

ASEAN
Engineering Inspectors
(AEI)



Overview of AEI-EI & Electrical Installation Standards

“Towards ASEANising Engineers”

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Hon. Sec. of ASEAN Engineering Inspectors – Electrical Installation

ASEAN Engineering Register (AER),

ASEAN Federation of Engineering Organisations (AFEO)





CONTENTS

- Overview of AFEO & AEI
- Why AEI
- AEI – Electrical Installations
- Way Forward

OVERVIEW OF AFEO & AEI



Formed the ASEAN Engineering Register (AER) in 1998

ASEAN ENGINEERS



Initiated AEI (ASEAN Engineering Inspectorate) in 2008

AFEO



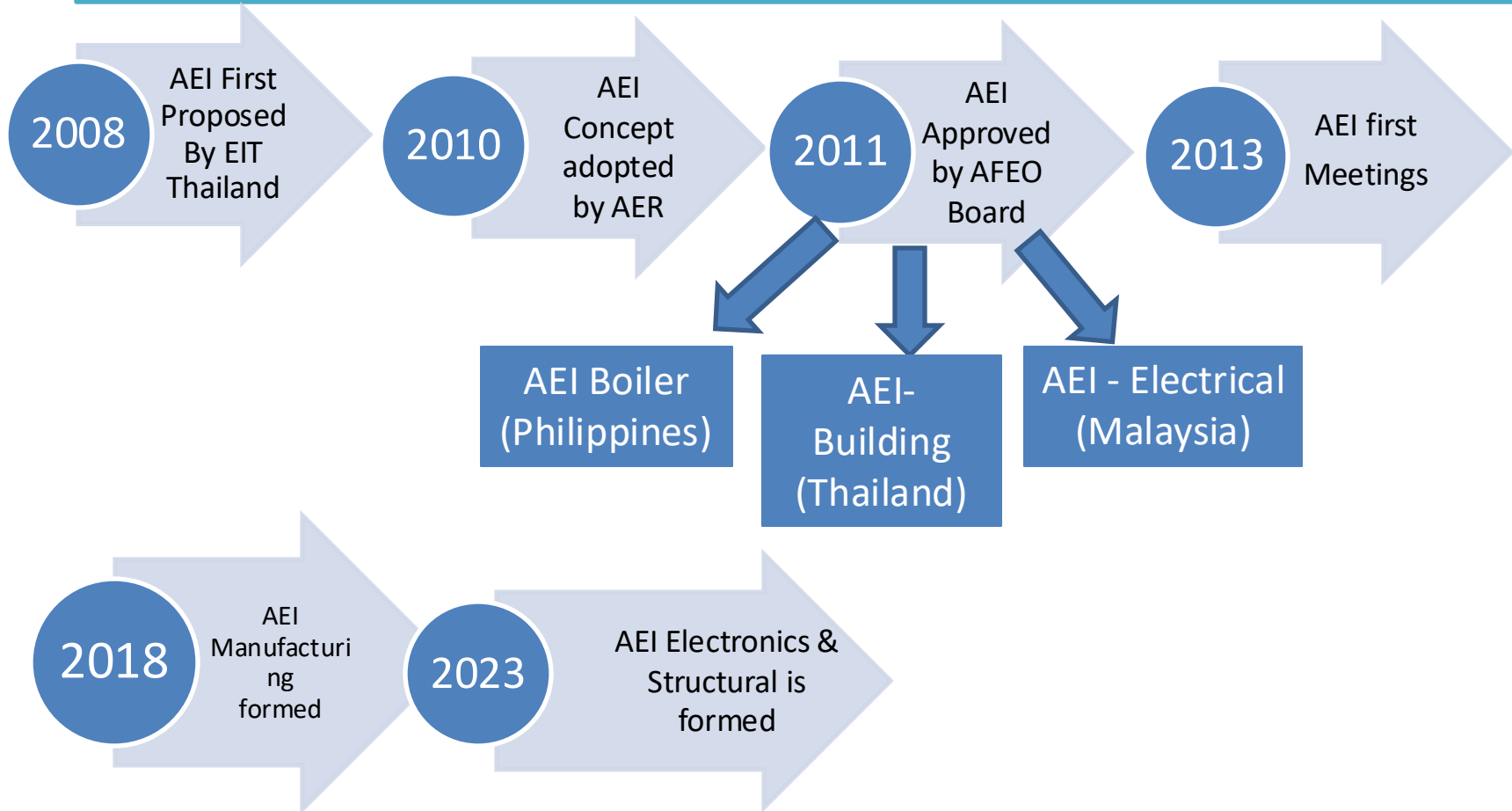
AER



AEI

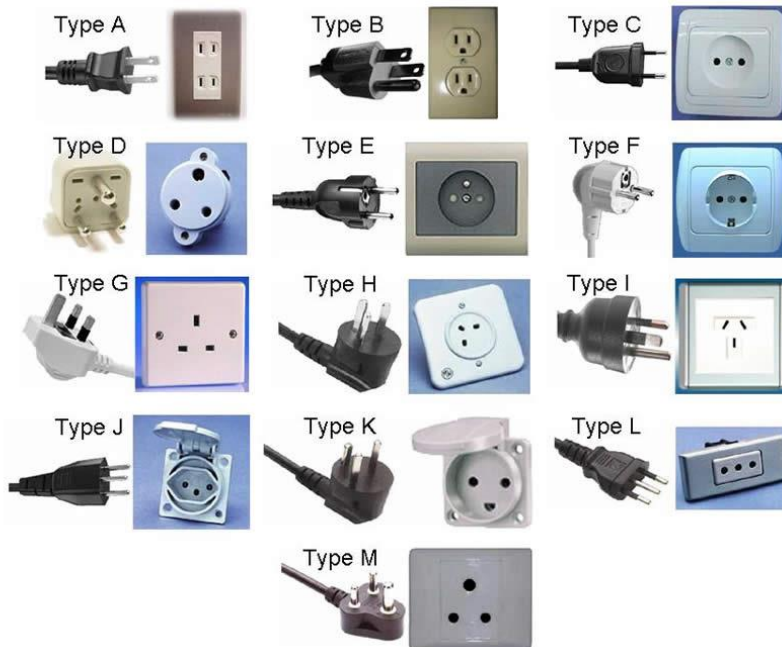


ASEAN Engineering Inspectors (AEI) initiative led by the industry

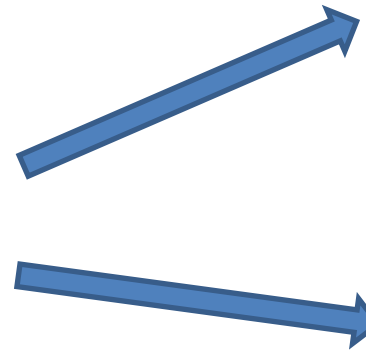


OVERVIEW OF AEI

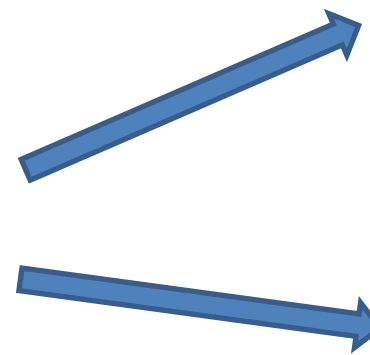
ASEAN Socket Outlets



Adaptors - Recognition



ASEAN Handphone Brands



Common Platform 5G/Wifi - Mutual Recognition



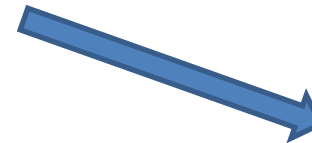
ASEAN Standards




*Mutual
Recognition
Of Standards*



New ASEAN
Engineering
Guidelines





Development of ASEAN ENGINEERS ASEAN STANDARDS



OVERVIEW



ASEAN ENGINEERS

Design Engineers

Contractors

Service/T&C Engineers

**How Many Are Able To Work ABROAD &
Outside The Country (ASEAN)?**

Can we do so?



OVERVIEW



ASEAN Regulations & Standards

Are We The Same Across ASEAN?



OVERVIEW



What is the basis of our AEI?



ASEAN & APEC Success Stories in Harmonization & Roadmap



ASEAN Charter



One Vision, One Identity, One Community

ASEAN Economic Community Framework

- Free flow of goods, investment, capital
- Free mobility of skilled labour

Harmonization of standards with reference to international standards

ASEAN CHARTER





The AEC Blueprint 2025 will build on the AEC Blueprint 2015.

On November 22nd 2015, the ASEAN leaders have agreed on the “**Kuala Lumpur Declaration on ASEAN 2025: Forging Ahead Together**” during the 27th ASEAN Summit held in Kuala Lumpur, Malaysia.

Amongst the highlights

- Acceleration on the **harmonization of standards** and of E-Commerce regimes
- **Straightening of services** and financial integration

