 solar installations have been licensed in Peninsular Malaysia and Sabah, with a total cumulative capacity of 234MW," he notes. "These numbers do not take into account approved projects which are in various stages of implementations, such as the large scale solar project."

In the grand scheme of things however, he concedes that the technology has a way to go to become on par with conventional energy. "Relatively higher cost and lower efficiency, along with the intermittency of production (due to, but not limited to daytime-only yield and the occasional interfering weather conditions) are among the challenges encountered when it comes to integrating solar power effectively and economically in the grid. Hence, I can say that for the time being, solar power can complement conventional energy, but not to replace it totally."

**Large Scale Solar**

One of the more pertinent challenges in the Malaysian power sector is striking a balance between meeting the rising electricity demand of a growing economy and meeting the requirements outlined by government climate change objectives to reduce emissions intensity.

One of the methods employed to address this challenge is the implementation of large scale solar, which involves solar photovoltaic plants that sit within the 1 to 50 MW range, connected to either the transmission or distribution networks in Peninsular Malaysia, Sabah or Labuan. The programme was started in March 2016 with a competitive bidding process conducted by the Energy Commission.

"We have embarked on the large scale solar programme in line with the 11th Malaysia Plan with a cautious approach in order to ensure that the impact to the grid security is manageable and the additional cost is reasonable to consumers," Ir Azhar reveals.

Elaborating, he says that the plants under this project will be developed in phases with appropriate capacities at suitable locations. This is done in order to ensure that the intermittency nature

"In addition to considering international grid connections and focusing on gas-based and efficient supercritical coal generation, increasing the share of solar and other renewable energy sources in the overall energy mix is a sure-fire way of reducing carbon emissions in the power sector."

– Ir Azhar Omar,
Senior Director of Industry Development and Electricity Market Regulation Department,
Energy Commission

of solar power does not adversely affect the reliability and security of the power supply system, while maintaining sensible end-user tariffs at the same time.

**Gradual Implementation**

"If you look at the quota set, we expect to achieve 1,000MW under the large scale solar programme by 2020, which is about 4 to 5% of the installed capacity in Peninsular Malaysia and Sabah," Ir Azhar remarks. "The 1,000MW is a cumulative figure over a four-year period between 2017 and 2020, with annual capacity capped at 200MW for Peninsular Malaysia and 50MW for Sabah and Labuan."

In an effort to accelerate the development of large scale solar plants in the country, the government has also awarded two fast track solar power projects; a 150MW venture in Peninsular Malaysia and another 50MW in Sabah. These plants are set to be operational by the end of 2017.

The large scale solar programme has received enthusiastic response from the industry. 184 participants signed up for the pre-qualification process to develop a total of 400MW of power from large scale solar plants, which are to be commissioned in 2017 and 2018. "Out of these 184, 127 qualified to submit their final bids for the plants, which they have done by the 23rd of September 2016," says Ir Azhar.

**Looking Ahead**

"In line with development around the globe, the expansion of solar photovoltaics will rely heavily on the ability to overcome the three 'E' energy mix challenges – energy security, economic efficiency and environmental requirements," explains Ir Azhar. Nonetheless, he expects that the ongoing advancement of solar technologies, coupled with improving energy storage solutions, to spearhead more robust take-up of solar power.

The increasing usage of solar photovoltaic technology will push the prices of solar installation downward. This, Ir Azhar says, will lead to grid parity – a situation where an alternative energy source, in this case solar, can produce power at a cost that is less than or equal to the price of purchasing power from the electricity grid.