ROADMAP TO AEC 2025



ELECTRICAL



CENELEC



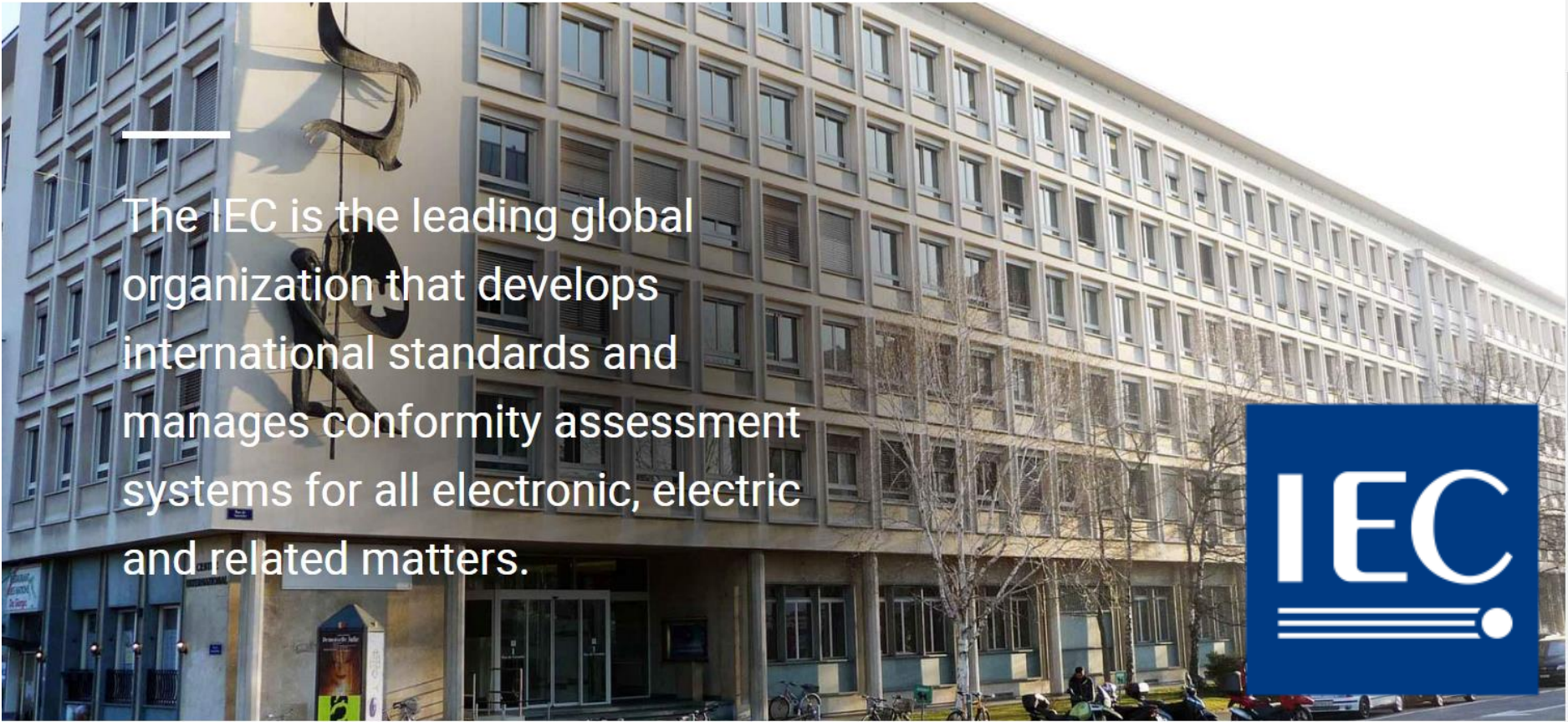
CENELEC is the **European Committee for Electrotechnical Standardization** and is responsible for **standardization in the electrotechnical engineering** field. CENELEC prepares voluntary standards, which help facilitate trade between countries, create new markets, cut compliance costs and support the development of a Single European Market.

CENELEC creates market access at European level but also at international level, adopting international standards wherever possible, through its close collaboration with the International Electrotechnical Commission (IEC), under the [Frankfurt Agreement](#).



IEC





The IEC is the leading global organization that develops international standards and manages conformity assessment systems for all electronic, electric and related matters.

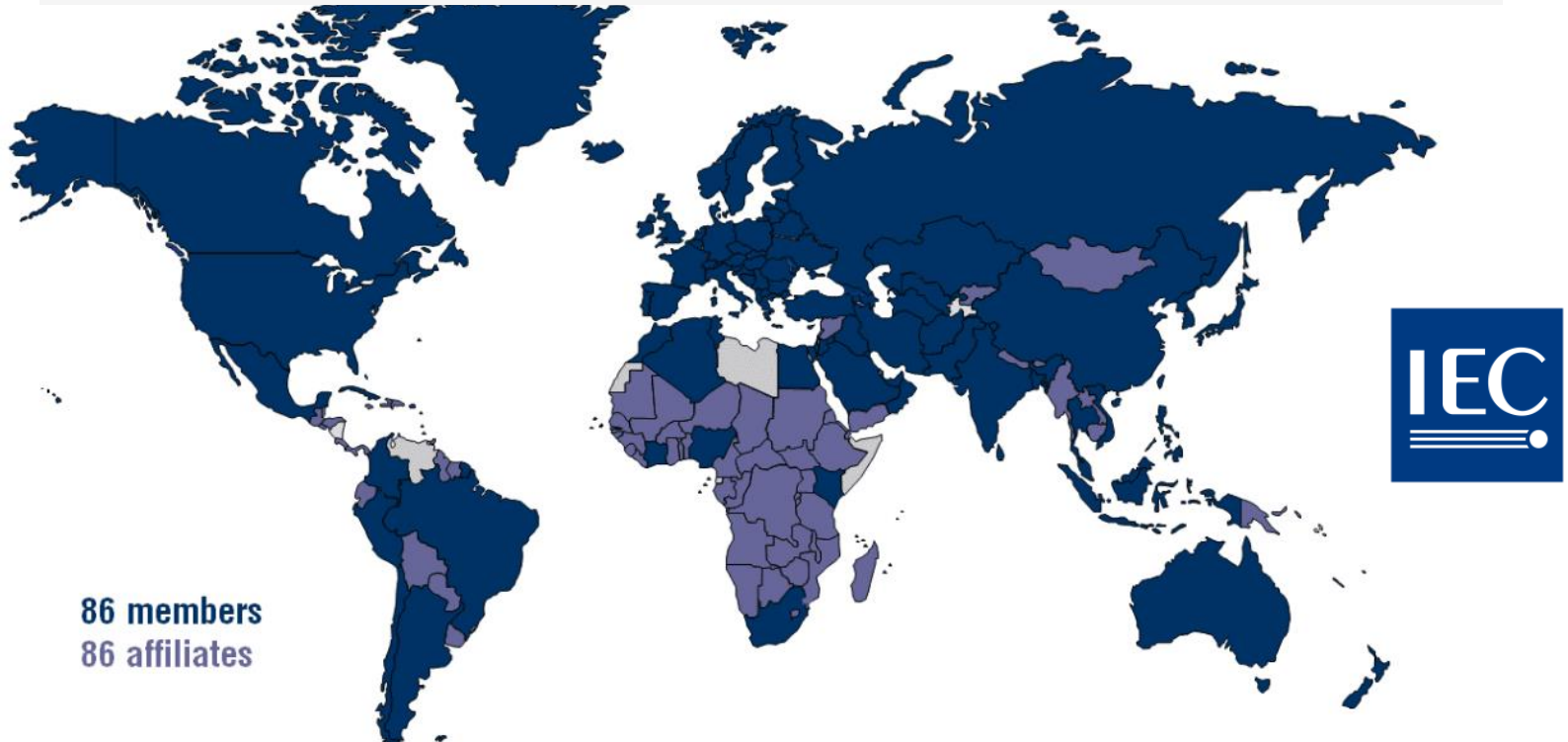


Source: IEC



A total of 172 countries are included in the IEC family, of which 86 are members and 86 are affiliates.