"With the experience gained from the large scale solar programme, we will be able to assess the impact of solar power to the grid," Ir Azhar remarks. "The knowledge obtained will help us to develop a viable plan to introduce additional capacity of solar-sourced electricity into the national power network. However, we must also tread lightly and ensure that we uphold the sanctity of the environment, as we do not want to clear acres of virgin forest or agricultural land to build solar farms. To ensure a sustainable outcome, other renewable sources will be pursued and developed in tandem with solar power." EM

# MERGING SKILLS

## Energy Commission's Regional Office of Selangor, Kuala Lumpur and Putrajaya

One of Malaysia's areas of focus is developing a capable workforce to meet the country's rapidly growing economy. With the aim of increasing participation in the energy sector, this section of ***Energy Malaysia*** explores careers and professionals in the energy sector and how they contribute to the industry. Ir Mustapa Abu Bakar, Regional Director for Selangor, Kuala Lumpur and Putrajaya of the Energy Commission talks about the roles and functions of Regional Offices of the Energy Commission.

Being a Regional Director of the Energy Commission translates into responsibility for a number of activities stipulated by energy supply laws in the country, such as enforcing laws, regulations, codes, guidelines and directives to the industry and public, and investigating complaints with electricity supply issues. This also includes registering electrical competent persons working in electrical installations or with electrical contractors.

**Bigger Picture**

The role ties closely with the missions and values of the Energy Commission, which are reliability, excellence, sense of fairness and fairplay. The Commission's goals also include balancing the needs of the industry and the consumers of energy, as well as ensuring safe and reliable supply at reasonable prices, and fostering economic development.

The regional office upholds those responsibilities. For instance, it issues private licences for installations with 5MW, registration of electrical installation such as stand-by gen-set and high voltage switch gear and registration of competent persons. The office is also responsible for direct services to consumers and the public.

Since the E-Aduan online complaints website was introduced, the regional office has received more feedback from the public. Between January and September 2016, the Regional Office for Selangor, Kuala Lumpur and Putrajaya

A Regional Office is responsible for a number of activities stipulated by energy supply laws in the country such as enforcing laws, regulations, codes, guidelines and directives to the industry and public, and investigating complaints with electricity supply issues.

received 211 complaints, almost double the figures from last year before the online system was introduced.

**Wide Range**

All complaints received are investigated within 15 days and the complainants will be informed about the status of their query. More complex situations however may require a more comprehensive investigation, which might mean involving all the parties involved such as the owner, renter, contractor, consultant and TNB.

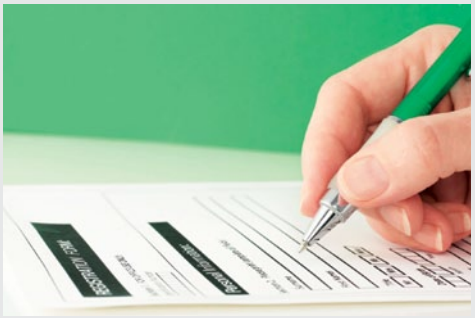
To be able to manage such situations as electrical engineers, full exposure to other disciplines, directly or otherwise is essential. Different disciplines give various ideas and assist in accomplishing tasks such as how to manage people. An example is Ir Mustapa who had to learn the relevant electricity laws, acts and regulations, and also improve personal communication skills.

Also important for career development in the electrical industry is staying up to date with rapidly changing technologies. This also entails adapting and adopting trends as and when necessary for career progression.


*Officers from the Regional Office may be required to assess electrical installations in the field as part of their daily routine. The regional office is responsible for licensing them.*

In the electrical engineering industry, experience is also a major consideration—particularly exposure to technical works during inspections, investigations and testing. To progress further, electrical engineers should also understand the standards, codes, guidelines, laws, regulations and good practices of electrical engineering systems. EM

# A Day in The Life



An average of 60-80 people come to the Energy Commission's Regional Office daily for various reasons and services. Building Managers come for registration or to apply for licences for their installations while contractors come to register as electrical contractors.

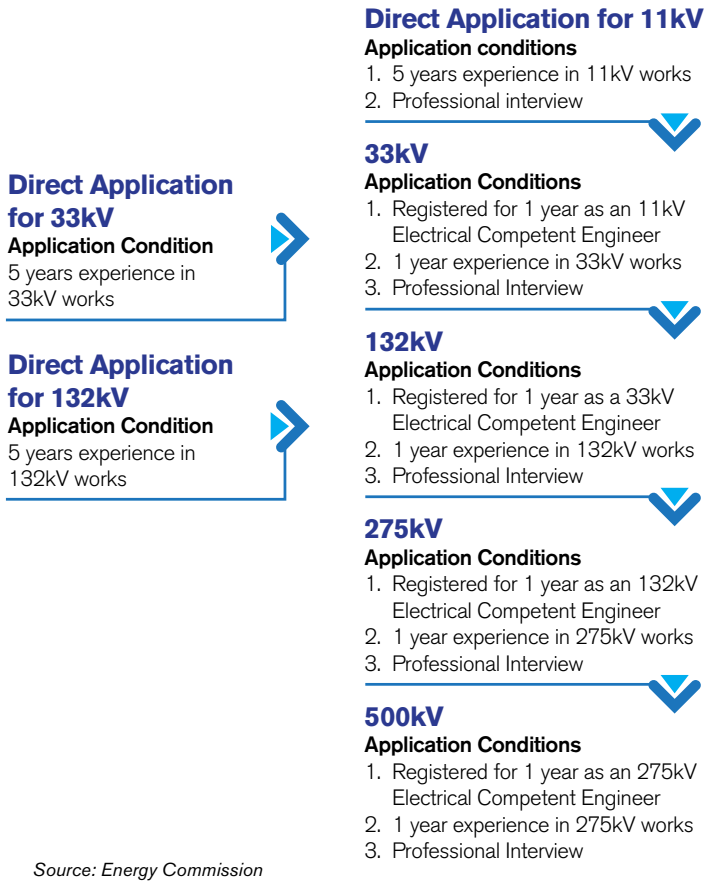
Electrical engineers also register their Competency Certificates with the Regional Office when they have jobs with electrical installations or contractors. On a daily basis, the Regional Office receives inquiries from those who are interested in getting their competency certificates and how to sit for the examinations.

Regional Directors have to manage daily administrative and financial operations. They also approve (when necessary) applications that have been checked by officers, and sign correspondence letters and licences issued to customers.

# The Competent Electrical Engineer

Electricity is an instrumental life force in the development of the human race. However, this blessing to mankind has the potential to become deadly if its power is not treated with respect – throw electricity and an untrained person into mix together and you would likely end up with a tragedy. Therefore, it makes sense that only qualified and competent persons be allowed to work on electrical fittings and equipment to ensure that the safety is not compromised at all costs. In Malaysia, competent electrical engineers form a vital portion of this group of people.

## Flow Chart For The Certified Electrical Engineer Competency Examination




*Source: Energy Commission*

### Important Roles

Tucked under the job scope of a competent electrical engineer are many responsibilities. The foremost is conducting, handling or having control over any work or operation on an electrical installation according to the engineer's voltage competency rating. This includes issuing a written instruction (Permit-to-Work) to people under their control if necessary.

The engineer also has to conduct visits and inspect as well as record and report findings for the purpose of repairing or eliminating defects on any electrical installations. Additionally, they must prepare and submit plans, drawings and specifications of electrical installations in accordance with the allowed voltage/amperes limits.

### Before Getting Certified

The aforementioned responsibilities require that the engineers attain proper certification as proof of their competency. In order to do that, they have to sit for an examination, which calls for several prerequisites. These are:

- A citizen of Malaysia
- Who holds a Degree, or an equivalent qualification to a Degree in Electrical Engineering from a recognised university or institution
- Who is a professional engineer in electrical engineering and is registered with the Board of Engineers according to *Engineers Registration Act 1967*
- Has a working experience of not less than five years in the field, where there is handling of electrical equipment
- Possesses experience controlling live equipment
- Is able to speak and write in the national language
- Has sufficient knowledge of modern electrical engineering practices, including the principles of operation of the equipment used for the generation, transmission, distribution, usage, protection and metering in electrical installations and energy efficiency management
- Has sufficient knowledge of first aid, respiratory recovery and electric shock treatment
- Has sufficient knowledge of the *Electricity Supply Act 1990* and any regulations made thereunder

### The Examination

The certified electrical engineer competency examination consists of two parts. The first is a written exam where the applicant is quizzed on various aspects of electricity, such as the relevant laws and legislation, electrical equipment, installations and system as a whole, as well as other miscellaneous electrical concerns.