Combining the national committees and the Affiliate Country Programme, the IEC family spreads across more than 99% of the world's population.



Source: IEC



A total of 172 countries are included in the IEC family, of which 86 are **members** and 86 are **affiliates**.

Vision

"IEC everywhere for a safer, more efficient world."

Mission

"Our mission is to achieve worldwide use of IEC International Standards and Conformity Assessment Services that ensure the safety, efficiency, reliability and interoperability of electrical, electronic and information technologies, to enhance international trade, facilitate broad electricity access and enable a more sustainable world."



IEC Masterplan  473KB

About us

The IEC brings nations and experts together to develop International Standards which facilitate world trade by removing technical barriers to trade, leading to new markets and economic growth.

Through its **members**, the Commission promotes international cooperation on all questions of standardization and related matters, such as the assessment of conformity to standards, in all electrical, electronic and related technologies – collectively known as "electrotechnology".

The IEC's vision, mission and strategy is outlined in the **Masterplan**. This document takes into account the needs of the whole IEC community and of developing markets to shape the Commission's long-term objectives and policies.



A global network of some 170 countries that covers 99% of world population and electricity generation



Offers an Affiliate Country Programme to encourage developing countries to use and participate in IEC work free of charge



Develops International Standards that represent a global consensus of state-of-the-art know-how and expertise.
Administers Conformity Assessment Systems



Over 20 000 experts



100 years expertise.

White Paper For Electrical Installation Standards & Regulations In Buildings Amongst ASEAN Countries



Feasibility Study –

White Paper On Electrical Installation Standards In Buildings
Amongst ASEAN Countries



Prepared By:
Electrical Engineering Technical Division (EETD)
The Institution of Engineers, Malaysia (IEM)



Supported By:
International Copper Association Southeast Asia Ltd.



Copper Alliance



AEI-EI For Electrical Installation In Buildings White Paper For Electrical Installation Standards In Buildings Amongst ASEAN Countries

Report Outline

1 Chapter 1

ASEAN Electrical Installation Standards Executive Summary

- 1.1 Objectives
- 1.2 Studies Methodology
- 1.3 Key finding & Recommendations
- 1.4 Reference Standards
- 1.5 Findings and Summary Table Of Studies



Feasibility Study –

White Paper On Electrical Installation Standards In Buildings Amongst ASEAN Countries



Prepared By:
Electrical Engineering Technical Division (EETD)
The Institution of Engineers, Malaysia (IEM)



Supported By:
International Copper Association Southeast Asia Ltd.



Copper Alliance

OUTLINE OF REPORT



AFEO Energy WG: AEI For Electrical Installation In Buildings
Feasibility Studies – White Paper For Electrical Installation Standards In Buildings Amongst
ASEAN Countries

2 Chapter 2

Development and Recent ASEAN Initiatives

- 2.1 Development of ASEAN standards and roles of ASEAN
- 2.2 Global Landscape of Standard Development
- 2.3 ASEAN Electrical Standards Development – Role of ASEAN
- 2.4 ASEAN Electrical Installation Situation
- 2.5 Strength and Weaknesses of Electrical Installation In the ASEAN Region
- 2.6 The Electrical Installation Standards Cooperation

3 Chapter 3

Detailed Studies and Outlook of Each ASEAN Country

- 3.1 BRUNEI
- 3.2 CAMBODIA
- 3.3 INDONESIA
- 3.4 LAOS
- 3.5 MALAYSIA

OUTLINE OF REPORT



AFEO Energy WG: AEI For Electrical Installation In Buildings
Feasibility Studies – White Paper For Electrical Installation Standards In Buildings Amongst ASEAN
Countries

Report Outline

Detailed Studies and Outlook of Each ASEAN Country

- 3.6 MYANMAR
- 3.7 PHILIPPINES
- 3.8 SINGAPORE
- 3.9 THAILAND
- 3.10 VIETNAM

4 Chapter 4
Indicators & Way Forward

- 4.1 Electrical Installation differences
- 4.2 Potential
- 4.3 Proposed Activities

5 Chapter 5
References & Bibliography

OUTLINE OF REPORT



Detailed Studies Scope

- 1 Act & Regulation**
- 2 Mandatory Standards**
- 3 Government Agencies**
- 4 Standards Development**
- 5 Registration**
- 6 Statistics On Electrical Safety**
- 7 The Electricity Distribution Company**
- 8 Power Quality Requirements**
- 9 Voltage Level**
- 10 Inspection**
- 11 Constraints**
- 12 Other Findings Relevant To Our Studies And General Institutional Finding**