The second portion of the examination is a professional interview, which is conducted based on the experience and training of the candidate, and their written replies to the provided questions.

The competent electrical engineer has many responsibilities, including conducting, handling or having control over any work or operation on an electrical installation according to the engineer's voltage competency rating. This includes issuing a written instruction (Permit-to-Work) to people whom they supervise.

*Competent Electrical engineers help to beef up safety levels in the electrical industry.*

The interview will also take into account the knowledge of the candidate with respect to the *Electricity Supply Act 1990* and *Electricity Regulations 1994*.

Applications for examinations shall be made by filling out the *ST (PE) 1 Pind. 4/2007* form, and submitting the completed document to the Energy Commission. Should the candidate fail the examination, they are allowed to repeat it after six months past their prior examination date.

**New Applications**

There are three main voltage range categories under which a competent electrical engineer may sit for direct competency certification examination. The first is 11kV to 33KV, followed by 33kV to 132kV, and finally 132kV and above. To undergo the certification process, the engineers who do not have any certification should first have work experience of no less than five years in the field involving the handling and operating live equipment according to the relevant voltage category.

**Upgrading Applications**

To upgrade a certification level from a lower voltage category to a higher one, there are certain requirements to fulfil. The engineer in question should be certified as a competent electrical engineer for at least one year on the current voltage category as well as in the voltage category that they are applying for, and they have to be registered with the Energy Commission to prove their relevant experience.

Competent electrical engineers are important members of the energy industry, ensuring that the installation and maintenance of electrical installations are performed in the best and safest possible manner. These qualified individuals, with expertise in each of the voltage categories, help to reduce the likelihood of accidents caused by improper electrical works and inept handling of the electrical system. EM

# Gearing up for NEDA

The much-anticipated New Enhanced Dispatch Arrangement (NEDA) is set to bring welcomed changes to the Single Buyer market in Malaysia. As the September 2016 commencement date for its six-month trial period drew nearer, the Energy Commission held a briefing to prepare and acclimatise relevant players in the industry to these changes.

Taking place on 28 July, the event saw consultants, who were engaged by the Energy Commission, shedding some light on the details of NEDA. This included Tom McInally of DNV GL Singapore – an international certification and classification body specialising in technical assessment – as well as Munir Hassan, the Head of Clean Energy at London-based multinational law firm, CMS Cameron Mckenna LLP.

Attendees included the representatives from the national utility (Tenaga Nasional Berhad), consultants, single buyer, grid system operator and Petronas. The briefing began with a cursory introduction to NEDA, which was described as a way of introducing enhanced competition and cost efficiency in a single buyer market.

Among NEDA's main objectives are to encourage the use of efficient technology such as co-generation, and provide opportunity for expired and non-power purchase agreement (PPA) and service level agreement (SLA) generators to operate as merchant generators.

NEDA works by allowing PPA and SLA holders to submit heat rates and variable operating rates (VOR) lower than contracted levels. Eligible participants can submit price quantity bids, resulting in short-run pricing competition, which encourages participation as well as incentivising more efficient use of existing facilities.

These participants include existing generators, merchant generators larger than 30MW and price takers (small generators) between 100kW and 30MW. Each of these categories will be subjected to their respective participation parameters, as detailed in the NEDA framework. Other details pertaining to NEDA, such as the NEDA registration process, NEDA governance, as well as the intricacies of bidding and scheduling processes was also discussed.

In his closing speech, Energy Commission Chairman Dato' Abdul Razak Abdul Majid said, "This comprehensive briefing session is important to inform and expose the stakeholders to the implementation mechanism of NEDA as presented earlier. NEDA is an exercise to extract the maximum value from the energy that we consume into the system, and we hope participants share our view and encourage and promote efficiency at their respective facilities." Various other speakers contributed to the success of the briefing by sharing their expertise on NEDA. EM

***Above left:*** *Energy Commission Chairman Dato' Abdul Razak expressed hope that NEDA would be well received by industry players.*

***Above:*** *Members of the audience consisted of representatives from the industry such as Tenaga Nasional Berhad, independent power producers and players from the gas sector.*

# The Importance of

Energy security is a crucial area of focus in Asia, and is an essential policy goal of any country in the region. This was the gist of the message delivered by renowned economist Dr Ken Koyama as part of a public lecture held by the Energy Commission on 4 October.

The Chairholder in Energy Economics of Energy Commission at Universiti Tenaga Nasional (UNITEN) and also the Managing Director and Chief Economist at the Institute of Energy Economics, Japan (IEEJ), Dr Koyama touched on many aspects in his talk. Of particular focus were the growing uncertainties and challenges faced by the Asian energy sector.

He also highlighted past studies by the IEEJ which showed that concern over energy security is mainly caused by negative sentiment exacerbated by a crisis in the market. This crisis can be a result of physical shortage, higher prices, and/or diplomatic incidents. He further pointed out that the nature of risks that affect energy security is contingent (such as

# Energy Security

*Dato' Abdul Razak, Chairman of Energy Commision (left) and Ho Sook Wah, Secretary General of the Malaysian Gas Association (right) engages Ken Koyama in a discussion after the lecture.*

political and military risks in main energy supply areas) or structural (such as a politically-motivated embargo imposed on a supplier).

Dr Koyama then touched on challenges for 3E + S (Energy security, Economic growth, Environmental conservation and Safety) in Asia. These are rooted in rising import dependence and energy security, high coal dependence and environmental loads, the need for an energy market reform and challenges for a nuclear power programme.

He noted that there are several policy avenues to enhance Asian energy security. Examples include, but are not limited to, improving energy self-sufficiency, diversifying energy sources and multiplying oil import sources. This, he said, is part of a unilateral approach. The other approach is through international cooperation, where countries work together both regionally and with oil-producing countries, to maximise resource utilisation.

Among the attendees of the lecture were representatives from key players in the energy sector and policy making in Malaysia such as the Economic Planning Unit (EPU), the Ministry of Energy, Green Technology and Water (KeTTHA), Tenaga Nasional Berhad (TNB) and Petronas. It was apt that these important agencies and organisations were present as the message of Dr Ken Koyama's lecture is one that should be heeded by industry players and policy makers. EM

*The Chairholder in Energy Economics of Energy Commission at Universiti Tenaga Nasional (UNITEN) and the Managing Director and Chief Economist of the Institute of Energy Economics, Japan, Dr Ken Koyama is one of the most respected experts on energy economics today. In 30 years of his career, he has gained a reputation for his insights and analysis of the oil and gas markets, as well as on energy security and geopolitics of energy.*

*As such, his lecture on the global oil and gas market, which was organised by the Energy Commission, was a must attend for anyone who is involved in the oil and gas sector. Below are the highlights of this talk, which was held on 1st August.*

### *The Cause of Crude Price Volatility*

*A phenomenon which started during the past decade, this can be attributed to various socio-political shocks including the collapse of the Lehman Brothers bank, the Arab Spring in the Middle East and North Africa, the Eurozone (or European debt) crisis and the impact of the terrorist group ISIS.*

*Global oil production and demand also affects price, in particular issues relating to Organization of the Petroleum Exporting Countries (OPEC) members such as Saudi Arabia and Iran, as well as non-OPEC producers such as the United States and Russia.*