OUTLINE OF REPORT



Act & Regulation

Registration –

- Electrical Professional Engineers**
- Contractor**
- Inspection**
- Products**

Additional Findings

- Cable Colour Coding in ASEAN**
- Definition Of Electrical Competent Person in ASEAN**
- Electrical Inspection Methodology in ASEAN**
- Earthing Systems requirements**

KEY FINDINGS



Some Findings



Country	Status	Remarks
Brunei	Implemented since 2012	Based on IET Wiring Regulations Amendments
Cambodia	Both Accepted	Based on Cambodia's Electric Power Technical Standards of the Kingdom of Cambodia
Indonesia	Implemented since 2013	Peraturan Umum Industri Listrik tahun 2011 Amandemen 1 tahun 2013.
Laos	Not Mentioned	
Malaysia	In Process	UNITEN is appointed by Energy Commission To Carry Out on transition
Myanmar	No Plans To Convert Yet	
Philippines	Implemented 2009	Philippine Electrical Code
Singapore	Implemented since 1 st March 2011	
Thailand	Implemented in 2013	Thai Electrical Code 2013 (EIT)
Vietnam	No implementation yet	

The Future Of Cable Color Code



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Brunei	Implemented since 2012	Based on IET Wiring Regulations Amendments
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Vietnam	No implementation yet	

The Future Of Cable Color Code



Country	Definition Used	Remarks
Brunei	Registered Electrical Worker (REW)	Based on Electrical Installation Requirements 2011 — First Edition
Cambodia	Only Qualified Electrical Engineers is required	Based on Cambodia's Electric Power Technical Standards of the Kingdom of Cambodia
Indonesia	Kompetensi Instansi Pemanfaatan Tenaga Listrik	Peraturan Umum Industri Listrik tahun 2011 Amandemen 1 tahun 2013.
Laos	Not Mentioned	
Malaysia	Electrical Services Engineer, Competent Electrical Engineer, Electrical Supervisor, Chargeman & Cable Jointer, Wireman	Registered with Energy Commission
Myanmar	Professional Electrician Registration with the Ministry of Labour with 4 levels of trade skills	
Philippines	Master Electrician	Registered Under PCAB
Singapore	There are 3 classes of LEWs	
Thailand	No specific registration	
Vietnam	No definition as yet	

The Definition Of Electrical Competent Person



Country	Methodology Of Inspection	Remarks
Brunei	DES authorised persons or DES Approved (Specialised) Contractor/Inspectors.	Based on Electrical Installation Requirements 2011 — First Edition
Cambodia	Only Qualified Electrical Engineers is required	Based on Cambodia's Electric Power Technical Standards of the Kingdom of Cambodia
Indonesia	Electrical Installation has to be verified and approved by KONSUIL (Komite Nasional Keselamatan untuk Instalasi Listrik) atau PPILN (Perkumpulan Pemeriksa Instalasi Listrik Nasional),	Sertifikat Laik Operasi (SLO) will be issued upon approval.
Laos	Not Mentioned	
Malaysia	Electrical Contractor test and inspect before handover and register the installation.	Fill up forms
Myanmar	Inspection Only When Is Required	
Philippines	After completion of construction, government inspectorate will certify based on safety (fire) code. Government means city or municipal.	
Singapore	Certificate shall be issued by the electrical worker who carried out the inspection.	
Thailand	Visual inspection of buildings has to be done annually by certified building inspectors.	Building Inspectors falls under Public Works Department.
Vietnam	Only registration	

Electrical Inspection



Country	Methodology Of Inspection	Frequency Of Inspection	Remarks
Brunei	DES authorised persons or DES Approved (Specialised) Contractor/Inspectors.	<ul style="list-style-type: none"> ⌚ 10 years interval for domestic installation (private houses, flats). ⌚ 5 years interval for commercial properties (shops & offices), educational establishments (schools colleges & universities), hotels & boarding houses. ⌚ 3 years interval for factories, workshops and agricultural installation. ⌚ 1 year interval for petrol filling stations, public entertainment areas (theatres & cinemas), public launderettes, places of worship. ⌚ 6 months interval for construction sites and temporary installation. ⌚ Change of occupancy or owner 	Based on Electrical Installation Requirements 2011 — First Edition

Electrical Inspection



Country	Methodology Of Inspection	Frequency Of Inspection	Remarks
Cambodia	Only Qualified Electrical Engineers is required	No requirements and regulations	Based on Cambodia's Electric Power Technical Standards of the Kingdom of Cambodia
Indonesia	Electrical Installation has to be verified and approved by KONSUIL (Komite Nasional Keselamatan untuk Instalasi Listrik) atau PPILN (Perkumpulan Pemeriksa Instalasi Listrik Nasional),	1) Instalasi pembangkit tenaga listrik - 5 Tahun 2) Instalasi transmisi dan distribusi tenaga listrik - 10 Tahun 3) Instalasi pemanfaatan tenaga listrik TT dan TM 10 - 10 Tahun 4) Instalasi pemanfaatan tenaga listrik TR - 15 Tahun	Sertifikat Laik Operasi (SLO) will be issued upon approval.
Laos	Not Mentioned	No requirements and regulations	

Electrical Inspection



Country	Methodology Of Inspection		Remarks
Malaysia	Electrical Contractor test and inspect before handover and register the installation.	<p>(3) An installation, other than a domestic installation, shall be checked and tested by a competent person at least once in every five years, or at any time as directed by the Commission.</p> <p>(4) Any protective relay and device of an installation shall be checked, tested and calibrated by a competent person at least once in every two years, or at any time as directed by the Commission.</p>	Borang G & H
Myanmar	For hotels, motels and factory buildings, inspection is done annually. For residential, government office and other commercial building, inspection upon request	Yearly	

Electrical Inspection

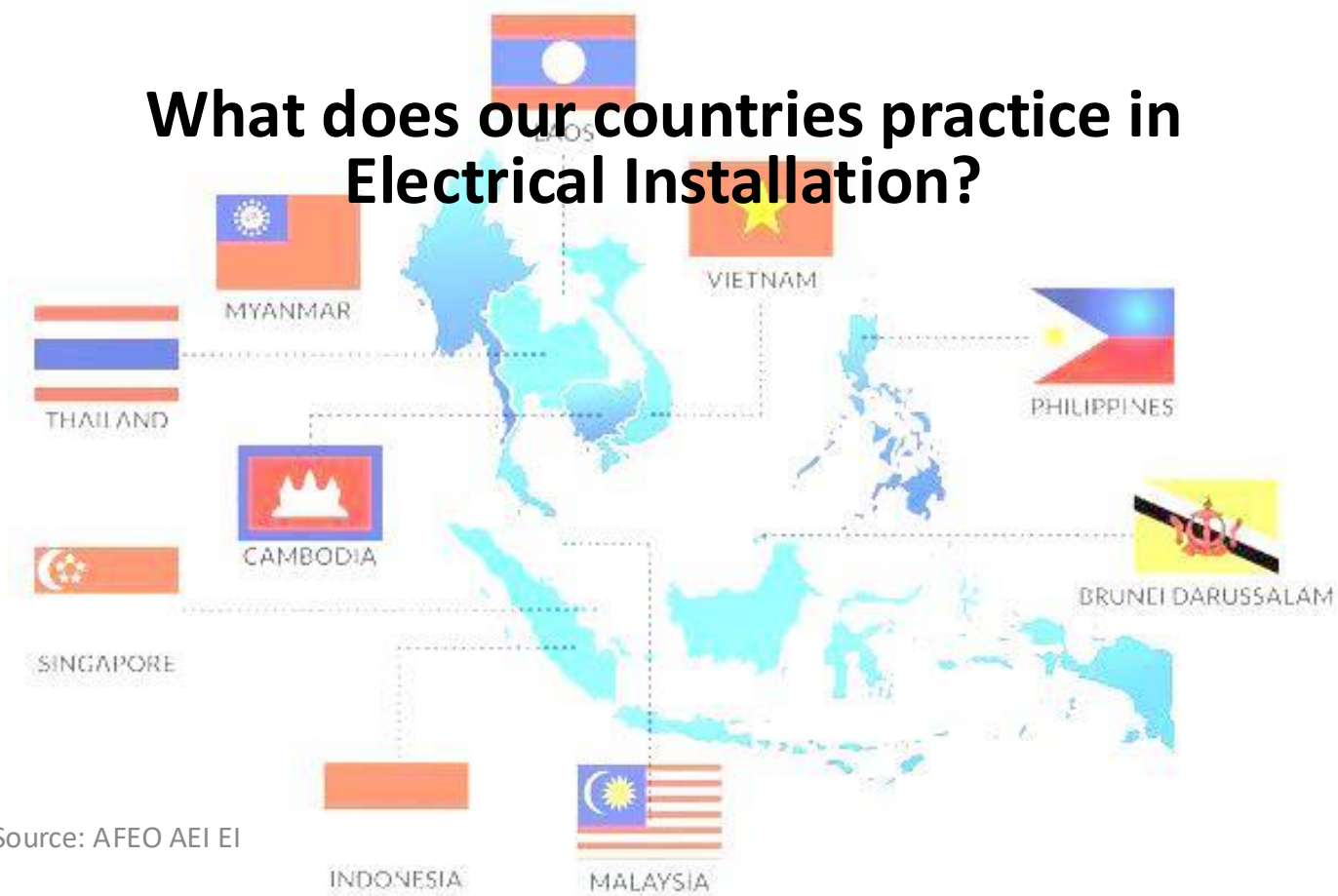


Country	Methodology Of Inspection	Frequency Of Inspection	Remarks
Philippines	After completion of construction, government inspectorate will certify based on safety (fire) code. Government means city or municipal (Office of the city electrician, fire department and department of labor and employment). This is for industrial, commercial & institutional buildings.	Yearly	
Singapore	Certificate shall be issued by the electrical worker who carried out the inspection.	Annually	Inspection carried out by LEW
Thailand	Visual inspection of buildings has to be done annually by certified building inspectors.	Annual Inspection	Building Inspectors falls under Public Works Department.
Vietnam	Only registration & maintenance servicing requirements.	No requirements	

Electrical Inspection



What do our countries practice in Electrical Installation?