### *Oil Prices Remain Low*

*The current oil price level will remain low in the near future due to over-supply. However, this is at risk of being affected by unforeseen factors such as supply disruption, Brexit and/or the Chinese economic slowdown. Down the line, crude oil prices may settle at a ballpark figure of US$70 by 2020.*

### *Positive for Gas*

*Gas demand in various markets such as the United States, Europe, China and India influence one another. In Asia, factors affecting LNG demand include economic growth, the future of nuclear power, competition by coal and renewable energy, and local gas market liberalisation. However, the LNG sector in Asia is looking healthy with a growth in demand and enough supply to meet that, while upcoming LNG projects will bolster gas supply globally.*

# Sustainable Energy Transformation

The National Energy Forum is an annual event that brings together policy makers, regulators, industry players, experts and other stakeholders to confer on current issues and the future direction of the Malaysian energy industry. This year marks the 7th iteration of this forum, with the theme *Energy Transformation in Malaysia – Towards a Sustainable Equilibrium*.

Jointly organised by the Energy Commission, the Malaysian Gas Association (MGA) and the Energy Council of Malaysia (ECOM), the 7th National Energy Forum took place at the InterContinental Hotel Kuala Lumpur on 8 September.

Among the attendees were Dato' Seri Ir. Dr. Zaini Ujang, the Secretary General of the Ministry of Energy, Green Technology & Water (KeTTHA) and key figures from the local energy sector, including Dato' Abdul Razak Abdul Majid, the Chairman of the Energy Commission, Hazli Sham Kassim, President of the MGA and Catherine Ridu, the CEO of the Sustainable Energy Development Authority Malaysia (SEDA). Also present were keynote speakers such as Mel YDreos, the Chairman, Coordination Committee of the International Gas Union and Australia-based Mark Sheppard, the CEO of GE Digital, Asia Pacific.

In his welcome speech, Dato' Abdul Razak Abdul Majid, the Chairman of the Energy Commission, said that the forum's theme focused on the art of balancing the needs of the economy, the environment and the people in building a resilient, sustainable and secure energy industry. However, he noted that while balancing the interest of various stakeholders is a challenging task, he expressed confidence that the forum is the ideal platform to attempt it.

The event was then officiated by Dato' Seri Ir. Dr. Zaini, who discussed the importance of transforming the energy landscape, such as increasing the contribution by renewable energy sources to the generation mix, in order to reduce greenhouse gas emissions. The second keynote speech was delivered by Mel, who said that there is a real urgency to address climate change and environmental pollution, which can be facilitated by policy and regulatory changes.

The first presentation delivered by Datuk Ir Ahmad Fauzi Hasan, the CEO of the Energy Commission, shed light on the *Gas Supply Act* amendments and third party access in the gas market. Datuk Torstein Dale Sjotveit, the CEO of Sarawak Energy Berhad, gave the second presentation, which revealed the key strategies in meeting Sarawak's energy needs.

Three other subsequent panel discussions focused on topics central to the theme followed. The topics were *Achieving Energy Supply Security, Digital Transformation for Energy,* and *Demand Side Management*. The panellists comprised industry experts that each presented detailed views relevant to the discussions, before taking questions from the audience.

To cap off the forum, a final plenary session was held in the form of an armchair conversation between Dato' Seri Idris Jala, the CEO of the Performance Management and Delivery Unit (PEMANDU) and Kamarul Bahrin Haron, the Executive Director of Astro Awani. They discussed the impact of the energy sector on the Economic Transformation Programme (ETP), with Dato' Idris replying to questions posed by Kamarul and from the audience. EM

***Above:*** *Dato' Abdul Razak, the Chairman of the Energy Commission, delivering his welcome address.*

***Right:*** *Dato' Seri Idris Jala, the CEO of the Performance Management and Delivery Unit (PEMANDU) (left) and Kamarul Bahrin Haron, the Executive Director of Astro Awani engaging in a discussion during the final plenary session.*

# Cable Safety

Representatives from government agencies, regulators, and statutory and enforcement bodies gathered at the Grand Bluewave Hotel, Shah Alam to participate in a workshop on the Guidelines and Techniques of Identifying Substandard Cables and Related Products for Regulators and Enforcement bodies on 11 October 2016. The event was organised by the Energy Commission and Malaysian Cable Manufacturers Association (MCMA) and co-organised by FEC Cables and Master Tec Wire and Cable, and generated a sufficient turn-out of young engineers and electricians who sought to learn more about the world of energy.


*From left, Ir. Fairus Abd Manaf, Tee Tone Vei, Mohd Elmi Anas, Fauziah Fadzi, Zamri Mustaff, Tee Kok Wha and Lokman Ahmad Dahlan at the Q&A session.*

Mohd Elmi Anas, the Director of Electrical Safety Regulation Department of the Energy Commission started off the event with a welcoming speech. He highlighted some of the aims of this workshop which was to ensure public safety by eradicating manufacturing, importing, advertising or sale of sub-standard cables, water heaters and adapters/ chargers in Malaysia. This workshop could serve as a platform in educating regulators and enforcement bodies on the approval process of electrical equipment and identifying substandard cable, non-approved adapter/ charger and safety installation/ maintenance of water heater. The workshop would be beneficial for the attendees in identifying unsafe/ non-compliance electrical equipment effectively during enforcement activities and relevant tasks.

The floor was then given to Ir. Fairus Abd Manaf, the Head of Electrical Equipment Unit of the Energy Commission. She spoke about the regulatory requirements on import, manufacture, display and advertisement of electrical equipment in Malaysia. She revealed the numerous acts and regulations under the Malaysian *Electricity Regulations 1994*, specifying that

***Left:*** *Attendees during the talk on different aspects of the guidelines and techniques on sub-standard cables.*

***Below:*** *Representatives from Fajar Cable demonstrating on cable sizes and certification of SIRIM for the attendees after touring the factory.*

there were 34 categories on electrical appliances that requires a Certificate of Approval (COA) and labelling of the appliances, and also some of the challenges that they face such as the aspects of market surveillance and the consequences if the electrical equipment did not meet the minimum requirements that have been set.

Fauziah Fadzil, from the Malaysian Communication and Multimedia Commission (MCMC) talked about the laws and regulations of electrical appliances, and how the Scientific and Industrial Research Institute of Malaysia (SIRIM) is the one stop centre for approval and certification for equipment. She added on the reasons on why the equipment must be certified, the certification framework with step by step process flow and also highlighted on some security measures that smartphone users should know of to prevent from mobile device related injuries. For example ensuring that the smartphones are certified by MCMC and to always check the adapter for both the SIRIM ST labels and the MCMC logo- this is to validate that the devices are up to their standards and are safe for use by the citizens.

Lokman Ahmad Dahlan from the Malaysia Cable Manufacturers Association (MCMA) went through the list of standards on cables, the basic elements of a cable such as the cable jacket, wire insulation and the stripped wire and also spoke about the myths of substandard cables for example how users feel that different types of copper and the amount of copper used can result in good cables.

Zamri Mustaffa presented on the procedure and standard requirements of electrical cable testing, followed by Tee Tone Vei from The Electrical and Electronics Association of Malaysia (TEEAM) on the Installation and Maintenance of Water Heater for Domestic Use and ended with Tee Kok Wha from MCMA on the analysis and impact of substandard cables to the industries and consumers.

The second part of this workshop was a visit to FEC Cables (M) factory in Klang. Attendees were separated in different groups and were brought into the factory for a tour on how cables were made from the raw material, to production, testing and quality control to the final product of cables. After all groups were done with the tour, there was a demonstration on how to verify SIRIM and the Malaysian standard for cables certificates and finally how to determine the quality of cables. EM

# WE WOULD LIKE TO HEAR FROM YOU!

**Energy Malaysia** welcomes your questions, comments and suggestions to help the Energy Commission of Malaysia work better at safeguarding your interest.