Source: AFEO AEI EI

OVERVIEW – ASEAN ELECTRICAL SCENARIO



Description	Malaysia	Malaysia (Sarawak)	Brunei	Laos	Myanmar	Cambodia	Singapore	Thailand	Indonesia	Vietnam	Philippines
Electricity Regulations & Electrical Safety Regulations Authority	Energy Commission (EC)	Electrical Inspectorate Unit (EIU), Ministry of Public Utilities Sarawak	Department of Electricity Services (Till 2018), Electricity Authority Brunei Darussalam	The Ministry of Energy and Mines	Electrical Inspection Department, Directorate of Supervision and Inspection, Ministry of Industry	General Department of Energy, Ministry of Mines & Energy	Energy Marketing Authority (EMA)	Energy Regulatory Committee (ERC)	Direktorat Jenderal Ketenagalistrikan (DGE)	Ministry of Industry and Commerce, Ministry of Science and Technology, Ministry of Construction and other relevant ministries.	Board of Electrical Engineering (BEE)
Standards Writing Authority	Department of Standards Malaysia (DSM)	Refer to Department of Standards Malaysia (DSM)	Department of Electricity Services	The Ministry of Energy and Mines	Technical Committee of Electrical & Electronic, Ministry of Education	Ministry of Mines & Energy For Electrical Installation Works & Institute of Standards, Cambodia (ISC)	Spring Singapore (Standards, Productivity and Innovation Board)	Engineering Institute of Thailand (EIT) – for engineering standards	Standards Nasional Indonesia (SNI)	Directorate for Standards, Metrology and Quality (STAMEQ)	Institute of Electrical Engineers (IIEE) Philippines
Registration of Electrical Products	Energy Commission (EC)	Electrical Inspectorate Unit (EIU), Ministry of Public Utilities Sarawak	Authority For Building Construction Industry (ABCI) – Consumer Product	The Ministry of Energy and Mines	Electrical Inspection Department, Directorate of Supervision and Inspection, Ministry of Industry	Institute of Standards, Cambodia (ISC)	Spring Singapore (Standards, Productivity and Innovation Board)	Thai Industrial Standards Institute (TISI)	Lembaga Sertifikasi Produk	Ministry of Science and Technology (MOST)	Bureau of Products Standards (BPS)
National standards on Electrical Installation and Electrical Safety	MS1979, MS1936 & MS IEC 60364	Refer to Malaysian Standards & International Standards	Electricity Installation Regulation 2011 (EIR)	Lao Electric Power Technical Standards	Electricity Law 2014, National Building Code 2016	The Electricity Law - promulgated by the Royal Decree no.NS/RKM/0201/03, dated February 02, 2001	CP 5 & CP 88	Thai Electricity Code 2013	Electrical Installation Regulation: Persyaratan Umum Instalasi Listrik (PUIL) 2011	National Technical Regulation on Electrical Installations of Dwelling and Public Building & National technical regulation on Electric safety	National Electrical Code (NEC)
General Reference Standards	IEC	IEC/BS	IEC/BS	IEC	IEC	IEC	IEC/BS	IEC	IEC	IEC	Mixture

Source: AFEO AEI EI



AEI-EI

40

OVERVIEW – ASEAN ELECTRICAL



Recent Developments: EV Charging Requirements



GUIDE ON ELECTRIC VEHICLE CHARGING SYSTEM (EVCS)

SSS 111025

Package/Series Number	SSS 111025
Package/Series Title	Electric vehicles charging system
Synopsis	Electric vehicles charging system
Last Updated Date	04 Jul 2022

This package/series comprises:

TR 25-1:2022 Electric vehicles charging system - Part 1: Electrical safety and general requirements

TR 25-2:2022 Electric vehicles charging system – Part 2 : Low power charging

TR 25-3:2022 Electric vehicles charging system – Part 3: High power charging

TR 25-4:2022 Electric vehicles charging system – Part 4 : Battery swapping

1 Currently, the awareness of each other AMS standards is low and majority are unaware of the AMS regulatory requirements

2 There are differences in terminology and definition used in the standards

3 There are differences in the regulations' practice and implementation of standards

4 90% Of The ASEAN MEMBER STATES (AMS) adopts IEC Standards as based standards



5 Most of the AMS are willing to learn each other and share their knowledge counterparts

Source: AFEO AEI EI

AEI-EI

SUMMARY OF FINDINGS



43

Part 6 Verification of Installations (revised)



Initial verification : Inspection & Tests

- Method of protection against electric shocks (Chap 41)
- Protection against fire & thermal effects (Chap 42)
- Cross section of conductors (Chap 43)
- Protection against overvoltages (Chap 44)
- Identification of neutral and protective conductor (Chap 51)
- Selection of protective devices (Chap 53)

Periodic verification : frequency

- **General case several years (e.g. 4 years)**
- **Dwelling 10 years recommended**



AEI-EI

Latest in IEC Findings



44

Installation Rules recommend the use of AFDD

how to understand the standard ? (new)

1. IEC 60364-4-42 (2014) recommends the use of AFDD to protect against arc fault in final circuit
 - > in premises with sleeping accommodations : **e.g. bedrooms (in residential), hotels**
 - > in locations with risks of fire due to the nature of processed or stored materials: **e.g. barns, wood-working shops, stores of combustible materials**
 - > in locations with combustible constructional materials: **e.g. wooden buildings**
 - > in fire propagating structures: **e.g. high rise buildings**
 - > in locations with endangering of irreplaceable goods : **e.g. museums**
2. In a.c. circuits, the use of arc fault detection devices (AFDD) in compliance with IEC 62606 will satisfy above-mentioned recommendation : **to promote conformity marks**
3. The AFDD shall be installed at the origin of the final circuit to be protected : **in the switchboard**

AEI-EI

Latest in IEC Findings



45

IEC 60364-8-1: Energy Efficiency

Main principles



Energy Efficiency in electrical installation
is a system approach based on the 3 main following principles:

1. Minimize energy losses
In the electrical installation

2. Use energy:
at the right time
when needed
- at the lower cost

3. Maintain the
performance

Note: safety shall be maintained when implementing energy efficiency measures

9

AEI-EI

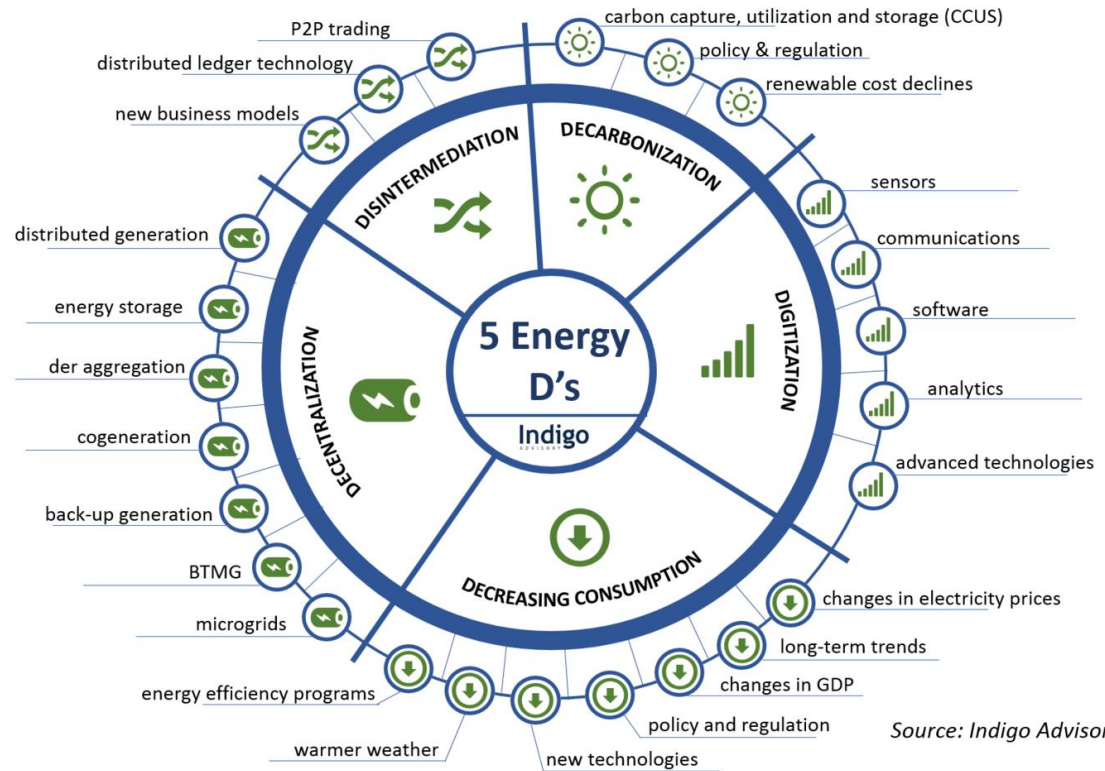
Latest in IEC Findings



46

The Future

The 5D Energy Transition



Source: Indigo Advisory

AEI-EI

47

Latest in IEC Findings





IEC White Papers
& Technology Reports



- Virtualising power systems
- Zero carbon power systems
- Power semiconductors for an energy-wise society
- LVDC: electricity for the 21st century
- Factory of the future
- Global energy interconnection
- IoT 2020: Smart and secure IoT platform
- Strategic asset management of power networks
- Orchestrating infrastructure for sustainable Smart Cities
- Internet of Things: Wireless Sensor Networks
- Microgrids for disaster preparedness and recovery - With electricity continuity plans and systems
- Nanotechnology in the sectors of solar energy and energy storage
- Grid integration of large-capacity Renewable Energy sources and use of large-capacity
- Electrical Energy Storage
- Electrical Safety

AEI-EI

Latest in IEC White Paper



48



TOWARDS ONE ASEAN, ONE COMMUNITY & ONE STANDARDS



PROMOTIONAL



Upcoming Webinars

Global Outreach Expert Series (GOES 2.0) - starting February 2025



Global Outreach Series (GOES) #9

WEBINAR TALK ON

RECENT UPDATES ON LIGHTNING PROTECTION STANDARD IEC 62305-2 LIGHTNING RISK MANAGEMENT

ALAIN ROUSSEAU

29 FEB THURSDAY

06.00 PM - 7.30 PM

REGISTER HERE

Jointly Organised between Electrical Engineering Technical Division and ASEAN Engineering Inspectors - Electrical Installation (AEI-EI)

ASEAN ENGINEERING REGISTER



Global Outreach Series (GOES) #12

WEBINAR

Personal lightning Protection Shelters LPS

30TH APRIL, 2024 AT 9.30AM - 11.30AM

VIA ZOOM PLATFORM


Speaker: Francisco Roman

Synopsis

In Colombia there have been many lightning accidents due to its location in the tropics. In our EMC research group we are developing lightning protection shelters using conductive textiles and in this oral presentation we present the main lightning accidents we have in our country and the need to develop portable LPS. The main topic of our presentation is the testing of portable LPS against direct and indirect lightning strikes.

Jointly Organised between Electrical Engineering Technical Division and ASEAN Engineering Inspectors - Electrical Installation (AEI-EI)

ASEAN ENGINEERING REGISTER



Webinar Talk

LATEST DEVELOPMENT IN SOCKET-OUTLETS AND SWITCHES STANDARDISATION

Join Our Talk for Inspiration and Insights

24th May, 2024 **Start at 3.00pm** **Zoom Platform**

Cristiano Masini

Secretary of Subcommittee 23B of IEC

Secure Your Seat!

Register