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Suruhanjaya Tenaga
Energy Commission

# ORDERLY SUPPLY and USE OF ENERGY

Established under the *Energy Commission Act 2001*, *Suruhanjaya Tenaga* (ST – The Energy Commission) is a statutory body entrusted with regulating the energy sector, in particular electricity and piped gas in Peninsular Malaysia and Sabah to ensure security, reliability, safety, efficiency and economy.

## The Energy Commission...

### Advises
Ministers on all matters concerning the national policy objectives for energy supply activities, the supply and use of electricity, the supply of gas through pipelines and the use of gas.

### Regulates
electricity and piped gas tariffs and the quality of supply services, as well as promote competition and prevent misuse of monopoly power.

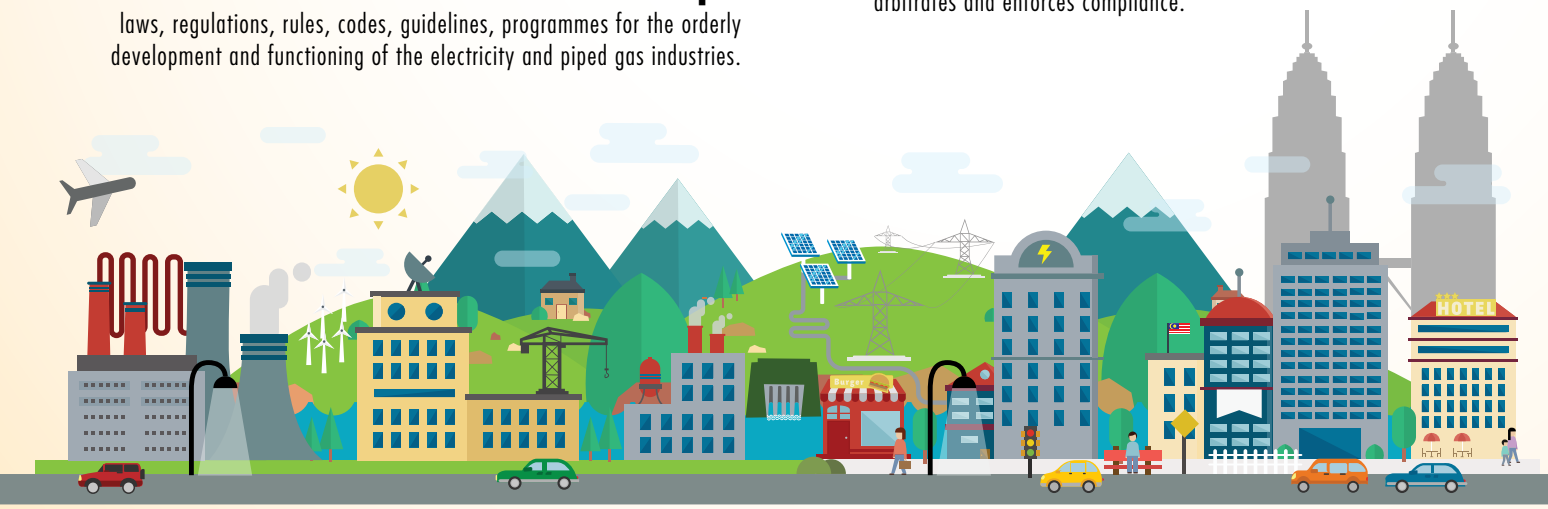
### Promotes
good practices, as well as research, development and innovation in the electricity and piped gas industries.

### Plans and develops
laws, regulations, rules, codes, guidelines, programmes for the orderly development and functioning of the electricity and piped gas industries.

### Licenses and certifies
electricity and piped gas suppliers, competent electricity and gas personnel, training providers, contractors, equipment and installations, energy service companies and energy managers.

### Monitors and audits
performance and compliance of licensed and certified suppliers, service providers, installations, equipment importers, manufacturers and retailers.

### Investigates
complaints, accidents, offences and industry issues; arbitrates and enforces compliance.

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